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Planning Proposal Report

Proposed Amendment to Dubbo LEP 2022.

Client: Spicers Creek Wind Farm

Site Address: Part Lot 101 in DP 1301426, Dubbo

20 March 2025

Our Reference: 42896-PR01_E

DISCLAIMER

This report has been prepared solely for **Spicers Creek Wind Farm** in accordance with the scope provided by the client and for the purpose(s) as outlined throughout this report.
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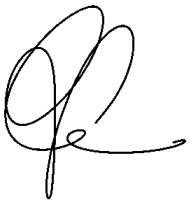
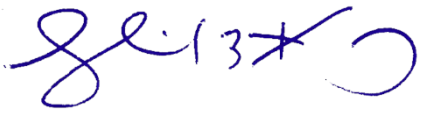
Project Name:	Planning Proposal Report Part Lot 101 in DP 1301426, Dubbo
Client:	**Spicers Creek Wind Farm**
Project Number:	42896
Report Reference:	42896-PR01_D
Date:	20/03/2025

Prepared by:	Reviewed by:
	
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1. INTRODUCTION

1.1. Background

Barnson Pty Ltd has been enlisted by Spicers Creek Wind Farm "proponent" to prepare this Planning Proposal aimed at modifying the *Dubbo Local Environmental Plan 2022*. The proposal seeks to rezone a specific section of Lot 101 in Deposited Plan 1301426 that has a current land zoning of R2 – Low Density Residential to R1 – General Residential. The objective of this rezoning is to enable various forms of residential accommodation within a well-suited area of Keswick, a suburb in Dubbo. This location is strategically situated in close proximity to parklands, local centres, and transportation nodes.
The proposed amendment aligns with the NSW Government Department of Planning, Housing and Infrastructure Central West and Orana Regional Plan 2041, as well as the Dubbo Regional Council Local Strategic Planning Statement and Dubbo Residential Area Strategies, along with other pertinent future plans. This modification is anticipated to foster more diverse housing options, ultimately contributing to the availability of affordable housing.

1.2. Planning Proposal

Spicers Creek Wind Farm has engaged Barnson Pty Ltd to assist with the preparation of a Planning Proposal affecting a portion of the land legally described as Lot 101 in Deposited Plan 1301426– referred to as "the site", that seeks to amend the *Dubbo Local Environmental Plan* by way of:

1. Land Rezoning – Rezone a portion of residential land to R1 – General Residential.
2. Minimum Allotment Size – Remove the Minimum Allotment Size.

Consistent with the NSW Government Planning & Environment's *Planning Proposals: Local Environmental Plan Making Guideline* (the Guide), this Planning Proposal has been prepared in the following format:

- Part 1 – Objectives or intended outcomes
- Part 2 – Explanation of Provisions
- Part 3 – Justification and strategic and site-specific merit
- Part 4 – Maps
- Part 5 – Community Consultation
- Part 6 – Project Timeline

1.3. Proponent

The proponent for this Planning Proposal is Spicers Creek Wind Farm.

1.4. Consultant

Josh Eagleton
Barnson Pty Ltd
Suite 34/361 Harbour Drive
Coffs Harbour NSW 24500

1.5. Supportive Documentation

This Planning Proposal is supported by the following documentation.

Table 1: Appendix

Document	Prepared by	Date	Appendix
Deposited Plan	NSW LRS		Appendix A
Aboriginal Heritage Due Diligence Assessment	AREA	March 2024	Appendix B
Biodiversity Assessment Report	AREA	March 2024	Appendix C
Preliminary Site Investigation	Barnson	March 2024	Appendix D
Traffic Impact Statement	McLaren Traffic Engineering	March 2024	Appendix E
Planning Proposal Plan	Barnson	March 2024	Appendix F

2. PLANNING PROPOSAL AREA

2.1. Location and Title

Subject Land

The planning proposal pertains to a portion of property legally described as Lot 101 in Deposited Plan 1301426 – Figure 1. The portion of the property is known as Stage 8 by Dubbo Regional Council, relating to the Keswick Estate.

Figure 1: The Site (Identified in black)
Source: SIXMAPS (Edited by Barnson Pty Ltd)

Table 2 Provides a summary of the key attributes of the site.

Table 2: Subject Land Details Summary

Street Address:	Boundary Road
Suburb:	Dubbo (Keswick)
Subject Land Property Description:	Lot 101 in Deposited Plan 1301426
Existing Land Zone Land Zoning:	R2 – Low Density Residential
Name of Landowner:	Dubbo Regional Council
Local Government Area:	Dubbo Regional Council

A copy of the titles and deposited plans have been provided at **Appendix A** of this report.

Images 1-3 below depict the site. The pictures were taken in November 2023.

Image One: Boundary Road (Intersection of Sheraton Road)

Image one illustrates the upgrades works undertaken along Boundary Road and the frontage of the site (site on right hand side of photo).

Image Two: Planning Proposal Area

Image two is taken from the intersection of Boundary Road and Sheraton Road and looks across the front of the site (in a westerly direction). The Image illustrates the lack of significant vegetation and stockpiles currently within the boundaries of the site.

Image Three: Sheraton Road

Image Three was taken from the intersection of Boundary Road and Sheraton Road, looking north along Sheraton Road. The road resembles a sealed dual lane rural road. As you head further north along the road, upgrade works have been undertaken close to Dubbo Sports World and several educational establishments.

The property is situated in Keswick Estate, near schools, shopping centres, hospitals, parklands, and neighbourhood hubs – **Figure 2**. Keswick Estate, encompassing approximately 354 hectares of land, is positioned at the southeastern periphery of Dubbo's established urban area, forming part of the South-East Dubbo Residential Urban Release Area. Additionally, the site is on the border of the South Lakes/Hillview Urban Release Area, commencing on the southern side of Boundary Street.

Figure 2: The Site (Identified in red)
Source: South East Residential Urban Release Area Structure Plan

2.2. Existing Land Use

The site is located within the Local Government Area (LGA) of "Dubbo Regional" and is therefore subject to the provisions of the *Dubbo Regional Local Environmental Plan* 2022 (DRLEP 2022). The DRLEP 2022 establishes a policy framework for land use planning decisions and guides the community in terms of how land can and cannot be used within the Shire. The site has a current land zoning of R2 – Low Density Residential (Refer to Figure 3 below).

The site is located 6 kilometres southeast of the Dubbo Regional Central Business District. The site sits adjacent to the Land Zoned of R1 – General Residential land and E1 - Local Centre, being land nominated as part of the Hillview and South Lakes Urban Release Area. Notably, a large amount of the R1 – General Residential Land has either been subdivided for residential use as detached single/ double storey dwellings, with a small portion of the land being used for higher density housing, including multi dwelling housing or a variation of dual occupancies.

The site is positioned close to several key locations. Nearby are Dubbo Christian School, St John College, and Dubbo Sports World, all situated to the north along Sheraton Road. Additionally, a quarry via Sheraton Road is over 2kms away from the site.

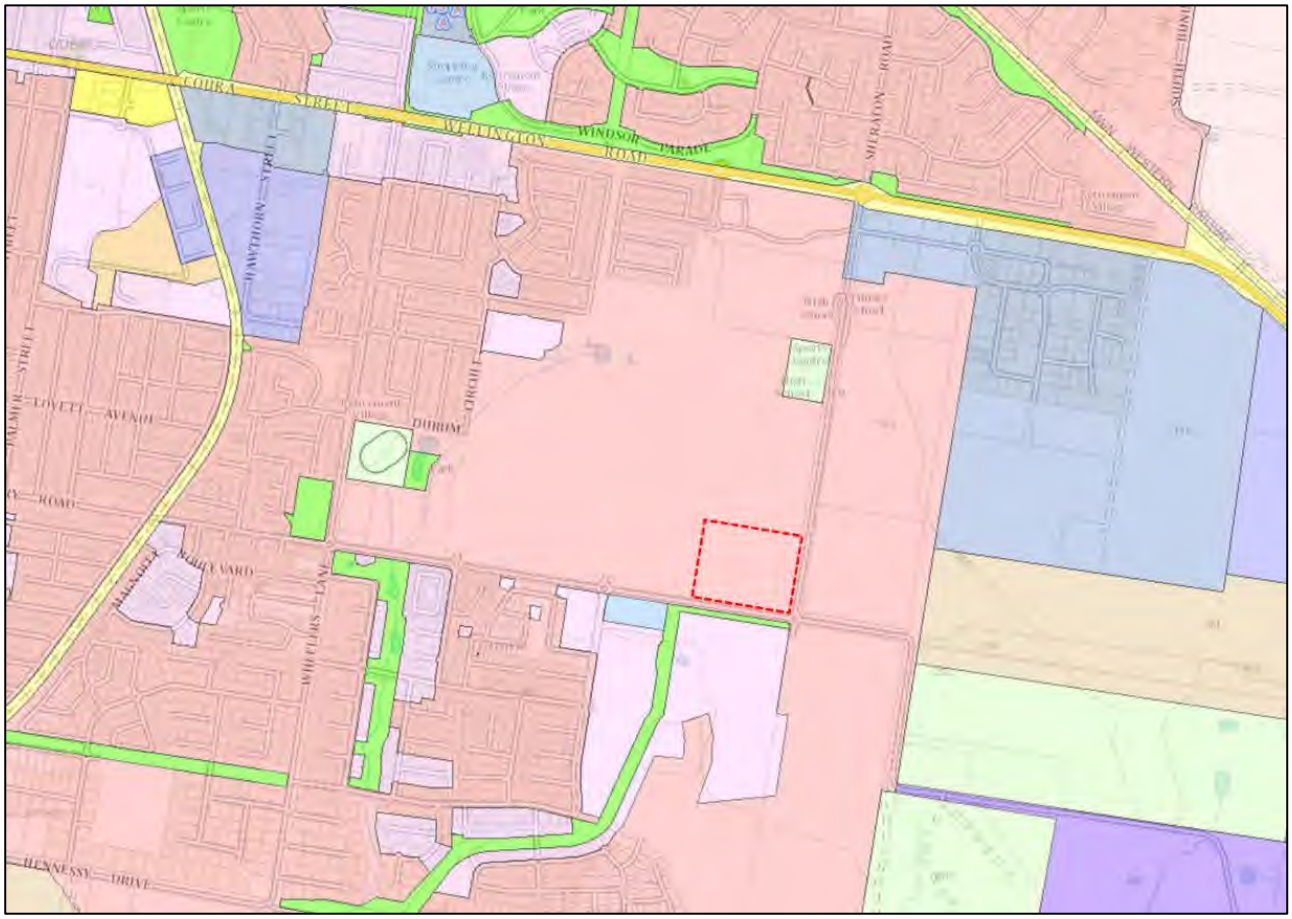


Figure 3: Existing Land Use Zones – Dubbo Regional LEP 2022
Source: Barnson Pty Ltd

2.3. Existing Lot Size

The current Minimum Allotment Size for the subject site is 600m^2 under the DRLEP 2022 – **Figure 4**. It is noteworthy that the land zoned R1 – General Residential throughout the Urban Release Area has no Minimum Allotment Size designated. Currently Dubbo Regional Council assess the subdivision of land in accordance with objectives of the zone and the planning controls within the Dubbo Regional Development Control Plan 2013 relating to building envelopes, setbacks, private open space, landscaping and any other constraints that may pertain to the development of the land.

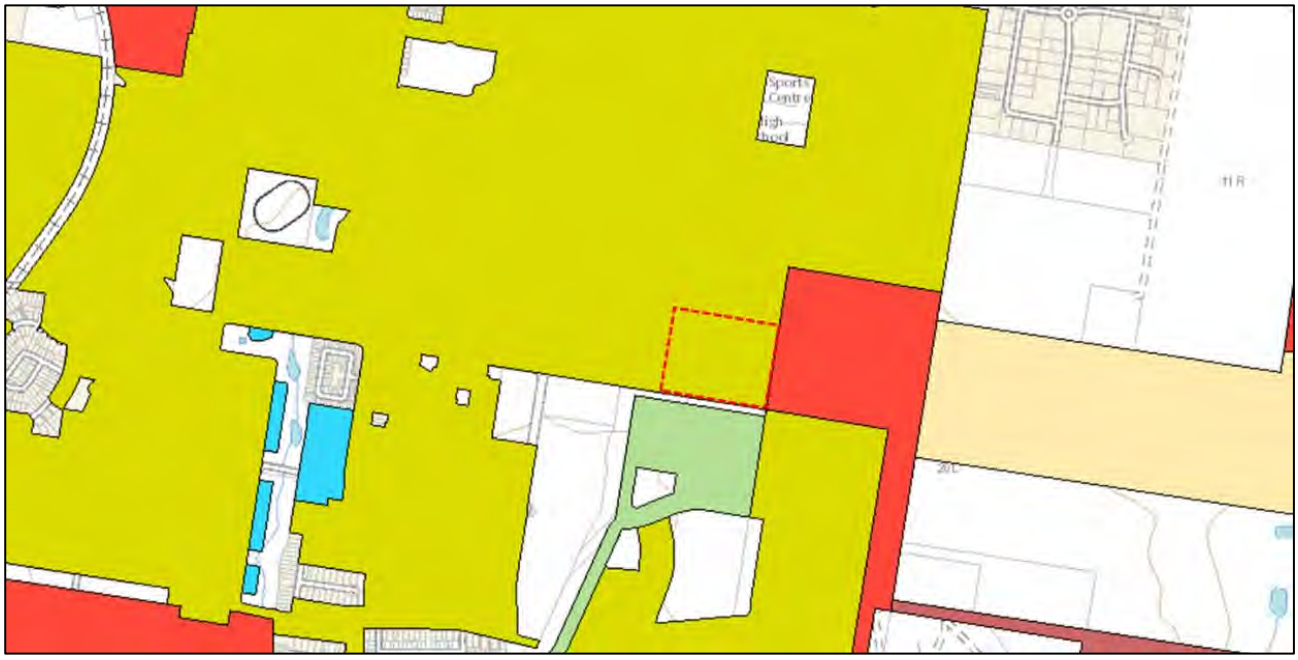


Figure 4: Existing Minimum Allotment Size – Dubbo Regional LEP 2022
Source: NSW Legislation – Edited by Barnson Pty td

2.4. Topography

A Site Survey has not been undertaken over the site. However, a site walk over has been undertaken and Barnson can confirm that the site is generally flat with a slight grade to the west of the site. The site has limited vegetation within its boundary, with sparse trees scattered throughout the area. Stockpiles are located at southeastern portion of the site – **Figure 5**

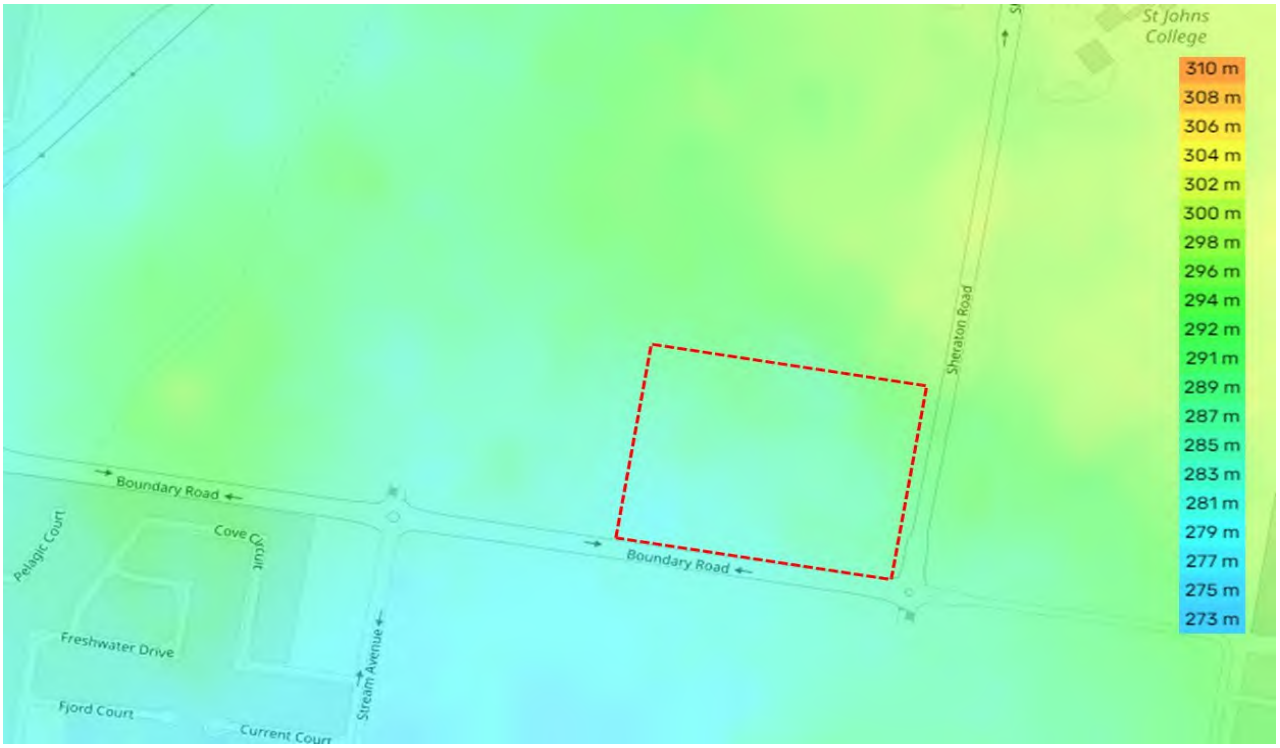


Figure 5: Topography of the Planning Proposal Area
Source: SixMaps – Edited by Barnson Pty Ltd.

2.5. Heritage

European Heritage

The site and immediate surrounding area have not been identified on the existing DRLEP 2022 Heritage Mapping to accommodate any heritage items or to be located within a heritage conservation area. A review of Schedule 5 of the DRLEP 2022 does not include any heritage items within proximity to the subject site. The closest items have been identified in **Figure 6** – these include:

- Item I143 – Communication Bunk (Local Item – hatched brown) – Keswich Parkway -Lot 307-315, DP1266543. This item is located approximately 1km away from the site.
- Item I194 – RAAF Stores Depot (State Item – hatched blue) – Palmer Street – Lot 1-3 in DP1263883. This item is located more than 2kms away from the site.

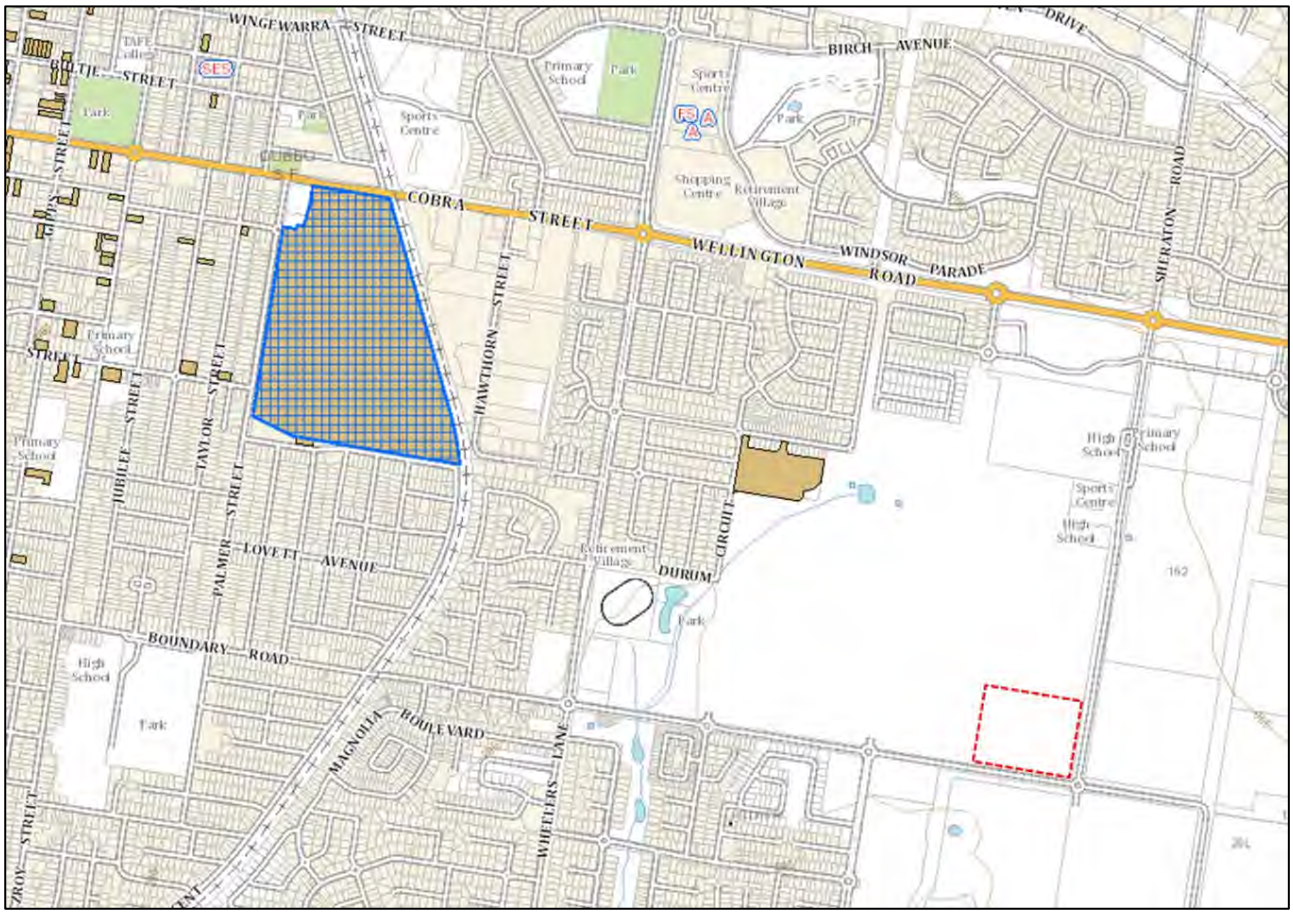


Figure 6: Heritage Map – DRLEP 2022
Source: NSW Legislation - Edited Barnson Pty Ltd

The planning proposal does not affect any items, areas, objects, or places of heritage significance. Hence, no additional European heritage investigation was conducted to support this planning proposal.

Aboriginal Cultural Heritage

In the preparation of the Planning Proposal, the services of Area Environmental and Heritage Consultants were enlisted to conduct an Aboriginal Heritage Due-Diligence assessment - **Appendix B**. The reporting adheres to the guidelines outlined in the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (NSW Department of Environment Climate Change and Water (DECCW), 2010b). The primary objective of this report is to ascertain whether the proposed project would have any impact on Aboriginal objects or areas of archaeological significance within the study area, and to meet the stipulations set forth in relevant codes and legislation should development proceed. The on-site inspection was carried out on 8 February 2024 by Kim Newman, an archaeologist. It's noteworthy that the Aboriginal community was not engaged in this assessment, however the Local Aboriginal Land Council will be referred to as part of the Gateway Process.

Historically, the land has been utilised for agricultural purposes. The southern part of the study area exhibits significant ground disturbance, reducing the likelihood of finding any heritage objects. Conversely, the northern section, having experienced less disturbance, presents minimal ground surface visibility. On 7 February 2024, a search of the AHIMS database (Service ID 862037) was conducted, providing archaeological context for the area and identifying any previously documented Aboriginal sites within or adjacent to the study area. The search revealed nine Aboriginal sites recorded within a 1000-metre radius of the Planning Proposal area – see **Figure 7**. The predominant site type recorded was modified trees, followed by artefact sites. None of these previously recorded Aboriginal sites are situated within the Planning Proposal area itself. The nearest sites, three (3) culturally modified trees (scarred), are approximately 400 metres to the north and west of the study area (AHIMS ID 36-1-0181, AHIMS ID 36-1-0180, AHIMS ID 36-1-0213). The two (2) artefact sites are located to the south, approximately 500 metres north of Eulomogo Creek, down the slope.

The investigation has recommended if any proposed development occurs over the study area, that further assessment and consultation take place. If Aboriginal objects are not recorded and are considered unlikely to occur, the development may proceed with caution. In the event Aboriginal objects are recorded, an Aboriginal Cultural Heritage Assessment Report will be required, involving full consultation according to clause 60 of the National Parks and Wildlife Regulation 2019.

Figure 7: AHIMS Search
Source: Aboriginal Heritage Due-Diligence assessment – AREA

2.6. Flora and Fauna

In preparation for this Planning Proposal, AREA Environmental and Heritage Consultants were engaged to produce a Biodiversity Assessment Report (BAR) – **Appendix C**. The BAR was conducted to meet the obligations outlined in Section 5.5 of the *Environmental Planning and Assessment Act 1979*, which requires a thorough examination of all environmental factors relevant to the proposed activity. Additionally, the assessment addressed the requirements set forth in Section 7.3 of the *Biodiversity Conservation Act 2016* (BC Act), focusing on impacts to nationally listed threatened species, ecological communities, and migratory species as per the guidelines outlined in the Matters of National Environmental Significance: Significant Impact Guidelines 1.1 of the *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) (DoE, 2013).

The Planning Proposal Area, approximately 10.51 hectares located on the outskirts of Dubbo, NSW, is zoned for low-density residential use. The land has undergone significant disturbance and historical clearing, with a ground cover consisting of both exotic and native species along with remnants of paddock trees. A field assessment for the Planning Proposal was conducted on February 8, 2024, utilising the Biodiversity Assessment Method 2020 (BAM) (NSW DPIE, 2020). This assessment included BAM vegetation integrity plots, habitat assessment, and preliminary searches for threatened flora and fauna species. Three BAM vegetation plots were utilised to evaluate the native vegetation present on the subject land. It was determined that one Plant Community Type (PCT), PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions, covers approximately 9.06 hectares of the subject land where native vegetation exists. Approximately 1.45 hectares of the land have no vegetation due to previous clearance for an existing access track and stockpile – Figure 8.

Figure 8: PCT Ground Truthing
Source: Biodiversity Assessment Report - AREA

The assessment determined that no threatened species listed under the EPBC or BCA were recorded during the field survey. The BAM calculator provided a list of predicted threatened species which are known to have associated with PCT 76 on the subject and are assumed to have potential to use the habitat. These species can only be excluded where specific habitat or geographic constraints are not present in the subject land. Targeted species surveys have not been undertaken as part of the Planning Proposal, however, will likely be completed as part of the preparation of any future development application.

Significantly, the site is designated as R2 – Low Density Residential, allowing development in accordance with the applicable development regulations. The Planning Proposal does not aim to rezone areas recognized for their high environmental significance; instead, it has thoroughly assessed the ecological impact of potential development on the land. It's important to note that the extent of this impact will be assessed during the Development Application (DA) stage.

2.7. Hazard

Bushfire Prone Land

The Planning Proposal Area is not identified as Bushfire Prone Land under section 10.3 of the EP&A Act – **Figure 9**. Therefore, Direction 4.3 issued by the Minister for Planning under Section 9.1.(2) of the *Environmental Planning and Assessment Act 1979* and *Planning for Bushfire Protection 2019* is not applicable to this Planning Proposal. Notably, the site is part a residential release area that is currently undergoing significant development and therefore any potential bushfire hazards that may be identified within proximity to the site will not have a significant impact on the future development of the site.

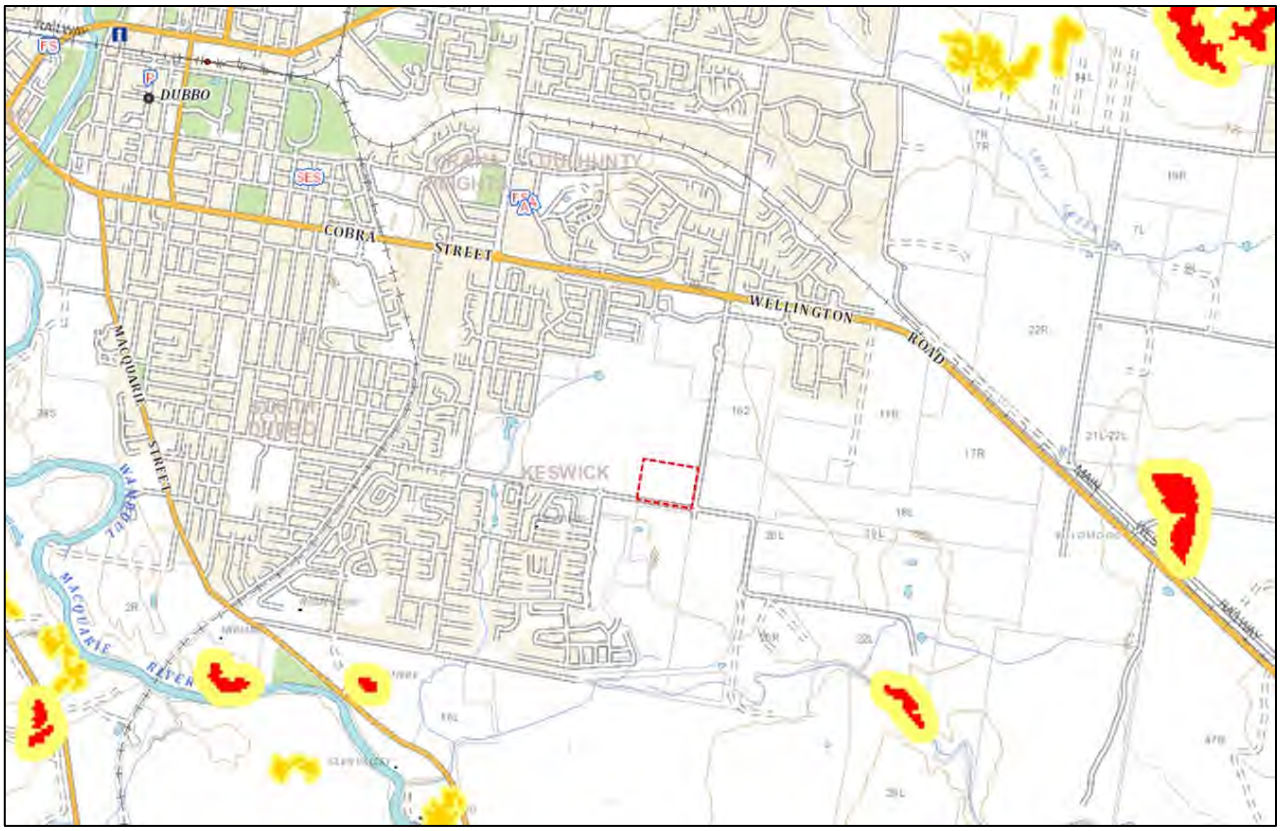


Figure 9: Bushfire Prone Land – site area identified in RED
Source: E Planning Mapping – Edited by Barnson Pty Ltd

Flooding

The evaluation of Dubbo's Flood Risk Management Plan reveals that the Planning Proposal Area remains unaffected by flooding – **Figure 10**. The comprehensive review concludes that the risk of flooding is localised to the southern region Dubbo, extending more than 2kms away. This flood affectation is intricately linked with the Wambuul Macquarie River. Notably, the site sits adjacent to the dedicated drainage land that runs parallel to Boundary Road, and traverses south. The existing Keswick Estate benefits from this drainage land.

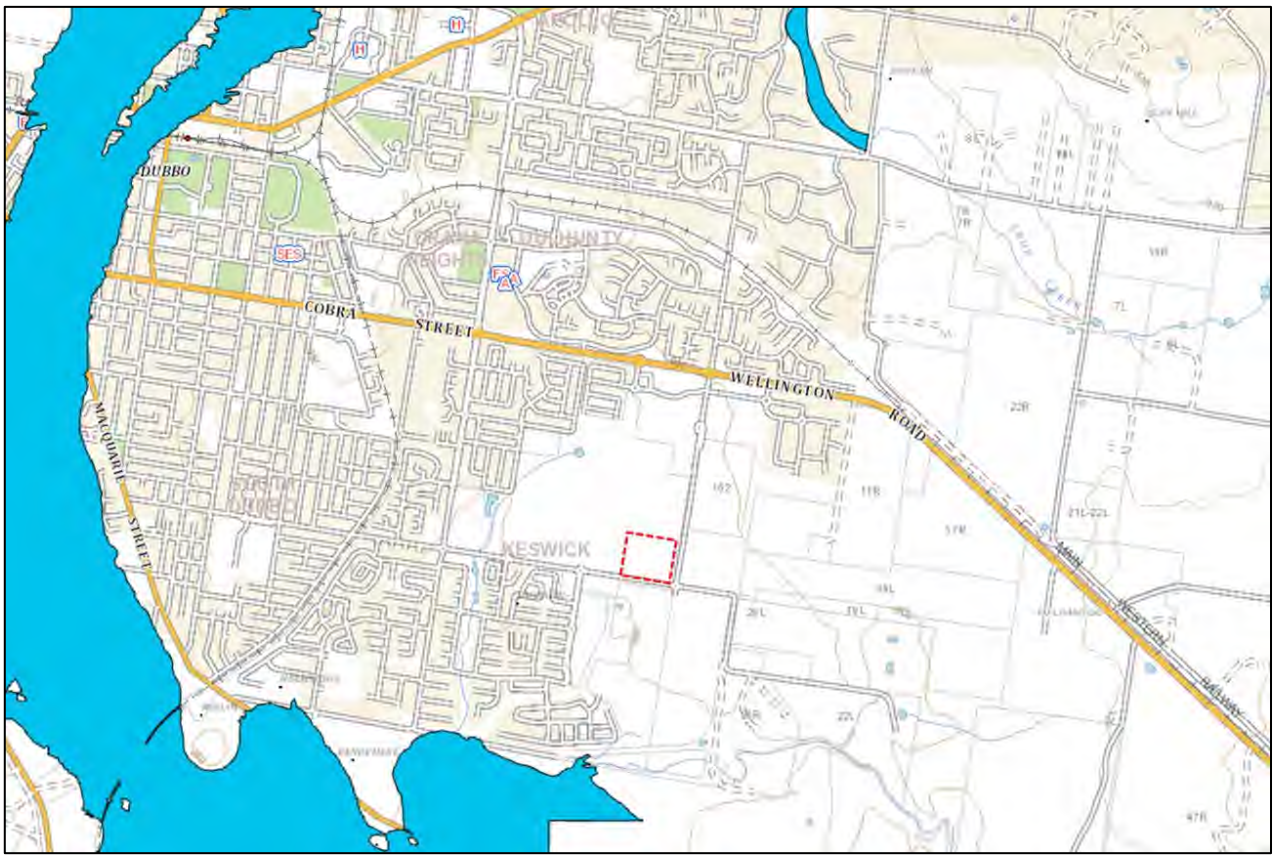


Figure 10: Flood Prone Land
Source: Dubbo Flood Risk Management Plan – Edited by Barnson Pty Ltd

2.8. Land and Soil Capabilities.

Contamination

As part of the preparation of this Planning Proposal, Barnson was engaged to prepare a Preliminary Site Investigation Report – **Appendix D**. The investigation had as its objectives to identify any contamination issues that may affect the suitability of the site for future residential development and assess the need for possible further investigations, remediation or management of any contamination issues identified. The investigation was based on a desktop review of information available for the site, as well as the findings of a site inspection and confirmatory sampling and analysis of surface soils collected at the site. A review of the available historical information, including contaminated sites databases, indicated no recorded activities with the potential to significantly contaminate the site. Historical aerial photographs of the site indicated that the land use at the site has been vacant for an extended time. However, recent road construction saw a part of the site being used as a storage yard.

A site inspection, supplemented with confirmatory sampling and analysis, was conducted to determine the presence and significance of potential contamination associated with the identified sources. Figure 11 illustrates the location of 14 samples, at 10 selected locations across the site.

Figure 11: Sample Location
Source: Preliminary Site Investigation – prepared by Barnson Pty Ltd

Chemical analysis of the surface soil revealed that no contamination is present above risk-based screening criteria. Based on the findings of the desktop review and site investigation it was concluded that the subject site is suitable for the proposed construction and further development. There are no identified contaminants present that are likely to present a risk of impact to the health of humans or the environment from the proposed future use.

2.9. Services

Gas

Natural Gas is available to the site.

Telecommunications

Pit and pipe are installed on the western side of the northern leg of the Boundary Road and Stream Avenue roundabout allowing the extension of the NBN.co fibre network to the site.

Electricity Services

The land in question currently lacks power supply. However, there is access to existing conduits nearby, facilitating the extension of Essential Energy networks. These conduits can be found on the western side of the Boundary Road and Stream Avenue roundabout. They are linked to established high voltage (11kv) infrastructure at Wheelers Lane and Sheraton Road. Additionally, a low voltage pole (415V) is accessible. It's important to mention that twin 11kV feeds run along the northern edge of Boundary Road (depicted as blue dashed lines in Figure 12), connecting the South Keswick Solar Farm with the Keswick Zone Substation. However, these cables are encased in thermal concrete and cannot be utilised to power the specific land parcel in question.

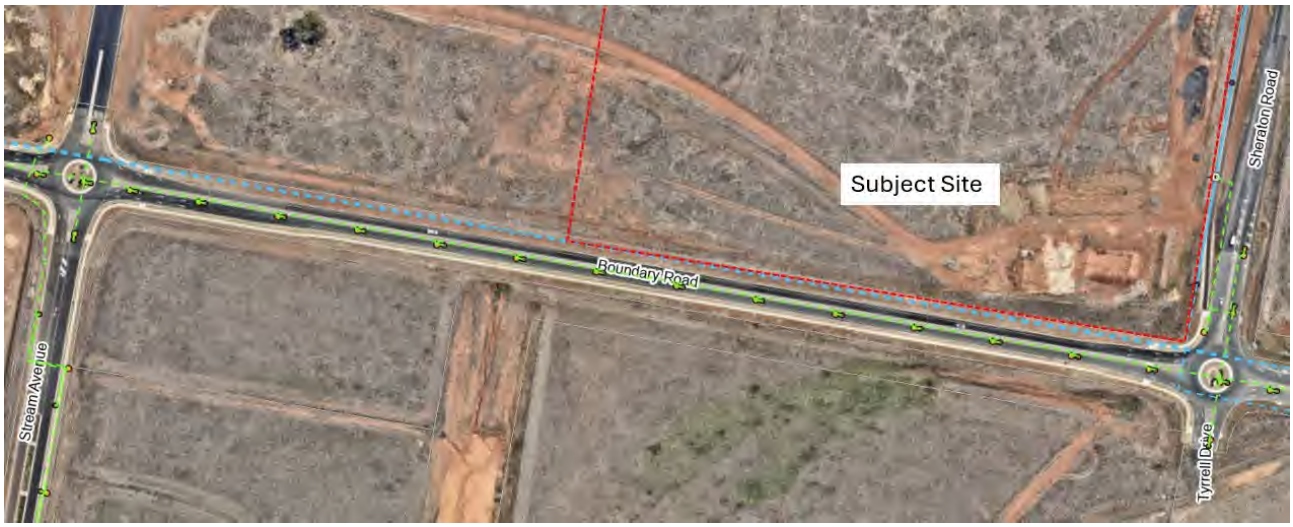


Figure 12: Planning Proposal Area (existing electricity services)
Source: Dubbo Regional Council

Sewer

No direct access to gravity sewerage exists for the subject land parcel. A uPVC DN225 gravity sewerage main does exist along the northern edge of Boundary Road between Stream Avenue and Sheraton Road (**Figure 13**). This pipeline is not currently connected to the broader Keswick Sewerage Pump Station gravity system however, and requires an extension be constructed within Southlake's Estate residential subdivision, enabling the pipeline. The extension, a length of approximately 780m (subject to final design), is to be constructed within the eastern Council owned drainage corridor of Southlakes Estate. Council is undertaking hydraulic modelling of the subject sewerage catchment to determine the exact size and length of the proposed extension.

Figure 13: Planning Proposal Area (Sewer)
Source: Dubbo Regional Council

Water

The site has access to a PVC-o DN150 stub, provided on the western side of the northern leg of the Boundary Road Stream Avenue roundabout – **Figure 14**. More broadly, a PVC-o DN150 water main is installed along the southern edge of Boundary Road, between Stream Avenue and Sheraton Road.

Figure 14: Planning Proposal Area (water)
Source: Dubbo Regional Council

2.10. Access and Traffic

The location of the site is depicted on an aerial in **Figure 15** below. The site currently fronts two public roads, these being Boundary Road running along the site's southern boundary, and Sheraton Road, running along the site's eastern boundary. A partly formed road named Stream Avenue fronts the western boundary. The characteristics of the site and surrounding transport network are summarised in **Table 3** below.

Figure 15: Planning Proposal Area (existing street frontage)
Source: SIXMAPs – Edited by Barnson Pty Ltd

Table 3: Transport and Traffic Summary

Road Frontage	The site subject to the rezoning fronts the following roads: • Boundary Road – Illustrated in Green above. • Sheraton Road to the east – illustrated in Orange above. • Stream Avenue Access to the site will be considered during the DA stage however, safe and compliant road access can be achieved from any of the surrounding access roads.
State Planning Controls	The site is neither of sufficient size of capacity or fronted by or provided access via a classified road and is therefore not required to be referred to Transport for NSW as part of the DA process.
Public Transport	The site is located within a 5-minute (400m) walking distance of bus stops, which services the 570 (Orana Mall to Dubbo CBD via Southlakes and South Dubbo) loop service provided by Dubbo Business 11 times a day. Dubbo Train Station is located approximately 5km to the northwest of the subject site which services Western NSW – Regional Trains timetable, providing direct access from Sydney Central Station to Dubbo Station.
Future Road and Infrastructure Changes	The road network surrounding the site, including Boundary Road on the sites southern boundary has been subject to numerous road upgrades by Dubbo Regional Council

In preparation for the Planning Proposal, a Traffic Impact Statement was prepared by McLaren Traffic Engineering (**Appendix E**). This assessment examines the potential transport and traffic implications of rezoning the land to R1 – General Residential, considering the broader range of permissible uses within the altered zone. It was found that the rezoning is likely to have only a slight impact on nearby intersections and can be accommodated within the existing road network. The proposed rezoning is expected to minimally affect traffic flow efficiency, with no anticipated change to road safety conditions. It's emphasized that a detailed traffic impact for any proposal on the land should be assessed during DA stage to determine the development's traffic generation and its impacts on the surrounding road network.

Given the above assessment, the proposed rezoning from R2 – Low Density Residential to R1 – General Residential for the subject site is generally supported, as it will only marginally affect traffic generation. Parking provision for any proposed land use will be considered during the detailed development application stage, with each proposal expected to adequately meet parking demand within their respective sites.

3. EXISTING LEGISLATIVE FRAMEWORK

3.1. Dubbo Regional Local Environmental Plan 2022

DRLEP 2022 was gazetted on 25th of March 2022. DRLEP 2022 adopted the Standard Instrument LEP Template required by the NSW Government.

3.2. Existing Land Use Zoning

The subject site had a land zoning of R2 – Low Density Residential. A copy of the R2 – General Residential Land Use Table has been provided below:

Zone R2 Low Density Residential

1 Objectives of zone

• To provide for the housing needs of the community within a low density residential environment.

• To enable other land uses that provide facilities or services to meet the day to day needs of residents.

• To ensure development is consistent with the character of the immediate locality.

2 Permitted without consent

Environmental protection works; Home-based child care; Home occupations; Roads

3 Permitted with consent

*Bed and breakfast accommodation; Centre-based child care facilities; Community facilities; Dwelling houses; Educational establishments; Environmental facilities; Exhibition homes; Exhibition villages; Group homes; Health consulting rooms; Home businesses; Home industries; Information and education facilities; Medical centres; Neighbourhood shops; Oyster aquaculture; Places of public worship; Pond-based aquaculture; Recreation areas; **Residential accommodation**; Respite day care centres; Signage; Tank-based aquaculture; Water reticulation systems*

4 Prohibited

*Advertising structures; **Attached dwellings; Hostels; Multi dwelling housing; Residential flat buildings; Rural workers' dwellings; Shop top housing**; Any other development not specified in item 2 or 3*

Notably, "residential accommodation" is permitted within consent. Residential accommodation covers a variety of housing typologies, which are discussed in the alter sections of this report. As such, only those housing typologies specifically mentioned in Item 4, including Attached Dwellings, Hostels, Multi dwelling Housing, Residential Flat Building, Rural Works Dwellings and Shop Top Housing, are prohibited.

3.3. Existing Minimum Allotment Size

The DRLEP 2022 includes a number of clauses in Part 4 – Principal Development Standards of the LEP that currently govern the development "subdivision" of land. These include:

Clause 4.1 Minimum Allotment Size

Clauses 4.1 of the LEP applies to subdivision of any land shown on the Lot Size Map and that requires development consent. Pursuant to Clause 4.1 Subclause 3, the size of any lot resulting from a subdivision of land to which this clause applies is not be less than the minimum size shown on the Lot Size Map. A review of the DRLEP 2022 depicted a 600sqm Minimum Allotment Size for the site.

Notably, Clause 3B permitted R2 – Low Density Residential land to be submitted smaller than the minimum size shown on the Lot Size Map if the subdivision is for the purposes of multi-dwelling housing or dual occupancy development. Notably, Multi dwelling housing development is a prohibited development type on land zone R2 – Low Density Residential; however, dual occupancy are permitted.

Clause 4.1AA Minimum Subdivision lot size for community title scheme

Clause 4.1AA of the LEP applies to the subdivision of land zoned R2 – Low Density under the Community Land Development Act 2021. Similar to Clause 4.1, Subclause 3 of Clause 4.1AA requires all lot resulting from the subdivision of land, other than the lot comprising the association property within the meaning of the Community Land Development Act 2021 is not to be less than the 600sqm Minimum Allotment Size that applies to the property.

3.4. Natural Resources – Groundwater Vulnerability

Lot 101 in Deposited Plan 1301426 is mapped under the DRLEP 2022 has being subject to Natural Resources – Ground Water Vulnerability. Nonetheless, **Figure 16** illustrates that the Planning Proposal Area not mapped to be affected by the Groundwater Vulnerability constraint.

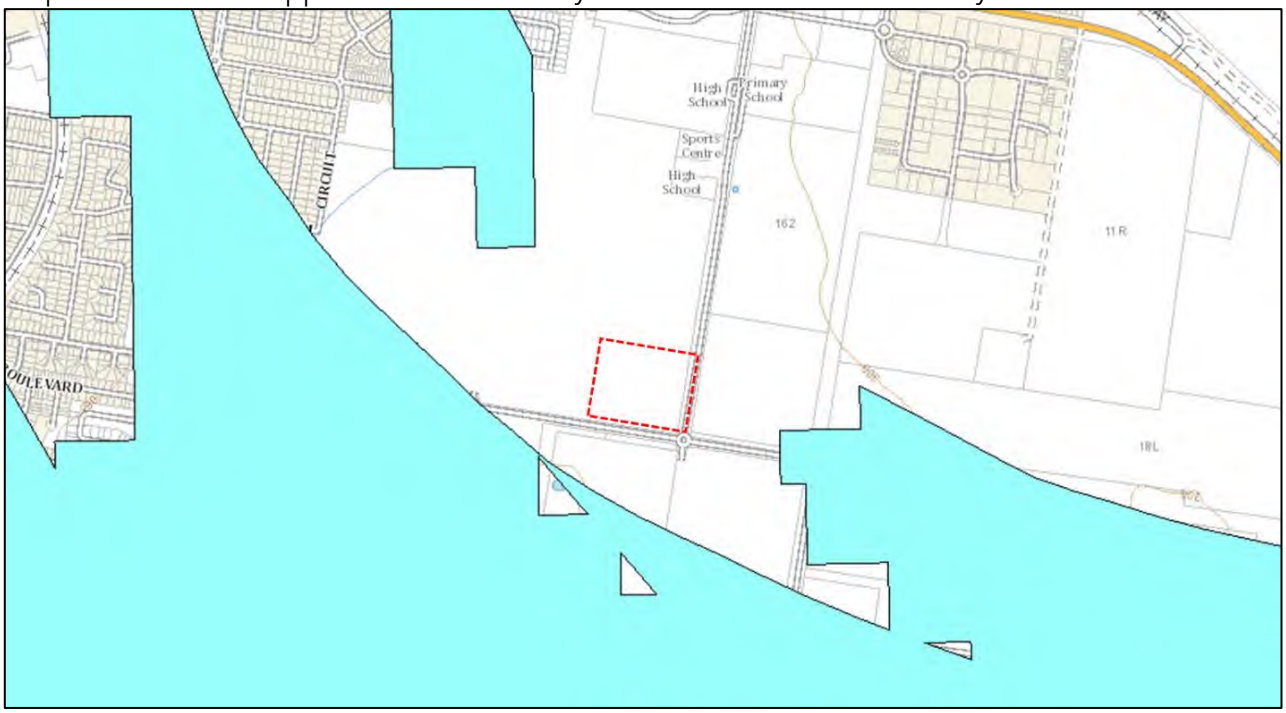


Figure 16: Ground Water Vulnerability
Source: DRLEP 2022

4. DEVELOPMENT CONCEPT

4.1. Overview

It is expected that the Planning Proposal will mainly enable a blend of medium density housing typology. The intended housing types within the R1-zoned land include:

- Traditional Medium Density Residential Accommodation, such as Multi Dwelling Housing.
- Small Lot Housing, including attached and semi-detached dwellings.
- Integrated house and land development featuring multi-dwelling housing, attached dwellings, semi-detached dwellings, and individual dwellings, along with private roads, open spaces, and community facilities.

The expectation is that the R1-General Residential lands will undergo development encompassing a variety of housing forms, ranging from traditional medium-density housing to integrated house and land developments. Example of these type of developments within proximity to the site have been included below:

Image Four: Image 4 was taken at 1 Fountain Court Dubbo. The development at this location is a typical multi dwelling housing development, another type of medium density housing product typical to development on R1 General Residential Land Zoning.

Image 5 – Image 5 was taken at 169A - 175B Boundary Road. The development at this location is typical attached dwelling, another type of medium density housing product typical to the R1 – General Residential Land Zoning

5. PLANNING PROPOSAL

5.1. Part 1 – Objectives or Intended Outcomes

The Intention of this Planning Proposal.

The Planning Proposal is seeking to facilitate amendments to the DRLEP 2022 by way of:

- **Land Rezoning** - The Planning Proposal aims to revise the existing land zoning of the property by rezoning the land from R2 – Low Density Residential to R1 – General Residential.

The aim of the Planning Proposal is to revise the existing LEP by adjusting land zoning to offer increased flexibility and options in residential land and housing products within the accessible areas of Dubbo LGA. In particular allow residential flats buildings and medium density housing typology to be permissible.

- **Removal of Minimum Allotment Size –** The Planning Proposal aims to remove the existing Minimum Allotment Size of 600sqm, associated with the existing R2 – Low Density Residential.

The purpose of the Planning Proposal, in removing the Minimum Allotment Size requirement from the current LEP, is to allow for the creation of a range of residential allotments tailored to accommodate diverse housing products.

The key outcomes of this Planning Proposal.

The overarching objectives of this project entail:

- Greater flexibility and choice in residential land and housing product. In particular, increasing the medium density and housing choice options.

The Planning Proposal includes comprehensive supporting information that:

- Describe the subject land, its locality, the current zoning and justification to provide for additional permitted uses on the subject land.
- Request an amendment to the land zoning.
- Address the 'Gateway Determination Assessment' Criteria under Part 3 of the EP&A Act 1979.
- Provide justification for the LEP amendment and demonstrate the net community benefits which follow.
- Demonstrate that the Planning Proposal is consistent with NSW Department of Planning, Industry and Environment and Council broad strategic direction for the locality.

5.2. Part 2 – Explanation of Provisions

5.2.1. Land Rezoning and Minimum Allotment Size

The Planning Proposal affect Land Zoning Map – Sheet LZN_002B and Minimum Lot Size Map – Sheet LSZ_002B.This Planning Proposal seeks to alter the current R2 – Low Land Use zone over the land by rezoning the land to R1 – General Residential. **Figure 17** below illustrates the Existing Land Zone, taken from the Dubbo LEP 2022. Whilst **Figure 18** illustrates the proposed land to be rezoned. **Table 4** provides an understanding of the breakdown of land to be rezoned. The Planning Proposal also seeks to modify the Minimum Lot Size Map by removing the development standard from the portion of the land. **Figure 19** and **Figure 20** illustrates these changes.

Table 4: Land Zone Breakdown

	Existing	Proposed
R2 – Low Density Residential	10ha	-
R1 – General Residential	-	10ha

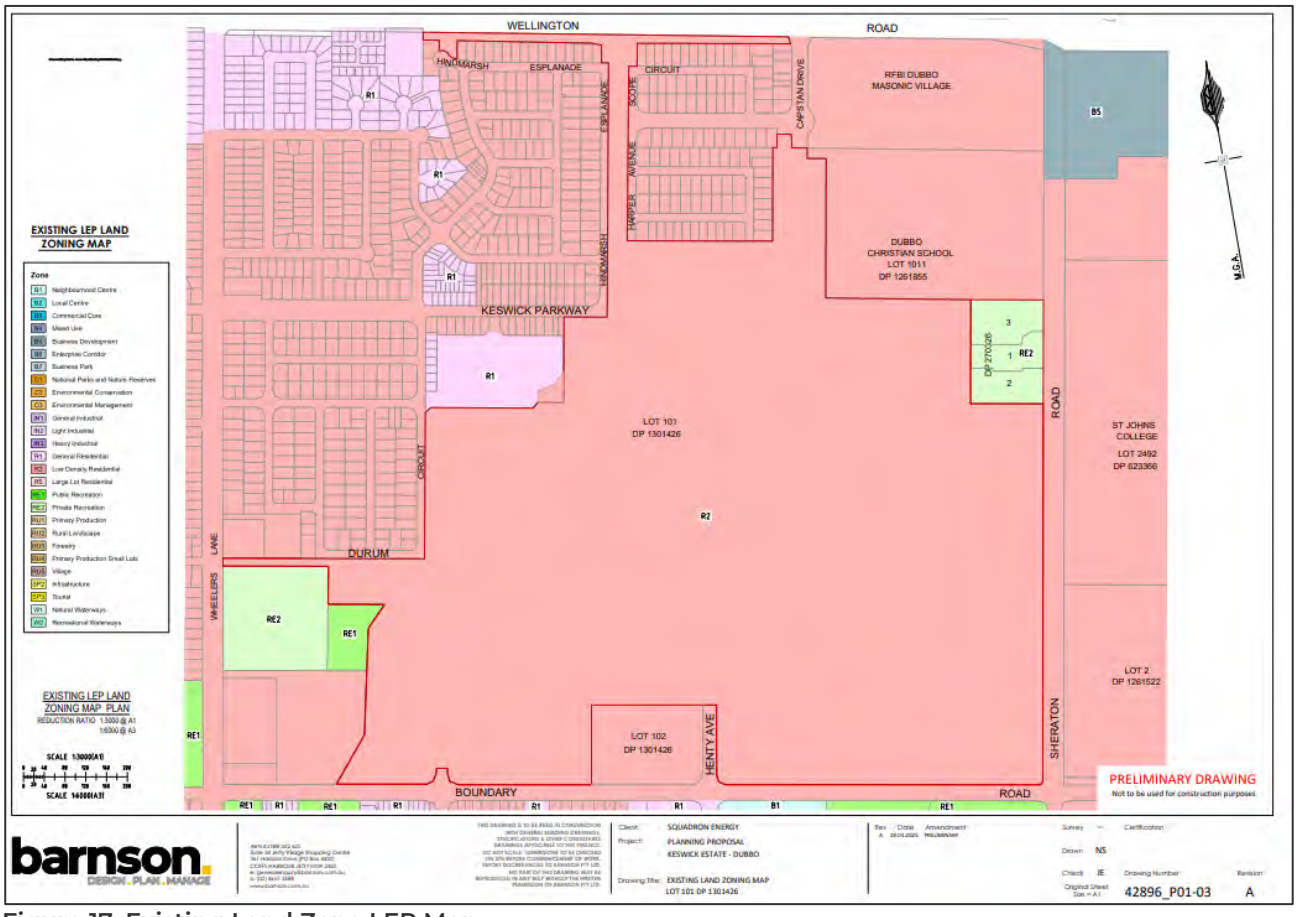


Figure 17: Existing Land Zone LEP Map
Source: Barnson Pty Ltd

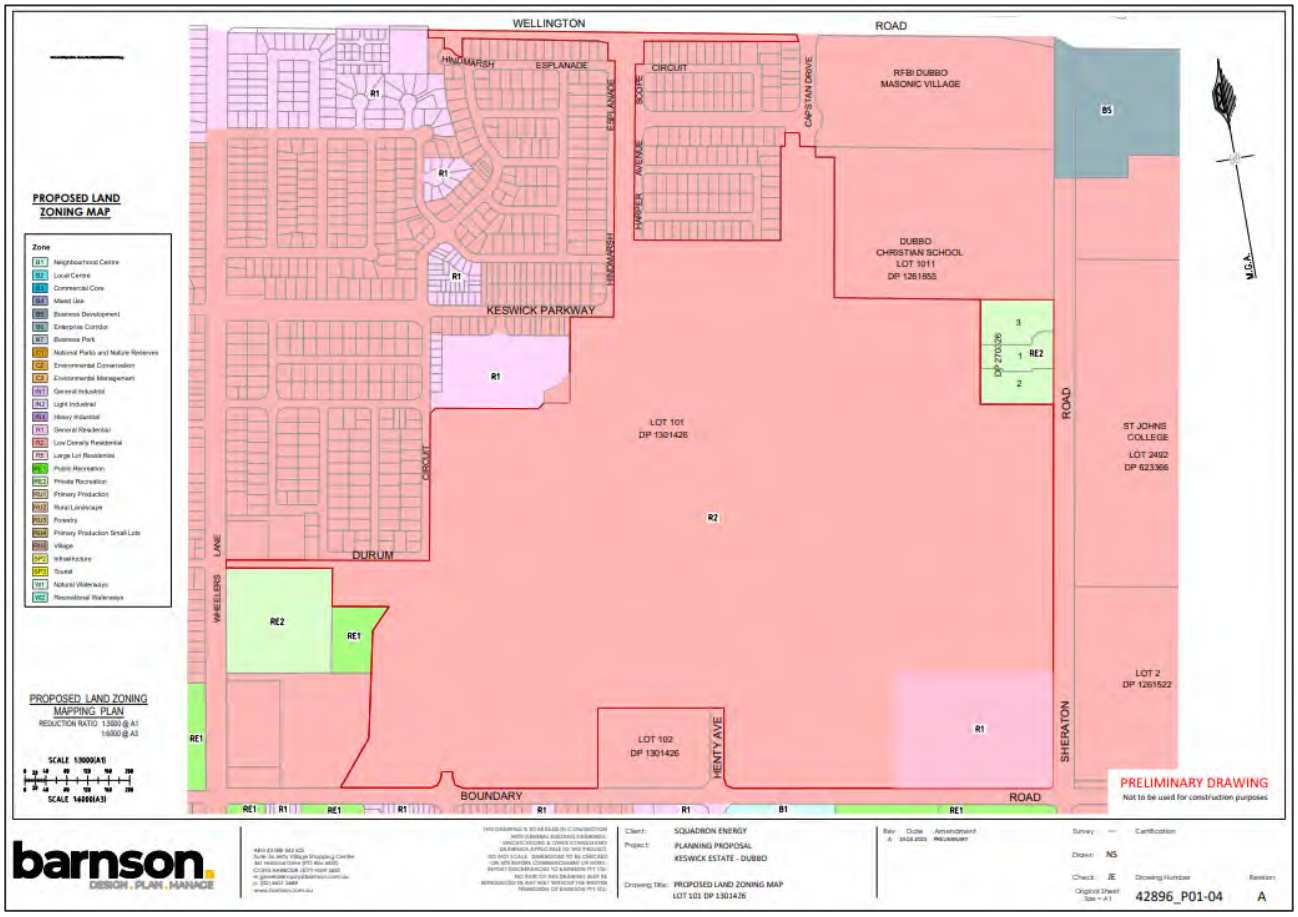


Figure 18: Proposed Land Zone LEP Map
Source: Barnson Pty Ltd

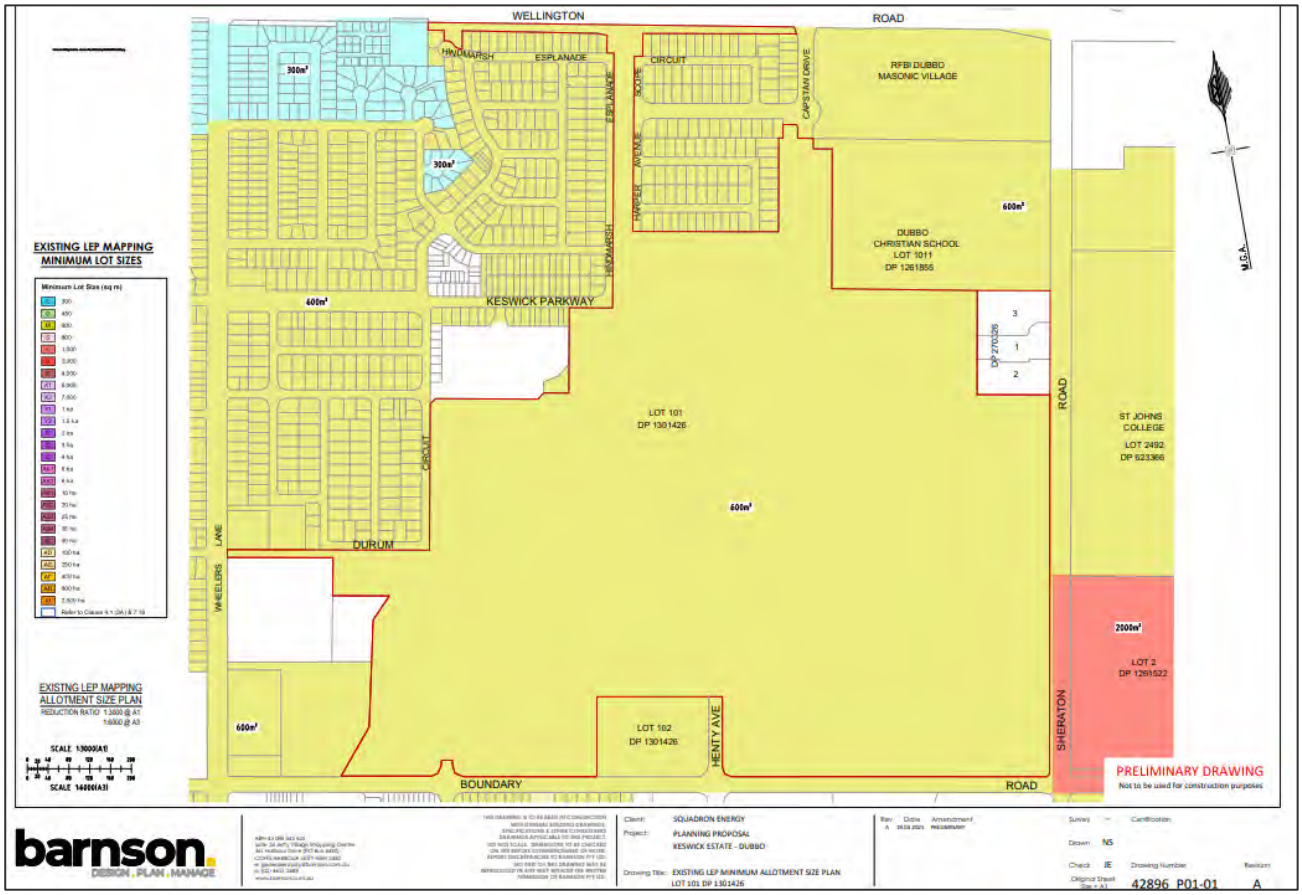


Figure 19: Existing Minimum Allotment Size LEP Map
Source: Barnson Pty Ltd

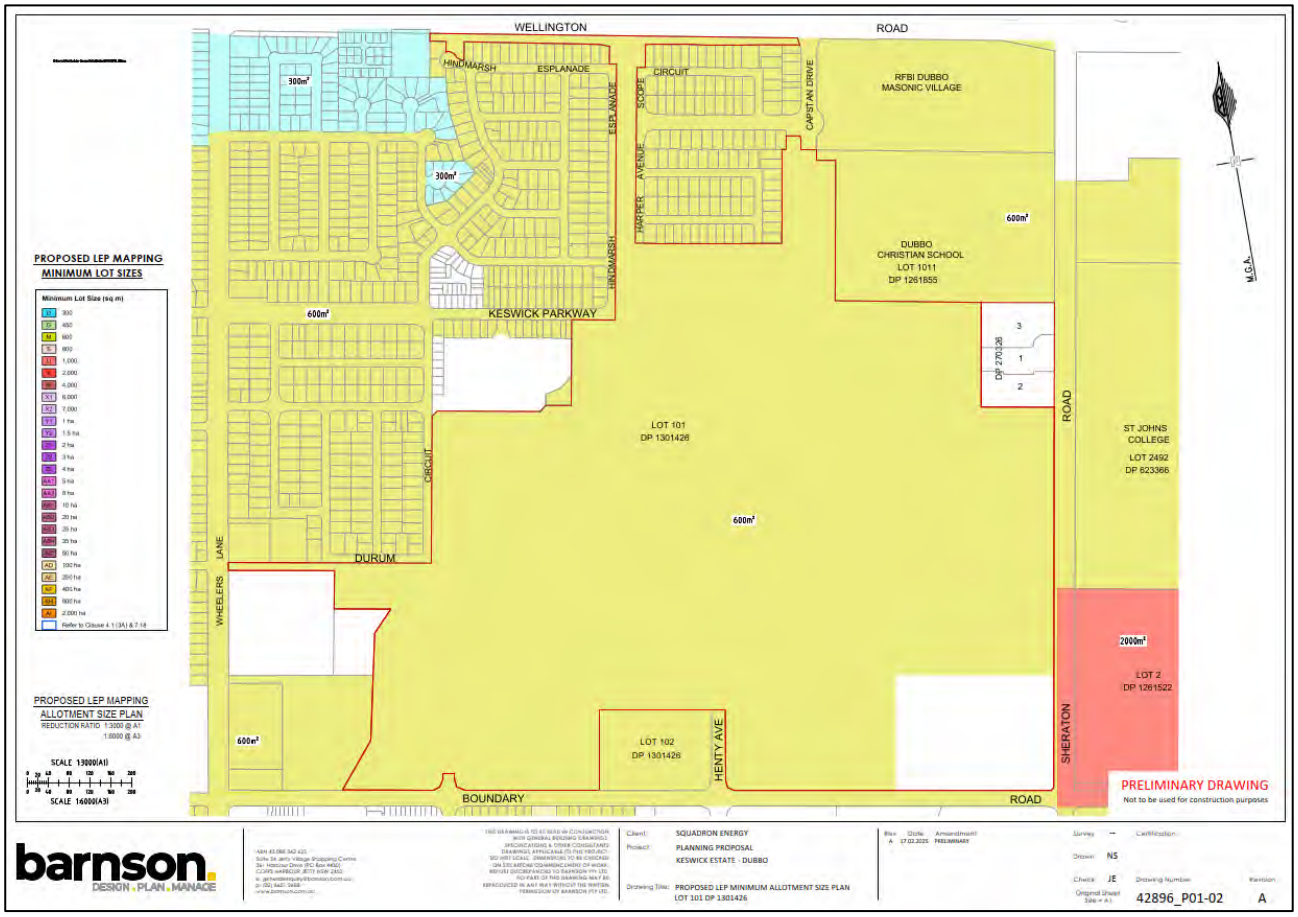


Figure 20: Proposed Minimum Allotment Size LEP Map
Source: Barnson Pty Ltd

A copy of the Planning Proposal Plans is provided at **Appendix F.**

5.2.2. Adoption of the R1 – General Residential Land Use Zone

R1 – General Residential Land Use Zone

The Planning Proposal aims to modify the existing land use zone to R1 – General Residential. A detailed R1- General Residential Land Use table is included for reference. The LEP defines "Residential Accommodation" broadly, encompassing various residential development types, and the specific definition is provided below. Importantly, R1 – General Residential allows for a range of "residential accommodation" options, with highlighted examples listed. However, the R1 – General Residential Land Zoning permits "any other development" not explicitly mentioned in Item 2 and 4 of the Land Use Table. Consequently, all types of "residential accommodation" are allowed, except for Rural Workers Dwellings.

Zone R1 General Residential

1 Objectives of zone
- *To provide for the housing needs of the community.*
- *To provide for a variety of housing types and densities.*
- *To enable other land uses that provide facilities or services to meet the day to day needs of residents.*
- *To ensure development is consistent with the character of the immediate locality.*

2 Permitted without consent
Environmental protection works; Home-based child care; Home occupations; Roads

3 Permitted with consent
Attached dwellings**; Boarding houses; Centre-based child care facilities; Community facilities; **Dwelling houses**; Group homes; Home industries; **Hostels; Multi dwelling housing**; Neighbourhood shops; Oyster aquaculture; Places of public worship; Pond-based aquaculture; **Residential flat buildings**; Respite day care centres; Restaurants or cafes; **Semi-detached dwellings**; Seniors housing; Sewage reticulation systems; Shop top housing; Tank-based aquaculture; Water reticulation systems; **Any other development not specified in item 2 or 4

4 Prohibited
*Advertising structures; Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Boat building and repair facilities; Boat launching ramps; Boat sheds; Camping grounds; Car parks; Caravan parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Entertainment facilities; Extractive industries; Farm buildings; Farm stay accommodation; Flood mitigation works; Forestry; Freight transport facilities; Function centres; Heavy industrial storage establishments; Helipads; Highway service centres; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Industries; Jetties; Local distribution premises; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Passenger transport facilities; Public administration buildings; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Registered clubs; Research stations; Restricted premises; Rural industries; **Rural workers' dwellings**; Service stations; Sewerage systems; Sex services premises; Storage premises; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Veterinary hospitals; Warehouse or distribution centres; Waste or resource management facilities; Water recreation structures; Water supply systems; Wharf or boating facilities; Wholesale supplies*

***residential accommodation** means a building or place used predominantly as a place of residence, and includes any of the following—*
(a) attached dwellings,
(b) boarding houses,
(baa) co-living housing,
(c) dual occupancies,
(d) dwelling houses,
(e) group homes,
(f) hostels,
(g) multi dwelling housing,
(h) residential flat buildings,
(i) rural workers' dwellings,
(j) secondary dwellings,
(k) semi-detached dwellings,
(l) seniors housing,
(m) shop top housing,
but does not include tourist and visitor accommodation or caravan parks.

5.3. Part 3 – Justification

5.3.1. Section A – Need for the Planning Proposals

Is the planning proposal a result of an endorsed LSPS, strategic study or report?

The Planning Proposal is not a result of a strategic study or report but rather the current demand of housing choice and residential land product. Current land release areas of Dubbo are heavily focused upon delivering the standard R2 – Low Density land and house package yet limited focus exists on delivering medium density options or larger land size.

Having regard to these current market forces and the reality of housing choice and residential land product within Dubbo it is considered that there is sufficient demand upon the housing market to warrant the expansion of the existing R1 – General Housing zone and continue to vary minimum lot size requirements of R1 – General Residential Land to assist the facilitation of housing choice and varied residential land product.

The proposed zoning is selected having regard to the land's proximity to public recreation areas, drainage reserve, cycleway and walkways and their proximity to supporting road and infrastructure networks including public transport services that would support the increased density and commercial development options.

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

The desired range of housing choice and development is not permissible within the R2 – Low Density Residential zone and is further limited by the minimum lot size restriction in accordance with the provisions of the DRLEP. The Planning Proposal aims to amend the DRLEP by rezoning land, ultimately enabling the approval of additional residential development types in the specified area. Currently, the DRLEP incorporates three residential land zones: R1 – General Residential, R2 – Low Density Residential (the current land zoning), and R5 – Large Lot Residential. Notably, R5 – Large Lot Residential is designed for semi-rural areas, which is not applicable to the subject land.

A comprehensive review of the types of residential accommodations types and their permissibility within the R1 – General Residential and R2 – Low Density Residential Land Zoning has been conducted and outlined in **Table 5.** Importantly, the review reveals that the R1 – General Residential Land Zoning allows for a broader range of residential accommodation types. Therefore, by amending the LEP through rezoning the land to R1 – General Residential, the Planning Proposal objectives will be achieved, facilitating the pursuit of additional and diverse housing types in a suitable area of Dubbo. This ultimately contributes to improving housing affordability in the region.

The land use table for R2 – Low Density Residential areas imposes restrictions on non-residential development types, prohibiting any development not explicitly mentioned as "permitted with consent". Permissible non-residential development includes Centre-based childcare facilities, Community facilities, Educational establishments, Environmental facilities, Health consulting rooms, Home businesses, Home industries, Information and education facilities, Medical centres, Neighbourhood shops, Places of public worship, Recreation areas, and Respite day care centres.

In contrast, R1 – General Industrial Development allows a wider array of non-residential uses, only explicitly prohibiting those listed, whilst all others are permitted. 'R1 – General Residential permits mixed-use development types, integrating active street-level spaces with residential units above, thus offering a more diverse range of non-residential land uses. Specifically, it permits uses like food and drink premises, which are prohibited in the R2 - Low Density Residential land use zone

Notably, both R1 – General Industrial and R2 – Low Density Residential zones prohibit commercial premises, including Business, Retail, and Office premises.

Table 5: Land Zone Breakdown

Residential Accommodation	R1 - General Residential,	R2 – Low Density Residential
Attached Dwellings	Permitted	Prohibited
Boarding Houses	Permitted	Permitted
Co-Living Housing	Permitted	Permitted
Dual Occupancies	Permitted	Permitted
Dwelling Houses	Permitted	Permitted
Group Home	Permitted	Permitted
Hostels	Permitted	Prohibited
Multi Dwelling Housing	Permitted	Prohibited
Residential Flat Buildings	Permitted	Prohibited
Rural Workers Dwelling	Prohibited	Prohibited
Secondary dwellings	Permitted	Permitted
Semi-detached dwelling	Permitted	Permitted
Seniors Housing	Permitted	Permitted
Shop Top Housing	Permitted	Prohibited

5.3.2. Section B – Relationship to the strategic planning framework

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?

Central West and Orana Regional Plan 2041

Central West and Orana Regional Plan 2041 is a 20-year blueprint for the future of the Central West and Orana area and includes five overarching goals. The goals and the Planning Proposals consistency have been addressed below.

Table 6: Central West and Orana Regional Plan 2041

Part 1 – Region-Shaping Investment	
Objective	**Comment**
Objective 1 - Deliver the Parkes Special Activation Precinct and share its benefits across the region	The Planning Proposal is not inconsistent with this objective.
Objective 2 - Support the States Transition to Net Zero by 2050 and deliver the Central West Orana Renewable Energy Zone	The Planning Proposal is not inconsistent with this objective.
Objective 3 – Sustainably Manage extractive resources land and grow the critical minerals sector	The Planning Proposal is not inconsistent with this objective.
Objective 4 – Leverage inter-regional transport connections	The Planning Proposal is not inconsistent with this objective.
Part 2: A sustainable and resilient place	
Objective 5 – Identify, protect and connect important environmental assets	The Planning Proposal is backed by environmental assessments conducted by AREA. It's important to note that the current LEP allows the land to be developed for residential use. The assessment by AREA highlights that the site contains some vegetation and habitat of value, necessitating offsetting under the NSW Biodiversity Offset Scheme (BOS). However, the Planning Proposal doesn't aim to rezone additional land for residential use; instead, it focuses solely on modifying existing residential land. Consequently, the Proposal won't change or degrade any existing strategic measures aimed at safeguarding the land's high environmental values. Subsequent assessments will ensure that impacts are avoided, and where unavoidable, they will be mitigated or offset in compliance with the BOS.
Objective 6 – Support connected and healthy communities	The Planning Proposal is not inconsistent with this objective.
Objective 7 – Plan for resilient places and communities.	The Planning Proposal has examined the site's vulnerability to constraints, including flooding, bushfire, ecology and contamination. As mentioned earlier, the site is not situated in a flood planning area nor is it located on land identified to be

	Bushfire. Therefore, the Planning Proposal is consistent with the objective of these clause by way of pursuing a LEP amendment that will ultimately locate development away from these know constraints.
Objective 8 – Secure resilient regional water resources	The Planning Proposal is not inconsistent with this objective.
Objective 9 – Ensure site selection and design embraces and respects the regions landscapes, character and cultural heritage.	The Planning Proposal aligns with these objectives as it refrains from endorsing development on land identified for accommodating Aboriginal heritage.
Objective 10 – Protect Australia first Dark Sky Park	The Planning Proposal area is located within 120kms of the Siding Spring Observatory. Dubbo LEP has adopted the Siding Spring Observatory Clause in the LEP. Therefore, the Council will ensure that any further development meets the Dark Sky Planning Guidelines.
Part 3: People, centres, housing and communities	
Objectives 11 – Strengthen Bathurst, Dubbo and Orange as innovative and progressive regional cities	The Planning Proposal seeks to revise the LEP to enable additional varied residential development, ultimately addressing the needs of the population in a conveniently accessible area. The adjustments to the LEP, including land rezoning, will enhance housing options and subsequently, bolster housing affordability.
Objectives 12 – Sustain a network of healthy and prosperous centres	The Planning Proposal aligns with the objective of promoting medium-density residential development in a suitable Dubbo area, characterised by its proximity to open spaces, transportation hubs, and infrastructure access.
Objectives 13 – Provide well located housing options to meet demand	The Planning Proposal is in line with this objective. Ultimately, it aims to rezone the land, enabling a variety of housing options. Furthermore, it will encourage denser housing in a well-suited location, close to parks, services, and easily accessible via public and private transportation. The increased housing supply will help address housing needs in the area and improve affordability.
Objective 14 – Plan for diverse affordable, resilient and inclusive housing	The Planning Proposal aligns with this objective. By adopting the R1 – General Residential Land Zoning, it will allow for a wider variety of housing options (including Residential Flat Buildings, Attached housing and Multi-Dwelling Housing) compared to the existing R1 – General Residential land zoning. The proposed changes to the land zoning will boost the housing and lot supply

	in the market, ultimately aiding in addressing housing affordability.
Objective 15 – Manage rural residential development	The Planning Proposal is not inconsistent with this objective.
Objective 16 – Provide accommodation options for seasonal, temporary and key workers.	The Planning Proposal is not inconsistent with this objective. Notably, this proposed amendment the LEP is likely to allow for Temporary Workers Accommodation.
Objective 17 - Coordinate smart and resilient utility infrastructure	The Planning Proposal is not inconsistent with this objective. The Planning Proposal has demonstrated that the site is able to be serviced.
Part 4: Prosperity, productivity, and innovation	
Objective 18 – Leverage existing industries and employment areas and support new and innovative economic enterprises	The Planning Proposal is not inconsistent with this objective.
Objective 19 – Protect agricultural production values and promote agricultural innovation, sustainability and value-add opportunities	The Planning Proposal is not inconsistent with this objective.
Objective 20 – Protect and leverage the existing and future road, rail and air transport networks and infrastructure.	The Planning Proposal is not inconsistent with this objective.
Objective 21 – Implement a precinct-based approach to planning for higher education and health facilities	The Planning Proposal is not in consistent with this objective.
Objective 22 – Support a diverse visitor economy	The Planning Proposal is not in consistent with this objective. The proposed Planning Proposal.
Objective 23 – Supporting Aboriginal aspirations through land use planning	The Planning Proposal aligns with the objective. Through the gateway process the planning proposal is able to proactively collaborate with the Local Aboriginal Land Council (LALC) as required. Extensive studies have been conducted to explore the cultural significance of the site. Importantly, the findings confirm that the site lacks any Aboriginal heritage significance, relics, or items of importance.
Part 5: Local Government Priorities	

Location - Dubbo	The Planning Proposal is in accordance with the established priorities outlined by Dubbo Regional Local Government Priorities, as evidenced by its alignment with the vision and objectives of the Local Strategic Planning Statement. The Proposal aims to modify the LEP by adopting an R1 – General Residential Land Zoning for a designated portion of land intended for residential development. This proposed amendment to the land zoning will allow for a higher density of residential accommodation in an appropriately situated area, close to services, parks, and transportation. Additionally, the zoning change will ultimately result in an increased diversity of residential accommodation, thereby expanding the supply and exerting downward pressure on housing affordability.

Is the planning proposal consistent with a council LSPS that has been endorsed by the Planning Secretary or GSC, or another endorsed local strategy or strategic plan?

Dubbo Regional Local Strategic Planning Statement 2020

Though the Planning Proposal is not a result of an endorsed strategic study or report; the Planning Proposal is consistent with the Dubbo Shire Local Strategic Planning Statement 2020, specifically:

Priority 9 – Provide diversity and housing choice to cater for the needs of the community.

The Planning Proposal aims to modify the DRLEP by changing the land zoning and removing the minimum allotment size over the site. This alteration will ultimately allow for a broader range of residential accommodations, presently restricted under the current R2 – Low Density Residential Land Zone. The proposed changes align with Priority 9, involving a review of existing residential land zoning and the upzoning of land situated close to services and open space. The site is conveniently positioned near employment centres and parklands, with easy access to transportation nodes. The Planning Proposal will ultimately enact amendments to the LEP that contribute to expanding housing options, thereby improving housing affordability.

Priority 12 Create sustainable and well- designed neighbourhoods.

The Planning Proposal seeks to alter the land in the South-East Dubbo Residential Urban Release Area. Furthermore, the site is situated on the boundary of the South Lakes/Hillview Urban Release Area, starting on the southern side of Boundary Street. The proposal aims to facilitate the development of higher density residential accommodations in a well-suited location, providing accessibility to transportation nodes, open spaces, and crucial pedestrian and cycling links.

Is the planning proposal consistent with any other applicable State and regional studies or strategies?

Towards 2040 Community Strategic Plan

The Planning Proposal is found to be consistent with the objectives and strategies within Theme 1 – Housing of the Towards 2040 Community Strategic Plan, specifically:

- 1.1 Housing meets the current and future needs of our community; and,

- 1.2 An adequate supply of land is located close to community services and facilities

The Planning Proposal demonstrates alignment with the objective of meeting both current and future housing needs within our community. By proposing amendments to the LEP and rezoning land, it aims to facilitate a diverse range of residential accommodations, addressing the evolving requirements of Dubbo demographics. This strategic approach ensures that the housing options provided are in tune with the dynamic demands of our community, contributing to a well-balanced and sustainable living environment.

The Planning Proposal aligns with the goal of ensuring an adequate supply of land near community services and facilities. Through thoughtful consideration of the site's location and accessibility, the proposal seeks to designate areas for medium density residential development that are conveniently connected to transportation nodes, open spaces, and essential pedestrian and cycling links. This strategic planning ensures that the housing developments not only meet residential needs but also integrate seamlessly with the surrounding community services and facilities, fostering a cohesive and well-connected urban environment.

Dubbo City Planning and Transportation Strategy 2036

The Dubbo City Planning and Transportation Strategy 2036 aims to provide guidance on the construction of roads and pedestrian pathways in Dubbo City. While the Strategy is to be considered in future strategic land use planning decisions, it is not the adopted Strategic Land Use Policy for the city's growth. However, given the location of the land within an expanding residential area of Dubbo, the Planning Proposal generally aligns with the Strategy's scheduling, expectations, and recommendations.

Detailed assessment of the Planning Proposal against the Strategy's recommendations is deemed unnecessary. It should be noted that the Strategy outlines plans for residential development in three sectors: South East, North West, and South West. The existing residential density is approximately 7.8 dwellings per hectare, inclusive of infrastructure such as roads, schools, and community facilities.

While specific development concept plans are not accompanying the Planning Proposal, the proposed LEP amendments does seek to modify land zoning permit a diversity of residential accommodation and typical medium-higher density development. Therefore, the Planning Proposal is not at odds with the objectives outlined in the Strategy.

Is the planning proposal consistent with applicable SEPPS

Table 7 on the following pages provides a summary of applicable SEPPs, their relevance and how the proposed Planning Proposal is consistent with the instrument:

Table 7: State Environmental Planning Policies

SEPP	Comments
SEPP (Housing) 2021	The Planning Proposal is not inconsistent with the principles of this SEPP as it enables diverse housing types and encourages the development of housing to the community.
SEPP (Planning Systems) 2021	Nothing in this Planning Proposal impacts the operation of this SEPP.

SEPP (Resource and Energy) 2021)	Nothing in this Planning Proposal impacts the operation of this SEPP.
SEPP (Resilience and Hazards) 2021	Chapter 4 of the SEPP applies to the land. As part of the preparation of the Planning Proposal a Preliminary Site Investigation was undertaken by Barnson Pty Ltd (**Appendix D**). This investigation revealed no evidence of contamination. Based on the findings of the desktop review and site investigation it can be stated with a reasonable level of confidence that the Planning Proposal area is suitable for future residential development. The Planning Proposal is not inconsistent with the SEPP.
SEPP (Transport and Infrastructure) 2021	Consistent - The SEPP is the primary planning instrument addressing the provision and operation of infrastructure across the State. Referral to the NSW Roads and Maritime Services (RMS) may be required for certain development. The SEPP would continue to apply to the site. The Planning Proposal does not include and provisions which impede the operation of this SEPP over the site.
SEPP – Biodiversity and Conservation 2021 –	The Biodiversity and Conservation SEPP aims to encourage the protection of biodiversity values and preservation of amenities in non-rural areas as well as conservation and management of areas of natural vegetation. The proposed environmental impacts are negligible as the site is current zoned R2 – Low Density Residential. The clearing of some native vegetation may be required despite the rezoning. The Planning Proposal is not inconsistent with the SEPP.
SEPP (Exempt and Complying Development Codes) 2008	The Planning Proposal does not contravene the provisions of the SEPP and is therefore consistent with it.

Is the planning proposal consistent with the applicable Ministerial Directions (Section 9.1)

Table 8 considers applicable Ministerial Directions.

Table 8: Section 9.1 Directions

Direction	Applicable	Comment
1. Focus Area 1: Planning Systems		
1.1 Implementation of Regional Plans	Yes	The Planning Proposal is found to be consistent with the overall intent of the Central West and Orana Regional Plan 2041.

1.2 Development of Aboriginal Land Council Land	No	The site has not been identified within the Land Application Map of the State Environmental Planning Policy (Aboriginal Land) 2019.
1.3 approval and Referral Requirements	Yes	Noted.
1.4 Site Specific Provisions	Yes	Noted
1.4A	No	N/A
2. Focus Area 1: Planning System – Place based		
1.5 Parramatta Road Corridor Urban Transformation Strategy	No	N/A
1.6 Implementation of North West Priority Growth Area Land Use and Infrastructure Implementation Plan	No	N/A
1.7 Implementation of Greater Parramatta Priority Growth Area Interim Land Use and Infrastructure Implementation Plan	No	N/A

1.8 Implementation of Wilton Priority Growth Area Interim Land Use and Infrastructure Implementation Plan	No	N/A
1.9 Implementation of Glenfield to Macarthur Urban Renewal Corridor	No	N/A
1.10 Implementation of the Western Sydney Aerotropolis Plan	No	N/A
1.11 Implementation of Bayside West Precincts 2036 Plan	No	N/A
1.12 Implementation of Planning Principles for the Cooks Cove Precinct	No	N/A
1.13 Implementation of St Leonards and Crows Nest 2036 Plan	No	N/A

1.14 Implementation of Greater Macarthur 2040	No	N/A
1.15 Implementation of the Pyrmont Peninsula Place Strategy	No	N/A
1.16 North West Rail Link Corridor Strategy	No	N/A
1.17 Implementation of Bays West Place Strategy	No	N/A
1.18 Implementation of Macquarie Park Innovation Precinct	No	N/A
1.19 Implementation of Westmead place strategy	No	N/A
1.20 Implementation of the Camellia Rosehill Place Strategy	No	N/A
1.21 Implementation of South West Growth Area Structure Plan	No	N/A

1.22 Implementation of the Cherrybrook Station Place Strategy.	No	N/A
3. Focus Area 2: Design and Place		
This Focus Area was blank when the Directions were made.		
4.Focus Area 3: Biodiversity and Conservation		
3.1 Conservation Zones	Yes	The Planning Proposal is supported by an ecological assessment conducted by AREA, as detailed in **Appendix C**. Notably, no environmentally sensitive areas were found within the site. However, the assessment did highlight the necessity for vegetation removal as part of the site's development. The specific impact of this removal will be evaluated during any Development Application (DA) stage.
3.2 Heritage Conservation	Yes	Area Environmental and Heritage Consultants conducted an Aboriginal Heritage Due-Diligence assessment for the Planning Proposal. Historically, the land was used for agriculture. The southern part shows significant ground disturbance, reducing object likelihood. Conversely, the northern section has minimal ground visibility. On February 7, 2024, AHIMS database search (Service ID 862037) identified nine Aboriginal sites within a 1000-meter radius of Lot 101 - **Figure 7** of this report. Therefore, it is not expected that the planning proposal will enact the development of land identified to accommodate aboriginal objects or aboriginal places. Notably the Planning Proposal can be submitted to the LALC for comment and if necessary, heritage surveys will be undertaken by the LALC.
3.3 Sydney Drinking Water Catchments	No	N/A
3.4 Application of C3 and C3 Zones and	No	N/A

Environmental Overlays in Far North Coast LEPs		
3.5 Recreation Vehicle Area	No	N/A
3.6 Strategic Conservation Planning	No	Ministerial Direction 3.5 – Strategic Conservation Planning is not relevant to his Planning Proposal as the Planning Proposal area is not mapped to be "avoided land" or "strategic conservation area" under the State Environmental Planning Policy (Biodiversity and Conservation 2021).
3.7 Public Bushland	No	N/A
3.8 Willandra Lakes Region	No	N/A
3.9 Sydney Harbour Foreshores and Waterways Area	No	N/A
3.10 Water Catchment Protection	No	N/A
5. Focus Area 4: Resilience and Hazards		
4.1 Flooding	No	The Planning Proposal is does not affect land identified to be flood prone.
4.2 Coastal Management	No	The site is not located within a coastal zone nor is it located within a coastal wetlands and littoral rainforests area, coastal vulnerability area, coastal environment area and coastal use area - and as identified by chapter 2 of *State Environmental Planning Policy (Resilience and Hazards) 2021*.
4.3 Planning for Bushfire Protection	No	The site has not been identified and mapped as Bushfire Prone Land under Section 10.3 of the EP&A Act.

4.4 Remediation of contaminated land	Yes	The Planning Proposal is accompanied by a Preliminary Site Investigation (**Appendix D**). The reporting within the area investigated did not identify any land to be significantly contaminated. Therefore, the Planning Proposal is found to be consistent with the objectives of this direction by way of ensuring that risk to human health and the environment is adequately considered.
4.5 Acid Sulfate Soils	No	N/A
4.6 Mine Subsidence and unstable land	No	The Planning Proposal is not associated with land within a Mine Subsidence district.
5. Focus Area 5 – Transport and Infrastructure		
5.1 Integrating land use and transport	Yes	The Planning Proposal, accompanied by a Transport Impact Assessment carried out by McLaren Traffic Engineering, illustrates that it aligns with the key objectives of Ministerial Direction 5.1 - Integrated Land Use Transport. Specifically, the adjustments to the LEP outlined in this Proposal aim to rezone land from R2 - Low Density Residential to R1 - General Residential, enhancing accessibility to housing, job opportunities, and essential services for future residents in Dubbo LGA. These modifications to the LEP will ultimately enable higher density living in a well-connected urban environment that will greatly benefit from existing and planned walking, cycling, and public transit infrastructure networks. By broadening the range of housing options in this area, it effectively diminishes reliance on personal vehicles, thereby enhancing transportation alternatives and easing travel demand, particularly by car. The assessment has also determined that the proposed LEP amendment and potential higher density living are unlikely to have significant adverse effects on traffic flow efficiency and road safety, with any potential impacts being thoroughly addressed during the subsequent Development Application (DA) phase. The Planning Proposal demonstrates a commitment to enhancing the efficient operation of public transport services while ensuring a seamless integration of land use and transportation systems within the region.
5.2 Reserving land for public purposes	No	N/A

5.3 Development near regulated airports and defence airfields	No	N/A
5.4 shooting ranges	No	N/A
6. Focus Area 6: Housing		
6.1 Residential Zones	Yes	The Planning Proposal impacts residential zone areas; thus, Ministerial Direction 6.1 is relevant to it. The Proposal aligns with Direction 6.1. It aims to change the current land zoning from R2 – Low Density Residential to R1 – General Residential. This modification will enable a wider range of building options in a suitable section of Dubbo, near services and with infrastructure access. The increased housing variety resulting from the rezoning will also aid in improving housing affordability.
6.2 Caravan Parks and Manufactured Home Estates	No	N/A
7. Focus Area 7: Industry and Employment		
7.1 Employment Zones	No	N/A
7.2 Reduction in non-hosted short term rental accommodation period	(Revoked 18 November 2019)	N/A
7.3 Commercial and Retail Development along the Pacific Highway, North Coast	No	N/A – not within applicable LGAs.
8.Focus Area 8: Resources and Energy		

8.1 Mining, Petroleum Production and Extractive Industries	No	N/A – not within applicable precinct.
9. Focus Area 9: Primary Production		
9.1 Rural Zones	No	N/A
9.2 Rural Lands	No	N/A
9.3 Oyster Aquaculture	No	N/A
9.4 Farmland of State Regional Significance on the NSW Far North Coast	No	N/A

5.3.3. Section C – Environmental, Social and Economic Impact

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

To prepare for this Planning Proposal, AREA Environmental and Heritage Consultants were enlisted to generate a Biodiversity Assessment Report (BAR) – **Appendix C**. A field assessment for the Planning Proposal took place on February 8, 2024, employing the Biodiversity Assessment Method 2020 (BAM) (NSW DPIE, 2020). This assessment encompassed BAM vegetation integrity plots, habitat assessment, and initial searches for threatened flora and fauna species. Three BAM vegetation plots were deployed to assess the native vegetation present on the land investigated. It was established that PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions, encompasses approximately 9.06 hectares of the land investigated where native vegetation persists. Roughly 1.45 hectares of the land lack vegetation due to previous clearance for an existing access track and stockpile.

The assessment revealed that no threatened species listed under the Environment Protection Conservation Act or Biodiversity Conservation Act were observed during the field survey. The BAM calculator generated a list of predicted threatened species associated with PCT76 on the subject land, presumed to potentially utilise the habitat. These species can only be disregarded in cases where specific habitat or geographical constraints are absent from the subject land. Targeted species surveys have not been conducted as part of the Planning Proposal; however, they are likely to be carried out during the preparation of a DA. Nonetheless, the Planning Proposal does not alter the LEP in a way that would permit the development of land leading to critical habitat, threatened

species, populations, or ecological communities from being adversely affected. Given that the land is already designated for development, the Planning Proposal maintains this designation unchanged, consequently leaving the potential environmental impact unaffected.

Subsequent development applications for the land will need to confront the pertinent environmental aspects concerning the site. They will be obligated to illustrate how the development primarily avoids environmental impact and, where avoidance is not feasible, demonstrate measures to mitigate its impact.

Are there any other likely environmental effects of the planning proposal and how are they proposed to be managed–

The following is a summary of other likely environmental effects as a result of the Planning Proposal or any other constraints within the Planning Area.

Constraints	Comments
Natural Resources Biodiversity Map Groundwater Vulnerability	The area is mapped by the DRLEP 2022 Natural Resources Biodiversity Map Groundwater Vulnerability Map. However, the area that the Planning Proposal is over is not mapped to subject to Groundwater Vulnerability. The development intentions for this land is for residential development with supporting road and infrastructure, including stormwater. The resultant development would be required to manage stormwater collection and disposal in controlled engineering fashion and in accordance with Council policies.
Aboriginal Culture Heritage	The Planning Proposal includes Aboriginal Heritage Due-Diligence assessment - Appendix B. The investigation has suggested any proposed development over the study area, further assessment and consultation is recommended. If Aboriginal objects are not recorded and are considered unlikely to occur, the development may proceed with caution. In the event Aboriginal objects are recorded, an Aboriginal Cultural Heritage Assessment Report will be required, involving full consultation according to clause 60 of the National Parks and Wildlife Regulation 2019
Siding Spring Observatory	The Planning Proposal will permit denser development, potentially increasing light emission in the area. According to Clause 5.14 of the DRLEP 2022, any future development must adequately consider the provisions related to development within the Siding Spring Observatory area to ensure that light pollution is minimized. It will be a requirement of any future application that the development is assesses against the provisions of this Clause.
Noise and Dust Impacts	As mentioned earlier in this report, the site is located near the quarry on Sheraton Road, approximately 2 km away. Currently, trucks servicing this quarry use Sheraton Road as their haulage route, potentially causing dust and noise pollution at the site. However, the Council's long-term strategy aims to efficiently distribute traffic around the eastern and southern edges of Dubbo's urban limits. This plan includes the acquisition and establishment of the BlueRidge Road Haulage Strategy. The Blue Ridge Road Haulage Strategy will be delivered in two stages. Stage 1 will redirect heavy and industrial traffic to a

	Stage 1 temporary haulage route connecting to Capital Drive. Stage 2 will provide a permanent route to Wellington Road (Mitchell Highway). Consequently, the Council is developing a precinct-wide strategy to mitigate or eliminate potential noise and dust impacts from existing haulage routes near Keswick Estate.

The land is currently zoned for residential development. Any future development within these regions would necessitate careful assessment of the pertinent environmental repercussions. Such an evaluation would need to be conducted as part of a development application, particularly if the Council seeks assurance regarding the suitability of the land for the intended purpose.

Has the planning proposal adequately addressed any social and economic effects?

The Planning Proposal will have a positive social and economic impact by way of:

Increased Housing Diversity:

Rezoning land from R2 – Low Density Residential to R1 – General Residential allows for greater flexibility in housing options. R1 zoning typically permits a wider range of housing types, multi dwelling housing, attached housing and residential flat buildings. This increased diversity can cater to the needs of different demographic groups, such as young families, professionals, retirees, and individuals with varying income levels.

Stimulating Construction Activity:

Rezoning land from R2 – Low Density Residential to R1 – General Residential can stimulate construction activity in the area. Developers may be incentivized to invest in the development of new housing projects, which can create job opportunities in construction, architecture, engineering, and related industries. Increased construction activity can also have positive ripple effects on the local economy, including increased spending in retail and service sectors.

Social Inclusion and Vibrancy:

By offering a broader range of housing options, which can contribute to affordable housing and housing suitable for different household sizes, the Planning Proposal can contribute to greater social inclusion and diversity within the community. It allows people from various socio-economic backgrounds to live in proximity, fostering a more vibrant and interconnected neighborhood. This can lead to the creation of stronger social networks, increased community engagement, and a greater sense of belonging among residents.

5.3.4. Section D – State and Commonwealth Interests

Is there adequate public infrastructure for the planning proposal?

The Planning Proposal will increase the demand for public facilitates and services. Proposed works within the Keswick Estate are subject to staged approach, and accordingly, specific water and sewer infrastructure upgrades requirements will be confirmed at a later stage. Notably, the site does have access to all services.

What are the views of state and federal public authorities and government agencies consulted in order to inform the Gateway determination?

If Council support this Planning Proposal and receives a Gateway Determination from the Department of Planning, Housing and Infrastructure, it is likely the proposal would be publicly exhibited for 28 days in accordance with the Local Environmental Plan Making Guidelines. Council will engage with state agencies, adjoining landowners and public as per the Gateway Determination. This is understood to include a notice on Council website and in Customer Experience Centres, the NSW Planning Portal, and letters to the affected and adjoining landowners.

In addition, state agencies would be consulted as part of the Gateway Determination. These agencies would likely include:

- Transport for New South Wales.
- Local Aboriginal Land Council

A further report is likely to be presented to Council by staff for consideration following the completion of public exhibition and any consultation processes.

5.4. Part 4 – Mapping

The plans provided in **Appendix F** clearly outline the Planning Proposal and associated likely development requirements. The plans include:

- Land Zoning Map – Proposed amendment to the Land Zoning Map (DIGITAL MAP)
- Minimum Allotment Size – Proposed amendment to the Minimum Allotment Size Map (DIGITAL MAP), noting that this shall reflect no minimum lot size as is the case with nearby R1 zoned land.

5.5. Part 5 – Community Consultation

It is expected that the Planning Proposal would not be a Low Impact Proposal and therefore community consultation would be undertaken in accordance with the requirements set out in *Local Environmental Plan Making Guidelines – Complex Planning Proposal*
The consultation would include:

- Notification in a newspaper that circulates in the area affected by the planning proposal;
- Notification on the website of the RPA; and
- Notification in writing to affected and adjoining landowners, unless the planning authority is of the opinion that the number of landowners makes it impractical to notify them.

5.6. Part 6 -Project Timeline

The following indicative project timeline is provided:

Table 9: Indicative Project Timing

Stage	Timing
Consideration by Council	50 days
Council Decisions	TBA
Gateway Determination	25 Days
Pre-exhibition	TBA
Commencement and completion of public exhibition period	95 Days
Consideration of submission	TBA
Post-exhibition review and additional studies	TBA
Submission to Department for finalisation	55 Days
Gazettal of LEP amendments.	TBA

6. CONCLUSION

Spicers Creek Wind Farm has engaged Barnson Pty Ltd to assist with the preparation of a Planning Proposal affecting a specific section of Lot 101 in Deposited Plan 1301426 that has a current land zoning of R2 – Low Density Residential. The Planning Proposal seeks to amend the DRLEP by way of:

1. **Land Rezoning** - The Planning Proposal aims to revise the existing land zoning of a portion of the property by rezoning it to R1 – General Residential.
2. **Minimum Allotment Size** – Removal of existing 600sqm Minimum Allotment Size.

The Planning Proposal is accompanied by a suite of specialised reports, focusing on the site's constraints. The overall conclusion drawn from the Planning Proposal and these expert reports strongly confirms the appropriateness of the site to be rezoned. Changing the zoning of land from R2 – Low Density Residential to R1 – General Residential provides more versatility in housing choices. R1 zoning typically allows for a broader spectrum of housing types, including multi-dwelling units, attached housing, and residential apartment buildings. This enhanced variety can address the requirements of diverse demographic segments, including young families, professionals, retirees, and individuals with differing income levels. Furthermore, the increased housing diversity can exert downward pressure on housing affordability, making housing options more accessible to a wider range of people.

Therefore, Barnson is of the view that Council should support this Planning Proposal based on the information provided in this report; and *resolve* to refer this Planning Proposal to NSW Department of Planning and Environment for a Gateway Determination to endorse its public exhibition. Pending endorsement by NSW DPHI, the Planning Proposal will be exhibited in accordance with the criteria outlined in the Gateway Determination. The outcome of the exhibition and referrals to various government departments will be subsequently reported to Council for determination.

barnson.

APPENDIX A

Deposited Plan

SCHEDULE OF SHORT LINES		
NO	BEARING	DISTANCE
1	53° 54' 25"	7.505
2	43° 58' 30"	55.495
3	10° 34' 10"	73.03
4	9° 47' 50"	15
5	55° 13' 05"	14.14
6	231° 17' 10"	15.915
7	100° 12' 50"	48.89
8	190° 03' 05"	25.8
9	100° 03' 05"	26.225
10	347° 26' 20"	5.34
11	190° 03' 15"	21.21
12	280° 37' 55"	30
13	10° 03' 15"	20
14	100° 03' 15"	36.64
15	99° 20' 05"	16
16	280° 03' 05"	36.5
42	100° 03' 05"	8.22

ALL LINES ARE PO

NOTE - SEE SHEET 2 FOR:
- COORDINATE SCHEDULE
- DIAGRAMS 2 & 3

CONNECTIONS					
SSM 160192	- PM 84295	84° 19' 46"	1652.269	SCIMS (GND)
		84° 19' 46"	1652.282	BY SURVEY
PM 84295	- PM 65627	161° 19' 39"	956.548	SCIMS (GND)
		161° 19' 38"	956.556	BY SURVEY
PM 65627	- PM 200349	299° 58' 03"	1403.993	BY SURVEY
PM 200349	- SSM 160192	273° 14' 48"	735.336	BY SURVEY
SSM 160192	- CNR A	85° 49' 55"	474.515	
PM 84295	- CNR B	191° 38' 40"	328.665	

(E) ~ EASEMENT FOR UNDERGROUND POWERLINES 2 WIDE AND VARIABLE (DP 1241356)
(F) ~ EASEMENT FOR WATER SUPPLY 6 WIDE (DP 849890)
(G) ~ EASEMENT FOR OVERHEAD POWERLINES 40 WIDE (DEALING AI233398)
(H) ~ EASEMENT FOR DRAINAGE 1.525 WIDE (DEALING D411346)
(K) ~ EASEMENT TO DRAIN WATER 40 WIDE (DP 814043)
(L) ~ RESTRICTIONS ON THE USE OF LAND (DP 814043)
(P) ~ EASEMENT TO DRAIN WATER 20 WIDE (DP 583858)
(R) ~ RIGHT OF ACCESS 20 WIDE (DP 1261855)
(U) ~ EASEMENT FOR OVERHEAD POWERLINES 20 WIDE (DP 1220591)
(E1) ~ EASEMENT FOR OVERHEAD POWERLINES 20 WIDE (DP 1272474)
(E2) ~ EASEMENT FOR UNDERGROUND POWERLINES 2 WIDE (DP 1272474)
(U2) ~ EASEMENT FOR UNDERGROUND POWERLINES 2 WIDE AND VARIABLE (DP 1280301)

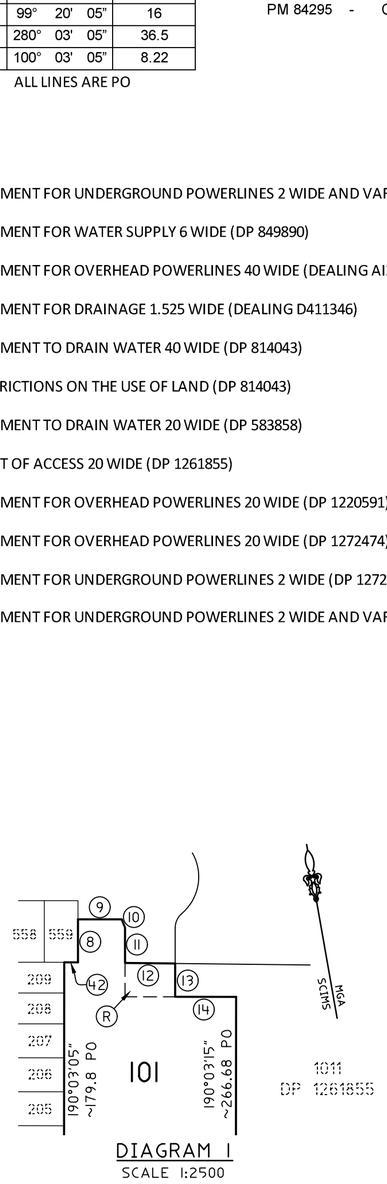
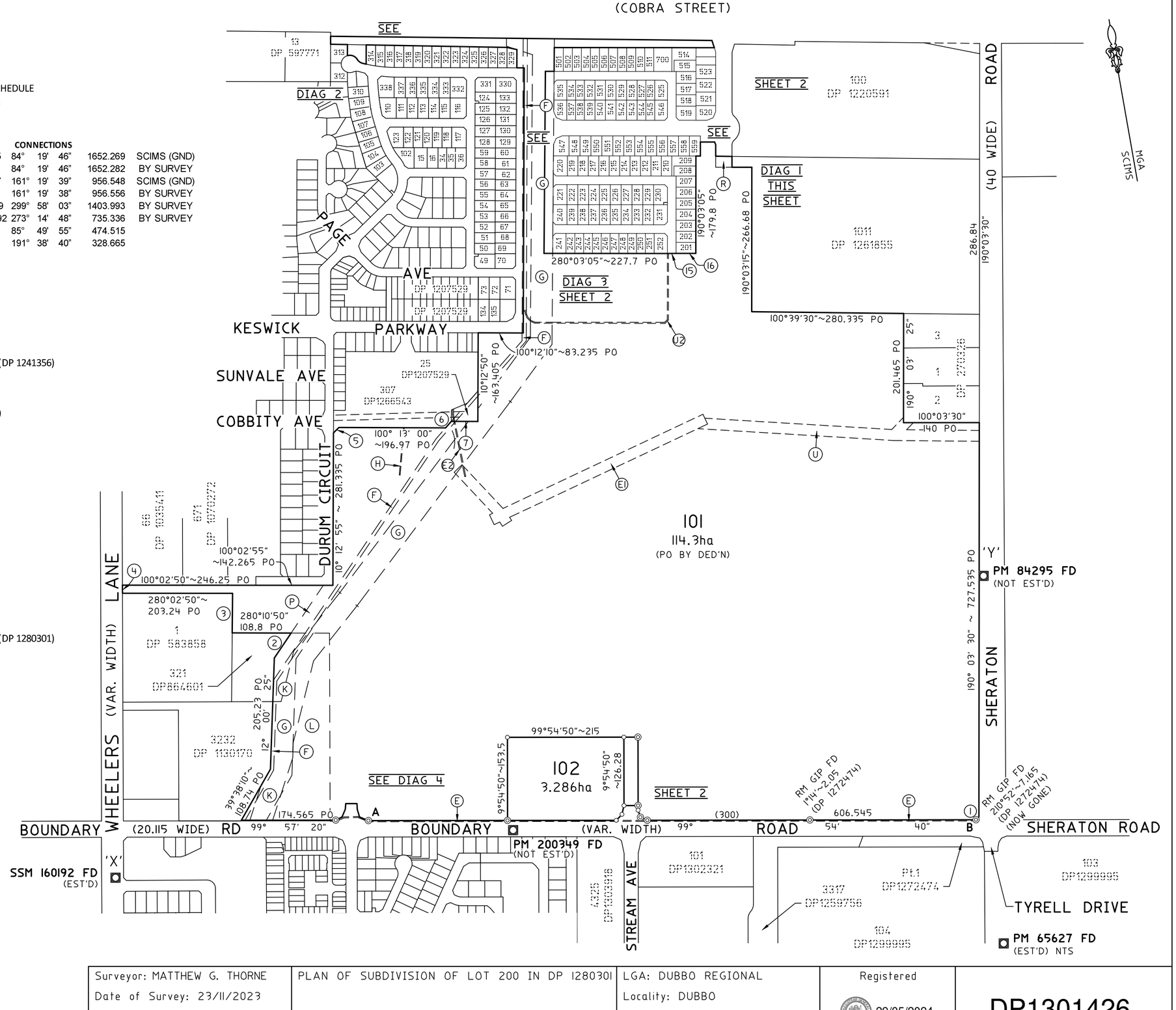


DIAGRAM 1
SCALE 1:2500



Surveyor: MATTHEW G. THORNE Date of Survey: 23/11/2023 Surveyor's Ref: 120126.01B.DP01	PLAN OF SUBDIVISION OF LOT 200 IN DP 1280301	LGA: DUBBO REGIONAL Locality: DUBBO Subdivision No: SC20-502 Lengths are in metres. Reduction Ratio 1:5000	Registered 29/05/2024	DP1301426

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

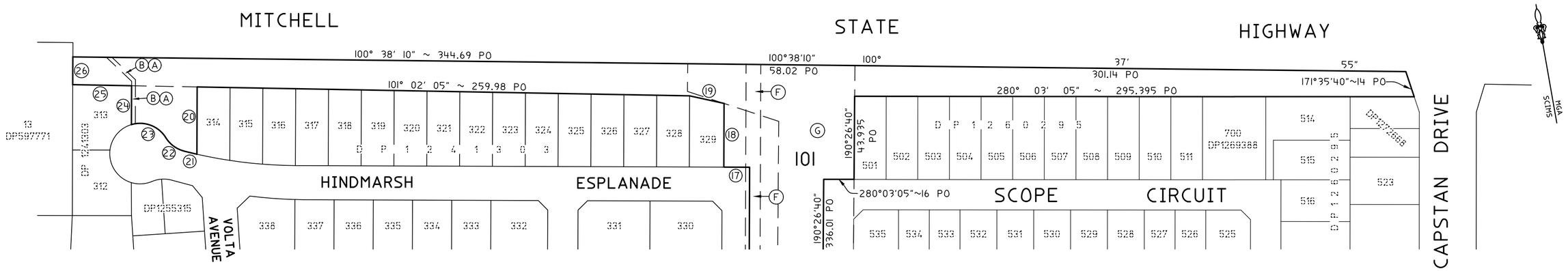


DIAGRAM 2
SCALE 1:1500

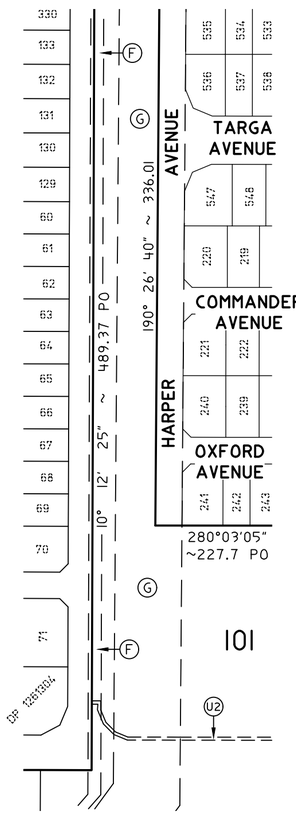


DIAGRAM 3
SCALE 1:2500

SCHEDULE OF SHORT LINES AND ARCS				
NO	BEARING	DISTANCE	ARC	RADIUS
17	280° 12' 25"	13.6		
18	10° 09' 40"	33.735		
19	112° 12'	18.635		
20	10° 12' 15"	35.55		
21	113° 31' 35"	6.995	6.995	246
22	136° 18' 10"	11.97	12.265	16
23	120° 54' 55"	19.415	20.86	16
24	10° 12' 15"	20.525		
25	101° 02' 05"	31.065		
26	10° 10' 10"	14.77		
27	123° 42'	13.86		
28	170° 40' 10"	13.66		
29	189° 54' 50"	8.725		
30	99° 54' 50"	26.01		
31	22° 59' 40"	16.675		
32	53° 47' 55"	15.205		
33	122° 22' 20"	17.73		
34	173° 12' 55"	14.895		
35	187° 34' 15"	8.83		
36	189° 40' 25"	1.675		
37	99° 54' 50"	21		
38	9° 40' 25"	1.675		
39	14° 33' 35"	8.855		
40	32° 52' 35"	15.305		
41	72° 40' 20"	13.03		

ALL LINES AND ARCS ARE PO

- (A) ~ EASEMENT FOR UNDERGROUND POWERLINE 2 WIDE (DEALING AN881748)
- (B) ~ EASEMENT FOR SERVICES 2 WIDE (DEALING AN881799)
- (E) ~ EASEMENT FOR UNDERGROUND POWERLINES 2 WIDE & VARIABLE (DP 1241356)
- (F) ~ EASEMENT FOR WATER SUPPLY 6 WIDE (DP 849890)
- (G) ~ EASEMENT FOR OVERHEAD POWERLINES 40 WIDE (DEALING AI233398)
- (L) ~ RESTRICTIONS ON THE USE OF LAND (DP 814043)
- (U2) ~ EASEMENT FOR UNDERGROUND POWERLINES 2 WIDE & VARIABLE (DP 1280301)

COORDINATE SCHEDULE						
MARK	MGA COORDINATES		CLASS	PU	METHOD	STATE
	EASTING	NORTHING				
PM 65627	655162.869	6427596.019	B	0.02	FROM SCIMS	FOUND
SSM 160192	653212.740	6428338.846	C	N/A	FROM SCIMS	FOUND
PM 200349	653947	6428297	U	N/A	FROM SCIMS	FOUND
PM 84295	654856.669	6428502.078	B	0.02	FROM SCIMS	FOUND
DATE OF SCIMS COORDINATES: 23-11-2023						
MGA ZONE: 55						
MGA DATUM: GDA2020						
COMBINED SCALE FACTOR: 0.999845						

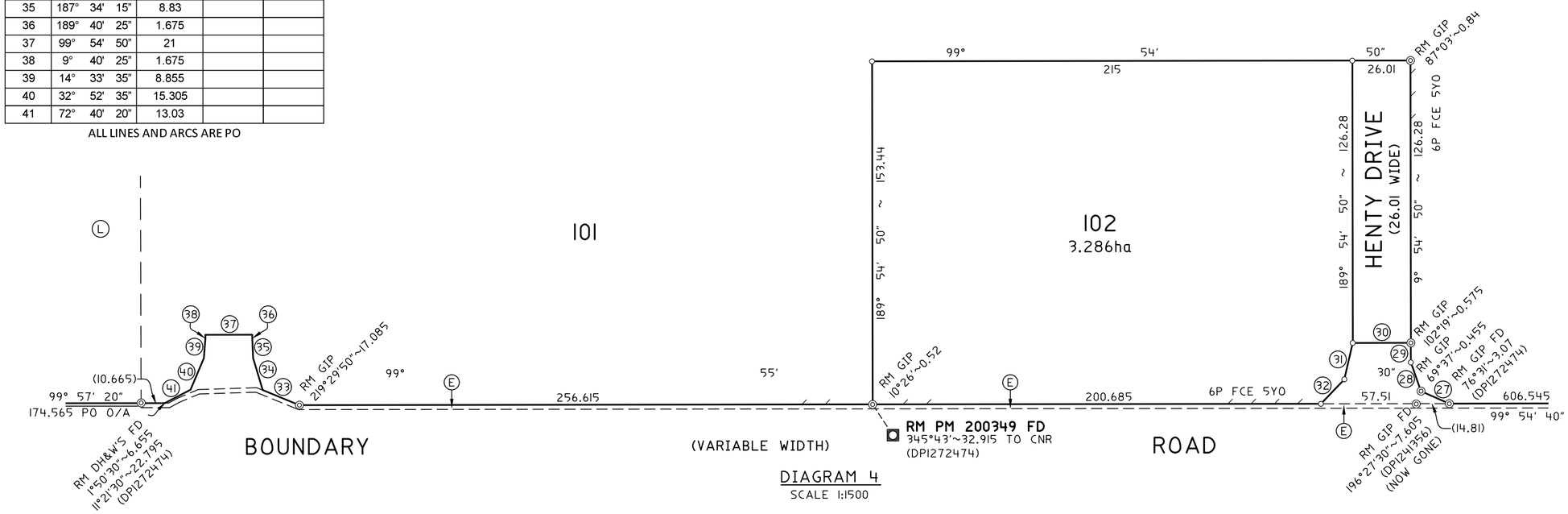


DIAGRAM 4
SCALE 1:1500

Surveyor: MATTHEW G. THORNE Date of Survey: 23/11/2023 Surveyor's Ref: 120126.01B.DP01	PLAN OF SUBDIVISION OF LOT 200 IN DP 1280301	LGA: DUBBO REGIONAL Locality: DUBBO Subdivision No: SC20-502 Lengths are in metres. Reduction Ratio 1:4000	Registered 29/05/2024	DP1301426

0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140

PLAN FORM 6 (2020) **WARNING: Creasing or folding will lead to rejection**

DEPOSITED PLAN ADMINISTRATION SHEET

Office Use Only

Registered: 29/05/2024

Title System: TORRENS

Office Use Only

DP1301426

SUBDIVISION OF LOT 200 IN DP 1280301

LGA: DUBBO REGIONAL

Locality: DUBBO

Parish: DUBBO

County: LINCOLN

Survey Certificate

I, MATTHEW G. THORNE

of PREMISE PTY LTD, PO BOX 1842 DUBBO 2830

a surveyor registered under the *Surveying and Spatial Information Act 2002*, certify that:

~~*(a) The land shown in the plan was surveyed in accordance with the *Surveying and Spatial Information Regulation 2017*, is accurate and the survey was completed on 7 February 2022, or~~

(b) The part of the land shown in the plan (~~being~~/*excluding the residue of lot 101) was surveyed in accordance with the *Surveying and Spatial Information Regulation* 2017, the part surveyed is accurate and the survey was completed on, 23/11/2023 the part not surveyed was compiled in accordance with that Regulation, or

~~*(c) The land shown in this plan was compiled in accordance with the *Surveying and Spatial Information Regulation 2017*.~~

Datum Line: "X" ~ "Y"

Type: *Urban/*~~Rural~~

The terrain is *Level-Undulating / *~~Steep-Mountainous.~~

Signature: ..... Dated: 05/12/2023

Surveyor Identification No: 2100
Surveyor registered under
the *Surveying and Spatial Information Act 2002*
[Electronic signature of me Matthew G. Thorne, affixed by me on 05/12/2023]

*Strike out inappropriate words.

**Specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey.

~~Crown Lands NSW/Western Lands Office Approval~~

~~I, ... (Authorised Officer) in approving this plan certify that all necessary approvals in regard to the allocation of the land shown herein have been given.~~

~~Signature: .....~~

~~Date: .....~~

~~File Number: .....~~

~~Office: .....~~

Subdivision Certificate

I, Stephen Wallace

Authorised Person/~~General Manager/*Accredited Certifier~~, certify that the provisions of s.6.15 of the *Environmental Planning and Assessment Act 1979* have been satisfied in relation to the proposed subdivision, new road or reserve set out herein.

Signature: Electronic signature of me, Stephen Wallace, affixed by me, or at my direction, on 10/4/2024.

Accreditation number: N/A

Consent Authority: Dubbo Regional Council

Date of endorsement: 10/4/24

Subdivision Certificate number: SC20-502

File number: D20-502

*Strike through if inapplicable.

Plans used in the preparation of survey/compilation.

DP 1280301

DP 1241356

DP 1272474

Statements of intention to dedicate public roads, create public reserves and drainage reserves, acquire/resume land.

IT IS INTENDED TO DEDICATE THE EXTENSION OF HENTY AVENUE 26.01 WIDE TO THE PUBLIC AS PUBLIC ROAD.

Surveyor's Reference: 120126.01B.DP01

Signatures, Seals and Section 88B Statements should appear on PLAN FORM 6A

PLAN FORM 6A (2019) **DEPOSITED PLAN ADMINISTRATION SHEET** Sheet 2 of 2 sheet(s)

Office Use Only

Registered: 29/05/2024

DP1301426

SUBDIVISION OF LOT 200 IN DP 1280301

Subdivision Certificate number: SC20-502

Date of Endorsement: 10/4/24

This sheet is for the provision of the following information as required:

- A schedule of lots and addresses - See 60(c) *SSI Regulation 2017*
- Statements of intention to create and release affecting interests in accordance with section 88B *Conveyancing Act 1919*
- Signatures and seals- see 195D *Conveyancing Act 1919*
- Any information which cannot fit in the appropriate panel of sheet 1 of the administration sheets.

PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT 1919 AS AMENDED, IT IS INTENDED TO CREATE:-

1. RESTRICTION ON THE USE OF LAND
2. RESTRICTION ON THE USE OF LAND

LOT No.	STREET NUMBER	STREET NAME	STREET TYPE	LOCALITY
101	ADDRESS	NOT	AVAILABLE	
102	180	BOUNDARY	ROAD	DUBBO

The Common Seal of the DUBBO REGIONAL COUNCIL ABN 53 529 070 928)

was affixed on this 30TH day of APRIL 2024)

pursuant to a resolution of the Council dated 24 April 2024)

DUBBO REGIONAL COUNCIL The Common Seal of ABN 53 539 070 928

Signed: Signed:

Murray Wood Councillor Mathew Dickerson

Name: Name:

Chief Executive Officer Mayor

Position Held: Position Held:

If space is insufficient use additional annexure sheet

Surveyor's Reference: 120126.01B.DP01

barnson.

APPENDIX B

Aboriginal Heritage Due Diligence Assessment

Planning Proposal - Lot 200 Keswick

Aboriginal heritage due diligence assessment

Dubbo LGA NSW

Report to Barnson

March 2024

AREA Environmental & Heritage Consultants

"The Old Macquarie Brewery" c1876, 72 Brisbane Street Dubbo NSW 2830

P: 0409 852 098

E: phil@areaenv.com.au

AREA Environmental & Heritage Consultants ABN:29 616 529 867

- ✓ Environmental impact assessment, auditing, and approvals
- ✓ High level preliminary environmental assessment (PEA)
- ✓ Review of environmental factors (REF)
- ✓ Peer review
- ✓ Community engagement
- ✓ Biobanking and biodiversity offsetting assessments
- ✓ Aboriginal heritage assessments and community walkovers
- ✓ Landscape architecture and design

AREA Environmental & Heritage Consultants acknowledge Traditional Owners of the country on which we work.

Document controls

Client	Barnson Pty Ltd		
AREA job no.	QU-1236		
Document description	Lot 200 Keswick Planning Proposal - Aboriginal heritage due diligence assessment		
Clients representative managing this document	Jim Sarantzouklis		
AREA representative managing this document	Phil Cameron		
Cover image	Dirt stockpiles and disturbance within the study area		
Document status	**Version**	**Date**	**Action**
DRAFT (internal document)	V1.0	23/02/2024	AREA internal edit
DRAFT (AREA / Client)	V2.0 V2.1	26/02/2024 05/03/2024	AREA to client Client edits
FINAL	V3.0 V3.1	11/03/2024 18/03/2024	Final draft to client Update to address minor client edits
Prepared for	Barnson Pty Ltd Unit 1 36 Darling Street Dubbo, NSW, 2830		
Prepared by	Kim Newman Heritage Consultant **AREA Environmental & Heritage Consultants Pty Ltd** 72 Brisbane Street Dubbo NSW 2830 M 0409 038 628 E kim@areaenv.com.au ABN: 29 616 529 867		

Executive summary

AREA Environmental & Heritage Consultants (AREA) have been engaged by Barnson (the proponent) to complete an Aboriginal heritage due diligence assessment to inform a proposed amendment to the *Dubbo Regional Local Environmental Plan 2022* (the LEP) for a section of Lot 200 DP1280301 (the study area, Figure 1-1 and Figure 1-2). The proponent seeks to amend the land zoning map of the LEP to rezone the study area from *R2 - Low Density Residential* to *R1 - General Residential* to enable permitted uses therein (the Planning Proposal).

The study area will be assessed in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (NSW Department of Environment Climate Change and Water (DECCW), 2010b). The aim of this report is to identify whether any Aboriginal objects or areas of archaeological potential would be impacted by the proposal, and address the requirements under the relevant codes and legislation should development of the study area proceed.

The site inspection was conducted on 8 February 2024 by Kim Newman. The Aboriginal community was not involved in this assessment.

No Aboriginal sites or potential archaeological deposits were identified during this survey.

The ground surface of the southern portion of the study area is considered to be highly disturbed and there is a low probability of objects occurring in this section. The northern section has been subjected to less disturbance and had very low ground surface visibility. Given the moderate level of disturbance, the presence of stone resources within the area, and a distance of 1,250 meters to Eulomogo Creek, there is a possibility of objects occurring in the northern section. In addition, while the archaeologist did not interpret the scar on the tree a being culturally modified community knowledge should be consulted to inform this identification.

Applying the due diligence process has demonstrated that further investigation is required.

Prior to the commencement of any proposed development over the study area, further assessment and consultation is recommended. An archaeological assessment should be carried out across the site with the involvement of local Aboriginal traditional owners.

If Aboriginal objects are not recorded and are considered unlikely to occur, the development may proceed with caution.

In the event Aboriginal objects are recorded, an Aboriginal Cultural Heritage Assessment Report will be required, involving full consultation according to clause 60 of the *National Parks and Wildlife Regulation 2019*.

Table of contents

Figures

Tables

Glossary

Acronym	Definition
ACHAR	Aboriginal Cultural Heritage Assessment Report
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
AREA	AREA Environmental and Heritage Consultants
ASL	Above Sea Level
BOM	Bureau of Meteorology
Code of Practice	Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW
DECCW	Department of Environment, Climate Change and Water
DPE	Department of Planning, and the Environment
Ephemeral	Not permanent, lasting only short periods of time
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
GPS	Global positioning system
GSV	Ground Surface Visibility
ICOMOS	(International Council on Monuments and Sites
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NPWS	National Parks and Wildlife Services
NSW	New South Wales
OEH	Office of Environment and Heritage
RAP	Registered Aboriginal Party
Rill erosion	A rill is a small channel up to 0.3m deep
Study area	The land assessed for this report

1 Introduction

1.1 Background

AREA Environmental & Heritage Consultants (AREA) have been engaged by Barnson (the proponent) to complete an Aboriginal heritage due diligence assessment to inform a proposed amendment to the Dubbo Regional Local Environmental Plan 2022 (the LEP) for a section of Lot 200 DP1280301 (the study are; Figure 1-1 and Figure 1-2). The proponent seeks to amend the land zoning map of the LEP to rezone the study area from R2 - Low Density Residential to R1 - General Residential to enable permitted uses therein (the Planning Proposal).

The study area has been assessed in accordance with the Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (NSW Department of Environment Climate Change and Water (DECCW), 2010b).

The aim of this report is to identify whether it is likely any Aboriginal objects or areas of archaeological potential would be impacted by the proposal. This report addresses the requirements for assessment as set out in:

- National Parks and Wildlife Act 1974
- Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (DECCW, 2010c).

1.2 Locality

The regional geographical context of the study area is provided in Table 1-1.

Table 1-1: Regional geographical context of the study area

Criteria	Study area
Central coordinates (GDA94 z55)	654450 mN 6428348 mS
Interim Biogeographic Regionalisation for Australia (IBRA Region)	Brigalow Belt South region, Talbragar Valley
State	NSW
Topographical map sheet	Dubbo 1:250 000
Local Government Area	Dubbo Regional LGA
Local Aboriginal Land Council area (LALC)	Dubbo LALC
Parish	Dubbo
Country	Lincoln
Schedule of Native Title Determination Applications (Claims, ILUA Future Acts etc.)	NA
Nearest town / locality	Dubbo
Accessed from nearest town by	Boundary Road
Land use / disturbance	Farming, residential
Nearest waterway (Name, Strahler Order)	Eulomogo Creek located 1250 m to the south
Spot point Australian Height Datum (AHD)	284m (AHD)

Criteria	Study area
Surrounding land use	Residential, farming, road corridor
Expected disturbance footprint land use	Residential

1.3 Aboriginal community involvement

The Aboriginal community was not involved in this assessment.

1.4 Project description

The Planning Proposal seeks to amend the *Dubbo Regional Local Environmental Plan 2022*, in particular rezoning the study area from its current zone *R2 – Low Density Residential* to *R1 – General Residential t*o enable permitted uses therein.

For the purpose of this assessment the land affected by the proposal will be referred to as the '**study area'.**

1.5 Project personnel

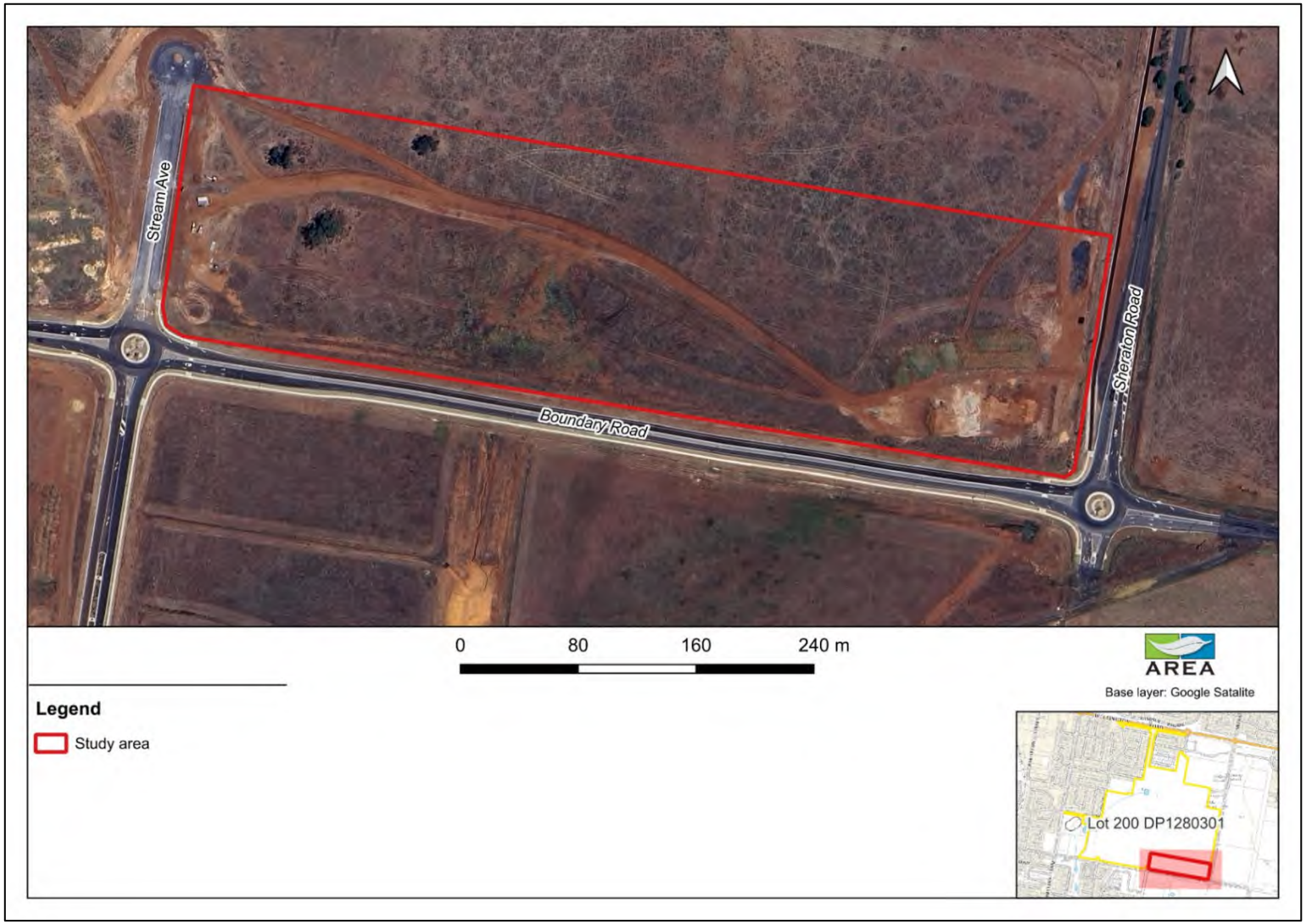
This assessment was carried out by appropriately experienced or qualified staff (Table 1-2**)**. Kim Newman conducted the field survey and prepared this report.

Table 1-2: Summary the project team's qualifications

Name	Position	Qualifications	Responsibilities
Kim Newman	Heritage Consultant	• Bachelor of Archaeology (Honours) University of New England • Master of Science (Archaeology). University of New England • PhD Candidate in Archaeology (Griffith University Qld)	• Undertook field survey. • Authored the report
Rowan Murphy	Senior Environmental Consultant	• Bachelor of Environmental Science University of New England • Bachelor of Laws University of New England	• Edited this report.

Figure 1-1: Location of the study area

Figure 1-2: The study area



2 Legislative context

2.1 The Burra Charter (Australia ICOMOS 2013)

Australia ICOMOS (International Council on Monuments and Sites) has developed a set of principles and practices for the management of cultural heritage in Australia. Local government authorities including the NSW DPE have used the Burra Charter to guide their own heritage management documents. The charter promotes the conservation of places of cultural significance (Australia ICOMOS, 2013:3). It placed an emphasis on understanding significance as the basis for managing the heritage values for a place, as well as the importance of consulting with community groups to achieve this understanding (Australia ICOMOS, 2013:4, 8).

2.2 EPBC Act

The *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) is the primary framework of legislation for the protection of nationally significant ecological communities and heritage places. Heritage items are protected through their inscription on the World Heritage List, Commonwealth Heritage List or the National Heritage List. There are no items listed on the above registers within the study area.

The Act also has jurisdiction over environmental impacts other than those of national significance where they occur on commonwealth-owned land. The EPBC Act becomes the primary piece of legislation for the approval of a project when a proposal may significantly impact a matter of national environmental significance. In this case, the assessment is referred to the Department of Agriculture, Water and Environment.

2.1 Native title

The *Native Title Act 1994* was introduced to work in conjunction with the Commonwealth *Native Title Act 1993.* Native Title claims, registers and Indigenous Land Use Agreements are administered under the Act. There are no Native Title claims currently registered in the study area.

2.2 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act) establishes a framework for the formal assessment of cultural heritage values within the land use planning and development consent process. The EP&A Act comprises three key parts directly pertaining to Aboriginal cultural heritage:

- Part 3: This section governs the preparation of planning instruments, which include policies and regulations related to land use planning.
- Part 4: Part 4 of the EP&A Act specifically pertains to the processes involved in assessing developments for local government consent authorities. This part outlines the requirements and procedures for evaluating development proposals.
- Part 5 which relates to activity approvals by governing (determining) authorities.

This planning proposal will be assessed in accordance with Part 3.

2.3 National Parks and Wildlife Act 1974

Under the *National Parks and Wildlife Act 1974* (NPW Act), the Director-General of the National Parks and Wildlife Service is responsible for the care and protection of Aboriginal objects and places in NSW. An *Aboriginal object* means any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction and includes Aboriginal remains. An *Aboriginal place* means any place of special significance with respect to Aboriginal culture as declared by the Minister.

Under Section 86 of the Act, a person must not harm an Aboriginal object or place. However, the Chief Executive may issue an Aboriginal Heritage Impact Permit (AHIP) subject to conditions. Penalties are in place for anyone who breaches these conditions or knowingly defaces or destroys and Aboriginal object or place without a permit.

2.4 Dubbo Regional Local Environmental Plan 2022

The Dubbo Regional Local Environmental Plan 2022 (LEP 2022) provides statutory protection for certain places listed as being of heritage significance, generally of historic heritage significance, although on occasions can hold particular significance to the Aboriginal community. It ensures that essential best practice components of the heritage decision making process are followed.

For listed heritage items, relics and heritage conservation areas, the following actions can only be carried out with the consent of the Dubbo Regional Council. Development consent is required for the following:

a) demolishing or moving any of the following or altering the exterior of any of the following (including, in the case of a building, making changes to its detail, fabric, finish or appearance):
   i. a heritage item.
   ii. an Aboriginal Object
   iii. a building, work, relic or tree within a heritage conservation area
b) altering a heritage item that is a building by making structural changes to its interior or by making changes to anything inside the item that is specified in Schedule 5 in relation to the item.
c) disturbing or excavating an archaeological site while knowing, or having reasonable cause to suspect, that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed.
d) disturbing or excavating an Aboriginal place of heritage significance.
e) erecting a building on land:
   i. on which a heritage item is located or that is within a heritage conservation area, or
   ii. on which an Aboriginal Object is located or that is within an Aboriginal place of heritage significance; and
f) subdividing land:
   i. on which a heritage item is located or that is within a heritage conservation area, or
   ii. on which an Aboriginal Object is located or that is within an Aboriginal place of heritage significance.

3 Landscape features

3.1 Overview

A review of the landscape of the study area and surrounds allows for comparison with other areas archaeologically investigated. It also assists in assessing existing and previous disturbances which may have affected the integrity of archaeological remains. Environmental features such as landforms, topography, water sources, geology, soils, and vegetation are also relevant for an archaeological assessment.

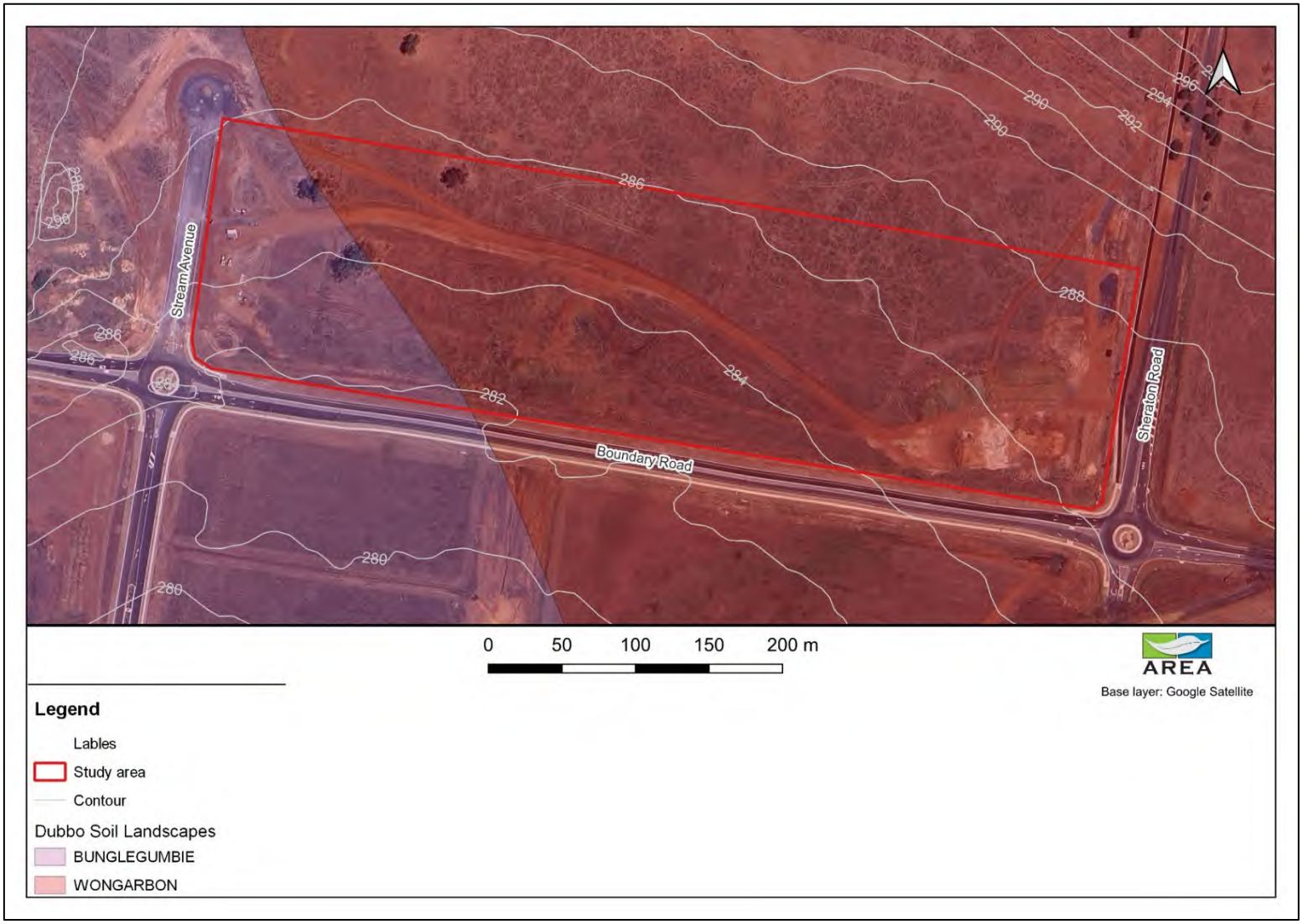
The study area is in the Brigalow Belt South Bioregion and the Talbragar Valley subregion. Located to the southeast of Dubbo at an elevation between 282-288m above sea level (ASL) (Figure 3-2).

3.2 Landforms and topography

The study area is located on the southern side of a gently undulating rise that slopes down to Eulomogo Creek in the south (Figure 3-1). Volcanic cobbles were present across the study area however no raised rocky outcrops were present.

Figure 3-1: View to the west across northern section of the study area

Figure 3-2: Overview of the landscape context of the study area



3.3 Geology and soils

The majority of the study area sits within the Dubbo Basalts landscape, with characteristic volcanic rock outcrops visible across the study area (Mitchell, 2010). Wongarbon Soils overly most of this geology consisting of red-brown, strongly-structured clay soils with a somewhat lower clay content near the surface (Figure 3-2 and Figure 3-3). Bunglegumbie soils overlay the western section of the study area consisting of red-brown earths comprising dark brown, sandy loam topsoil with bleached silty loam to reddish-brown, medium clay subsoil (Figure 3-2 and Figure 3-4). These soils have moderate fertility and generally low erodibility.

Figure 3-3: Red-brown clayey soil with natural basalt cobbles

Figure 3-4: Bleached red-brown silty loam overlaying hardened clay

3.4 Vegetation

The current landscape within the study area is highly modified. It has been mostly cleared of upper- and mid-strata vegetation with only isolated Grey Box (*Eucalyptus microcarpa*) trees remaining and a mixture of exotic (including Cobbler's pegs (*Bidens Pilosa*), African Boxthorn (*Lycium ferrocissimum*), and Blue heliotrope (*Heliotropium amplexicaule*)) (Figure 3-5) and native (mostly Slender Bamboo Grass (*Austrostipa verticillata*)) (Figure 3-6) ground cover.

Figure 3-5: Example of mixed exotic groundcover

Figure 3-6: Exampled of Bamboo Grass ground cover

3.5 Waterways

Eulomogo Creek is a 2nd order stream located 1250 meters to the south of the study area (Figure 3-7). This creek is a tributary of the Macquarie-Wambuul River which is located approximately two kilometers to the southwest of the study area. To the north of the study area, an ephemeral drainage line runs northwest to southeast, however most physical traces of this have been obscured by historic agricultural activities.

3.6 Climate

Dubbo is subject to a climate of hot summers and mild winters with consistent rainfall throughout the year (BOM, 2022) (Table 3-1).

Table 3-1: Summary climate data (red maximum, blue minimum values)

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years	
	Temperature														
Mean maximum temperature (°C)	33.0	32.1	29.4	24.8	19.8	16.0	15.2	17.3	20.8	25.1	29.0	31.9	24.5	129	1871 1999
Mean minimum temperature (°C)	17.9	17.6	15.1	10.6	6.5	4.1	2.7	3.5	6.0	9.6	13.2	16.2	10.2	128	1872 1999
Decile 5 (median) rainfall (mm)	19.1	23.7	28.2	13.6	23.8	24.6	20.7	17.6	17.4	27.4	22.8	19.5	375.6	58	1962 2020
Mean number of days of rain ≥ 1 mm	4.1	3.3	3.6	2.8	3.6	4.4	3.9	3.7	3.6	4.1	4.2	3.6	44.9	58	1962 2020

Figure 3-7: Watercourses nearest to the study area

3.7 Current disturbance

The land has historically been used as agricultural land. Historical aerial photographs indicate that the land was cleared of trees before 1963 with three mature trees left within the study area (Figure 3-8). Cropping activity is not clear from these historic aerial photos however the paddocks do appear to have been slashed and have been used for stock grazing (Figure 3-9).

An old quarry and rubbish tip was recorded by Kelton (1995) located adjacent to the western edge of the study area. The southern two third and eastern quarter of the study area are currently or in the past have been used as a stockpile location by Dubbo Regional Council (Figure 5-3). The ground surface has had been significantly disturbed by the grading of vehicle tracks, surface leveling, the depositing of fill material including dirt containing broken up section of road surface, dirt, sand and bluemetal, and the formation of rills and rutted vehicle tracks have also modified this ground surface. A partially developed road has been constructed along the western side of the study area with associated road base material extending into the western edge of the study area. A stormwater channel has been dug parallel with a sewer line that runs along the southern (Boundary Road) side of the study area with the sewer line continuing north parallel with the partially constructed road.

Figure 3-8: Historic aerial photo showing the study area 1963 (study are shown in red) (NSW Historical Imagery, 1994)

Figure 3-9: Historic aerial photo showing the study area in 1995 (study are shown in red) (NSW Historical Imagery, 1995)

4 Archaeological context

4.1 Aboriginal cultural heritage

4.1.1 Regional cultural and archaeological context

Aboriginal people have been present in Australia for approximately 60,000 years. The archaeological record provides evidence of a dynamic culture coupled with a long occupation of the land. Aboriginal occupation of the Darling Basin (the Wiradjuri occupy the portion of the basin to the west) has been dated to c. 40,000 years BP (Bowler et al., 2003). Within the region, the period of occupation of several sites dates to c. 7,000 years BP. These Aboriginal sites are Granites 2 shelter near Manildra (Pearson, 1981) and the skeletal remains of a male individual near Cowra (Pardoe and Webb, 1986).

While the boundaries of language groups, as defined by people like Tindale (1974) should be taken as indicative (Attenbrow, 2010), the study area is within the traditional lands of the Wiradjuri peoples (Tindale, 1974). The Wiradjuri are the people of the three rivers, inhabiting a widespread area which extended from the Great Dividing Range, west to the Macquarie-Wambuul, Lachlan (*Kalare*) and the Murrumbidgee (*Murrumbidjeri*) rivers (Coe, 1989, Bamblett, 2013).

The Wiradjuri is one of the largest language groups in Australia with an estimation of between 12,000 and 100,000 people at the time of European arrival (Bamblett, 2013). Wiradjuri people maintained connections across the long distances, through ceremonial cycles which moved around the tribal area (Tindale, 1974). The name Wiradjuri is an antonym derived from *wirraay* meaning 'no' and *-thuurray* or *tyuuray* meaning 'having' (Donaldson, 1984). Differences in dialect have been recorded amongst the Wiradjuri (Tindale, 1974) including the Tubba-gah dialect spoken in the Dubbo region which differed significantly with the broader Wiradjuri language. The Tubba-gah dialect was spoken as far north as Gilgandra, west to Narromine, and east to Wellington (Mal Burns pers. com. 2022).

John Oxley was the first European explorer to travel up the Macquarie-Wambuul River from Wellington Valley in 1817. This expedition was the first encounter many Wiradjuri people had with the new European invaders. An entry from 14 August 1817 details an encountered at Tanners creek near Tomingley between the party and a Wiradjuri man who had climbed a tree to catch possums. He was joined by a friend and the account records their shock and fear at meeting the party of white explorers and their excitement at trading for a metal tomahawk (Oxley, 1820:79, Whitehead, 2003:309). Despite low population densities, word of the White explorers spread quickly and at an encounter the next day people were less scared of these strangers in their land.

On the 9 and 10 June 1818 Oxley's expedition reached Dubbo where they based themselves on what would later become the property Miriam and explored around the Dubbo area. During this time Oxley observed many natural resources including fish, swans, ducks, and kangaroos, as well as stone resources including sandstone, iron-stone, agate and jasper (Oxley, 1820). Oxley's expedition continued down the east bank of the Macquarie-Wambuul River crossing the Erskine (Talbragar) River on the 11 June 1818 and continuing on towards Narromine.

The Sturt expedition set out from Wellington Valley on the 3 December 1828 reaching the property of Mr Palmer, Dibilamble (No. 2) located at present day Dubbo on December 1828 (Sturt, 1833:56). It is not known how long this property operated for, however its sister

property Dibilamble (No. 1) located south of Dubbo was divided into four stations following the *Licensing Land Act 1836*.

Robert Dulhunty settled in 1829 squatting at a place called Dubambil, the site of the quarry for the red ochre he would later name his property after, and which would give name to the later town of Dubbo. Within 20 years, the Surveyor, G. Boyle White would present a plan for 150 town allotments and 12 cultivated plots which was Gazetted on 23rd November 1849 (Dormer, 1981).

Edward Garnsey, who was born in Dubbo in 1874, provides an account of the life of the Dubbo-ga *(Tubba-gah)* one of the groups of the Dubbo region. However, it should be noted his is based on personal observations of both himself and his father and is not a systematic or authoritative account and aspects of his record have been challenged (Garnsey, 1942, OzArk, 2007:31). Garnsey (1942) provides many words spoken in the Dubbo region and their meaning, however he does not distinguish between Wiradjuri and Tubba-gah words and it is possible he did not know the difference or was not aware of the different dialects. These words have been included here, along with Tubba-gah words (Mal Burns pers. com. 2022) and where it is known the language has been specified next to the word.

The people of the Dubbo region were of the *Wirruh-Jah-Mine* or Wiradjuri group which was bordered by the *Wong-ga* or Wongaibon group, to the west and Kamambarai to the north (Tindale, 1974, Garnsey, 1942). Within the Dubbo region Garnsey (1942) lists seven groups. The *Dubbo-ga* or *Tubba-gah,* whose territory extends from the Talbragar River south to Eulomogo Creek and east to the Macquarie-Wambuul River. The *Warrie-ga*, which lies to the south of Eulomogo Creek, the *Munga*, which lies to the north of the Talbragar River and Macquarie-Wambuul River confluence and the *Eumalga*, which lies to the east of these groups. The *Bungiljumbie* and *Dundullamal* groups lie to the west of the Macquarie-Wambuul River. It has been noted in previous reports, in contrast to Garnsey's reported boundaries, the *Tubba-gah* inhabited both sides of the Macquarie-Wambuul River (OzArk, 2007), so it should be understood these group boundaries were unlikely to be hard boundaries as defined by Garnsey.

The *Tubba-gah* name is derived from the red pigment *Dub bo* which was quarried from the sandstone banks of the Macquarie-Wambuul River to the south of the city (*Dub-Am-bil* - meaning place of pigment). This pigment was highly valued and used in ceremonies and trade (Garnsey, 1942:4, 13). The Macquarie-Wambuul River was a significant resource for the people of the Dubbo region. In addition to supplying ochre, the river bank supported *Coolabage*[1] (river gum), *Bellar-gan*❖ (river oak) which supported *Wirra-wirra la*† /*Willa*❖ (possums), *Ban-da*† (Koalas), and *Kurruh*†/ *Builarn*❖ (grub food). In addition, Kurrajong and quandongs were a source of seeds and nuts. A variety of bird life (*Talbragar*† – plenty bird to eat), fish (*Murruh*† /*Gouya*❖) including cod (*Gouyum*❖), perch and catfish, platypus, shrimp, turtles and frogs (*Dunn-Dunn*❖ - small (brown) frog) were sourced from the river. In the middle of the *Tubba-gah* territory, in the location of the present-day Victoria Park, the *Wingewarra*† swamp (low river flats subject to floods) was also an important resource of *yabbies*† / *Gidjarn*❖ (crayfish) and water birds. The ridges east of Dubbo were sources of *wyalabies* (wallabies),

[1] *Wiradjuri* word
❖ *Tubba-gah* word

cooce-baw† (wombats), and bandicoots while *Wan-ban*† /*Bundah*❖ (kangaroos), *Bogga*† /*Guulbri*❖ (Emu), *Birrawah*† (plain turkeys) could be found on the plains (Garnsey, 1942:5).

Group sizes among the Wiradjuri could vary. Accounts from Wellington Valley recorded groups contained between 60-70 people, and near Lake Buddah, Stuart recorded groups of between 20-30 people (Koettig, 1985:21). In the Dubbo region Garnsey (1942:6) reported these groups consisted of between 30-40 people. The Chief of these groups was the *Eula* who was responsible for maintaining and administering laws, obeying rites and totems and supervised camp life. The members of these groups were subject to the *Eulomogo*† (Chief man belonga spirit stones) who was the head ceremonial man who presided over rites and ceremonies and was the keeper of ancestral knowledge (Garnsey, 1942:14). The *Tubba-gah* was a matrilineal society with the birth of a *wana*† (girl) child see as carrying on the *Jorah* (totemic spirit) of the tribe. This could only be handed down through the mother and the birth of a *wana* was considered an important obligation of a couple.

Group camps or *whurlie* consisted of *gunyahs*† (huts) erected in an east facing semi-circle around a ceremonial fire (*Wengel-go*† constructed of Myall and Yarran wood to drive off the *Boola*† (devil or bunyip). Gunyahs were constructed on a circular framework of saplings covered with overlapping downward facing branches of leaves that both let in light and shed water and could accommodate eight to ten people. *Whurlies*† were organised with mens *gunyahs* to the north, *miahs*† (womans huts) to the center and weaned children to the south. Weaned children were raised by the older woman of the group with boys and girls going through separate initiations as they matured to become full members (Garnsey, 1942:10-15). Camp sites were not permanent locations and were moved frequently for a variety of reasons including for food and water, ceremony, superstitions, war or other unspecified reasons (Pearson, 1981:72-75)

By the 1890s, Garnsey (1942:13-14) reports traditional ceremonial life of the *Tubba-ga* had been seriously disrupted as few old men who were fully initiated remained in the community. The extent to which this cultural knowledge had been lost at this time and the extent that those men who were present were also unwilling to discuss sacred ceremonial lore with him is unclear. While Garnsey recorded a number of ceremonies and rituals they are pieced together from a variety of sources and are not necessarily reliable. In Dubbo, a Bora ground was known to exist on the Dundullimal property on the west bank of the Macquarie-Wambuul River. In 1839 a cooroberee held there attracted between 600-800 people (Koettig, 1985:24). Garnsey (1942:4) also reports that a Bora ground (*borambil*) was present “almost opposite Holmwood gates”. The location of this site has caused some confusion. Opposite the Holmwood gates would place the site between the Old Dubbo Road and the Macquarie-Wambuul River, on the old ‘Dubbo’ property, currently ‘Miriam’. Kelton (1995:9, 18) speculated the Bora ground could be located on the top of the knoll on the property Miriam, located opposite Holmwood and on the north bank of the Macquarie-Wambuul River. However, he appears to have conflated the Garnsey (1942:4) account of a bora ground opposite the Holmwood gates, with an account by Gresser (1941) which describes a bora ground in the Dubbo region on top of a hill. Kelton (1995:18) speculated the location of this site was the Miriam property, however Pearce (1981:557) describes the site as being on top of a hill on Mannington a site 7 miles north of Dubbo. There are oral accounts of a Bora ring located on Tinks Ave circle in south Dubbo, approximately 1.5 km from the old Holmwood gates (Will Burns n.d. to Phil Cameron pers. com. 2006). In addition, the Dundullimal property and Bora ground is located opposite the Miriam property on the south bank of the Macquarie-Wambuul

River. It was not possible to obtain a copy of the Gresser (1941) account to verify the speculation presented in Kelton (1995:18). However, as the Dundullimal Bora ground is the only ceremonial site recorded on the AHIMS register in this part of Dubbo, it may be that the bora ground recorded by Garnsey is in fact the Dundullimal bora ground.

Scared and carved culturally modified trees were a significant part of the Dubbo landscape. Scared trees were produced from the removal of bark for the construction of containers, water crafts and shelters. Carved trees contained complex designs and were produced for a number of reasons including to mark burial grounds, bora grounds or mark other important locations (Etheridge, 1918). To the south of Dubbo, Garnsey (1942:4) recorded an area of *wooroon* (graves) which were marked by carved trees known as *Cobba-da* (blood brother trees) and a *Eula-da* (big or chief man tree). These are possibly the same trees recorded in Etheridge (1918:35) as being located about two miles from the Dubbo Railway station and calculated as being at least 150 years old. Etheridge recorded at least eight locations between Wellington, Narromine, Dubbo and Tomingley with carved trees. These sites were mostly located along the Macquarie-Wambuul River. While limited information accompanied the recording of these sites, they are either associated with burials or contained no contextual information.

4.1.2 Local archaeological context

An extensive search of the AHIMS database was conducted on 7 February 2024 (Service ID 862037). The AHIMS search provides archaeological context for the area and identifies whether any previously recorded Aboriginal sites are located within or near the study area.

An extensive search of the AHIMS database revealed nine Aboriginal sites recorded within 1000 meters of Lot 200 (Figure 4-1). The majority of the Aboriginal sites were recorded as Modified Tree (carved or scarred)' (n=7) with 'Artefact' (n= 2), site type the next highest recorded feature. No previously recorded Aboriginal sites are located within the study area. The nearest sites to the study area are three culturally modified trees (scarred) located approximately 400m to the north and west of the study area (K-ST-2 (AHIMS ID 36-1-0181), K-ST-4 (AHIMS ID 36-1-0180) and K-ST-6 (AHIMS ID 36-1-0213)). The two artefact sites are located to the south, down the slope approximately 500 meters to the north of Eulomogo creek.

The distribution of recorded AHIMS sites is shown in Figure 4-1 and presented in Appendix A.

Table 4-1: Summary of database searches for Aboriginal Heritage

Database	Date of Search	Parameters	Results
Aboriginal Heritage Information Management System (AHIMS)	07/02/2024	Lot : 200, DP:DP1280301, Section : - with a Buffer of 1000 meters	Nine Aboriginal sites were recorded within the search area. No sites were recorded within the study area
Dubbo LEP 2022	07/02/2024	Schedule 5: Environmental Heritage	No items relating to Aboriginal heritage are recorded on the LEP within the study area.
Native Title Vision https://nntt.maps.arcgis.com/	07/02/2024	NSW	There are no native title claims or determinations within the study area.
State Heritage Register http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx	07/02/2024	Dubbo LGA	No items relating to Aboriginal heritage are recorded on the State heritage register within the study area.

Figure 4-1:Results of the extensive AHIMS search

AREA

4.1.3 Previous assessments

The Proposed "Keswick' Housing Sub-Division, Dubbo, NSW (Kelton, 1995)

In 1995 Central West Archaeological and Heritage Services were contracted to assess 290ha of rural land for Dubbo City Council for the purposes of constructing a housing subdivision. The study area is located in the southeast corner of the 'Keswick' assessment area. Six sites were recorded as part of this research, one site is an historic Communications Bunker located outside of the study area while the remaining five recorded sites were Aboriginal scared trees included K-ST-2 (AHIMS ID 36-1-0181), K-ST-4 (AHIMS ID 36-1-0180) and K-ST-6 (AHIMS ID 36-1-0213) which are located approximately 400 meters from the study area.

Kelton observed that the pattern of sites was typical of the area and representative of a 'casual level' of occupation across the study area reflecting the distance the study area is to permanent water.

Southlakes Estate Super DA (AREA Environmental & Heritage Consultants (AREA), 2022)

AREA was contracted to assess the southern portion of the South-East Dubbo Residential Urban Release Area, Lot 407 DP1248682 and Lot 2 DP880413 for a proposed subdivision. The Southlakes assessment area is located to the immediate south of the study area extending from Boundary Road in the north to Eulomogo Creek. Three Aboriginal sites (Southlakes IF01 (AHIMS ID 36-1-0786), Hillview-IF1 (AHIMS ID 36-1-0707) and K-OS-3 (AHIMS ID 36-1-0188) were recorded in the assessment area during this and a previous survey. A test excavation on the banks of Eulomogo Creek recorded one additional site (Southlakes AS01 (AHIMS ID 36-1-0789). These sites are all stone artefact sites, located in close proximity to Eulomogo Creek a permanent water source. This was a pattern that was predicted by previous researchers. In addition, Eulomogo Creek was identified as the boundary of the Tubba-gah possibly making Eulomogo Creek an important meeting place between groups.

4.1.4 Predictive Model

A predictive model combines the archaeological context for the study area with landscape information to propose likely site types, distributions, and intactness within the area.

Areas of archaeological potential are regarded as any sensitive landform with a reasonable level of intactness (i.e. little to no disturbance or minor ground surface disturbance only and in areas not on self-mulching soils). The definition of disturbance used here follows that of the *National Parks and Wildlife Regulation 2009* (Clause 80B, Subclause 4). Sensitive landforms follow the definitions supplied in the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010b):

- within 200m of waters
- located within a sand dune system
- located on a ridge top, ridge line or headland
- located within 200m below or above a cliff face
- within 20m of or in a cave, rock shelter, or a cave mouth.

Pearson (1981) conducted a comprehensive study of the upper Macquarie region in relation to his PhD dissertation. Through excavation and extensive research, he determined Wiradjuri functioned primarily in small groups of variable size, dependent on the season. These groups were comprised of immediate relations, the smallest being the basic family unit. During feasting and ceremonies these family groups gathered in numbers possibly between 80-150

people. Pearson (1981: also developed a pattern of Aboriginal occupation through the analysis of just over 40 open sites within four regions between Bathurst and Dubbo. His findings indicated archaeological sites can be grouped into two main types, occupation sites, and non-occupation sites, which can include scarred or carved trees, ceremonial sites, grinding grooves and burial sites.

Through analysis of the location of these sites, Pearson (1981:) suggested that occupation sites would range from between 10 to 500 m from water sources. However larger sites were generally located closer, at an average of 90 m to water. Site locations that provided shelter, were protected from prevailing wind and cold air drainage, with well drained soil, and views of watercourses were favoured. These sites also tended to be situated in open woodlands and were rarely used for longer than three nights. Sites that showed evidence of dense archaeological deposits therefor represent accumulations from multiple occupation events. Non-occupation sites like scarred or carved trees, burial sites and grinding grooves were located in close proximity to these occupation sites. However, grinding grooves were also raw material dependent, occurring only where there are suitable sandstone outcrops. Scarred or carved trees were also distinguished by their close proximity to occupation sites and watercourses. While quarry sites were located at places with stone of serviceable knapping quality. Unlike these sites, ceremonial sites such as earth rings and stone arrangements were situated away from campsites, in isolated places, generally on small hills or knolls, although they could occur on flat land.

The close proximity of Aboriginal sites to drainage lines is supported by the research of Pearson (1981), Purcell (2002), and Koettig (1985) who showed that distance to water was an important feature in camp site selection and those landscapes in a protected position, close to permanent water showed the highest intensity of occupation. The broader archaeological context indicates that sites are very unlikely to occur unless there are landscape features that are at least able to hold water for short periods of time following heavy inundation.

If present, site types are most likely to be stone artefact sites or culturally modified trees based on the regional archaeological context (Figure 4-1). The geology of the study area indicates that with the exception of volcanic basalts, stone for artefacts would likely need to be brought into the area rather than locally manufactured. However, many tools and other objects were made from wood, bone and shell which do not survive into the archaeological record as well as stone (Clarke, 2011).

Culturally modified trees can occur anywhere on old growth trees to produce suitable bark to create carrying dishes (commonly known as coolamons), canoes and other items. Trees may also be modified as markers or other types of communication.

Other site types may occur but within the landscape context of the study area they are not likely to exist. Hearths are reasonably common but tend to deteriorate and be destroyed more easily. Quarries are possible where raw material is available. Ochre quarries and stone arrangements are unlikely to occur.

5 Field survey

5.1 Overview

The study area covers approximately 10 ha and was assessed on the 8 February 2024.

5.2 Methodology

The field methods used to assess the study area follow those described in the OEH's *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b).

The purpose of the field survey was to identify any previously undetected Aboriginal sites, places or areas with cultural heritage values and evaluate the possible need for further investigation. A GPS was used to ensure the survey covered the proposal area.

The study area was assessed by pedestrian survey. The survey was conducted by walking a series of transect at a pace that allowed opportunity to identify any features or objects (Figure 5-1). Variations in the transects were made depending on local disturbances and the location of dirt stockpiles.

A GPS was used to ensure the survey covered the study area. Photographic and written records were made of the landscape features relevant to archaeological potential. These features include disturbance levels, Ground Surface Visibility (GSV) and landforms of higher archaeological potential (see Section 4.1.4).

All ground exposures were examined for Aboriginal objects (stone artefacts, imported shell, or other traces of Aboriginal occupation). All trees of an age to possess a cultural scar were examined. Any Aboriginal sites recorded used AREA's criteria conforming with *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b).

5.3 Timing and personal

The site inspection was conducted on 8 February 2024 by Kim Newman. The Aboriginal community was not involved in this assessment.

5.4 Fieldwork results

No Aboriginal objects were observed within the study area.

5.5 Discussion

A desktop AHIMS search determined that no sites had been recorded within the study area, however nine Aboriginal sites had been recorded within 1000 metres of the Lot 200 boundary. The nearest previously recorded Aboriginal sites were three scarred trees located approximately 400 meters to the north and west of the study area. While stone artefact scatters had been recorded further to the south within 500 metres of Eulomogo Creek.

The study area had historically been cleared of most trees prior to 1963, with three mature Grey Box (*Eucalyptus microcarpa*) trees remaining within the study area (Figure 3-8). Natural fine-grain basalt cobbles were observed across the study area (Figure 5-4). The basalt was of a sufficient quality to flake into stone tools however no evidence of quarrying, or flaking of the

basalt was observed. It should be noted that basalt cobbles are present within the Dubbo Basalt landscape and Wangarbon soil type and are not considered rare. A yellow-green chert cobble was exposed in a grader scrape just north of the north east corner of the study area. The cobble was broken by the grading activities (Figure 5-5). This chert was highly silicious and of a quality that would be sufficient for making stone tools, however due to the damage sustained by the cobble it is not possible to determine if it had been previously flaked or was a natural outcrop.

A pedestrian survey of the study area observed high level of ground surface disturbance were present between Boundary Road and the graded internal track that crosses the site from east to west (Figure 5-2). This area has been used by Dubbo Regional Council to stockpile dirt and fill (Figure 5-3). As such the ground surface has been heavily modified by the grading of numerous vehicle tracks (some of which are overgrown) (Figure 5-6), the leveling of the ground surface (Figure 5-7) for the stockpiling of dirt, bluemetal, sand or other construction fill (Figure 5-9 and Figure 5-8) and localized erosions events including rilling (Figure 5-10) and vehicle rutting which has caused localised subsoil disturbance (Figure 5-11). In addition, an area extending approximately 15 meters in from Boundary Road, and the unfinished Stream Ave has been impacted by the construction of a sewer line (Figure 5-14) and stormwater drain (Figure 5-13).

The area to the north of the graded internal track and west of the Sheraton Road disturbance area has historically been cleared of most trees though does not appear to have been subject to the same level of disturbance as the southern area. Satellite images show light ungraded vehicle tracks across the area and historic images indicate that the vegetation has been slashed however cropping activities is not obvious (Figure 3-8 and Figure 3-9). This section should be considered to have been subject to a moderate level of disturbance.

Ground surface visibility (GSV) was moderate to high (20%-80% GSV) in the highly disturbed southern area (Figure 5-16) but very low (0% GSV) in the moderately disturbed northern area (Figure 5-17). Three mature Grey Box trees, located within the study area, were inspected. One tree contained a scar though it was not the opinion of the archaeologist that this was a culturally modified tree (Figure 5-18 and Figure 5-19). No Aboriginal sites or potential archaeological deposits were identified during this survey.

During Kelton's (1995) survey no sites were recorded within the study area. They recorded no artefact scatters however six culturally modified trees were recorded, of which three are located within 400 meters of the study area. The tree observed during the present survey was not identified during the Kelton survey.

Based on the above assessment the ground surface of the southern area would be considered to be highly disturbed and there would be a low probability of objects occurring in the area. The northern section has been subject to less disturbance and had very low GSV. Given the moderate level of disturbance, the presence of stone resources within the area, and a distance of 1250 meters to Eulomogo Creek there is a possibility of objects occurring in this area. In addition, while the archaeologist did not interpret the scar on the tree a being culturally modified community knowledge should be consulted to inform this identification.

Figure 5-1: Survey transects

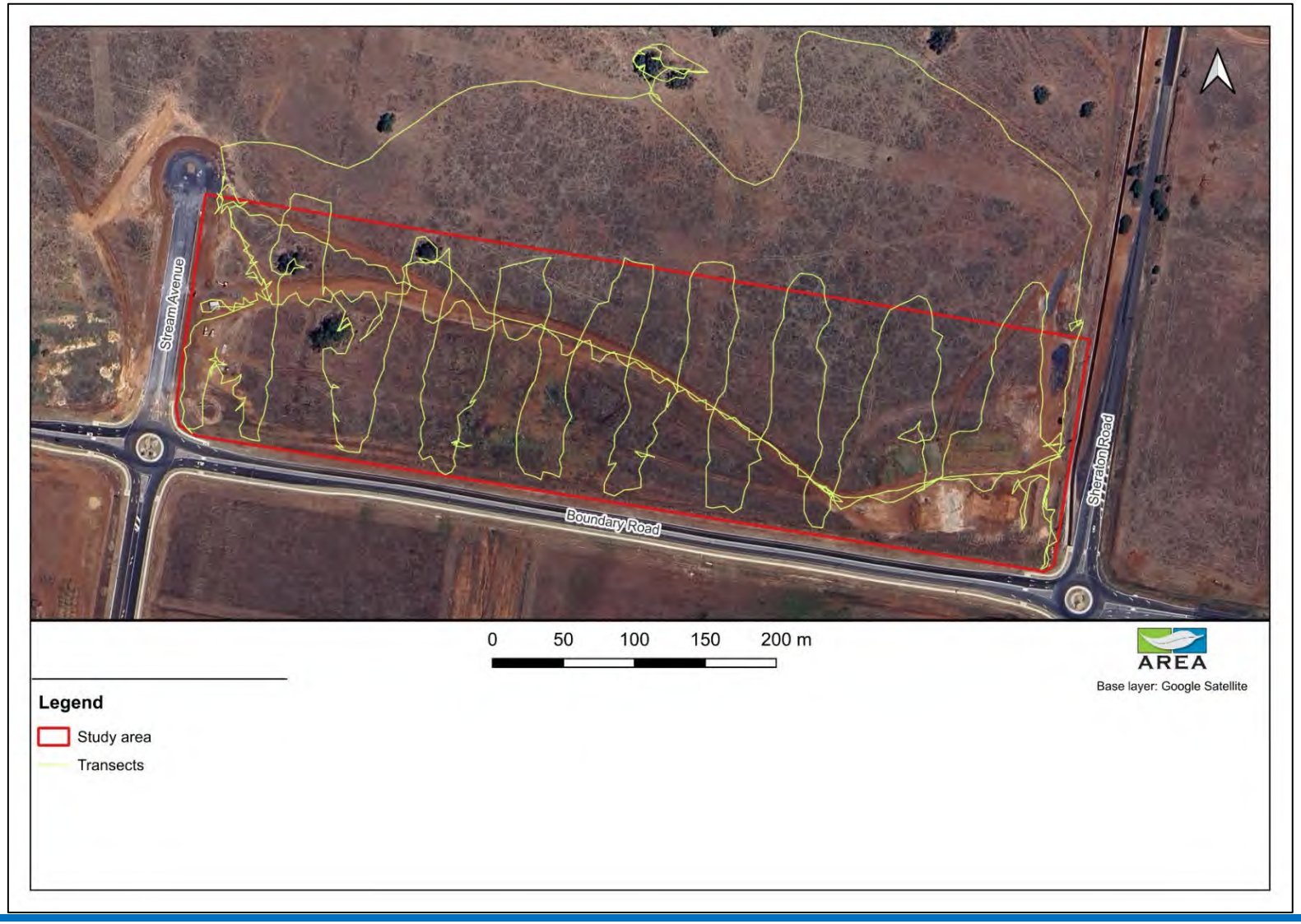


Figure 5-2: Disturbance areas

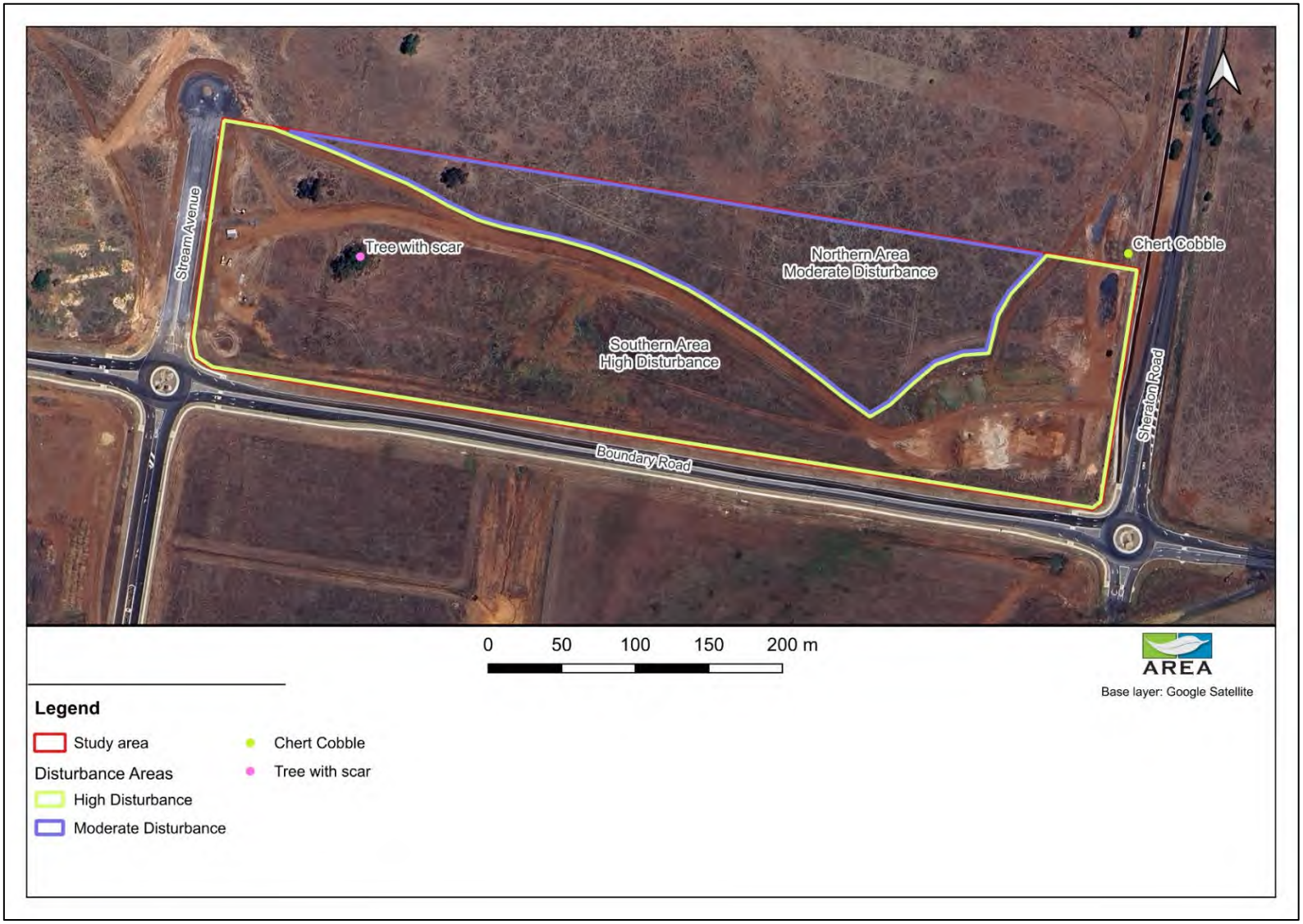


Figure 5-3: Dirt stockpiled in southeastern end of study area

Figure 5-4: Naturally occurring basalt cobbles

Figure 5-5: Yellow-green chert cobble

Figure 5-6: Multiple vehicle tracks have been graded across the study area

Figure 5-7: Exampled of the ground surface graded and levelled

Figure 5-8: Stockpiled fill containing mixed road material, bluemetal and sand

Figure 5-9: Example of older overgrown bluemetal stockpiles

Figure 5-10: Example of rilling

Figure 5-11: Example of rutting caused by vehicles

Figure 5-12: Road base from road construction built up along western side of the study area

Figure 5-13: Stormwater drain dug along southern edge of the study area

Figure 5-14: Example of the sewer manhole cover located along south and west of study area

Figure 5-15: View to west across northern area

Figure 5-16: Example of ground surface visibility in southern section

Figure 5-17: Example of ground surface visibility in northern section

Figure 5-18: Tree with scar, not interpreted as a cultural scar

Figure 5-19: Detail of scar

6 Due diligence

Part 6 of the *National Parks and Wildlife Act 1974* (NPW Act) is the primary legislation for the protection of Aboriginal cultural heritage in NSW. A person must exercise due diligence to determine if their actions will harm an Aboriginal object or place. The *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW, 2010c) (Code of Practice) sets out what due diligence means and a method to establish that due diligence is met (Figure 6-2).

6.1 Do you need to use the Code of Practice?

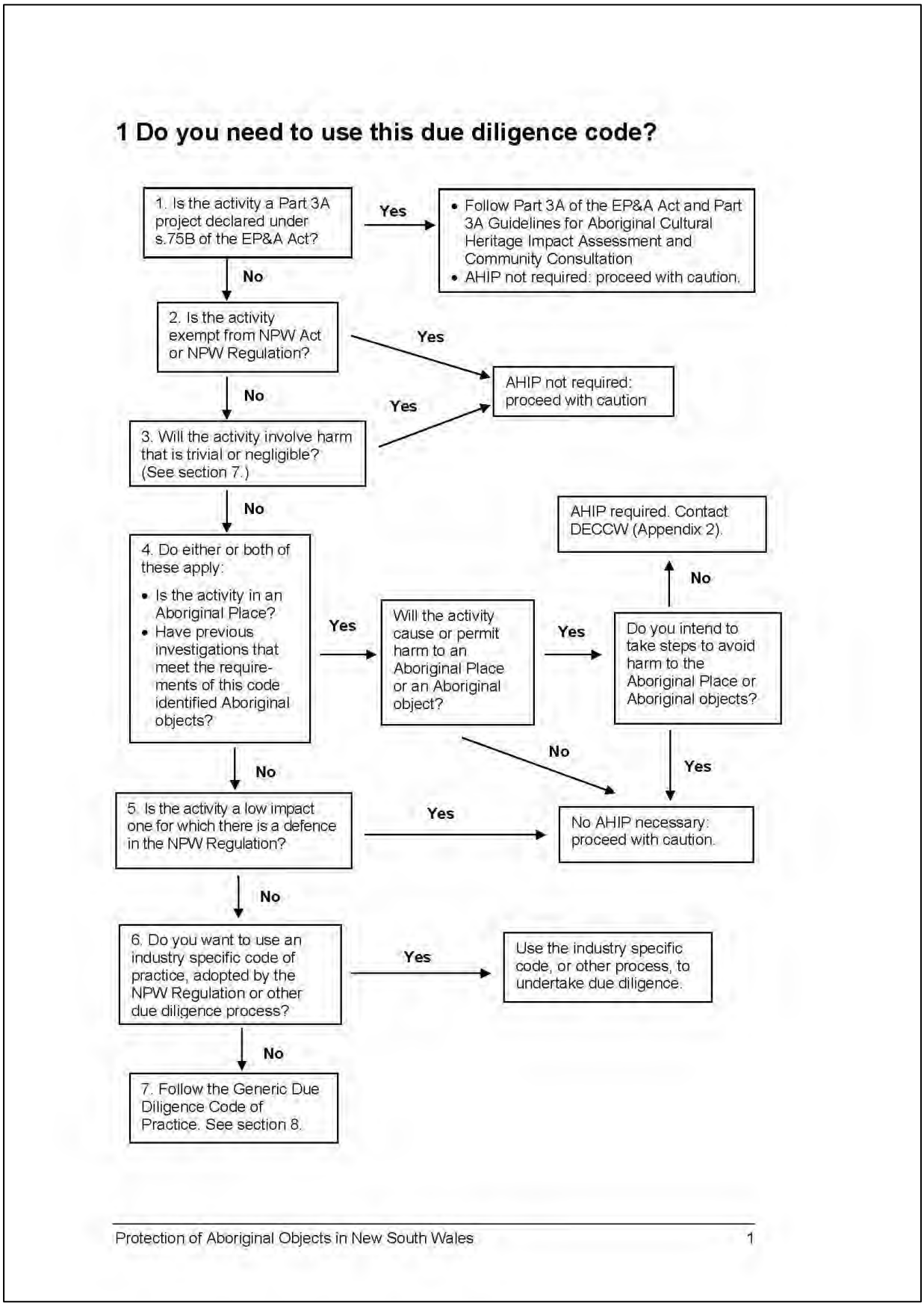
The Code of Practice sets out a number of criteria to determine if the Code of Practice needs to be followed (Figure 6-1). These criteria have been applied to a potential future Development Application associated with this Planning Proposal (Table 6-1).

Table 6-1: Criteria for using the Code of Practice applied to a potential future Development Application

Criteria	Result
1. Is the activity a Part 3A project declared under s.75B of the EP&A Act?	No
2. Is the activity exempt from NPW Act or NPW Regulation?	No
3. Will the activity involve harm that is trivial or negligible?	No
4. Do either or both of these apply: • **Is the activity in an Aboriginal Place?**	No
• **Have previous investigations that meet the requirements of this code identified Aboriginal objects?**	Yes, however Kelton's (1995) assessment of the area is 29 years old. Given the time that has passed and the ground surface disturbance which has occurred across the study area this investigation would not be considered current by Heritage NSW and a new assessment would be required.
5. Is the activity a low impact one for which there is a defence in the NPW Regulation?	No
6. Do you want to use an industry specific code of practice, adopted by the NPW Regulation or other due diligence process?	No
7. Follow the Generic Due Diligence Code of Practice.	

Future Development Applications associated with this Planning Proposal would need to ensure that due diligence is exercised to determine whether Aboriginal objects will be harmed by an activity and whether further investigation or an AHIP is required.

Figure 6-1: Criterion for using the Code of Practice (DECCW, 2010c:1)



6.2 Due diligence process

The due diligence process has a number of steps to determine what action is required to proceed (Figure 6-2). Depending on the impacts caused by the development, the presence of previously recorded sites and/or the results of desktop or visual inspection, there are different pathways to proceed and demonstrate that due diligence has been applied. The due diligence process as it applies to a potential future Development Application associated with this Planning Proposal is presented in Table 6-2.

Table 6-2: Generic due diligence process applied to a potential future Development Application

Criteria	Result
1. Will the activity disturb the ground surface or any culturally modified trees?	Yes any R1 development would disturb the ground surface.
2. Are there any: **a) relevant confirmed site records or other associated landscape feature information on AHIMS? and/or**	No sites have been recorded within the study area, however nine sites have been recorded within 1000 meters of Lot 200.
b) any other sources of information of which a person is already aware? and/or	A tree with a scar at the base was observed during the pedestrian survey of the site. This tree was not recorded as a culturally modified tree however community knowledge should be consulted to inform this identification. Three culturally modified trees were recorded within 400 meters of the study area during Kelton's (1995) survey. This tree was not recorded during this survey.
c) landscape features that are likely to indicate presence of Aboriginal objects?	Fine-grain basalt cobbles of a quality sufficient to produce stone tools were observed across the study area. As was an isolated highly silicious chert cobble. The northern section of the study area was subject to moderate disturbance but had low levels of GSV.
3. Can harm to Aboriginal objects listed on AHIMS or identified by other sources of information and/or can the carrying out of the activity at the relevant landscape features be avoided?	Unknown.
4. Does a desktop assessment and visual inspection confirm that there are Aboriginal objects or that they are likely?	This assessment would meet the requirement of the code for a desktop and visual inspection. No Aboriginal objects or sites were identified. However based on the disturbance levels the likelihood that Aboriginal object could be present in the study area was assessed to be different between the northern moderately disturbed section and the southern highly disturbed section. Due to the high level of past ground surface disturbance in the southern section it was considered unlikely that Aboriginal objects would be present. According to the Code of Practice development could proceed with caution in the southern section at this stage. Due to the lower level of past disturbance in the northern section and the low level of ground surface visibility it was considered possible that Aboriginal object could be present and further investigation would need to apply to this section.
Further investigation and impact assessment	

Following the due diligence process has demonstrated that further investigation is required.

The northern section has the potential to contain Aboriginal objects. A cultural heritage assessment of the norther section including Aboriginal Traditional Owners and undertaken when the grass is shorter (possibly during winter) could address the uncertainty relating to the presence of Aboriginal objects in this area. Traditional knowledge can also provide contextual information which can inform this assessment process. Given the small size of the study area including the southern section in this assessment and assessing the whole study area would reinforce that due diligence is being applied.

A future Development Application under Part 4 of the EP&A Act would require that potential impacts to Aboriginal heritage be assessed as part of the environmental impact assessment process.

An Aboriginal Cultural Heritage Assessment Report (ACHAR) is required if Aboriginal objects are identified, it is determined that test excavation is required and/or an Aboriginal Heritage Impact Permit (AHIP) is required. This report details the results of the assessment process and contains recommended actions to be undertaken throughout the development process to manage and protect Aboriginal objects and places identified through the investigation and assessment. An ACHAR and AHIP require community consultation as set out in Section 60 of the *National Parks and Wildlife Regulation 2019.*

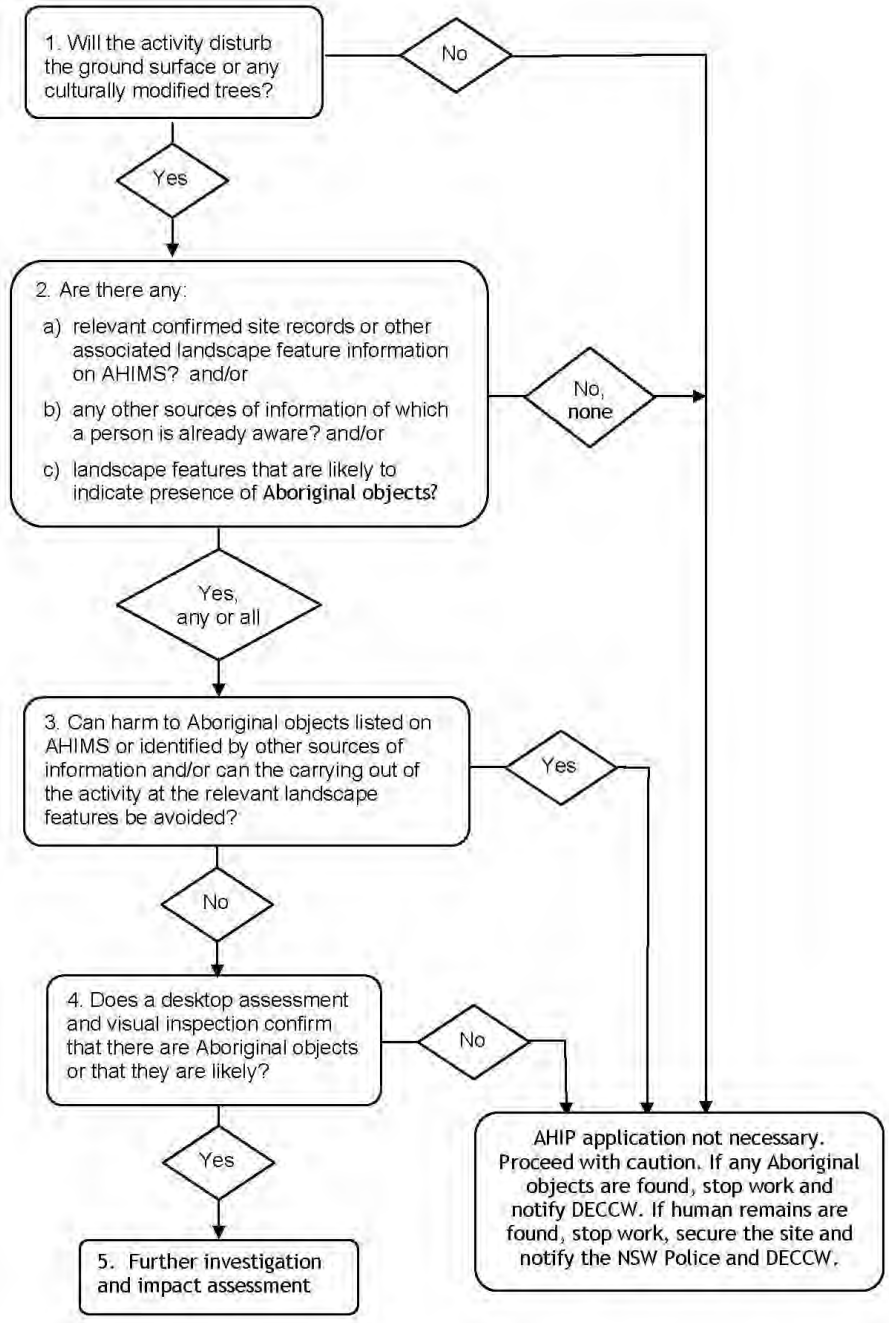
If Aboriginal objects are recorded then an ACHAR would need to be completed with regard to the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011), the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b) and the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW, 2010a).

If no Aboriginal objects are identified and it is determined that there is a low probability that Aboriginal objects will occur in the study area an archaeological due diligence assessment report should be completed to demonstrate that due diligence has been undertaken prior to the development proceeding with caution.

Proceeding with caution means that if an Aboriginal object is found while development is occurring then all work must stop and Heritage NSW notified. An AHIP or further investigation may then be required before work can resume.

Figure 6-2: Generic due diligence process (DECCW, 2010c:10)

8 The generic due diligence process



7 Conclusion

While no Aboriginal objects were identified during the assessment, due diligence process has demonstrated that the northern section has the potential to contain Aboriginal objects and further investigation is required.

At a minimum an archaeological assessment should be carried out across the site with the involvement of the local Aboriginal Traditional Owners.

In the event that Aboriginal objects are recorded than an ACHAR will be required, involving full consultation requirements according to Section 60 of the *National Parks and Wildlife Regulation 2019*, and potentially an AHIP depending on the actions implemented to manage and mitigate harm.

If following this due diligence assessment process, no Aboriginal objects are recorded or are considered to be unlikely to occur, then the development may proceed with caution.

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Appendix A: Database search results

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Lot 200 Keswick

Client Service ID : 862037

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
36-1-0182	K-ST-2	AGD	55	654220	6428870	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	3350
	Contact	**Recorders**	Central West Archaeological and Heritage Services Pty Ltd					**Permits**		
36-1-0179	Keswick-Scarred Tree-5 (K-ST-5)	GDA	55	653794	6429259	Open site	Destroyed	Modified Tree (Carved or Scarred) : -	Scarred Tree	3350
	Contact	**Recorders**	Central West Archaeological and Heritage Services Pty Ltd,OzArk Environmental a					**Permits**	3873	
36-1-0181	K-ST-3	AGD	55	654510	6428580	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	3350
	Contact	**Recorders**	Central West Archaeological and Heritage Services Pty Ltd					**Permits**		
36-1-0707	Hillview-IF1	GDA	55	655038	6427478	Open site	Valid	Artefact : -		103709
	Contact	**Recorders**	OzArk Environmental and Heritage Management - Dubbo,Doctor Chris Lovell					**Permits**		
36-1-0213	K-ST-6	AGD	55	653640	6428240	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	3350
	Contact	**Recorders**	Jim Kelton					**Permits**		
36-1-0668	Scarred Tree (RAAF-ST2)	GDA	55	652788	6429549	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	Ms.Morgan Wilcox					**Permits**		
36-1-0180	K-ST-4	AGD	55	654590	6428590	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	3350
	Contact	**Recorders**	Central West Archaeological and Heritage Services Pty Ltd					**Permits**		
36-1-0786	Southlakes IF01	GDA	55	655052	6427477	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mrs.Anna Darby					**Permits**		
36-1-0666	RAAF-ST3	GDA	55	652764	6429580	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	Ms.Morgan Wilcox					**Permits**		

**** Site Status**

Valid - The site has been recorded and accepted onto the system as valid

Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution

Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

Not a site – The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 07/02/2024 for Kim Newman for the following area at Lot : 200, DP:DP1280301, Section : - with a Buffer of 1000 meters.. Number of Aboriginal sites and Aboriginal objects found is 9

barnson.

APPENDIX C

Biodiversity Assessment Report

Planning Proposal

Lot 200 Keswick, Dubbo

March 2024

Biodiversity Assessment Report

Dubbo Regional LGA NSW

AREA Environmental & Heritage Consultants
"The Old Macquarie Brewery" c.1876, 72 Brisbane Street Dubbo, NSW 2830
Ph 0409 852 098
phil@areaenv.com.au

AREA Environmental & Heritage Consultants acknowledges the Traditional Owners of the land upon which we work.

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Document controls

Proponent	Spicers Creek Wind Farm
Client	Barnson Pty Ltd
Quote number	QU1235
Document Description	Lot 200 Keswick Planning proposal - Biodiversity Assessment Report
Clients Representative Managing this Document	Jim Sarantzouklis
AREA Person(s) Managing this Document	Addy Watson
Cover image	Representative vegetation in the study area

DOCUMENT STATUS		
DRAFT: Series V1.X AREA internal edits	**Date**	**Action**
V1.0	21/02/2024	1st draft complete
V1.1	21/02/2024	Internal edit
DRAFT Series V2.X Client edits	**Date**	**Action**
V2.0	22/02/2024	Draft to client
FINAL (Draft approved by client)	**Date**	**Action**
V3.0	08/03/2024	Final to client

Prepared for barnson.	Barnson Pty Ltd Unit 1 36 Darling Street Dubbo, NSW, 2830
Prepared by AREA	Michelle Glover I Senior Ecologist **AREA Environmental & Heritage Consultants Pty Ltd** ABN:29 616 529 867 72 Brisbane Street Dubbo, NSW 2830 E michelle@areaenv.com.au

Executive summary

AREA Environmental & Heritage Consultants (AREA) has been commissioned by Barnson Pty Ltd (the client) to complete a Biodiversity Assessment Report (BAR) to support a proposed amendment to the Dubbo Regional Local Environmental Plan (DRLEP) 2022. The proposal is for the land zoning map from its current zone R2 – Low Density Residential to R1 – General Residential for the purpose of further development in the south-eastern portion of Lot 200 DP1280301, Boundary Road, Dubbo (the subject land).

For the purposes of this assessment, and pending detail design, the entirety of the subject land is assumed to be impacted and potential future impacts to biodiversity values have been assessed as such.

This BAR considers the proponent's duties under Section 5.5 of the *Environmental Planning & Assessment Act 1979* to "examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity". This assessment also addresses the requirements under section 7.3 of the *Biodiversity Conservation Act 2016* (BC Act); and considers impacts to nationally listed threatened species, ecological communities, and migratory species in accordance with the *Matters of National Environmental Significance: Significant impact guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (DoE, 2013).

A field assessment for the Planning Proposal was completed 8 February 2024, using the Biodiversity Assessment Method 2020 (BAM) (NSW DPIE, 2020), including BAM vegetation integrity plots, habitat assessment, and preliminary threatened flora and fauna species searches.

The subject land is approximately 10.51 hectares on the outskirts of Dubbo, NSW and is zoned low density residential. The subject land is highly disturbed and historically cleared and, with a ground cover of exotics and natives and remnant paddock trees.

Three BAM vegetation plots were used to assess the native vegetation in the subject land. One Plant Community Type (PCT), PCT 76 *Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions*, was determined to occur in 9.06 hectares of the subject land were native vegetation was present. Approximately 1.45 hectares contained no vegetation as a result of being cleared for an existing access track and stockpile.

Plot data collected per the BAM (2020) was entered into the BAM calculator (BAM-C) to determine interim results including relevant threatened species lists and vegetation integrity (VI) scores which indicate the condition of native vegetation.

A summary of native vegetation, PCTs, areas (hectares) and resulting VI scores within the subject land is provided in the following table:

Zone	PCT	PCT description	Area in subject land (ha)	BAM Calculator VI score
1	76	*Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions*	9.06	**22.1**
N/A	N/A	*No vegetation*	1.45	N/A
		Total	**10.51**	

In the current state, the subject land is consistent with the definition of the endangered ecological communities based on the current, and past occupation of the site with Inland Grey Box (Eucalyptus microcarpa):

- Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions listed under the BC Act, and
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia listed under EPBC Act.

Few habitat values exist on the subject land. Three hollow bearing trees were identified within the subject land with potential to provide habitat for threatened fauna species. There are no waterways, Key Fish Habitat, vulnerable land or riparian areas mapped in the subject land.

No threatened species listed under the EPBC Act, BC Act or NSW *Fisheries Management Act 1994* (FM Act) were recorded during field survey, however, predicted threatened species are assumed to potentially occur in the subject land where suitable habitat exists.

Given the poor condition and urban environment, it is unlikely threatened species are present, however the Biodiversity Offsetting Scheme requires evidence to demonstrate absence of listed species identified in the BAM-C and any other listed species recorded during the assessment.

The BAM-C identified threatened flora or fauna species reliably predicted to use habitat associated with PCT 76 (predicted species) and those that require targeted survey to determine presence or absence in the subject land (candidate species credit species). Should future development occur on the subject land, and based on initial field survey, a list of predicted species and candidate species credit species requiring offset has been included in this report. Comment has been provided for each candidate species outlining results of conducted survey and where further survey would be required to confirm the presence or absence of those species.

Contents

Figures

Tables

1 Introduction

Barnson Pty Ltd is seeking to amend the land zoning map of the Dubbo Regional Local Environmental Plan 2022 (LEP) in the south-eastern portion of Lot 200/DP1280301, Boundary Road Dubbo (subject land) (Figure 1-1).

The entirety of the subject land is assumed to be impacted and impacts to biodiversity values have been assessed as such.

This Biodiversity Assessment Report (BAR) provides an assessment of biodiversity values on the subject land to support inform the Planning Proposal. Commonly used term and abbreviations used within this report are listed in Appendix A.

1.1 Background

AREA Environmental & Heritage Consultants Pty Ltd (AREA) has been engaged by Barnson Pty Ltd to undertake a biodiversity assessment of the subject land to accompany the Planning Proposal.

A field assessment for the Planning Proposal was completed 8 February 2024, using the Biodiversity Assessment Method 2020 (BAM) (NSW DPIE, 2020), including BAM vegetation integrity plots, habitat assessment, and preliminary threatened flora and fauna species searches.

Vegetation was broadly mapped to Plant Community Type (PCT) and all trees in the subject land were identified and checked for size class and presence of hollows. BAM vegetation plots were completed on the subject land which describe the condition of the native vegetation. The BAM calculator was used to determine a list of threatened species which would need to be considered as part of any Development Application.

1.2 Legislation

This BAR has been prepared to address the requirements for consideration of impacts to biodiversity under the:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- *Biodiversity Conservation Act 2016* (BC Act) and
- *Fisheries Management Act 1994* (FM Act).

This BAR considers the proponent's duties under section 5.5 of the *Environmental Planning & Assessment Act 1979* to "examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity". It also addresses the requirements under Section 7.3 of the BC Act; and considers impacts to nationally listed threatened species, ecological communities, and migratory species in accordance with the *Matters of National Environmental Significance: Significant impact guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999* (DoE, 2013).

1.3 The subject land

The subject land is located on the southeastern outskirts of Dubbo, NSW (Figure 1-2).

The subject land exists in a region primarily on alluvial plains, that has been historically cleared with only scattered remnant trees remaining. The vegetation is generally in poor condition.

Cleared areas of the subject land appear to be recently created as access tracks and for stockpiling and therefore lack native vegetation.

The ecological context of the subject land is discussed further in Section 3.

1.4 Requirement to be assessed under the Biodiversity Offset Scheme (BOS)

Five factors can trigger assessment under the BOS:

1. A development is a State Significant Development or State Significant Infrastructure
2. The subject land intersects areas mapped on the NSW Biodiversity Values Map[1]
3. The subject land would impact an Area of Outstanding Biodiversity Value[2]
4. The area of land impact exceeds the minimum lot size threshold as described in Section 7.2 of the *Biodiversity Conservation Regulation 2017*[3]
5. A development is likely to have a significant impact to threatened species, populations or communities as determined using the NSW test of significance prepared under Section 7.3 of the *Biodiversity Conservation Act 2016*[4]

Based on these criteria, a future Development Application may be required to be accompanied by a Biodiversity Development Assessment Report (BDAR) to assess impacts to biodiversity under the BOS clearing threshold (point 5 above).

The subject land is currently zoned RU2: Low Density Residential, with a minimum lot size of 600 square metres. Under the current minimum lot size, if 0.25 hectares or more of native vegetation will be impacted, the BOS would apply.

[1] https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap

[2] https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/areas-of-outstanding-biodiversity-value/area-of-outstanding-biodiversity-value-register

[3] https://legislation.nsw.gov.au/view/html/inforce/current/sl-2017-0432#sec.7.2

[4] https://legislation.nsw.gov.au/view/html/inforce/current/act-2016-063#sec.7.3

Figure 1-1: Location and regional context of the subject land

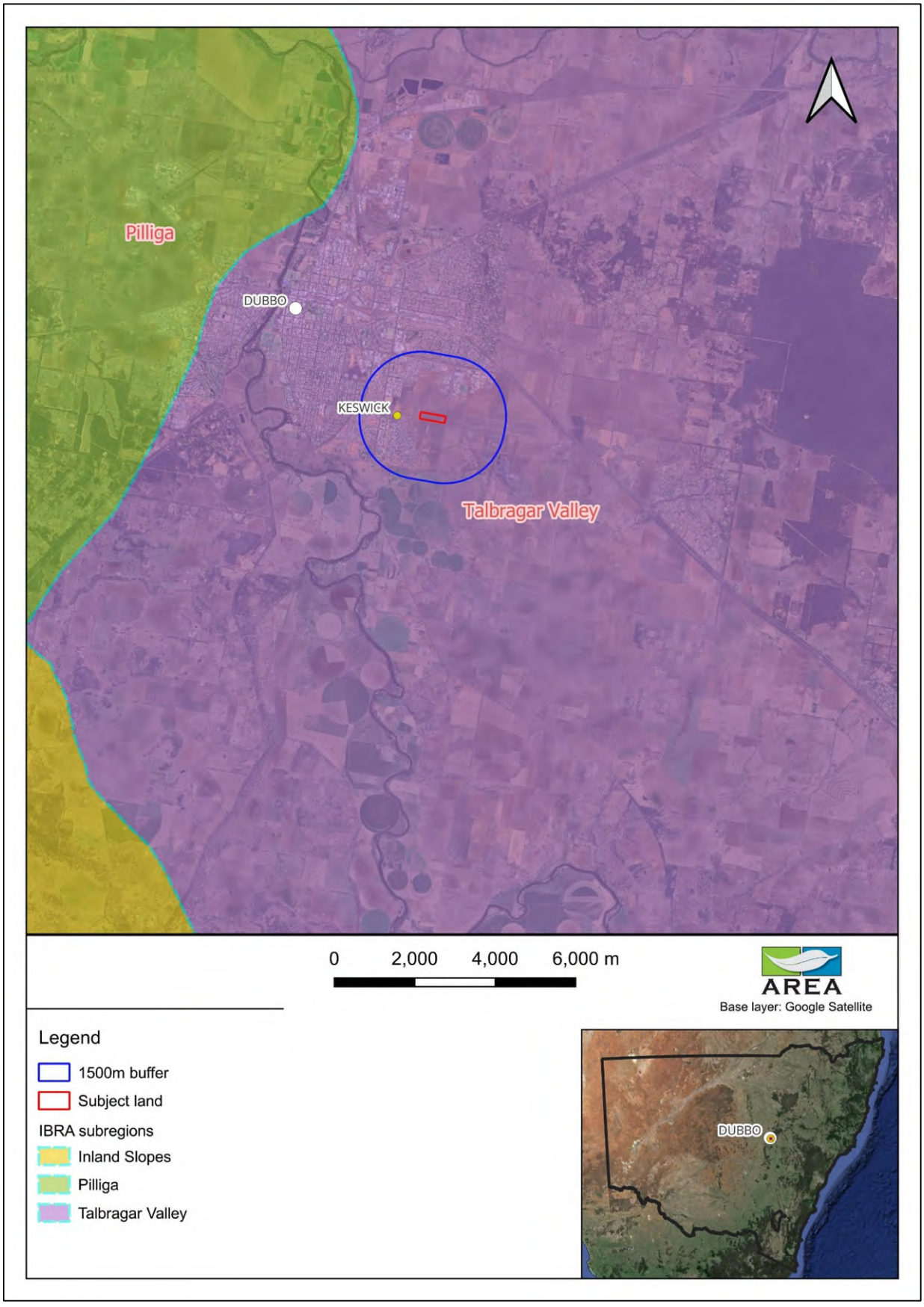


Figure 1-2: Subject land

2 Methods

The following methods were used for this assessment:

- desktop review of ecological databases and literature sources as direct references for the field survey
- field survey of the subject land.

The assessment aimed to evaluate the type and quality of habitat to be impacted by the potential future development on the subject land, apply professional judgement, and then complete targeted assessment of potential habitat to detect the region's listed species, populations, or communities.

This assessment was completed by the following AREA staff (Table 2-1).

Table 2-1: AREA staff qualifications

Name	Position	CV Details	Role in this assessment
Gabrielle Green	Environmental consultant	• B. Env. Sc. University of New England	Field assessment
Michelle Glover	Senior Ecologist	• B. Env. Sc. University of New England	Report preparation
Addy Watson	Manager Operations Biodiversity	• B. Env. Sc. University of New England. • NSW Biodiversity Assessment Method Accredited Assessor (BAAS19066)	Report review

2.1 Desktop review

2.1.1 Information sources

A desktop review was used to inform field surveys and assessment of potential impact to threatened flora and fauna. Preliminary assessment drew on local experience, previous reporting and information held on government databases and archives (Table 2-2 and Appendix B).

Table 2-2: Resources used for this assessment

Title	Web address
Legislation	
Biodiversity Conservation Act 2016	https://www.legislation.nsw.gov.au/view/html/inforce/current/act-2016-063
Commonwealth Environment Protection & Biodiversity Conservation Act 1999	http://www.austlii.edu.au/au/legis/cth/consol_act/epabca1999588/
Environmental Planning and Assessment Act 1979	https://www.legislation.nsw.gov.au/view/html/inforce/current/act-1979-203
Fisheries Management Act 1994	https://www.legislation.nsw.gov.au/view/html/inforce/current/act-1994-038
National Parks and Wildlife Act 1974	https://www.legislation.nsw.gov.au/view/html/inforce/current/act-1974-080
Water Management Act 2000	https://www.legislation.nsw.gov.au/view/html/inforce/current/act-2000-092
Biodiversity	
Atlas of NSW Wildlife	http://www.environment.nsw.gov.au/wildlifeatlas/about.htm
Biodiversity Assessment Method (2020)	https://www.environment.nsw.gov.au/research-and-publications/publications-search/biodiversity-assessment-method-2020

Title	Web address
DPIE Threatened Species website	https://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species
NSW survey guide for the Biodiversity Assessment Method (NSW DPIE, 2020)	https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Biodiversity/surveying-threatened-plants-and-habitats-nsw-survey-guide-biodiversity-assessment-method-200146.pdf
Survey requirements (birds, bats, reptiles, frogs, fish and mammals) for species listed under the EPBC Act	https://www.environment.gov.au/system/files/resources/b1c6b237-12d9-4071-a26e-ee816caa2b39/files/survey-guidelines-mammals.pdf
NSW Biodiversity Values Map and Threshold Tool	https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap
NSW Native Vegetation Regulatory Map	https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=NVRMap
NSW Planning Portal	https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address
PlantNET	http://plantnet.rbgsyd.nsw.gov.au/
Significant Impact Guidelines 1.1 - Matters of National Environmental Significance	http://www.environment.gov.au/epbc/publications/significant-impact-guidelines-11-matters-national-environmental-significance
Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities – Working Draft (DEC, 2004)	https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/draft-threatened-biodiversity-survey-guide.pdf
Threatened Species Assessment Guideline - The Assessment of Significance (DECCW, 2007)	https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/threatened-species-test-significance-guidelines-170634.pdf
Fisheries NSW Spatial Data Portal	https://webmap.industry.nsw.gov.au/Html5Viewer/index.html?viewer=Fisheries_Data_Portal

2.2 Field survey

The fieldwork component of this assessment was undertaken from 8 February 2024 by Gabrielle Green of AREA. The objectives of the field assessment were to:

- describe the nature and extent of vegetation (native or otherwise) present in the subject land,
- determine if listed species, populations, or communities would be, or have potential to be, impacted by future development,
- determine if groundwater dependent communities would be, or have potential to be, impacted by future development, and
- describe the quality and value of the habitat in the subject land.

Database searches were used to inform the field assessment and to determine the likelihood for a protected matter to be recorded within the subject land and what targeted searches would be needed for detection.

Published information showing predicted threatened species were used during the field assessment. Where a potentially threatened flora or fauna or ecological community were identified, such resources were used to confirm occurrence. Results of the field assessment are presented in Section 4.

2.2.1 Limitations

The following limitation and assumptions are relevant to this assessment:

- not all animals and plants can be fully accounted for within any given subject land, the presence of threatened species is not static as it changes over time, often in response to longer term natural forces which can at any time be dramatically influenced by human-made disturbance or weather. To overcome limitations, database searches were conducted for threatened species, populations and ecological communities known to occur within the region before the fieldwork,
- targeted searches for listed matters identified in database searches as well as identification of necessary habitat values were conducted during the field assessment as far as is possible during the allocated assessment time,
- a 'precautionary approach' for species occurrence was adopted where required,
- targeted threatened species assessment did not include insectivorous bat ultrasonic call capture, nocturnal assessment, or other remote sensing techniques,
- the subject land used in this assessment is defined by one identified lot. Impacts assessed within this report only apply to this lot and should be considered in the submission of any Development Application as it relates to this lot,
- design changes requiring impact to vegetation outside the assessment areas may require an additional site visit by AREA, depending on the extent of the change, and
- further assessment under the NSW Biodiversity Offset Scheme may include additional assessment, specifically for candidate species credit species, or for vegetation data to be re-collected if a protracted time period has passed or the status/ management of the land has changed.

The above-mentioned constraints are not considered to compromise the findings or results of the field assessment given the disturbed nature of the subject land and the data relevant to the preparation of this report.

2.2.2 Vegetation assessment

Assessment under the Biodiversity Offset Scheme (BOS) is not required for this Planning Proposal; however, AREA has conducted the assessment using the Biodiversity Assessment Method 2020 (BAM) (NSW DPIE, 2020) methodology. The BAM provides a robust method for data collection and assessment of the type and condition of vegetation.

BAM nested vegetation plots (a 20 metre by 20 metre plot within a 20 metre by 50 metre plot or equivalent to assess 400 square metres and 1000 square metres respectively) were used for vegetation assessment. Table 3 of the BAM stipulates the number of plots required, based on the area in hectares per vegetation zone (Table 2-3). Zones referred to in Table 2-3 are described in the BAM as a relatively homogeneous area of native vegetation on a *development site, clearing site, land to be biodiversity certified or biodiversity stewardship site that is the same PCT and has the same broad condition state.*

BAM plots and threatened species transects were not completed on land which is currently cropped, recently ploughed or otherwise highly disturbed and devoid of biodiversity values.

Data collected using this method was entered into the Biodiversity Assessment Method Calculator (BAM-C) to determine a vegetation integrity score, as well as other outputs relevant to the BOS. These outputs are discussed further in the following sections of this document.

Survey effort in the subject land is shown in Figure 4-1.

Table 2-3: Minimum plots required

Table 3 Minimum number of plots required per zone area

Vegetation zone area (ha)	Minimum number of plots
<2	1 plot
>2–5	2 plots
>5–20	3 plots
>20–50	4 plots
>50–100	5 plots
>100–250	6 plots
>250–1000	7 plots; more plots may be needed if the condition of the vegetation is variable across the zone
>1000	8 plots; more plots may be needed if the condition of the vegetation is variable across the zone

2.2.3 Plant Community Types

The 'State Vegetation Type Map' was used as a baseline for determining the Plant Community Types (PCTs). Where PCTs were not known or not immediately obvious the following process was used to classify them:

- complete BAM vegetation integrity plot to determine species composition and structure,
- access BioNet Vegetation classification website and enter available parameters into PCT filter tool, and
- review PCTs with most consistency and check for consistent floristics, location, and ancillary features.

To confirm PCT choices are appropriate, other resources including local mapping, local data, and any available state data were consulted.

2.2.4 Threatened Ecological Communities

Threatened Ecological Communities (TECs) were predicted based on database searches, and associations with ground-truthed PCTs. Data collected during the field assessment and the NSW and Commonwealth descriptions of TECs was used to confirm presence or absence of TECs in the subject land.

2.2.5 Habitat assessment

Habitat in the subject land was assessed for its potential to provide resources for listed species predicted or known to occur. The BAM Calculator defines habitat features which can

be used to indicate the likely presence of some threatened species. Where these habitat features are present, further assessment of the subject land would be required to confirm presence or absence of the threatened species (candidate species).

Mature trees in the subject land where present, were inspected for hollows and signs of use from listed fauna species and to determine if they were used as fauna breeding sites.

Ground habitat such as rocks and logs which may be potential habitat for listed reptiles were inspected to determine if they were significant habitat.

2.2.6 Threatened species search methodology

The presence of threatened species was conducted by general observation as the surveyor traversed the subject land and undertook vegetation surveys. Specific survey methods for those species that were not detected at the time of survey or are assumed present are described in Table 4-4.

3 Desktop review results

3.1 Landscape context

Landscape context is discussed in the following sections.

3.1.1 IBRA bioregion and subregions

The subject land occurs entirely within the Brigalow Belt South Interim Biogeographic Regionalisation of Australia (IBRA) Region, Talbragar Valley subregion (Figure 1-1).

Bioregions are relatively large land areas characterised by broad, landscape-scale natural features and environmental processes that influence the functions of entire ecosystems. IBRA regions inform the identification of PCTs and habitat suitability for threatened species.

3.1.2 NSW Landscapes (Mitchell Landscapes)

The subject land occurs mostly in the Dubbo Basalts Landscape (Figure 3-1 and Table 3-1).

NSW (Mitchell) Landscapes were developed for conservation planning and reserve establishment purposes and to provide consistent state-wide ecological units finer than the existing bioregions and sub-regions. They have relatively homogeneous geomorphology, soils, and broad vegetation types, and help to provide site context for the subject land.

Table 3-1: NSW Landscapes descriptions

Name	Description	Percent cleared
Dubbo Basalts Landscape	Slightly elevated plains and low hills on flat lying Tertiary basalt and trachyte flows, roughly parallel to the present course of the Talbragar and Macquarie Rivers. General elevation 300 to 330m, local relief 10m. Shallow stony red-brown clay loam and clay, self-mulching and with moderate fertility. Open white box (*Eucalyptus albens*), yellow box (*Eucalyptus melliodora*) and rough-barked apple (*Angophora floribunda*) with diverse grasses.	82

3.1.3 Hydrological features

One unnamed first and second strahler order waterway occurs within 750 metres, and one third Strahler order waterway (Eulomogo Creek) within 1500 metres subject land (Figure 3-2).

Landscape features such as distance to water and land-use can greatly influence the ecology of an area and consequently the likelihood that protected matters are present.

3.1.4 Land use

Grazing native vegetation is the only land use mapped within the subject land (Figure 3-3).

Land use mapping captures how land in NSW is being used for food production, forestry, nature conservation, infrastructure, and urban development. It can be used to monitor changes in the landscape and identify impacts on biodiversity values and individual ecosystems, as well as indicate past and ongoing disturbance experienced by a location.

3.1.5 Climate

Dubbo has a warm, temperate climate with hot summers and cold winters. Average climate data for the subject land are taken from the nearest weather station and is shown in Table 3-2 (BOM, Dubbo Airport AWS, 30 November 2023). Weather at time of assessment was cloudy with mild temperatures. The weather did not impose any limitations on field assessment.

Table 3-2: Average climate data

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean maximum temperature (°C)	33.6	32.0	29.1	24.9	20.0	16.4	15.7	17.6	21.5	25.2	28.6	31.5	24.7
Mean minimum temperature (°C)	18.4	17.6	14.8	10.3	6.4	4.4	3.1	3.3	6.1	9.5	13.5	15.9	10.3
Mean rainfall (mm)	60.1	45.3	66.3	36.7	38.2	48.3	43.7	36.2	42.4	50.2	61.6	60.0	589.1

Figure 3-1: Mitchell landscapes within 1500 metres of the subject land

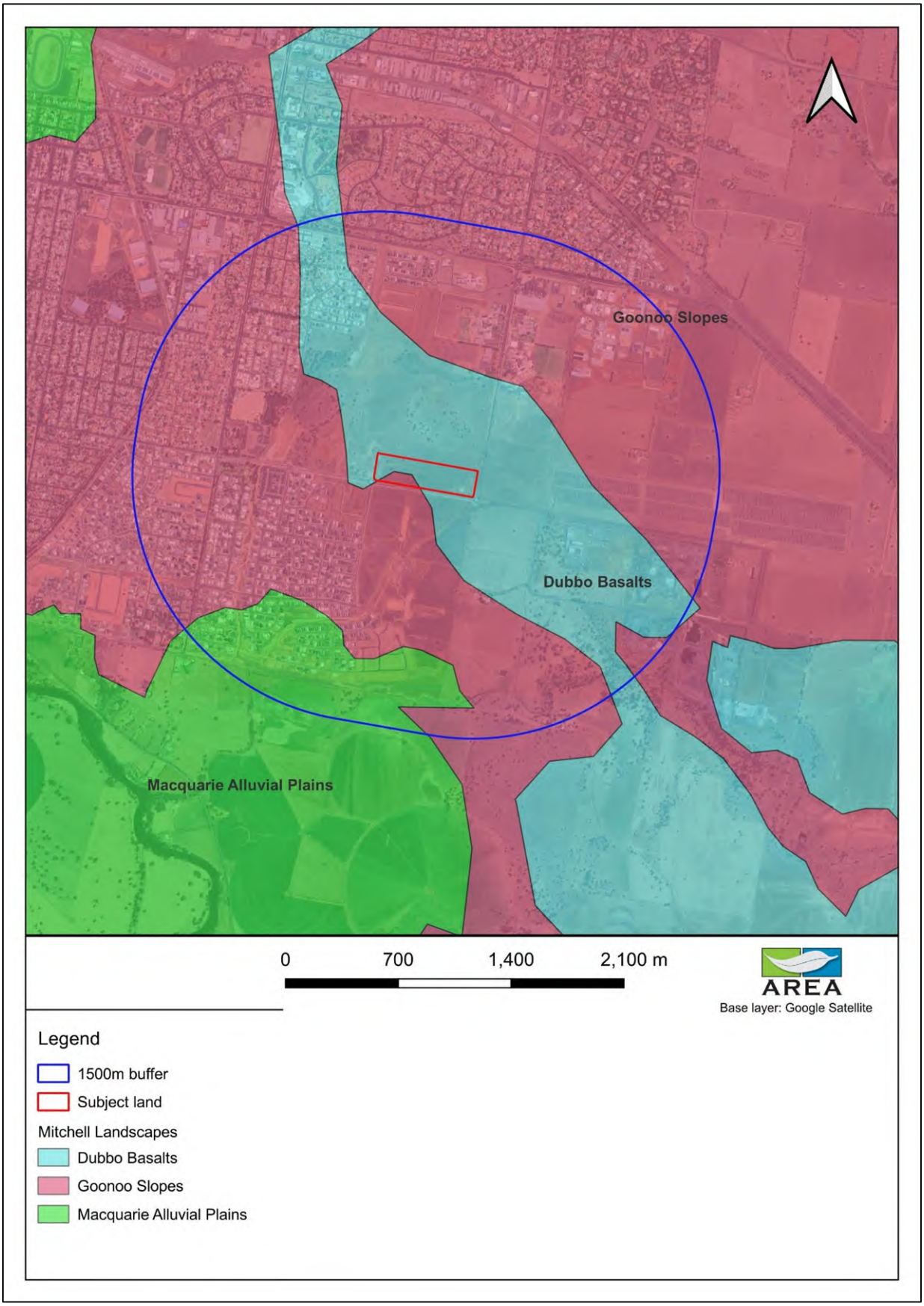
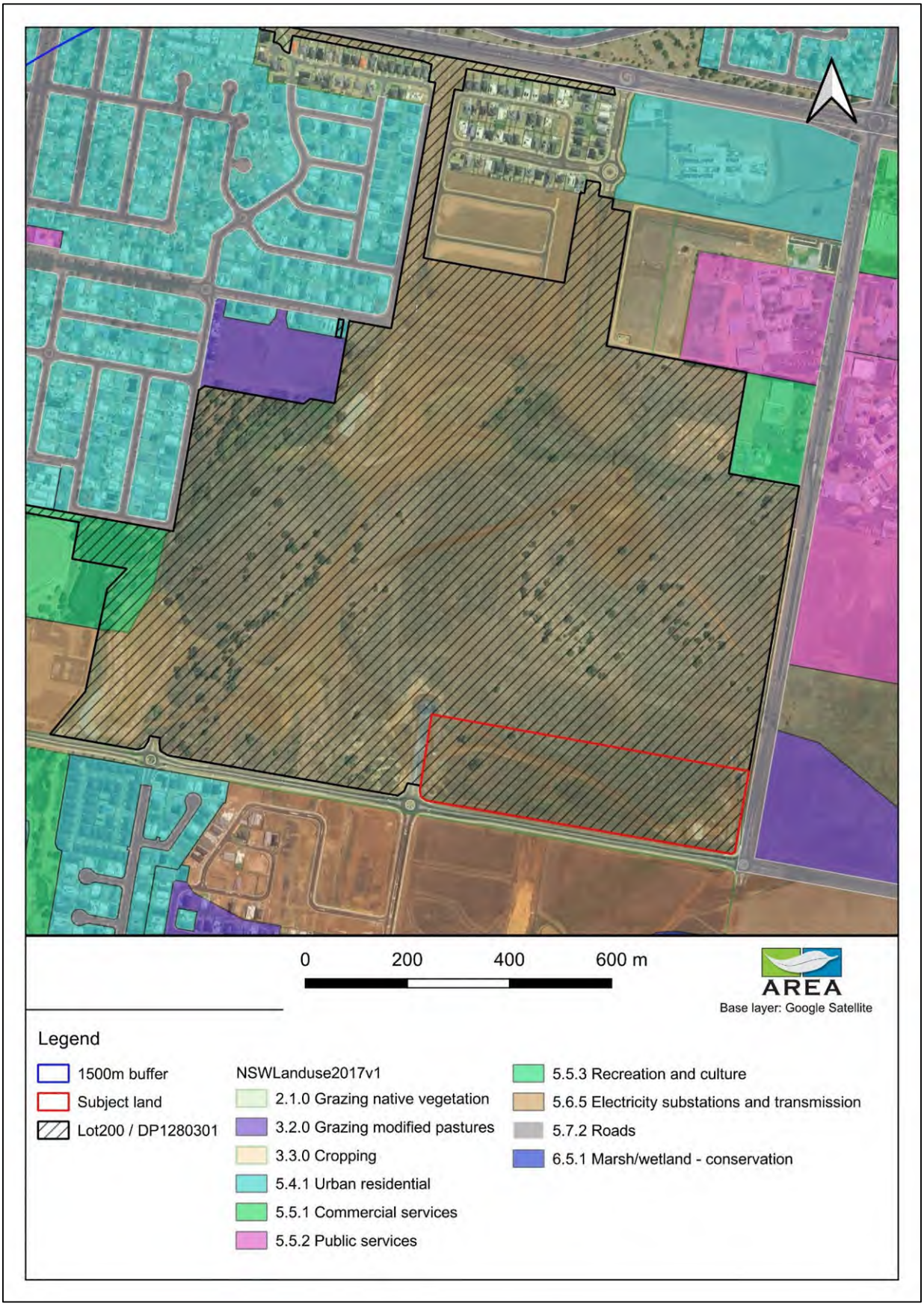


Figure 3-2: Hydrological features within 1500 metres of the subject land

Figure 3-3: Land use within the subject land



3.2 Ecological context

The ecological context of the subject land was assessed at desktop to inform the field survey. Existing data relating to the potential or previously recorded biodiversity values of the subject land were accessed and a summary of those results is provided in the following sections.

3.2.1 EPBC Protected Matters

An EPBC Protected Matters Report generated for this proposal considered Commonwealth environmental matters within a 1500 metre buffer of the subject land. This report is provided in Appendix B and summarised in Table 3-3.

Potential impacts to species and communities revealed by this report are considered in the following sections of this report. Assessment under the Biodiversity Offset Scheme (the BOS) ensures impact to matters of national significance are addressed under NSW legislation, or a referral to the Commonwealth is required if the impact is likely to be significant.

Table 3-3: EPBC Protected Matters Report summary

MNES	Result	Relevance to this assessment
World Heritage Properties	None	-
National Heritage Places	None	-
Wetlands of International Importance	4	N/A – Closest wetland is located 150-200 km downstream from subject land
Great Barrier Reef Marine Park	None	-
Commonwealth Marine Area	None	-
Listed Threatened Ecological Communities	6	Section 3.2.4 and Section 4.2
Listed Threatened Species	40	Section 3.2.3 and Section 4.5
Listed Migratory Species	10	Section 4.7
Commonwealth Land	2	Outside the subject land
Commonwealth Heritage Places	None	-
Listed Marine Species	17	All migratory bird species
Whales and Other Cetaceans	None	-
Critical Habitats	None	-
Commonwealth Reserves Terrestrial	None	-
Australian Marine Parks	None	-
Habitat Critical to the survival of Marine Turtles	None	-
State and Territory Reserves	None	-
Regional Forest Agreements	None	-
Nationally Important Wetlands	None	-
EPBC Act Referrals	3	Most relevant is EPBC 2020/8868 – Dubbo Quarry Continuation Project which is in feature area.
Key Ecological Features (Marine)	None	-
Biologically Important Areas	None	-
Bioregional Assessments	1	-
Geological and Bioregional Assessments	None	-

3.2.2 Plant Community Types (PCTs)

The NSW State Vegetation Type Map was used to determine PCTs mapped by NSW Government within the subject land (Figure 3-4). The subject land is largely unmapped. PCTs within 1500m of the subject land are described in Table 3-4.

Table 3-4: PCTs mapped within the subject land on the SVTM

PCT ID	PCT Name	Formation	Class
0	Not Native	Not Native	Not Native
45	*Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion*	Grasslands	Riverine Plain Grasslands
76	*Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions*	*Grassy Woodlands*	*Floodplain Transition Woodlands*
81	*Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion*	*Grassy Woodlands*	*Floodplain Transition Woodlands*
248	*Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW*	*Grassy Woodlands*	*Floodplain Transition Woodlands*
267	*White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion*	*Grassy Woodlands*	*Western Slopes Grassy Woodlands*
511	*Southwest Ranges White Box Woodland*	Grassy Woodlands	Western Slopes Grassy Woodlands

3.2.3 Threatened species previously recorded

Four threatened species have been recorded within 1500 metres of the subject land on the BioNet database (Table 3-5). The locations of these records are shown in Figure 3-5.

Table 3-5: BioNet threatened species records within 10 kilometres of the subject land

Scientific name	Common name	NSW status	Commonwealth status
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V	V
Lophochroa leadbeateri	Pink Cockatoo	V	-
Ninox connivens	Barking Owl	V	-
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	V	-

V = Vulnerable E = Endangered CE = Critically Endangered M = Migratory

The Fisheries NSW Spatial Data Portal showed no threatened freshwater fish species are predicted to occur in the subject land.

A search of the Talbragar Valley IBRA subregion identified 65 threatened species with potential to occur in the region (Appendix B).

3.2.4 Threatened Ecological Communities (TECs)

IBRA and MNES database searches identified nine predicted TECs with potential to be present in the subject land (Table 3-6). Field survey combined with desktop assessment results determined if any TECs are present and likely to be impacted by future development (Section 4).

Table 3-6: Predicted TECs

Threatened Ecological Community	NSW Status	Commonwealth Status	Database source
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Endangered	n/a	IBRA
Coolibah – Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	n/a	Endangered	MNES
Grey Box *(Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	n/a	Endangered	MNES
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	Endangered	n/a	IBRA
Poplar Box Grassy Woodland on Alluvial Plains	n/a	Endangered	MNES
White Box - Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	Critically Endangered	n/a	IBRA
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	n/a	Critically Endangered	MNES
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales	n/a	Critically Endangered	MNES
Weeping Myall Woodlands	n/a	Endangered	MNES

3.2.5 Biodiversity Values (BVM)

Biodiversity Values are mapped along the Eulomogo Creek approximately 1.3 kilometres south of the subject land within the 1500 metre buffer (Figure 3-6).

The Biodiversity Values Map (BVM) shows areas considered to contain important biodiversity value. Impact to land within the areas marked on the BVM would trigger a requirement for the proposed impact to the assessed under the Biodiversity Offset Scheme.

Figure 3-4: Plant Community Types mapped on State Vegetation Type Map

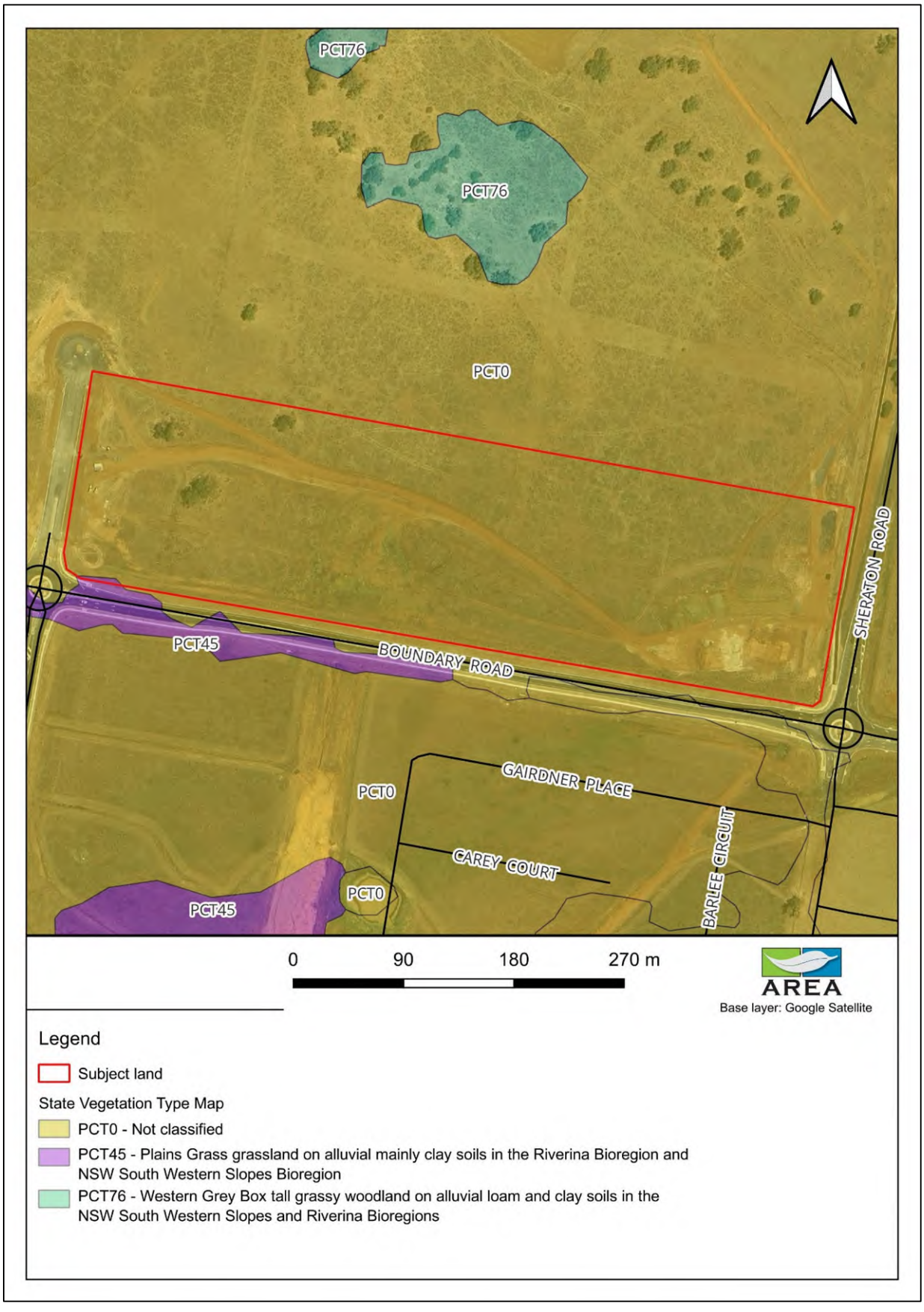


Figure 3-5: BioNet threatened species records within 1500 metres of the subject land

3.2.6 Key Fish Habitat (KFH)

Key Fish Habitat (KFH) is mapped along the Eulomogo Creek approximately 1.3 kilometres south of the subject land within the 1500 metre buffer (Figure 3-6).

The maps of KFH show those habitats that are most important for the survival of native fish stocks.

3.2.7 Transitional Native Vegetation Regulatory (NVR) mapping

The subject land is mapped as land excluded from the *Local Land Services Act 2013*. Vulnerable Regulated Land and Excluded Land are mapped within 1500 metres of the subject land (Figure 3-6).

The Transitional NVR map can be used to check if there is sensitive or vulnerable land mapped in a location. Further, it identifies areas which are excluded from the operation areas of the NSW Local Land Services.

3.2.8 Conservation zones

The NSW ePlanning Spatial Viewer maps the entire subject land as R2 – Low Density Residential (Figure 3-7). There are no environmental or conservation zones in the subject land.

3.2.9 Groundwater dependant ecosystems

The Bureau of Meteorology (BoM 2019) Atlas of Groundwater Dependant Ecosystems mapping was checked for Groundwater Dependent Ecosystems (GDEs) (Figure 3-8).

The terrestrial groundwater dependence map shows no GDE mapped within the subject land which aligns with state PCT mapping of the site. Low potential GDE (from regional studies) is mapped within 1500 metres.

There is no potential aquatic GDE mapped within 1500 metres of the subject land.

3.2.10 Native vegetation cover

Native vegetation cover is the percent of native vegetation occurring within 1500 metres of the subject land. Native vegetation is determined by review of current aerial imagery and assumes where trees have been cleared the vegetation is not native. The resulting percentage is used in the BAM Calculator. It is estimated the native vegetation cover within 1500 metres of the subject land is approximately 1.2 percent.

3.2.11 Areas of Outstanding Biodiversity Value

No Areas of Outstanding Biodiversity Values are present in the subject land.

Figure 3-6: Key Fish Habitat and Biodiversity Values Map

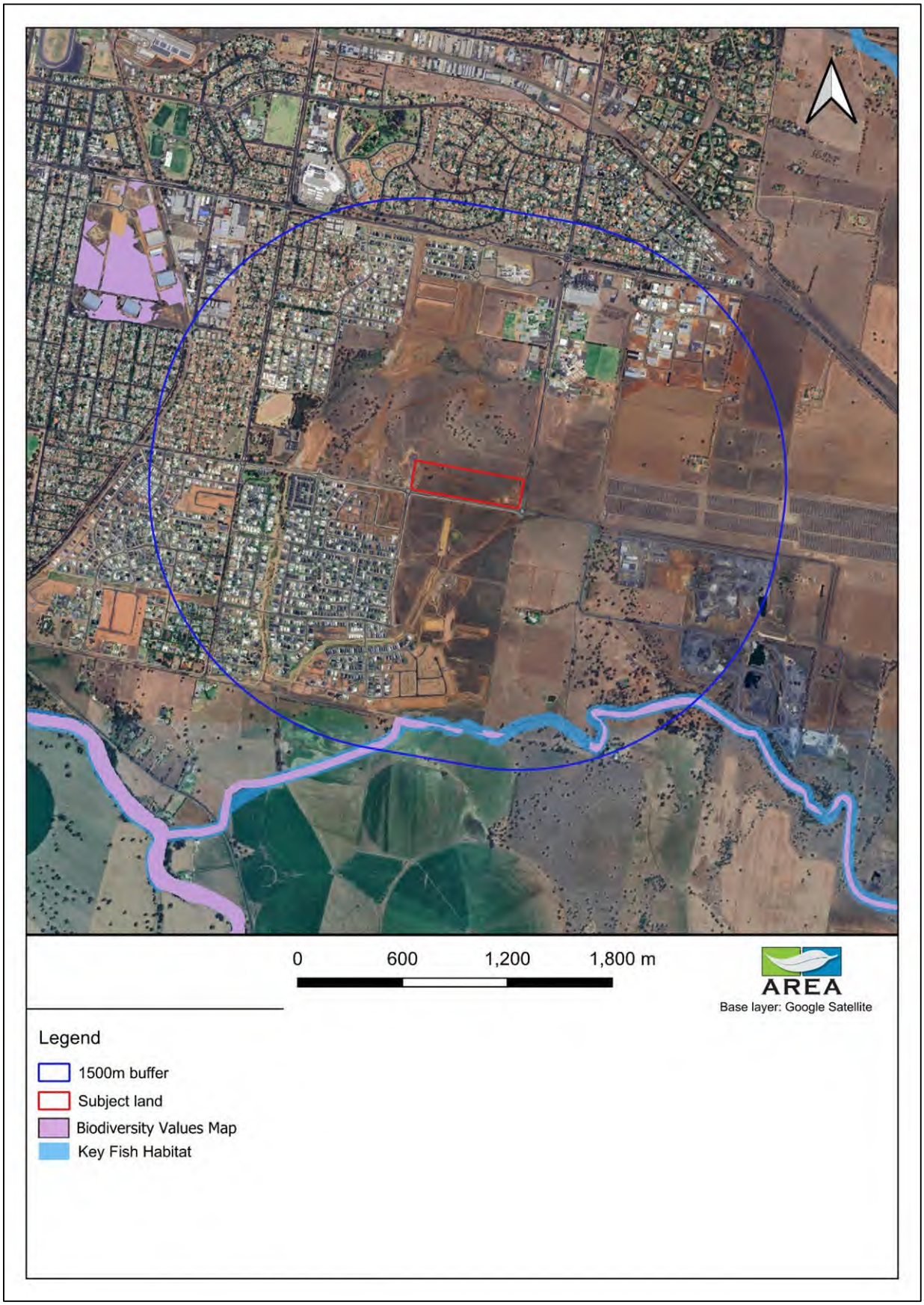


Figure 3-7: Transitional Native Vegetation Regulatory Map

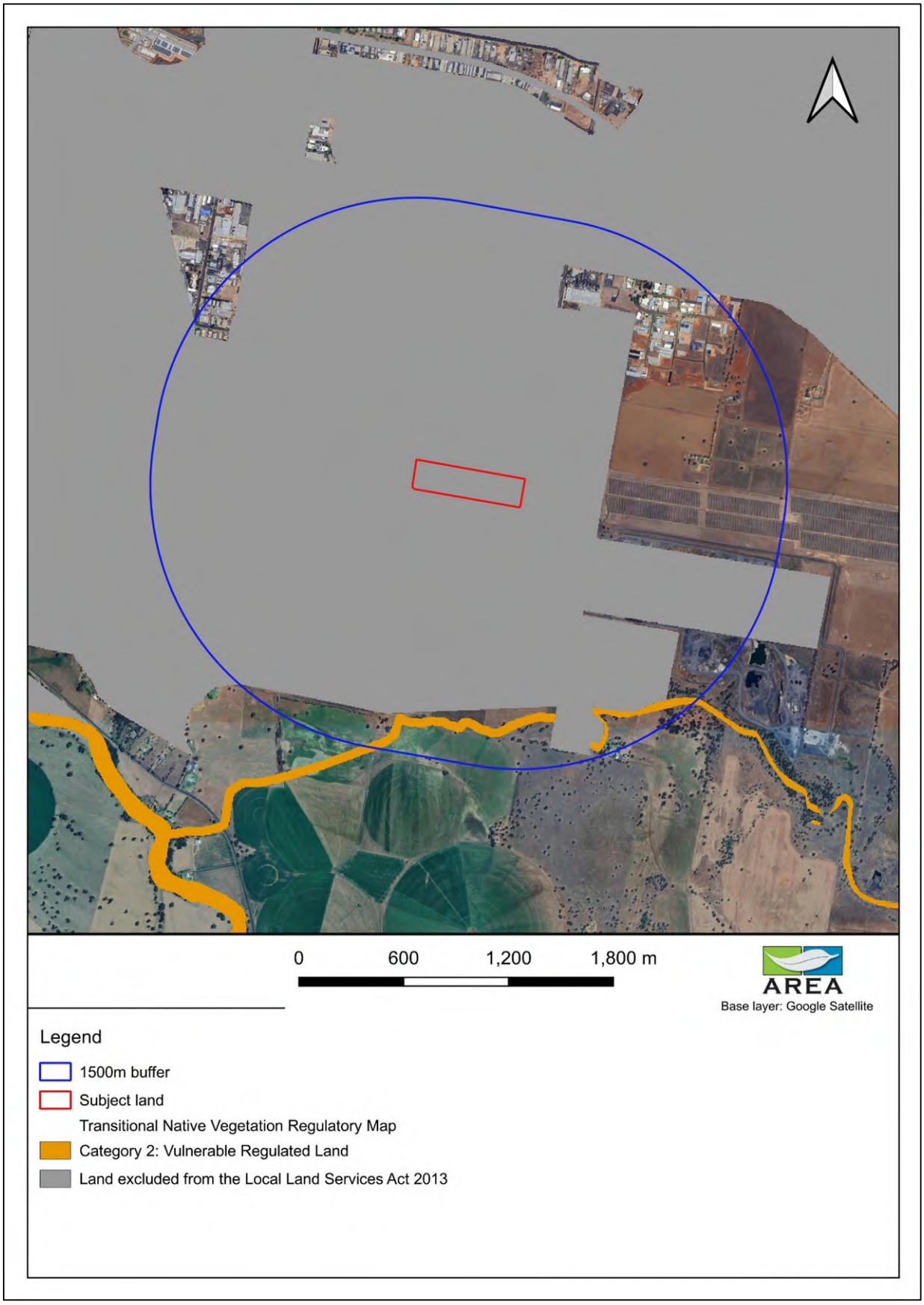


Figure 3-8: Land zoning

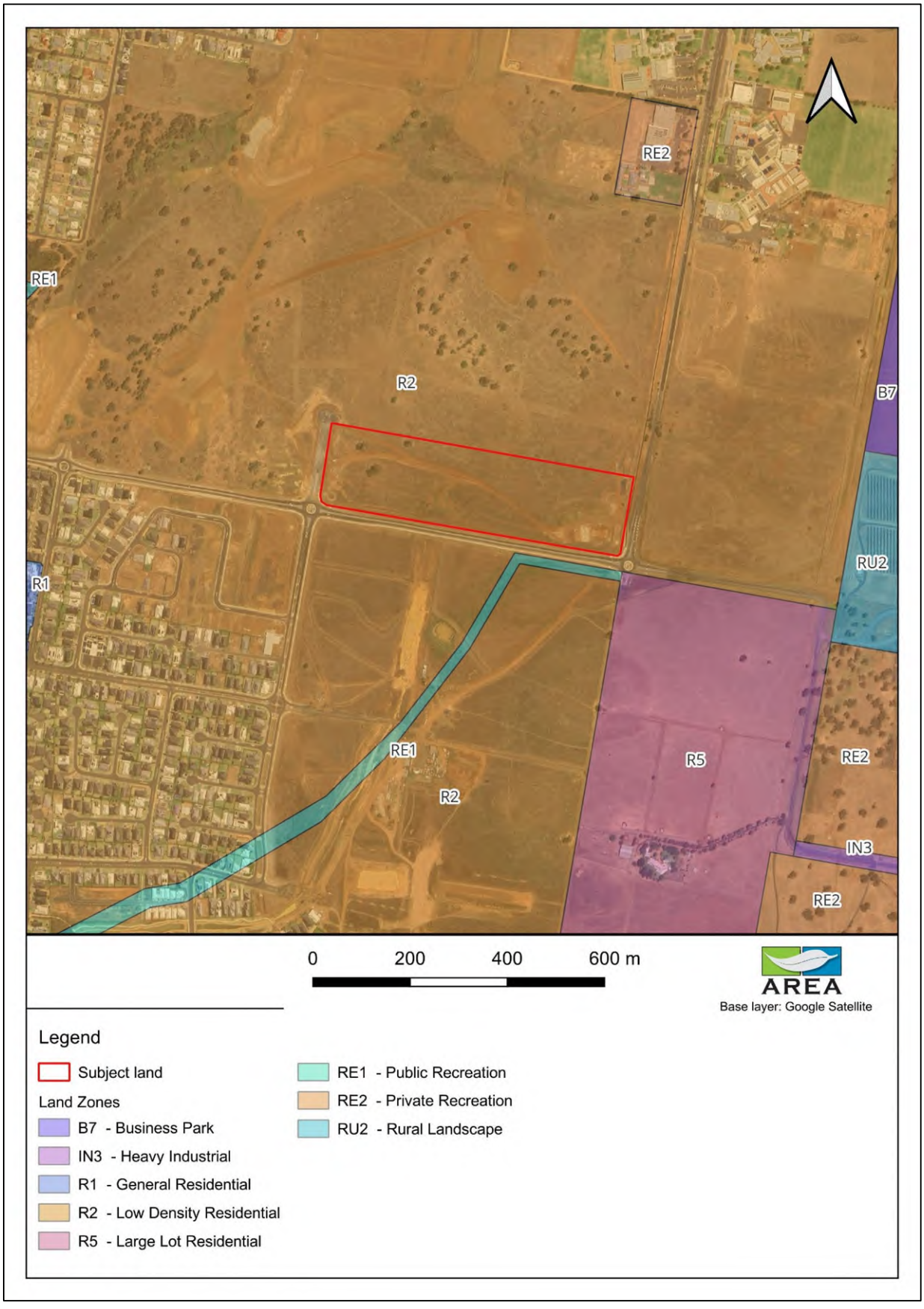
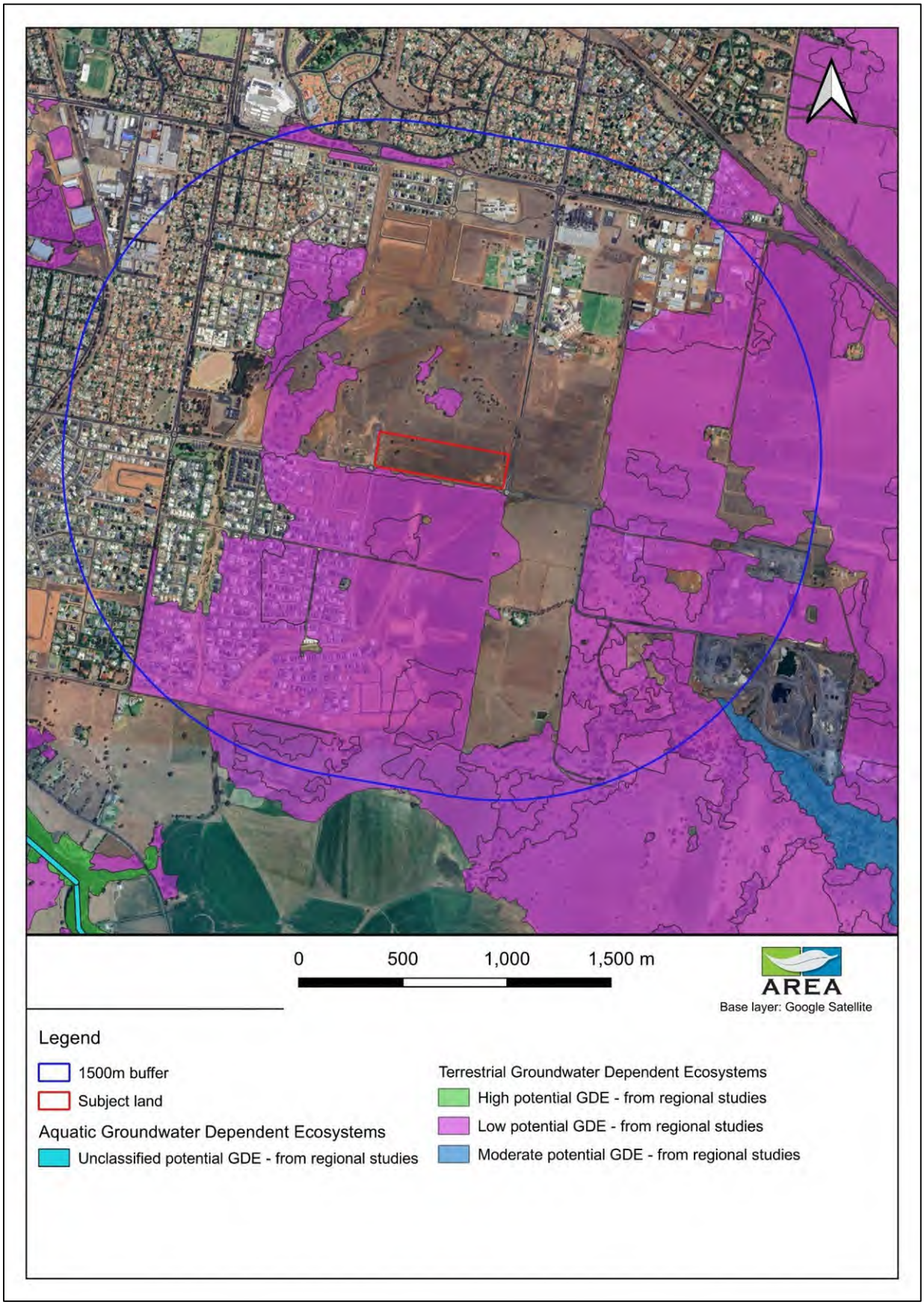


Figure 3-9: Groundwater Dependent Ecosystems



4 Field survey results

Figure 4-1 indicates the locations of transects and BAM plots undertaken in the subject land. BAM plot data sheets are shown in Appendix C.

Figure 4-1: Survey effort

4.1 Plant Community Types (PCT)

BAM vegetation plots were used to assess the native vegetation in the subject land and PCT mapping was corrected based on field observations of mid, upper, and ground stratum species, and landform, BAM plot data and other ancillary features.

One PCT; PCT 76 *Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions* was determined to occur in the subject land where there are remnant trees.

The remaining areas of the subject land were cleared as an access track/stock pile area and is therefore not native vegetation. Photos of the PCT are provided in Table 4-1 and PCT mapping is illustrated in Figure 4-2. The section below outlines the justification for the allocation of PCT 76 within the subject land:

PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions:

Determine Vegetation Formation: Grassy Woodlands

Determine Vegetation Class: Floodplain Transition Woodlands determined to be best fit as it meets the following descriptors:

- Annual rainfall falls just above 550 millimetres
- Located where the western slopes merge into the plains on the Murray/Darling River system
- Fertile soils supporting woodlands 15-25 metres tall dominated almost entirely by box eucalypts
- Largely continuous grassy groundcover and a sparse layer of mostly sclerophyllous shrubs.

Determination of PCT 76 using the BioNet Vegetation Classification Tool:

- filter by IBRA subregion – Talbragar Valley
- filter by dominant species *Eucalyptus microcarpa, Chloris truncata, Sida corrugata, Dichondra repens*

At this point one PCT is identified as consistent with all parameters: PCT 70, with five PCTs consistent with four of the five parameters: PCT 76, 81,101,237 and 244.

- PCT 70 *White Cypress Pine woodland on sandy loams in central NSW wheatbelt.* White Cypress Pine (*Callitris glaucophylla*) is a dominant canopy species of this PCT. There is no evidence of Cypress Pine regeneration within the subject land, nor is PCT 70 mapped within 1500 metres of the subject land on the SVTM, therefore PCT 70 is considered unlikely to be present.
- PCT 81 *Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion* was considered unlikely to be present due to absence of well drained alluvial brown sandy loam to loam soil.
- PCT 101 *Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion* was considered

unlikely to be present due to absence of Poplar Box (*Eucalyptus populnea subsp.bimbil*), the dominant species of this PCT. This PCT is also not mapped within 1500 metres of the subject land by the SVTM.

- PCT 237 *Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone* occurs on slight rises on floodplains dominated by River Red Gum forests mainly on the Murray and Murrumbidgee Rivers. Given the absence of other key upper stratum (River Red Gum, Black Box, Yellow Box and Buloke) and mid stratum species (Acacia species) in the subject land and that this PCT is not mapped within 1500 metres of the subject land by the SVTM, PCT 237 is considered unlikely to be present.
- PCT 244 *Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt)*, was considered unlikely to be present due to absence of Poplar Box (*Eucalyptus populnea subsp.bimbil*), the dominant species of this PCT. This PCT is also not mapped within 1500 metres of the subject land by the SVTM.

Although PCT 76 did not match the subregion search criteria it was determined to be the best fit. PCT 76 is dominated by Western Grey Box (*Eucalyptus macrocarpa*) often as the only tree species, and occurs on red or brown earths or grey clay soils consistent with the vegetation and soil types recorded in and adjacent to the subject land. PCT 76 is also mapped within 1500 metres of the subject land on the SVTM.

Plate 4-1: PCT 76 Community Profile Report

BioNet Vegatation Classification - Community Profile Report

Plant Community Type ID (PCT ID): 76

PCT Name: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

Classification Confidence Level: 3-Medium

Vegetation Description: Tall woodland to 25 m high dominated by Western Grey Box (Eucalyptus microcarpa) often as the only tree species often occupying 90% of the canopy cover but other trees may include Yellow Box (Eucalyptus melliodora), White Cypress Pine (Callitris glaucophylla) and minor Buloke. The shrub layer is absent or sparse and includes Dodonaea viscosa subsp. cuneata, Acacia buxifolia, Acacia acinacea, Acacia hakeoides, Bursaria spinosa. Grazing has eliminated shrubs these in many places. A mid-dense or dense grass ground cover is present composed of Austrodanthonia caespitosa, Austrodanthonia setacea, Austrostipa scabra subsp. falcata, Paspalidium constrictum,Themeda australis, Austrostipa aristiglumis, Aristida behriana and Elymus scaber var. scaber along with introduced grass species such as Bromus spp., Vulpia spp and Hordeum leporinum. The small scrambler Einadia nutans subsp. nutans is usually present. Native forbs include Sida corrugata, Wahlenbergia gracilis, Vittadinia gracilis, Dianella porracea, Oxalis perennans and Chamaesyce drummondii. Occurs on texture contrast red or brown earths or grey clay soils (that may be gilgaied) on undulating alluvial plains in the predominantly winter rainfall belt of south-central western NSW with an average annual rainfall between 550 and 450 mm. Mainly restricted to the eastern section of the Riverina Bioregion and the western section of the NSW South-western Slopes Bioregion. Distributed from north of Forbes in the north to near Albury in the south extending into north-central Victoria. It has lost its original shrub layer in many locations where grazing has been intense. Grades into the more shrubby Western Grey Box-White Cypress Pine - Buloke community (ID80) on loamy-sand soils and grades into White Box (Eucalyptus albens) on podzolic soils to the east on the western slopes. Grades into a riverine Western Grey Box community ID237 along the floodplains of the Murrumbidgee and Murray Rivers. Due to its occurrence on arable soils, this community has largely been cleared. Much of its remaining extent is threatened by grazing and weed invasion. It is a critically endangered community.

Variation and Natural Disturbance: Varies with soil type and drainage. Areas on heavier clays contain less shrubs and a rich forb/grass cover. Areas on lighter loam soils may contain White Cypress Pine and Yellow Box. Little is known about natural succession due to grass changes of understorey due to weed invasion. Fire may have played a significant role in grass shrub dynamics.

Vegetation Formation: Grassy Woodlands;

Vegetation Class: Floodplain Transition Woodlands;

IBRA Bioregion(s): NSW South Western Slopes; Riverina; Cobar Peneplain;

IBRA Sub-region(s): Lower Slopes; Murray Fans; Murrumbidgee; Lachlan Plains; Inland Slopes; Lachlan;

LGA: COOLAMON; LEETON; GREATER HUME SHIRE; MURRAY; GRIFFITH; COROWA; TEMORA; JUNEE; URANA; CONARGO; WAGGA WAGGA; LOCKHART; BERRIGAN; JERILDERIE; LACHLAN;

Lithology: Shale , Alluvial loams and clays

Landform Pattern: Alluvial plain , Flood plain

Landform Element: Levee , Plain , Valley flat

Emergent species:

Upper Stratum Species: Eucalyptus microcarpa; Callitris glaucophylla; Allocasuarina luehmannii;

Mid Stratum Species: Dodonaea viscosa subsp. cuneata; Acacia buxifolia subsp. buxifolia; Bursaria spinosa subsp. spinosa; Acacia oswaldii; Acacia pycnantha; Acacia hakeoides; Acacia brachybotrya; Santalum acuminatum; Acacia homalophylla; Templetonia stenophylla; Exocarpos aphyllus;

Ground Stratum Species: Austrodanthonia caespitosa; Chloris truncata; Sida corrugata; Austrostipa scabra subsp. falcata; Wahlenbergia gracilis; Einadia nutans subsp. nutans; Paspalidium constrictum; Themeda australis; Austrostipa aristiglumis; Aristida behriana; Elymus scaber var. scaber; Austrodanthonia setacea; Carex inversa; Poa sieberiana; Vittadinia gracilis; Dianella porracea; Salsola tragus subsp. tragus; Oxalis perennans; Atriplex semibaccata; Chamaesyce drummondii; Lomandra filiformis subsp. coriacea; Asperula conferta; Convolvulus erubescens; Rhodanthe corymbiflora; Austrostipa bigeniculata; Enchylaena tomentosa; Leiocarpa panaetioides; Podolepis jaceoides; Atriplex semibaccata;

Diagnostic Species:

Fire Regime: Unknown, highly fragmented so most patches are rarely burnt.

TEC Assessed: Has associated TEC

TEC List: Listed BC Act,E: Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (Part); Listed EPBC Act,E: Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia (Part);

TEC Comments:

PCT Percent Cleared: 9200

PCT Definition Status: Approved

Figure 4-2: Plant Community Types on subject land

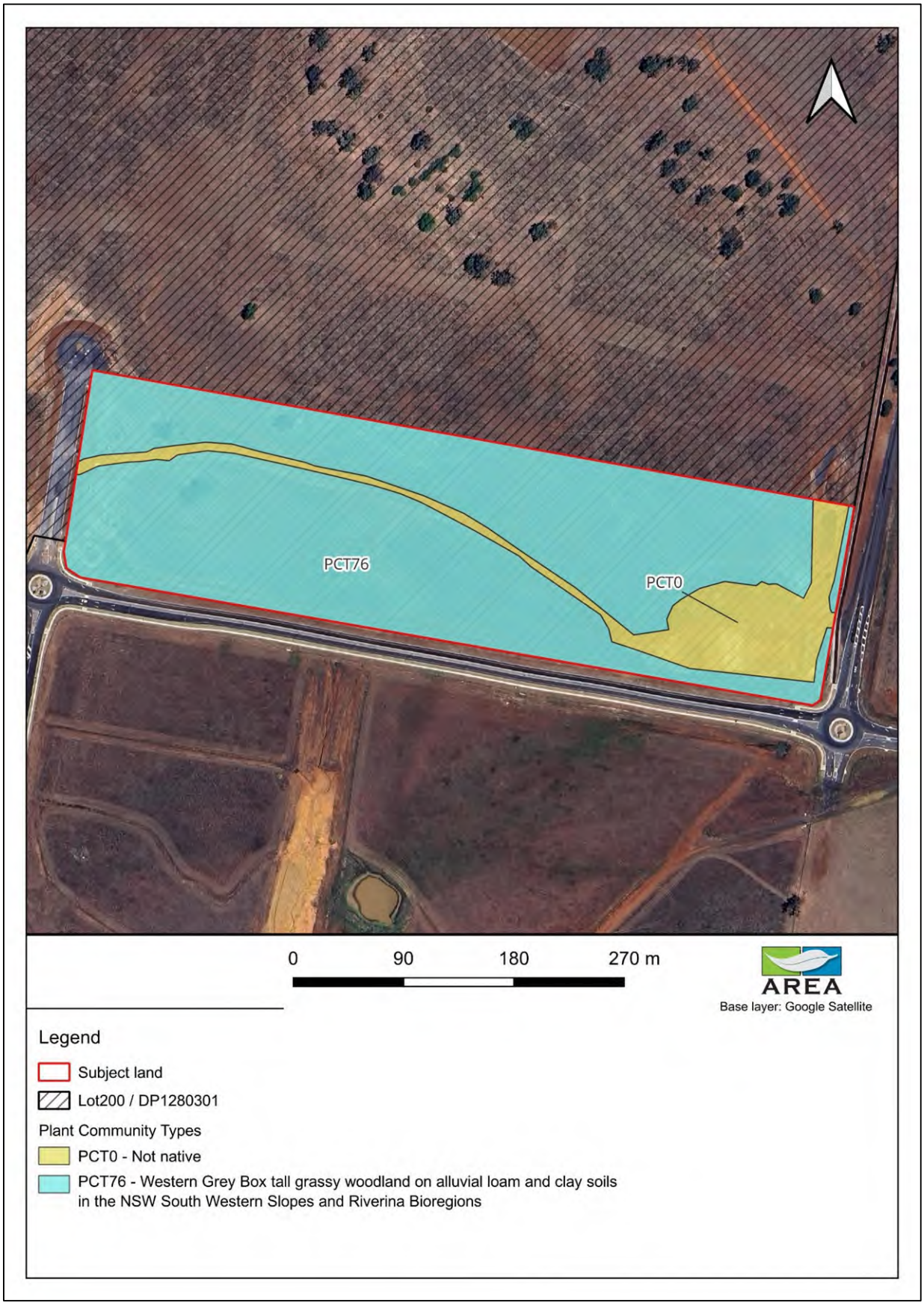


Table 4-1: Photos of PCTs recorded in the subject land

PCT	Photo
PCT 76 Poor condition	
Not native vegetation cleared parts of the subject land	

4.2 Threatened Ecological Communities

In the current state, the subject land, where PCT 76, is consistent with the definition of the endangered ecological communities associated with PCT 76, given the present and past occupation of the site with Inland Grey Box (*Eucalyptus* macrocarpa) including:

- *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (BC Act)*
- *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia (EPBC Act)*

Of the nine TECs identified in the database results (Section 3.2.4), these are the only two TECs area associated with PCT 76 and were determined to present.

4.3 Vegetation zones

One vegetation zones, outlined in Table 4-3, was mapped in the subject land (Figure 4-2). This included 9.06 hectares of native vegetation in poor condition. 1.45 hectares of not native vegetation (bare earth) also occurs within the subject land.

Plot data collected per BAM (2020) was entered into the BAM Calculator to determine relevant threatened species lists (Section 5.1) and vegetation integrity (VI) scores, which indicate the quality and state of native vegetation (Table 4-3). The appropriate number of plots were undertaken.

The BAM Calculator Credit Summary Report is included in Appendix D.

Table 4-2: Plant Community Types recorded within the subject land

Zone	PCT	PCT description	Condition	Area in subject land	Plots required	Plots done#	Composition condition score	Structure condition score	Function condition score	Vegetation integrity (VI) score	Ecosystem credit requirement	Credits per hectare
1	76	*Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions*	Poor	9.06	3	3	61.8	21.4	8.1	**22.1**	**100**	**10.99**
2	0	Not native	N/A	1.45	0	0	N/A	N/A	N/A	N/A	N/A	N/A
Total				**10.51**								

4.4 Habitat values

Few habitat values were identified during the field assessment with the exception of three remnant hollow bearing trees comprising small and medium hollows and two medium stick nests. Tree hollows could provide suitable nesting habitat for several threatened species of bird, bat, reptile, or mammal.

Locations of large trees and tree hollows are shown on Figure 4-3.

Figure 4-3: Indicative location of habitat trees in the subject land

4.5 Threatened species

No threatened species listed under the EPBC Act, BC Act or FM Act were recorded during the field survey.

The BAM Calculator (BAM-C) provides a list of predicted threatened species which are known to have an association with the plant community type (PCT) on the subject land and are assumed to have potential to use the habitat. These species can only be excluded where specific habitat or geographic constraints are not present in the subject land. On this basis, one species, Glossy Black-Cockatoo (*Calyptorhynchus lathami*) was removed as a predicted species from as required habitat does not occur (*Allocasuarina* sp. trees). Where required habitat constraints for these species do occur on the subject land, offsetting obligation is included within the ecosystem credit requirements for the vegetation calculated by the BAM-C. The full list of ecosystem credit species relevant to this assessment is provided in Appendix B.

The BAM-C provides a separate list of candidate species credit species which cannot be reliably associated with a PCT (Table 4-4). These species would generate a credit requirement if they were found to be present or are assumed to be present. These species can only be excluded where required survey effort (as per BAM survey guidelines) has been conducted and the species is not found to occur, or field assessment determines required habitat or geographic constraints do not occur, or habitat is too degraded to support the species.

On the basis of this assessment, the following species were excluded from further consideration:

- Sloane's Froglet *Crinia sloanei* – required habitat constraints (Semi-permanent/ephemeral wet areas containing relatively shallow sections with submergent and emergent vegetation, or within 500 metres of wet area/ swamps or within 500 metres of a waterbody) is not consistent with the subject land
- Swift Parrot *Lathamus discolor* – required habitat constraints (important habitat as per the Important Habitat Map) not present in subject land
- Grey-headed Flying-fox *Pteropus poliocephalus* - required habitat constraints (breeding camps) not present in subject land

All remaining candidate species are assumed to occur until all required seasonal surveys are conducted to either detect their presence or confirm their absence. Comment has been provided for each candidate species credit species in Table 4-4.

The Credit Summary Report provided in Appendix D outlines the estimated credit requirement generated by future development if the Biodiversity Offset Scheme (BOS) is applied. Species credit species (candidate species) each have offsetting requirements under the BOS, where there are known or assumed to occur.

Offsets for impact to 'Predicted' species resulting from future development are included in the ecosystem credit calculations generated by the BAM-C.

Table 4-3: Candidate species credit species

Common name	Scientific name	Habitat constraints	Survey months	Comment
Glossy Black-Cockatoo (Breeding)	*Calyptorhynchus lathami*	Hollow bearing trees - Living or dead tree with hollows greater than 15cm diameter	January - September	Breeding habitat was recorded in the subject land. Survey for the purposes of this report occurred in the required season, and no birds, or evidence of hollow use was detected.
Pine Donkey Orchid	*Diuris tricolor*	-	September - October	Search transects required.
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	Living or dead mature trees within suitable vegetation within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines	July - December	Not identified to be present during the field survey. May be able to be ruled our based on distance to suitable waterbodies, however one moderate dam exists within 1km.
Leafless Indigo	*Indigofera efoliata*	-	September and October	Search transects required in spring
Major Mitchell's Cockatoo (Breeding)	*Lophochroa leadbeateri*	Hollow bearing trees - Living or dead tree with hollows greater than 10cm diameter	September to October	Nesting habitat was recorded in the subject land.
Squirrel Glider	*Petaurus norfolcensis*	-	All Year	Survey using spotlighting or wildlife cameras would be required.
Koala	*Phascolarctos cinereus*	Presence of koala use trees - refer to Survey Comments field in TBDC	All Year	Survey required in accordance with the guidelines.
Superb Parrot (Breeding)	*Polytelis swainsonii*	Living or dead *E. blakelyi, E. melliodora, E. albens, E. camaldulensis, E. microcarpa, E. polyanthemos, E. mannifera, E. intertexta* with hollows greater than 5cm diameter greater than 4m above ground or trees with a DBH of greater than 30cm	September to November	Nesting habitat was recorded in the subject land. Survey required during breeding season.
Silky Swainson-pea	*Swainsona sericea*	-	September to November	Search transects required in spring

4.6 Aquatic communities

No hydrological features occur on the subject land, however, Eulomogo Creek occurs approximately 1.3 kilometres south of the subject land within the 1500 metre buffer as does a medium sized dam. Construction activities have the potential to impact nearby aquatic communities through runoff, as disturbances on land can translate to disturbances to aquatic habitats if not managed in accordance with standard environmental safeguards.

Measures to mitigate potential impacts to waterways are discussed in Section 6 of this report.

4.7 Migratory species

No migratory species were detected during field survey and a significant impact to migratory bird species under the EPBC Act is considered unlikely.

Ten migratory species (all birds) listed under the EPBC Act were identified as potentially occurring in the subject land in the EPBC Act Protected Matters Report, most of which rely on wetland habitats. Given the absence of appropriate habitat within the subject land, these species are not expected to occur or be impacted by future development. An assessment of significance for migratory birds predicted to occur in the subject land is provided in Table 4-5. There is no 'real chance' direct or indirect impacts would occur to migratory birds, therefore no significant impact to migratory birds would occur.

Table 4-4: Assessment of Significance, Migratory birds

An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:	
Criteria	**Response**
I. substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	There is little evidence to suggest that the subject land supports 'important habitat' for migratory species, however it may provide seasonal breeding and feeding grounds. Given their migratory habits, the arid nature of food and habitat resources and the extent of habitat across their range, it is likely that the existing resources within the subject land would be utilised infrequently and on a transitory basis only. Migratory birds are extremely mobile in nature and have a large feeding area that would not be solely reliant on the habitat provided in the subject land. Areas of woodland are loosely connected to the subject land in the event they are disturbed during any future construction processes.
II. result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or	The subject land has a history of habitat modification, which has benefited feral fauna and invasive flora species. The proponent will ensure the spread of weeds and feral fauna is not enhanced by the project.
III. seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	As noted above, the subject land is not considered to be an area of 'important habitat' for migratory birds, whether they are wetland or terrestrial species. It is unlikely that an ecological significant proportion of migratory birds would rely on habitat in the subject land.

4.8 Groundwater dependent communities

There are no potential GDEs mapped within the subject land. Mitigation of impacts to GDEs is primarily applied to managing the impact to the aquifer from extraction or large-scale removal of GDE vegetation. If there is proposed extraction of groundwater in the subject land, mitigation may be required. Retention of remnant trees were possible is recommended.

4.9 Soils and drainage

Soils on site are predominantly euchrozems, red and brown cracking clays typical of the Wongarbon soil landscape as classified in the Soil Landscapes of Central and Eastern NSW (Department of Planning, Industry and Environment, 2020). Soil types mapped as occurring in the subject land include:

Euchrozems

Topsoil - dark reddish-brown clay loam to light clay; strong structure (fine blocky to polyhedral); pH 6.0; to 15 cm depth.

Subsoil - strongly structured, dark reddish-brown light to medium clay; pH 6.5 - 8.0. Changing at 40 cm to reddish-brown to dark red light to medium clay; strong polyhedral to prismatic structure; pH ranges from 7.0 - 8.5. Calcium carbonate often occurs at depth (80 to 100 cm).

Red cracking clays

Topsoil - self-mulching, reddish-brown medium clay; strong fine blocky structure; some calcium carbonate nodules; pH 8.5; to 10 cm depth.

Subsoil - reddish-brown heavy clay; strong structure (coarse lenticular breaking to moderate blocky or prismatic) and soft calcium carbonate concretions; pH 8.5; to greater than 100 cm

Brown cracking clays

Topsoil - self-mulching brown medium clay; strong fine polyhedral peds with small CaCO3 nodules; pH 8.5. Irregular, gradual boundary at 8 cm.

Subsoil - brown heavy clay; strong prismatic structure (50 to 100 mm size peds) with very shiny ped faces; soft CaCO3 nodules present; grading to coarse (150 to 200 mm size peds), lenticular structure below 40 to 50 cm depth. pH is 8.5 and remains at this at 100 cm.

The soils identified in the study area are typically considered to be of moderate erosion hazard with low salinity. These soils have a moderate-high shrink-swell potential the main limitation to urban development.

Soils will be disturbed where future vegetation removal and construction activities occur and drainage may be affected as a result. Construction activities have the potential to impact the surrounding environment and hydrological features through runoff or other contaminants, as disturbances on land can translate to disturbances to aquatic habitats if not appropriately managed.

Standard mitigation and remediation processes applied to manage soil disturbance and drainage in the subject land after construction will ensure no long-term impact to the biodiversity values (Section 6).

4.10 Weeds and pests

Weed levels were high in in the groundcover stratum under the trees. High threat weeds recorded during the field assessment include Cobbler's pegs (*Bidens Pilosa*), African Boxthorn (*Lycium ferrocissimum*), Blue heliotrope (*Heliotropium amplexicaule*) .

An example of exotic vegetation recorded in the subject land is shown in Plate 4-2.

Plate 4-2: Example of African Boxthorn on site

It is anticipated feral fauna species such as the European rabbit (*Oryctolagus cuniculus*), Feral Cat (*Felis catus*) and European Fox (*Vulpes vulpes*) would use the subject land.

5 Impacts

Direct impacts are a direct result of construction activities, should future development occur.

Direct impacts include impact to native vegetation and threatened species as discussed throughout this report. Development of this site would require offsetting under the NSW Biodiversity Offset Scheme.

Indirect impacts are those which are not a direct result of development, often produced away from, or because of, a complex impact pathway. They can be hard to predict and difficult to manage.

Prescribed impacts are identified in the BAM 2020[5]:

a. on the habitat of threatened entities including:

i. karst, caves, crevices, cliffs, rocks and other geological features of significance,
or
ii. human-made structures,
or
iii. non-native vegetation

b. on areas connecting threatened species habitat, such as movement corridors

c. that affect water quality, water bodies and hydrological processes that sustain threatened entities (including from subsidence or upsidence from underground mining)

d. on threatened and protected animals from turbine strikes from a wind farm

e. on threatened species or fauna that are part of a TEC from vehicle strikes.

Future Development Applications associated with this Planning Proposal would need to consider safeguards against and mitigation of potential direct, indirect and or prescribed impacts. Recommended mitigation measures for any future development are outlined in Section 8.

5.1 Serious and Irreversible Impacts

Candidate Serious and Irreversible Impacts (SAII) are identified in the BAM-C and listed on the NSW department website[6].

Accredited Assessors are required to provide additional information about the existing population, potential impacts to the population, and other details, for each candidate SAII identified during the assessment. The determining authority uses this additional information to decide if the proposal will or will not pose an SAII to the matter. For Part 4 approvals, if the determining authority decides is will pose an SAII to the matter, the determining authority must refuse the development.

[5] https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Biodiversity/biodiversity-assessment-method-2020-200438.pdf

[6] https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity-offsets-scheme/local-government-and-other-decision-makers/serious-and-irreversible-impacts-of-development

One candidate SAII was identified by the BAM-C as part of this preliminary assessment: *Indigofera efoliata* (Leafless Indigo). Targeted assessment for this species should be conducted in September or October. If it is confirmed not to be present, then it no longer requires consideration as a candidate SAII.

5.2 Impact on Key Threatening Processes

Key Threatening Processes (KTPs) listed under the BC Act, EPBC Act and FM Act were reviewed (Appendix E). The following KTPS below will be possibly negligibly exacerbated by future development:

- Anthropogenic Climate Change (BC Act)
- Clearing of native vegetation (BC Act)
- Invasion of native plant communities by exotic perennial grasses (BC Act)
- Loss of Hollow-bearing Trees (BC Act)
- Removal of dead wood and dead trees (BC Act)
- Human-caused climate change (FM Act)
- Land clearance (EPBC Act)
- Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases (EPBC Act).
- Prevalence of feral cat populations.

Standard mitigation and remediation processes applied to manage disturbance in the subject land before, during and after construction would ensure impact to the KTPs outlined above are minimised (Section 6). Any residual impacts to these KTPs are unlikely to be significant.

5.3 Cumulative impact

Cumulative impact would be considered within a biodiversity development assessment report (BDAR). Cumulative impact considers the combined impact of the proposed development with other known developments at the time of preparing the report. For example, development in the subject land would need to be considered against the cumulative effect of the expansion of the urban development around the city of Dubbo.

6 Environmental safeguards and mitigation measures

The following sections provide recommendations of how the principles of 'avoid, minimise, mitigate' may be applied to future Development Applications associated with the Planning Proposal.

In managing biodiversity, the proponent aims to achieve a balanced outcome, taking account of environmental considerations together with economic and community objectives. This includes a balanced approach to examining the environmental consequences of an activity and recognising achieving an optimal outcome often requires compromise with respect to decisions regarding environmental values. A key part of the proponent's management of biodiversity for this proposal is the application of the 'avoid, minimise, mitigate and offset' hierarchy as follows:

1. avoid and minimise impacts as the highest priority,
2. mitigate impacts where avoidance is not feasible or practicable in the circumstance,
3. offset where residual, significant unavoidable impact to biodiversity would occur.

6.1 Avoid impact

The primary method to avoid impact is to locate activities away from areas of known or potential high biodiversity value, such as remnant hollow bearing trees. The first preference is to locate a development within existing cleared and disturbed areas which have good access, are not within immediate proximity to waterways, and support good site management practices.

Demonstrating effort to avoid impact to native vegetation, and threatened species, populations or ecological communities is a critical requirement for any BDAR.

6.2 Minimise impact

Future construction will require some native vegetation and habitat removal, however, a development proposal may minimise direct impact by:

- minimising native vegetation removal where reasonably practicable by detailed design
- electing to trim trees in preference to tree removal wherever possible.
- using existing disturbed areas where possible
- avoiding large trees and habitat trees where possible
- removing invasive weed species.

6.3 Mitigate impact

Once all practicable steps to avoid or minimise impact to biodiversity are implemented at the detailed design phase, mitigation measures would be implemented to lessen the potential ecological impacts of future development. Mitigation measures are to be undertaken during the construction and operational phases. Measures may include managing the vegetation

clearing process, re-establishment of native vegetation at the end of a construction where possible, weed management, provision of supplementary fauna habitat (such as nest boxes for appropriate species), and installation of erosion and sediment controls as appropriate (Table 6.1).

Table 6-1: Mitigation measures

Impact	Mitigation Measure	Responsibility	Timing
General	• Any change in design affecting land outside the subject land assessed in this report will require further ecological survey, notwithstanding minor changes where the ecological values have been considered by this assessment.	Proponent	Pre-construction, construction, operation
Clearing and prevention of over-clearing	• All personnel would be inducted to be aware any stand of native vegetation outside the subject land has legislative consequences if deliberately or accidentally impacted without approval. Evidence of all personnel receiving an induction would be kept on file (signed induction sheets etc.). • Before starting work, a physical vegetation clearing boundary at the approved clearing limit is to be identified and effectively communicated to the contractor. • Vegetation within the subject land would be removed to avoid damage to surrounding vegetation. Ensure groundcover disturbance would be kept to a minimum and within the subject land.	Proponent/ Contractor	Pre-construction, construction, operation
Removal of native vegetation	• Native vegetation removal will be minimised through detailed design. • Suitable barriers are installed to ensure the vegetation outside any approved limit of clearing is not inadvertently impacted.	Proponent/ Contractor	Construction and post-construction
Removal of hollow bearing trees	• Removal of native vegetation should be undertaken to mitigate the impact to any wildlife using the habitat at the time of the assessment. For example, the presence of a spotter catcher during the clearing of hollow bearing trees.	Proponent/ Contractor	Construction and post-construction
Removal of threatened fauna habitat	• Threatened fauna habitat removal would be minimised through detailed design wherever possible. • Habitat values may be replaced or re-instated in the local area. • An unexpected species find procedure is to be followed if fauna is injured during the clearing process. An unexpected finds process will be prepared to ensure suitable response to any threatened species detected during the clearing process.	Proponent/ Contractor	Pre-construction, construction, operation
Aquatic impacts	• Impacts to aquatic habitat will be minimised through detailed design. • Erosion and sediment plans will need to be implemented prior to clearing/construction	Proponent/ Contractor	Pre-construction, construction, operation
Changes to hydrology	• Changes to existing surface water flows will be minimised through detailed design.	Proponent/ Contractor	Pre-construction, construction, operation
Edge effects on adjacent native vegetation and habitat	• Exclusion zones will be set up at the limit of clearing.	Proponent/ Contractor	Pre-construction, construction, operation
Injury and mortality of fauna	• Fauna would be managed to minimise and mitigate impact or injury to fauna during vegetation clearing and construction.	Proponent/ Contractor	Pre-construction, construction, operation

Impact	Mitigation Measure	Responsibility	Timing
Soil Management	• Erosion and sediment controls are required. • Site management will incorporate best management erosion and sediment control practices such as those found in the Department of Housing's "Blue Book" (4th Edition) on erosion and sediment control. • Linear silt fencing to be installed down slope of all affected areas and stockpiles. Silt fencing will be installed before excavation begins. • All erosion and silt control devices will be visually inspected weekly to ensure effectiveness as well as after each rainfall event.	Proponent/ Contractor	Pre-construction, construction, operation
Water pollution - fuel, chemical spills and hazardous materials	• Store fuels, chemical and hazardous materials in secure, bunded areas within temporary • Capture and dispose of spill and contaminated materials from temporary construction ancillary facilities at a licensed facility. • Provide spill kits around temporary construction ancillary facilities.	Contractor	Pre-construction and during construction
Stockpiles	Stockpile and compound sites would be located using the following criteria: • At least 40 m away from the nearest waterway • In areas of low ecological conservation significance (i.e., previously disturbed land) • On relatively level ground • Outside the one in 10-year Average Recurrence Interval (ARI) floodplain. • Stockpiling materials and equipment and parking vehicles would be avoided within the dripline (extent of foliage cover) of any tree.	Proponent/ Contractor	Pre-construction, construction, operation
Introduction and spread of weeds and pathogens	• Any priority or high threat weeds identified during construction would be managed according to the requirements of the Biosecurity Act 2015. The growth of all priority weeds recorded in the subject land must be managed in a manner which continuously inhibits the ability of the plant to spread, and the plant must not be sold, propagated, or knowingly distributed. • Construction machinery (bulldozers, excavators, trucks, loaders, and graders) would be cleaned using a high-pressure washer (or other suitable device) before entering and exiting work sites. • Weed-free fill would be used for on-site earthwork if required. • All pesticides would be used in accordance with the requirements on the label. Any person carrying out pesticide (including herbicide) application would be trained to do so and have the proper certificate of completion/competency or statement of attainment issued by a registered training organisation. • Monitoring of green spaces should be undertaken post construction to confirm presence of any introduced species and appropriate weed management measures implemented. • Use weed-free topsoil in landscaping and revegetate disturbed sites with locally indigenous species.	Proponent/ Contractor	Construction
Noise, light and vibration	Noise, light and vibration impacts will be minimised during the detailed design process and construction.	Proponent/ Contractor	Construction; operation

6.4 Biodiversity offset strategy

The offsetting requirement for any future Development Application would be determined at the time of that application and would be required if impact to PCT 76 in the subject land exceeds 0.25 hectares. Native vegetation exists across the subject land, except where bare earth exists.

To meet the offsetting requirement, the proponent may purchase credits from the open market, credit holders or the Credit Supply Taskforce (CST) when credits are available. The proponent may also consider paying directly to the Biodiversity Conservation Fund (BCF), after seeking a Charge Quote and subsequently requesting to pay into the fund.

Offsetting is generally required to be complete, with biodiversity credits retired or the offsetting amount having been paid to the Biodiversity Conservation Trust (BCT) before on groundwork commences. Projects may be staged at the design stage and details included in the Development Application which would enable the credits to be purchased and retired for one stage at a time, before on-ground work commences for that stage, allowing the proponent to spread the financial liability.

7 Conclusion

The subject land contains vegetation and habitat values that would require offsetting should future development be assessed under the NSW Biodiversity Offset Scheme.

In the preparation of a BDAR for the development, it would be important to demonstrate the development has addressed the concept of 'Avoid and Minimise' which is a requirement of the provisions of the *Biodiversity Conservation Act 2016* (BC Act). Offsetting requirements would be reduced where treed vegetation is avoided.

Safeguards and mitigation measures have been provided to minimise harm to the environment.

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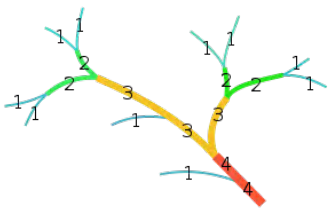
Appendix A: Terms and abbreviations used in this report

Terms and abbreviations used in this report

Abbreviation	Terminology	Description
	Assessment or test of significance	The Assessment of Significance refers to the factors that must be considered by decision makers to assess whether a Proposal is likely to have a significant effect on threatened biodiversity. These mechanisms are contained in s5A of the EP&A Act and s94 of the BC Act.
BoM	Australian Bureau of Meteorology	The Bureau of Meteorology is Australia's national weather, climate and water agency.
	Critical habitat	Critical habitat is defined as an area crucial to the survival of an endangered species, population, or ecological community. The declaration of critical habitat provides greater protection and stricter controls over activities in the area.
	Cumulative impacts	Impacts, when considered together, lead to a stronger impact than any impact in isolation.
	Direct impacts	Directly affect the habitat and individuals. They include, but are not limited to, death through predation, trampling, poisoning of the animal/plant itself and the removal of suitable habitat. When applying each factor, consideration must be given to all of the likely direct impacts of the proposed activity or development.
DCCEEW	Department of Climate Change, Energy, the Environment and Water	The DCCEEW protects Australia's natural environment and heritage sites as well as help Australia respond to climate change and carefully manage our water and energy resources.
TEC	Threatened Ecological Community	An ecological community identified by relevant legislation as being at risk of extinction.
	Environment	The environment includes all aspects of the surroundings of humans, whether affecting any human as an individual or in his or her social groupings.
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth).	Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
GDA	Geocentric Datum of Australia	The Geocentric Datum of Australia (GDA) is the latest Australian coordinate system, replacing the Australian Geodetic Datum (AGD). The GDA is a part of a global coordinate reference frame and is directly compatible with the Global Navigation Satellite Systems.
GDE	Groundwater Dependent Ecosystems	Six types of groundwater dependent ecosystems are conventionally recognised in Australia: Terrestrial vegetation relies on the availability of shallow groundwater. Wetlands such as paperbark swamp forests and mound springs ecosystems. River base flow systems where a groundwater discharge provides a base flow component to the river's discharge. Aquifer and cave ecosystems where life exists independent of sunlight Terrestrial fauna, both native and introduced, dependant on groundwater as a source of drinking water. Estuarine and near shore marine systems, such as some coastal mangroves, salt marshes and sea grass beds, which rely on the submarine discharge of groundwater.
	Habitat	The area occupied, or periodically or occasionally occupied, by any threatened species, population or ecological community and includes all the different aspects (both biotic and abiotic) used by species during the different stages of their life cycles.
IBRA	Interim Biogeographic Regionalisation of Australia	The Interim Biogeographic Regionalisation for Australia (IBRA) is a biogeographic regionalisation of Australia developed by the Australian Government's Department of the Environment. Each region is a land area

Abbreviation	Terminology	Description
		made up of a group of interacting ecosystems repeated in similar form across the landscape.
	Indirect impacts	Occur when project-related activities affect species, populations or ecological communities in a manner other than direct loss. Indirect impacts can include loss of individuals through starvation, exposure, predation by domestic and/or feral animals, loss of breeding opportunities, loss of shade/shelter, deleterious hydrological changes, increased soil salinity, erosion, inhibition of nitrogen fixation, weed invasion, fertiliser drift, or increased human activity within or directly adjacent to sensitive habitat areas. As with direct impacts, consideration must be given, when applying each factor, to all of the likely indirect impacts of the proposed activity or development.
KTP	Key Threatening Process	A key threatening process is defined as a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities. A requirement of their listing on the Act is that the process adversely affects two or more threatened species, populations or ecological communities, or may cause species, populations or ecological communities not threatened to become threatened.
LGA	Local Government Area	The relevant LGA is Governed by Council who are the determining authority for this development application.
	Local population	The population occurs in the subject land. The assessment of the local population may be extended to include individuals beyond the subject land if it can be clearly demonstrated contiguous or interconnecting parts of the population continue beyond the subject land. The local population of a threatened plant species comprises those individuals occurring in the subject land, or the cluster of individuals extend into habitat adjoining and contiguous with the subject land could reasonably be expected to be cross-pollinating with those in the subject land. The local population of resident fauna species comprises those individuals known or likely to occur in the subject land, as well as any individuals occurring in adjoining areas (contiguous or otherwise) are known or likely to utilise habitats in the subject land. The local population of migratory or nomadic fauna species comprises those individuals likely to occur in the subject land from time to time.
	Local population (EEC)	The ecological community present within the subject land. However, the local occurrence may include adjacent areas if the ecological community on the subject land forms part of a larger contiguous area of the ecological community and the movement of individuals and exchange of genetic material across the boundary of the subject land can be clearly demonstrated.
MNES	Matters of national environmental significance.	Refers to the seven matters of national environmental significance outlined under the EPBC Act.
RAMSAR	Convention on Wetlands of International Importance	The Ramsar Convention's broad aims are to halt the worldwide loss of wetlands and to conserve, through wise use and management, those remaining. This requires international cooperation, policy making, capacity building and technology transfer.
Significant impact		A 'significant impact' is an impact which is important, notable, or of consequence, having regard to its context or intensity.
Strahler stream order		Strahler stream order and are used to define stream size based on a hierarchy of tributaries (see below). 

Appendix B: Database search results

IBRA predicted species

Search results for predicted in the Pilliga IBRA subregion, filtered by Floodplain Transition Woodlands Keiths Vegetation Class

Scientific name	Common name	NSW status	Commonwealth status
Amphibian			
Crinia sloanei	Sloane's Froglet	Endangered	Endangered
Bird			
Anseranas semipalmata	Magpie Goose	Vulnerable	-
Anthochaera phrygia	Regent Honeyeater	Critically Endangered	Critically Endangered
Artamus cyanopterus cyanopterus	Dusky Woodswallow	Vulnerable	-
Botaurus poiciloptilus	Australasian Bittern	Endangered	Endangered
Burhinus grallarius	Bush Stone-curlew	Endangered	-
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	Vulnerable	Vulnerable
Chthonicola sagittata	Speckled Warbler	Vulnerable	-
Circus assimilis	Spotted Harrier	Vulnerable	-
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Vulnerable	Vulnerable
Daphoenositta chrysoptera	Varied Sittella	Vulnerable	-
Ephippiorhynchus asiaticus	Black-necked Stork	Endangered	-
Epthianura albifrons	White-fronted Chat	Vulnerable	-
Falco subniger	Black Falcon	Vulnerable	-
Glossopsitta pusilla	Little Lorikeet	Vulnerable	-
Grantiella picta	Painted Honeyeater	Vulnerable	Vulnerable
Grus rubicunda	Brolga	Vulnerable	-
Haliaeetus leucogaster	White-bellied Sea-Eagle	Vulnerable	-
Hamirostra melanosternon	Black-breasted Buzzard	Vulnerable	-
Hieraaetus morphnoides	Little Eagle	Vulnerable	-
Lathamus discolor	Swift Parrot	Endangered	Critically Endangered
Leipoa ocellata	Malleefowl	Endangered	Vulnerable
Limosa limosa	Black-tailed Godwit	Vulnerable	-
Lophochroa leadbeateri	Major Mitchell's Cockatoo	Vulnerable	Endangered
Lophoictinia isura	Square-tailed Kite	Vulnerable	-
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	Vulnerable	Endangered
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Vulnerable	-
Neophema pulchella	Turquoise Parrot	Vulnerable	-
Ninox connivens	Barking Owl	Vulnerable	-
Ninox strenua	Powerful Owl	Vulnerable	-
Oxyura australis	Blue-billed Duck	Vulnerable	-
Pachycephala inornata	Gilbert's Whistler	Vulnerable	-
Petroica boodang	Scarlet Robin	Vulnerable	-
Petroica phoenicea	Flame Robin	Vulnerable	-
Phaethon rubricauda	Red-tailed Tropicbird	Vulnerable	-
Polytelis swainsonii	Superb Parrot	Vulnerable	Vulnerable
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	Vulnerable	-
Rostratula australis	Australian Painted Snipe	Endangered	Endangered
Stagonopleura guttata	Diamond Firetail	Vulnerable	Vulnerable
Stictonetta naevosa	Freckled Duck	Vulnerable	-
Tyto novaehollandiae	Masked Owl	Vulnerable	-
Mammal			
Chalinolobus dwyeri	Large-eared Pied Bat	Vulnerable	Endangered

Scientific name	Common name	NSW status	Commonwealth status
Chalinolobus picatus	Little Pied Bat	Vulnerable	-
Miniopterus orianae oceanensis	Large Bent-winged Bat	Vulnerable	-
Nyctophilus corbeni	Corben's Long-eared Bat	Vulnerable	Vulnerable
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Vulnerable
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Vulnerable	-
Cercartetus nanus	Eastern Pygmy-possum	Vulnerable	-
Dasyurus maculatus	Spotted-tailed Quoll	Vulnerable	Endangered
Petaurus norfolcensis	Squirrel Glider	Vulnerable	-
Phascolarctos cinereus	Koala	Endangered	Endangered
Sminthopsis macroura	Stripe-faced Dunnart	Vulnerable	-
Reptile			
Aprasia parapulchella	Pink-tailed Legless Lizard	Vulnerable	Vulnerable
Hoplocephalus bitorquatus	Pale-headed Snake	Vulnerable	-
Plant			
Tylophora linearis	Tylophora linearis	Vulnerable	-
Acacia ausfeldii	Ausfeld's Wattle	Vulnerable	-
Calotis glandulosa	Mauve Burr-daisy	Vulnerable	-
Commersonia procumbens	Commersonia procumbens	Vulnerable	-
Dichanthium setosum	Bluegrass	Vulnerable	-
Diuris tricolor	Pine Donkey Orchid	Vulnerable	-
Homoranthus darwinioides	Fairy Bells	Vulnerable	-
Indigofera efoliata	Leafless Indigo	Endangered	-
Pomaderris queenslandica	Scant Pomaderris	Endangered	-
Swainsona sericea	Silky Swainson-pea	Vulnerable	-
Zieria ingramii	Keith's Zieria	Endangered	-
Ecological Community			
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions		Endangered Ecological Community	-
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions		Endangered Ecological Community	-
White Box - Yellow Box - Blakelys Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions		Critically Endangered Ecological Community	-

BAM Calculator - predicted species output

NSW GOVERNMENT

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00045958/BAAS19066/24/00045959	Lot 200 Keswick Estate	22/06/2023
Assessor Name	Report Created	BAM Data version *
Addy Watson	20/02/2024	61
Assessor Number	Assessment Type	BAM Case Status
BAAS19066	Part 4 Developments (General)	Open
Assessment Revision	BOS entry trigger	Date Finalised
0	BOS Threshold: Area clearing threshold	To be finalised

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Black Falcon	Falco subniger	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Diamond Firetail	Stagonopleura guttata	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Dusky Woodswallow	Artamus cyanopterus cyanopterus	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Flame Robin	Petroica phoenicea	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Grey-headed Flying-fox	Pteropus poliocephalus	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

BAM Predicted Species Report

Hooded Robin (south-eastern form)	Melanodryas cucullata cucullata	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Major Mitchell's Cockatoo	Lophochroa leadbeateri	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Scarlet Robin	Petroica boodang	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Speckled Warbler	Chthonicola sagittata	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Superb Parrot	Polytelis swainsonii	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Swift Parrot	Lathamus discolor	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
White-bellied Sea-Eagle	Haliaeetus leucogaster	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
White-throated Needletail	Hirundapus caudacutus	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

Threatened species Manually Added

None added

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Common Name	Scientific Name	Plant Community Type(s)
Glossy Black-Cockatoo	Calyptorhynchus lathami	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C
Glossy Black-Cockatoo	Calyptorhynchus lathami	Habitat constraints

Australian Government
Department of Climate Change, Energy, the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 15-Feb-2024

Summary

Matters of National Environment 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 (Ramsar	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	40
Listed Migratory Species:	10

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 https://www.dcceew.gov.au/parks-heritage/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 Lands:	2
Commonwealth Heritage Places:	None
Listed Marine Species:	17
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	3
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	700 - 800km upstream from Ramsar site	In feature area
Riverland	700 - 800km upstream from Ramsar site	In feature area
The coorong, and lakes alexandrina and albert wetland	900 - 1000km upstream from Ramsar site	In feature area
The macquarie marshes	150 - 200km upstream from Ramsar site	In feature area

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.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community may occur within area	In feature area
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within area	In feature area
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	Critically Endangered	Community may occur within area	In feature area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community may occur within area	In feature area
Weeping Myall Woodlands	Endangered	Community may occur within area	In feature area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area	In feature area

Community Name	Threatened Category	Presence Text	Buffer Status
Listed Threatened Species			[Resource Information]
Status of Conservation Dependent and Extinct are not MNES under the EPBC Act. Number is the current name ID.			
Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area	In feature area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat may occur within area	In feature area
Lophochroa leadbeateri leadbeateri Major Mitchell's Cockatoo (eastern), Eastern Major Mitchell's Cockatoo, Pink Cockatoo (eastern) [82926]	Endangered	Species or species habitat may occur within area	In feature area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat likely to occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area	In feature area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area	In feature area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat likely to occur within area	In feature area
FISH			
Bidyanus bidyanus Silver Perch, Bidyan [76155]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Galaxias rostratus			
Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow [84745]	Critically Endangered	Species or species habitat may occur within area	In feature area
Maccullochella macquariensis			
Trout Cod [26171]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Maccullochella peelii			
Murray Cod [66633]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Macquaria australasica			
Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In feature area
FROG			
Crinia sloanei			
Sloane's Froglet [59151]	Endangered	Species or species habitat may occur within area	In feature area
MAMMAL			
Chalinolobus dwyeri			
Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat may occur within area	In feature area
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	In feature area
Nyctophilus corbeni			
Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat likely to occur within area	In feature 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]	Endangered	Species or species habitat known to occur within area	In feature area
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
PLANT			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Androcalva procumbens [87153]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Austrostipa wakoolica [66623]	Endangered	Species or species habitat may occur within area	In feature area
Lepidium aschersonii Spiny Peppercress [10976]	Vulnerable	Species or species habitat may occur within area	In feature area
Lepidium monoplocoides Winged Pepper-cress [9190]	Endangered	Species or species habitat may occur within area	In feature area
Swainsona murrayana Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	Vulnerable	Species or species habitat may occur within area	In feature area
Swainsona recta Small Purple-pea, Mountain Swainson-pea, Small Purple Pea [7580]	Endangered	Species or species habitat may occur within area	In feature area
Vincetoxicum forsteri listed as Tylophora linearis [92384]	Endangered	Species or species habitat may occur within area	In feature area
REPTILE			
Anomalopus mackayi Five-clawed Worm-skink, Long-legged Worm-skink [25934]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Listed Migratory Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area	In buffer area only
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [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.

Commonwealth Land Name	State	Buffer Status
Defence		

Commonwealth Land Name	State	Buffer Status
Defence - DUBBO TRAINING DEPOT [10072]	NSW	In buffer area only
Unknown		
Commonwealth Land - [13249]	NSW	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area

Extra Information

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Dubbo Zirconia Project	2012/6625	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Dubbo Quarry Continuation Project	2020/8868	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area

Bioregional Assessments			
SubRegion	BioRegion	Website	Buffer Status
Central West	Northern Inland Catchments	BA website	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and 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

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

Where little information is available for a 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 detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

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

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

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

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Appendix C: BAM Plot sheets

Numbers [1-8] on this page correlate with the numbers and explanatory notes on page 3

Site sheet #	1 of	**Date**	8/2/24	**Survey name**	Lot 200 Keswick Estate	**Plot identifier**	1
Recorders	Gabrielle Green			**IBRA region**		**Veg zone ID**	1
[1]Datum		**Coordinate system**	☐ Projected ☐ Geographic	**MGA zone**		**[1]X coordinate** 654326	**[1]Y coordinate** 6428339
Location description	descriptive notes to locate site without grid reference						
[1] Plot dimensions	For composition & structure (400m²): 20 m x 20 m For function (1000m²): 20 m x 50 m					**[1] Orientation of midline from 0 m point**	Magnetic ° 172 **Photo #**

Datum: AGD66, WGS84, GDA94, GDA2020 or Other (specify). **MGA Zone** (for Projected coordinate system only): 56 (Coastal NSW), 55 (Central NSW or 54 (Western NSW). **X/Y coordinate**: Long/Lat (for Projected coordinate system), Easting/Northing (for geographic coordinate system)

Vegetation integrity

Composition and structure sum values may be completed after entering data into available tools. It is not required while in the field

Composition (400 m² plot)		Sum values	**Structure** (400 m² plot)		Sum values (%) (may sum to >100%)	**Function** (1000 m² plot) [3] Tree stem size class (DBH)	If data are to be used as more appropriate local data i.e. to generate local benchmarks, stems must be counted
Total count of native plant species **(richness)** in each growth form group (not individual plants within each growth form)	Trees (TG)	0	Sum of [2] **foliage cover** of native plant species by growth form group	Trees (TG)	0	80 + cm	Count 1
	Shrubs (SG)	0		Shrubs (SG)	0	50 – 79 cm	Count (best practice)/tick. If [3]large tree benchmark size ≥50 cm, count
	Grasses etc. (GG)	9		Grasses etc. (GG)	6.8	30 – 49 cm	Count (best practice)/tick. If [3]large tree benchmark size ≥ 30 cm, count
	Forbs (FG)	9		Forbs (FG)	3.7	20 – 29 cm	Count (best practice)/tick. If [3]large tree benchmark size ≥ 20 cm, count
	Ferns (EG)	0		Ferns (EG)	0	10 – 19 cm	Count (best practice)/tick
	Other (OG)	3		Other (OG)	0.4	5 – 9 cm	Count (best practice)/tick
						[4]Tree regeneration <5 cm	Tick
			Total high threat weed cover		7.5 %	[5]Length of fallen logs	Tally space 5 Total 5 m
						[6]Hollow bearing trees	Tick

Vegetation integrity - function cont. (five 1 m²) **plots)**	[7]Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	20 25 69 65 75 2 0 0 1 0 0 5 3 3 0 0 0 0 0 0 0 0 0 0 0			
Average of the 5 subplots	50.8	1.72	0	0

These attributes require consideration of site observations and may be completed after field work.

Vegetation class | **[8]Large tree benchmark size** 20/ 30/ 50/ 80 DBH | Confidence H/ M/ L

Plant community type (PCT) | **EEC** Tick | Confidence H/ M/ L

Physiography and site features that may help in determining PCT and management zone (optional) or for BioNet systematic flora survey purposes

Morphological type	Silt loam	Landform element		Landform pattern		Microrelief	
Lithology	Well sorted	Soil surface texture	Clay loam	Soil colour	Red Brown	Soil depth	<10cm
Slope	Slight	Aspect	West to east downward slope	Site drainage	well draining	Distance to nearest water and type	unknown

Disturbance	Severity code	Age code
Clearing (inc. logging)	2	O
Cultivation (inc. pasture)	1	NR
Soil erosion	1	O
Firewood / CWD removal	0	—
Grazing (id. native/stock)	1	NR
Fire damage	0	—
Storm damage	0	—
Weediness	3	R
Other	0	—

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Brief site description or other notes

Degraded farming land likely used for grazing. Old cow skull found under CB tree in plot. High exotic veg present - Likely grazed by native fauna currently

Emergents heights			Upper stratum heights			Middle stratum heights			Lower stratum heights		
Top	Mid	Bottom	Top	Mid	Bottom	Top	Mid	Bottom	Top	Mid	Bottom
m	m	m	m	m	m	m	m	m	m	m	m

% exotic species 8.4

Dead thistle in plot.

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 08 02 24	Lot 200 Keswick	1	Gabrielle Green

	GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund-ance	Voucher
1	HTE	Heliotropium amplexicaule Blue heliotrope	HTW	7	100	
2	G	Chloris truncata windmill grass	N	0.5	>30	
3	G	Eragrostis sp	N	0.1	>1	
4	F	Sida corrugata	N	1.0	>200	
5	F	Whalenbergia communis	N	0.1	>20	
6	F	Einadia polygonoides	N	2	>100	
7	—	Chondrilla juncea Naked weed	NHTW	0.2	>10	
8	G	Austrostipa nervicilata	N	3	>30	
9		~~Mitchell grass~~				
10	F	Villadinia cunata Fluzzweed	N	0.5	>30	
11	O	Glycine sp Round leaf.	N	0.2	>200	
12	—	Conzya bonariensis Tall Flea bane	NHTW	0.1	>3	
13	F	Senna barclayana	N	0.3	>15	
14	G	Austrostipa scabra	N	1	100	
15	O	Convolvolous sp	N	0.1	>20	
16	F	Dichandra repens	N	0.5	>500	
17	—	Verbanum bonariensis Purple top	NHTW	0.1	>1	
18	F	Epilobium hirtigerum	N	0.1	>2	
19	G	Paspalidium gracile Slender panic	N	1	>100	
20	—	Sisymbrium officinale Mustard weed	NHTW	0.1	>1	
21	G	Bothriochloa macra Red leg grass	N	0.1	>5	
22	F	Solanum esuriale	N	0.1	>10	
23	O	Glycine sp	N	0.1	>5	
24	—	Lactuca serriola Prickly lettuce	NHTW	0.1	>2	
25	—	Salvia verbenaca	NHTW	0.1	>10	
26	HTE	Bidens sp	HTW	0.5	>50	
27	G	Panicum decompositum.	N	0.5	>50	
28	—	Urochloa panicoides Liverseed grass	NHTW	0.1	>5	
29	—	Echium plantagineum Paterson's curse	NHTW	0.1	2	
30	G	Anthosachne scabra Common wheatgrass	N	0.1	>2	
31	G	Panicum effusum Hairy panic	N	0.5	>50	
32	F	Lepidium sp	N	0.1	>1	
33						
34						
35						

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

Numbers 1-8 on this page correlate with the numbers and explanatory notes on page 3

Site sheet #	1 of	**Date** 8/2/24	**Survey name** Lot 200 Beswick Estate	**Plot identifier**	2
Recorders	Gabrielle Green	**IBRA region**		**Veg zone ID**	1
[1]**Datum**	**Coordinate system** □ Projected □ Geographic	**MGA zone**	[1]**X coordinate** 654527	[1]**Y coordinate**	6428350
Location description	descriptive notes to locate site without grid reference				
[1]**Plot dimensions**	For composition & structure (400m²): 20 m x 20 m; For function (1000m²): 20 m x 50 m	[1]**Orientation of midline from 0 m point**	Magnetic° 189	**Photo #**	

Datum: AGD66, WGS84, GDA94, GDA2020 or Other (specify). MGA Zone (for Projected coordinate system only): 56 (Coastal NSW), 55 (Central NSW or 54 (Western NSW). X/Y coordinate: Long/Lat (for Projected coordinate. system), Easting/Northing (for geographic coordinate. system)

Vegetation integrity

Composition and structure sum values may be completed after entering data into available tools. It is not required while in the field

Composition (400 m² plot)		Sum values	**Structure** (400 m² plot)		Sum values (%) (may sum to >100%)	**Function** (1000 m² plot) [3]Tree stem size class (DBH)	If data are to be used as more appropriate local data i.e. to generate local benchmarks, stems must be counted
Total count of native plant species **(richness)** in each growth form group (not individual plants within each growth form)	Trees (TG)	0	Sum of [2]**foliage cover** of native plant species by growth form group	Trees (TG)	0	80 + cm	~~Count~~
	Shrubs (SG)	0		Shrubs (SG)	0	50 – 79 cm	Count (best practice)/tick. ~~If large tree benchmark size ≥50 cm, count~~
	Grasses etc. (GG)	7		Grasses etc. (GG)	24.5	30 – 49 cm	Count (best practice)/tick. ~~If large tree benchmark size ≥ 30 cm, count~~
	Forbs (FG)	7		Forbs (FG)	1.4	20 – 29 cm	Count (best practice)/tick. ~~If large tree benchmark size ≥ 20 cm, count~~
	Ferns (EG)	0		Ferns (EG)	0	10 – 19 cm	~~Count (best practice)/tick~~
	Other (OG)	0		Other (OG)	0	5 – 9 cm	~~Count (best practice)/tick~~
						[4]Tree regeneration <5 cm	~~Tick~~
			Total high threat weed cover		2 %	[5]Length of fallen logs	~~Tally space~~ Total — m
						[6]Hollow bearing trees	~~Tick~~

Vegetation integrity - function cont. (five 1 m²) **plots)**	[7]Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	10 7 50 10 15	1.5 0 2 0 0	0 0 0 0 0	0 0 0 0 0
Average of the 5 subplots	18.4	0.7	0	0

These attributes require consideration of site observations and may be completed after field work

Vegetation class	[8]**Large tree benchmark size**	20/ 30/ 50/ 80 DBH	Confidence	H/ M/ L
Plant community type (PCT)	**EEC**	Tick	Confidence	H/ M/ L

Physiography and site features that may help in determining PCT and management zone (optional) or for BioNet systematic flora survey purposes

Morphological type		Landform element		Landform pattern		Microrelief	
Lithology	well sorted	Soil surface texture	clay loam	Soil colour	Red Brown	Soil depth	<10cm
Slope	Slight	Aspect	NW to East downward slope	Site drainage	well draining	Distance to nearest water and type	unknown.

Disturbance	Severity code	Age code
Clearing (inc. logging)	2	O
Cultivation (inc. pasture)	1	NR
Soil erosion	1	O
Firewood / CWD removal	0	–
Grazing (id. native/stock)	1	NR
Fire damage	0	–
Storm damage	0	–
Weediness	3	R
Other	0	–

Brief site description or other notes

Degraded farming land likely used for grazing. Currently grazed by native fauna.

Emergents heights			Upper stratum heights			Middle stratum heights			Lower stratum heights		
Top	Mid	Bottom	Top	Mid	Bottom	Top	Mid	Bottom	Top	Mid	Bottom
m	m	m	m	m	m	m	m	m	m	m	m

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe   Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

% exotic species 3%

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 08 02 24	lot 200 keswick estate	2	AG

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund-ance	Voucher
—	1 Salvia verbenaca	NHTW	0.5	>100	
G	2 Bothriochloa macra Red leg grass	N	0.1	>20	
F	3 Vittadinia cuneata	N	0.1	>25	
—	4 Chondrilla juncea Naked weed	NHTW	0.1	>5	
G	5 Austrostipa verticillata	N	20	>100	
HTE	6 Heliotropium amplexicaule Blue heliotrope	HTW	2	>50	
O	7 Glycine sp	N	0.1	>	
O	8 Convolvulus sp	N	0.1	>5	
G	9 Paspalidium gracile Slender panic	N	0.2	>100	
G	Panicum decompositum	N	2	>100	
F	Sida corrugata	N	0.5	>200	
F	Senna barclayana	N	0.2	>8	
F	Einadia polygonoides	N	0.3	>25	
—	14 Centaurea solstitialis	NHTW	0.1	>3	
G	15 Chloris truncata	N	2	>200	
—	16 Conyza bonariensis tall fleabane	NHTW	0.1	>4	
—	17 Onopordum acanthium Scotch thistle	NHTW	0.1	>2	
F	18 Solanum esuriale	N	0.1	>1	
—	19 Sida rhombifolia	NHTW	0.1	>4	
F	20 Wahlenbergia communis	N	0.1	>1	
F	21 Euphorbia drummondi Caustic weed	N	0.1	>1	
G	22 Panicum effusum	N	0.1	>1	
G	23 Austrostipa scabra	N	0.1	>2	
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

Numbers [1-8] on this page correlate with the numbers and explanatory notes on page 3

Site sheet #	1 of	**Date**	8/2/24	**Survey name**	Lot 200 Keswick Estate	**Plot identifier**	3
Recorders	Gabrielle Green			**IBRA region**		**Veg zone ID**	1
[1]Datum		**Coordinate system**	□ Projected □ Geographic	**MGA zone**		**[1]X coordinate** 654677	**[1]Y coordinate** 6428343
Location description	descriptive notes to locate site without grid reference: Eastern end of footprint.						
[1] Plot dimensions	For composition & structure (400m²): 20 m x 20 m For function (1000m²): 20 m x 50 m				**[1] Orientation of midline from 0 m point**	Magnetic 164°	**Photo #**

Datum: AGD66, WGS84, GDA94, GDA2020 or Other (specify). **MGA Zone** (for Projected coordinate. system only): 56 (Coastal NSW), 55 (Central NSW or 54 (Western NSW). **X/Y coordinate**: Long/Lat (for Projected coordinate. system), Easting/Northing (for geographic coordinate. system)

Vegetation integrity

Composition and structure sum values may be completed after entering data into available tools. It is not required while in the field

Composition (400 m² plot)		Sum values	**Structure** (400 m² plot)		Sum values (%) (may sum to >100%)	**Function** (1000 m² plot) [3] Tree stem size class (DBH)	If data are to be used as more appropriate local data i.e. to generate local benchmarks, stems must be counted
Total count of native plant species **(richness)** in each growth form group (not individual plants within each growth form)	Trees (TG)	0	Sum of [2] **foliage cover** of native plant species by growth form group	Trees (TG)	0	80 + cm	Count
	Shrubs (SG)	0		Shrubs (SG)	0	50 – 79 cm	Count (best practice)/tick. If [3] ~~large tree~~ benchmark size ≥50 cm. count
	Grasses etc. (GG)	6		Grasses etc. (GG)	19.9	30 – 49 cm	Count (best practice)/tick. If [3] ~~large tree~~ benchmark size ≥ 30 cm. count
	Forbs (FG)	8		Forbs (FG)	1.7	20 – 29 cm	Count (best practice)/tick. If [3] ~~large tree~~ benchmark size ≥ 20 cm. count
	Ferns (EG)	0		Ferns (EG)	0	10 – 19 cm	~~Count (best~~ practice)/tick
	Other (OG)	0		Other (OG)	0	5 – 9 cm	~~Count (best~~ practice)/tick
						[4]Tree regeneration <5 cm	Tick
			Total high threat weed cover		5.2 %	[5] Length of fallen logs	Tally space Total m
						[6] Hollow bearing trees	Tick

Vegetation integrity - function cont. (five 1 m²) **plots)**	[7] Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	10/5/10/15/7	3/2/0/0/0	0/0/0/0/0	0/0/0/0/0
Average of the 5 subplots	11.4	0.4	0	0.2

These attributes require consideration of site observations and may be completed after field work:

Vegetation class | **[8] Large tree benchmark size** 20/ 30/ 50/ 80 DBH | Confidence H/ M/ L

Plant community type (PCT) | **EEC** Tick | Confidence H/ M/ L

Physiography and site features that may help in determining PCT and management zone (optional) or for BioNet systematic flora survey purposes:

Morphological type		Landform element		Landform pattern		Microrelief	
Lithology	well sorted	Soil surface texture	clay loam	Soil colour	Red/brown	Soil depth	<10cm
Slope	Slight	Aspect	NW to East downward slope	Site drainage	Well draining	Distance to nearest water and type	Unknown.

Disturbance	Severity code	Age code
Clearing (inc. logging)	2	O
Cultivation (inc. pasture)	1	NR
Soil erosion	1	O
Firewood / CWD removal	0	–
Grazing (id. native/stock)	1	NR
Fire damage	0	–
Storm damage	0	–
Weediness	3	R
Other	0	–

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Brief site description or other notes

Degraded farming land likely used for grazing. High exotic vegetation present - Currently grazed by native fauna.

Emergents heights			Upper stratum heights			Middle stratum heights			Lower stratum heights		
Top	Mid	Bottom	Top	Mid	Bottom	Top	Mid	Bottom	Top	Mid	Bottom
m	m	m	m	m	m	m	m	m	m	m	m

% exotic species 6.5%.

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 08 02 24	lot 200 Keswick Estate	3	Gabrielle Green

	GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund-ance	Voucher
1	HTE	Bidens sp	HTW	0.2	>26	
2	—	Conzya bonariensis Tall Fleabane	NHTW	0.2	>10	
3	HTE	Heliotropium amplexicaule Blue heliotrope	HTW	5	>50	
4	—	Sisymbrium officinale Mustard weed	NHTW	0.1	>20	
5	G	Austrostipa verticillata	N	18	>60	
6	F	Sida corrugata	N	0.1	>20	
7	F	Solanum esuriale	N	0.1	>3	
8	G	Panicum decompositum	N	1	>100	
9	F	Einadia polygonoides	N	1	>50	
10	—	Verbanum purple top	NHTW	0.2	>10	
11	F	Epilobium hirtigerum	N	0.1	>2	
12	G	Carex sp	N	0.5	>10	
13	—	Centaurea solstitialis	NATW	0.1	>10	
14	G	Panicum sp	N	0.1	>1	
15	—	Sida rhombifolia paddys lucern	NHTW	0.1	>3	
16	—	Salvia verbenaca	NHTW	0.1	>10	
17	—	Lactuca serriola prickly lettuce	NHTW	0.1	>1	
18	F	Senna barclayana	N	0.1	>1	
19	—	Trifolium sp	NHTW	0.1	>5	
20	—	Chondrilla juncea Naked weed	NHTW	0.1	>2	
21	—	Onopordum acanthium Scotch thistle	NHTW	0.1	>4	
22	F	Psoralea tenax Emu foot	N	0.1	>2	
23	F	Boerhavia diffusa tarvine	N	0.1	>5	
24	G	Echinochloa colona	N	0.1	>1	
25	G	Rhytidosperma sp lots post seeding	N	0.2	>100	
26	F	Dichondra repens	N	0.1	>50	
27	—	Heliotropium europaeum white heliotrope	NHTW	0.1	>2	
28						
29						
30						
31						
32						
33						
34						
35						

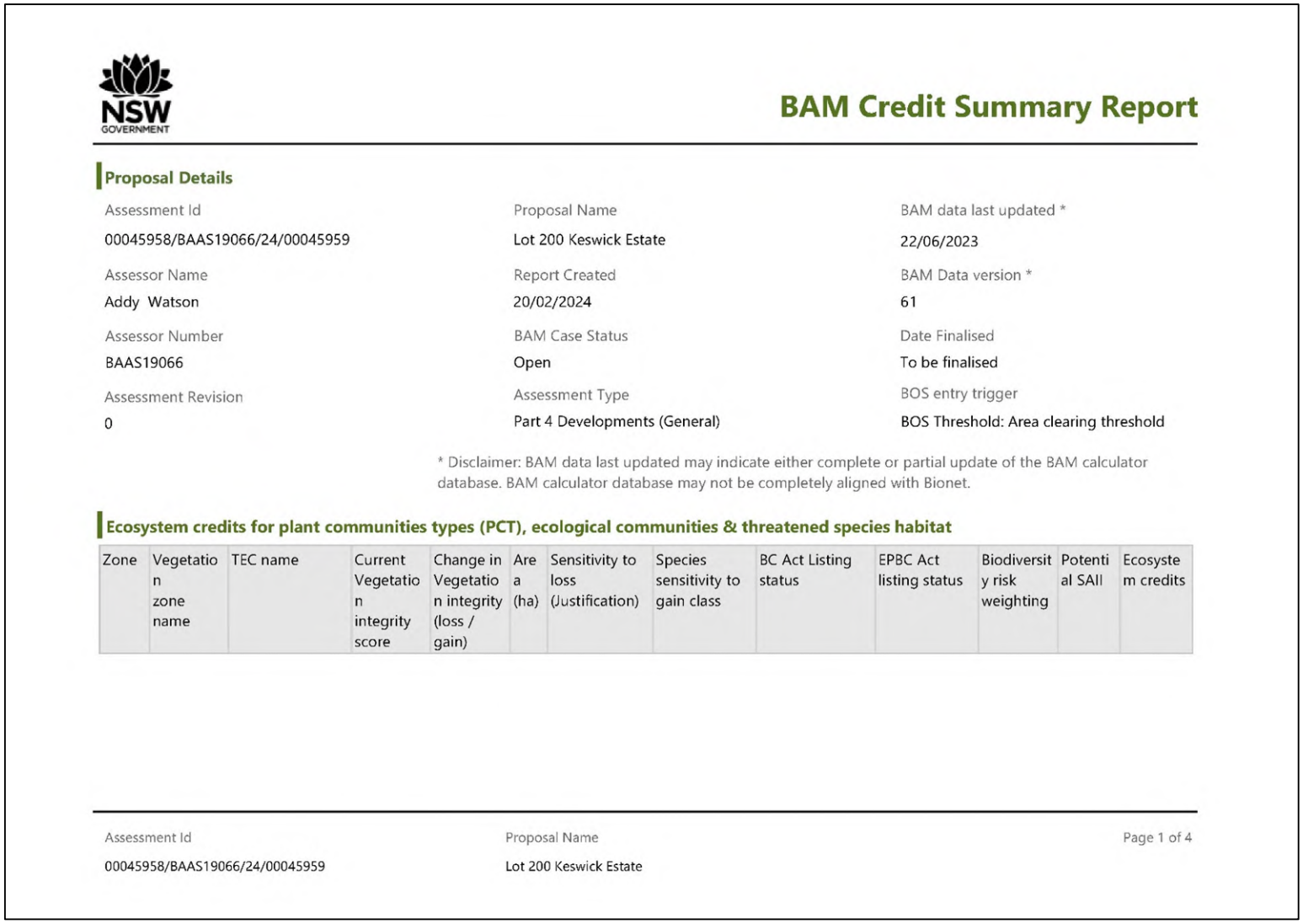
Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, …, 1, 2, 3, 4, 5, 10, 15, 20, 25, …100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 …, when ≤10, estimate when >10, 20, 30 … 100, 200, 300 …, 1000, 2000, 3000 … (as integer values).

Appendix D: BAM Calculator - Credit Summary Report



NSW GOVERNMENT

BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00045958/BAAS19066/24/00045959	Lot 200 Keswick Estate	22/06/2023
Assessor Name	Report Created	BAM Data version *
Addy Watson	20/02/2024	61
Assessor Number	BAM Case Status	Date Finalised
BAAS19066	Open	To be finalised
Assessment Revision	Assessment Type	BOS entry trigger
0	Part 4 Developments (General)	BOS Threshold: Area clearing threshold

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits

Assessment Id 00045958/BAAS19066/24/00045959 Proposal Name Lot 200 Keswick Estate Page 1 of 4

BAM Credit Summary Report

Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions											
1	76_Classname1	Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	22.1	22.1	9.1	Environment Protection and Conservation Act listing status	High Sensitivity to Gain	Not Listed	Endangered	2.00	100
										Subtotal	**100**
										Total	**100**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits
Calyptorhynchus lathami / Glossy Black-Cockatoo (Fauna)									
76_Classname1	22.1	22.1	0.9	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Vulnerable	False	10
								Subtotal	**10**

NSW GOVERNMENT

BAM Credit Summary Report

Diuris tricolor / Pine Donkey Orchid (Flora)									
76_Classname1	22.1	22.1	9.1	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	75
								Subtotal	**75**
Haliaeetus leucogaster / White-bellied Sea-Eagle (Fauna)									
76_Classname1	22.1	22.1	0.9	Biodiversity Conservation Act listing status	Fecundity – age at which females first produce	Vulnerable	Not Listed	False	10
								Subtotal	**10**
Indigofera efoliata / Leafless Indigo (Flora)									
76_Classname1	22.1	22.1	9.1	Geographic Distribution	Ecology or response to management is poorly known	Endangered	Endangered	True	150
								Subtotal	**150**
Lophochroa leadbeateri / Major Mitchell's Cockatoo (Fauna)									
76_Classname1	22.1	22.1	0.9	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	10
								Subtotal	**10**

NSW GOVERNMENT

BAM Credit Summary Report

Petaurus norfolcensis / Squirrel Glider (Fauna)									
76_Classname1	22.1	22.1	0.9	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	10
								Subtotal	**10**
Phascolarctos cinereus / Koala (Fauna)									
76_Classname1	22.1	22.1	0.9	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	10
								Subtotal	**10**
Polytelis swainsonii / Superb Parrot (Fauna)									
76_Classname1	22.1	22.1	0.9	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Vulnerable	False	10
								Subtotal	**10**
Swainsona sericea / Silky Swainson-pea (Flora)									
76_Classname1	22.1	22.1	9.1	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	100
								Subtotal	**100**

Appendix E: Key Threatening Processes

Table A-1: Review of proposed impacts to Key Threatening Processes

KTP	Implication for proposal
BC Act KTPs	
Alteration to the natural flow regimes of rivers, streams, floodplains & wetlands.	**Consider:** The subject land is on a floodplain with a tributary (Eulomogo Creek) to a major river within 1500m of the subject land. Drainage should be considered for any future development.
Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners *Manorina melanocephala*	**Neutral:** Future development is unlikely to influence Noisy Miner abundance
Alteration of habitat following subsidence due to longwall mining	**Not applicable**
Anthropogenic Climate Change	**Consider:** Development of the subject land may result in the loss of a carbon sink consisting of native vegetation, as well as generate emissions from construction machinery.
Bushrock Removal	**Not applicable.**
Clearing of native vegetation	**Consider:** Development of the subject land may result in the removal of native vegetation.
Competition and grazing by the feral European Rabbit, *Oryctolagus cuniculus* (L.)	**Neutral.** Future development is unlikely to influence feral rabbit numbers.
Competition and habitat degradation by Feral Goats, *Capra hircus* Linnaeus 1758	**Neutral.** Future development is unlikely to influence feral goat numbers.
Competition from feral honeybees, *Apis mellifera* L.	**Neutral.** Future development is unlikely to influence feral bee numbers.
Death or injury to marine species following capture in shark control programs on ocean beaches	**Not applicable.**
Entanglement in, or ingestion of anthropogenic debris in marine and estuarine environments	**Not applicable.**
Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	**Not applicable.**
Habitat degradation and loss by Feral Horses (brumbies, wild horses), *Equus caballus* Linnaeus 1758	**Not applicable.**
Herbivory and environmental degradation caused by feral deer	**Not applicable.**
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	**Neutral.** Future development is unlikely to result in accidental fire and associated disruption to native vegetation.
Importation of Red Imported Fire Ants *Solenopsis invicta* Buren 1972	**Neutral.** Future development is unlikely to increase the abundance of Red Imported Fire Ants.
Infection by Psittacine circoviral (beak and feather) disease affecting endangered psittacine species	**Neutral.** Future development is unlikely to influence any part of the beak and feather disease life cycle.
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	**Consider:** The subject land is adjacent to a waterway mapped on various NSW government databases of biodiversity value and one dam that likely provide frog habitat.
Infection of native plants by *Phytophthora cinnamomi*	**Neutral.** Future development is unlikely to result in the introduction or spread of *Phytophthora cinnamomic*. It is not known to occur in the subject land.
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family *Myrtaceae*	**Neutral.** Future development is unlikely to result in the spread of Exotic Rust Fungi as the subject land is outside the area of occupation for these fungi.
Introduction of the Large Earth Bumblebee *Bombus terrestris* (L.)	**Neutral.** Future development is unlikely to result in the spread of *Bombus terrestris* as this species is not known to occur in NSW.
Invasion and establishment of exotic vines and scramblers	**Neutral.** Future development is unlikely to result in the invasion and establishment of exotic vines and scramblers as the main species of this KTP are not present in the subject land and weed

KTP	Implication for proposal
	control measures would be followed to prevent invasion and establishment of exotic vines and scramblers.
Invasion and establishment of Scotch Broom (*Cytisus scoparius*)	**Neutral.** Future development is unlikely to result in the invasion and establishment of Scotch Broom as it is not known to occur in the subject land. Standard weed control measures employed by the proponent would be followed to prevent invasion and establishment of Scotch Broom.
Invasion and establishment of the Cane Toad	**Not applicable.**
Invasion of native plant communities by African Olive *Olea europaea subsp. cuspidata* (Wall. ex G. Don) Cif.	**Neutral.** Future development is unlikely to result in the invasion and establishment of African Olive as it is not known to occur in the subject land. Standard weed control measures would be followed to prevent invasion and establishment of African Olive.
Invasion of native plant communities by bitou bush and boneseed	**Neutral.** Future development is unlikely to result in the importation of Boneseed or Bitou Bush and these species are not known to occur in the subject land. Standard weed control measures would be followed to prevent importation.
Invasion of native plant communities by exotic perennial grasses	**Consider**. Exotic species are already present in the subject land however standard weed control measures employed by the proponent would be followed to mitigate the exacerbation of invasion by exotic perennial grasses.
Invasion of the Yellow Crazy Ant, *Anoplolepis gracilipes* (Fr. Smith) into NSW	**Neutral.** The Yellow Crazy Ant is not known to occur in the subject land, as they are more likely to occur in Northern Australia.
Invasion, establishment and spread of *Lantana camara*	**Neutral.** Future development is unlikely to result in the invasion and establishment of *Lantana camara* as this species was not present in the subject land and weed control measures would be followed to prevent invasion and establishment of all exotic vines and scramblers.
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	**Consider:** Development of the subject land may increase the risk of invasion and establishment of escaped garden plants. Standard weed control measures would be followed to prevent establishment.
Loss and/or degradation of sites used for hill-topping by butterflies	**Not applicable.**
Loss of Hollow-bearing Trees	**Increase.** Development of the subject land would likely result in the removal of hollow bearing trees.
Predation and hybridisation by Feral Dogs, *Canis lupus familiaris*	**Neutral.** Future development is unlikely to influence predation and hybridisation by Feral Dogs.
Predation by the European Red Fox	**Neutral.** Future development is unlikely to influence European red fox numbers.
Predation by the Plague Minnow (*Gambusia holbrooki*)	**Neutral.** Future development is unlikely to influence Plague Minnow numbers.
Predation by the Ship Rat (*Rattus rattus*) on Lord Howe Island	**Not applicable.**
Predation by feral cats	**Consider:** Development of the subject land may increase the feral cat numbers.
Predation, habitat degradation, competition and disease transmission by Feral Pigs, *Sus scrofa* Linnaeus 1758	**Neutral.** Future development is unlikely to influence feral pig numbers.
Removal of dead wood and dead trees	**Increased**. It is possible dead wood and dead trees could be removed by Future development. It is recommended dead wood and dead trees encountered in the subject land be located adjacent impacted areas to reduce impact.
FM Act KTPs	
Degradation of native riparian vegetation along New South Wales water courses	**Consider:** The subject land is adjacent to a waterway mapped as Key Fish Habitat.
Hook and line fishing in areas important for the survival of threatened fish species	**Consider:** The subject land is adjacent to a waterway mapped as Key Fish Habitat.
Human-caused climate change	**Consider:** Development of the subject land may result in the loss of a carbon sink consisting of native vegetation, as well as generate emissions from construction machinery.

KTP	Implication for proposal
Installation and operation of instream structures and other mechanisms that alter natural flow regimes of rivers and streams	**Consider:** The subject land is adjacent to a waterway mapped as Key Fish Habitat.
Introduction of fish to waters within a river catchment outside their natural range	**Consider:** The subject land is adjacent to a waterway mapped as Key Fish Habitat.
Introduction of non-indigenous fish and marine vegetation to the coastal waters of New South Wales	**Consider:** The subject land is adjacent to a waterway mapped as Key Fish Habitat.
Removal of large woody debris from New South Wales rivers and streams	**Consider:** The subject land is adjacent to a waterway mapped as Key Fish Habitat.
The current shark meshing program in New South Wales waters	**Not applicable.**
EPBC Act KTPs	
Aggressive exclusion of birds from potential woodland and forest habitat by over-abundant noisy miners (*Manorina melanocephala*)	**Neutral.** Future development is unlikely to increase exclusion by Noisy Miners.
Competition and land degradation by rabbits	**Neutral.** Future development is unlikely to influence feral rabbit numbers.
Competition and land degradation by unmanaged goats	**Neutral.** Future development is unlikely to influence feral goat numbers.
Dieback caused by the root-rot fungus (*Phytophthora cinnamomi*)	**Neutral.** Future development is unlikely to result in the introduction or spread of *Phytophthora cinnamomic* due to elevation above area of occupation.
Fire regimes that cause declines in biodiversity	**Neutral.** Future development is unlikely to result in accidental fire and associated disruption to native vegetation.
Incidental catch (bycatch) of Sea Turtle during coastal otter-trawling operations within Australian waters north of 28 degrees South	**Not applicable.**
Incidental catch (or bycatch) of seabirds during oceanic longline fishing operations	**Not applicable.**
Infection of amphibians with chytrid fungus resulting in chytridiomycosis	**Consider:** The subject land is adjacent to a waterway and dam that is likely to provide habitat for frogs.
Injury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris	**Not applicable.**
Invasion of northern Australia by Gamba Grass and other introduced grasses	**Not applicable.**
Land clearance	**Consider:** Development of the subject land will result in the removal of native vegetation.
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	**Consider:** Development of the subject land may increase the risk of invasion and establishment of escaped garden plants. Standard weed control measures would be followed to prevent establishment.
Loss of biodiversity and ecosystem integrity following invasion by the Yellow Crazy Ant (*Anoplolepis gracilipes*) on Christmas Island, Indian Ocean	**Not applicable.**
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	**Consider:** Development of the subject land may result in the loss of a carbon sink consisting of native vegetation, as well as generate emissions from construction machinery.
Novel biota and their impact on biodiversity	**Neutral.** The development is unlikely to influence novel biota numbers. All relevant weeds, invasive species, pathogens etc have been discussed in their specific KTP.
Predation by European red fox	**Neutral.** The development is unlikely to influence European red fox numbers.
Predation by exotic rats on Australian offshore islands of less than 1000 km2 (100,000 ha)	**Not applicable.**
Predation by feral cats	**Consider:** Development of the subject land may increase the feral cat numbers.

KTP	Implication for proposal
Predation, Habitat Degradation, Competition and Disease Transmission by Feral Pigs	**Neutral.** The development is unlikely to influence feral pig numbers.
Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species	**Neutral.** The development is unlikely to influence any part of the beak and feather disease life cycle.
The biological effects, including lethal toxic ingestion, caused by Cane Toads (*Bufo marinus*)	**Not applicable.**
The reduction in the biodiversity of Australian native fauna and flora due to the red imported fire ant, *Solenopsis invicta* (fire ant)	**Neutral.** Fire ants are not known to occur in the subject land and the development is unlikely to result in the importation of Fire Ants. Control measures would be followed to prevent importation.

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APPENDIX D

Preliminary Site Investigation

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DESIGN . PLAN . MANAGE

Preliminary Site Investigation

Client: Spicers Creek Wind Farm

Site Address: Part Lot 200 DP 1280301, Sheraton Road, Dubbo NSW 2830

27 March 2024

Our Reference: 42896-ER01_A

DISCLAIMER

This report has been prepared solely for Spicers Creek Wind Farm in accordance with the scope provided by the client and for the purpose(s) as outlined throughout this report.

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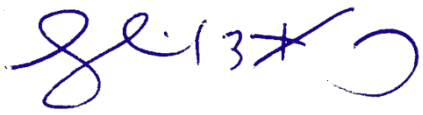
Project Name:	Preliminary Site Investigation for Part Lot 200 DP 1280301, Sheraton Road, Dubbo NSW 2830
Client:	Spicers Creek Wind Farm
Project Number:	42896
Report Reference:	42896 ER01
Revision	A
Date:	27/03/2024

Prepared by:	Reviewed by:
	
Nardus Potgieter MSc (Chem), BSc(Hons)Env.Tech. Environmental Scientist	Jim Sarantzouklis MAIBS (Assoc.) MEHA MAICD RPIA Director

Executive Summary

Barnson was engaged by Spicers Creek Wind Farm to undertake a preliminary site contamination investigation in support of the Planning Proposal for development of Part Lot 200 in DP 1280301, recognised as "Stage 8" within the Keswick Estate located at the corner of Boundary Road and Sherton Road, Dubbo.

The investigation had as its objectives to identify contamination issues that may affect the suitability of the site for future residential development and assess the need for possible further investigations, remediation or management of any contamination issues identified.

The investigation was based on a desktop review of information available for the site, as well as the findings of a site inspection and confirmatory sampling and analysis of surface soils collected at the site.

A review of the available historical information, including contaminated sites databases, indicated no recorded activities with the potential to significantly contaminate the site. Historical aerial photographs of the site indicated that the land use at the site has been vacant for an extended time however recent road construction saw a part of the site being used as a storage yard.

Although the potential for *significant* environmental contamination to be present across the site was concluded to be low, activities associated with the use of the site for historical livestock farming and more recent material storage were identified as having a potential to contaminate surface soil. The following potential sources of minor contamination were identified:

- Historical agricultural activities
- Vehicles and equipment
- Excavated materials and road building materials stockpiles
- Hazardous materials on adjoining property

A site inspection, supplemented with confirmatory sampling and analysis, was conducted to determine the presence and significance of potential contamination associated with the identified sources. Chemical analysis of the surface soil revealed that no contamination is present above risk-based screening criteria.

Based on the findings of the desktop review and site investigation it was concluded that the subject site is suitable for the proposed construction and further development. There are no identified contaminants present that are likely to present a risk of impact to the health of humans or the environment from the proposed future use.

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Appendices

1. INTRODUCTION

1.1 Background and Objectives

Barnson was engaged by Spicers Creek Wind Farm to undertake a preliminary site contamination investigation in support of the Planning Proposal for the development of a section of Lot 200 in DP 1280301, recognised as "Stage 8" within the Keswick Estate located at the corner of Boundary Road and Sherton Road, Dubbo

Lot 200 in DP 1280301 a 123-hectare portion of land located in the south-east of Dubbo. The future proposal involves accommodation on a portion of approximately 10 hectares in the southeast of the lot. This 10-hectare portion of land is bound between Sheraton Road to the east and the Stream Avenue extension to the west, with Boundary Road forming the southern boundary.

Figure 1.1 presents a map indicating the location of the Subject Site, with the portion of the Site intended for siting of the proposed development (the Investigation Area) outlined in blue.

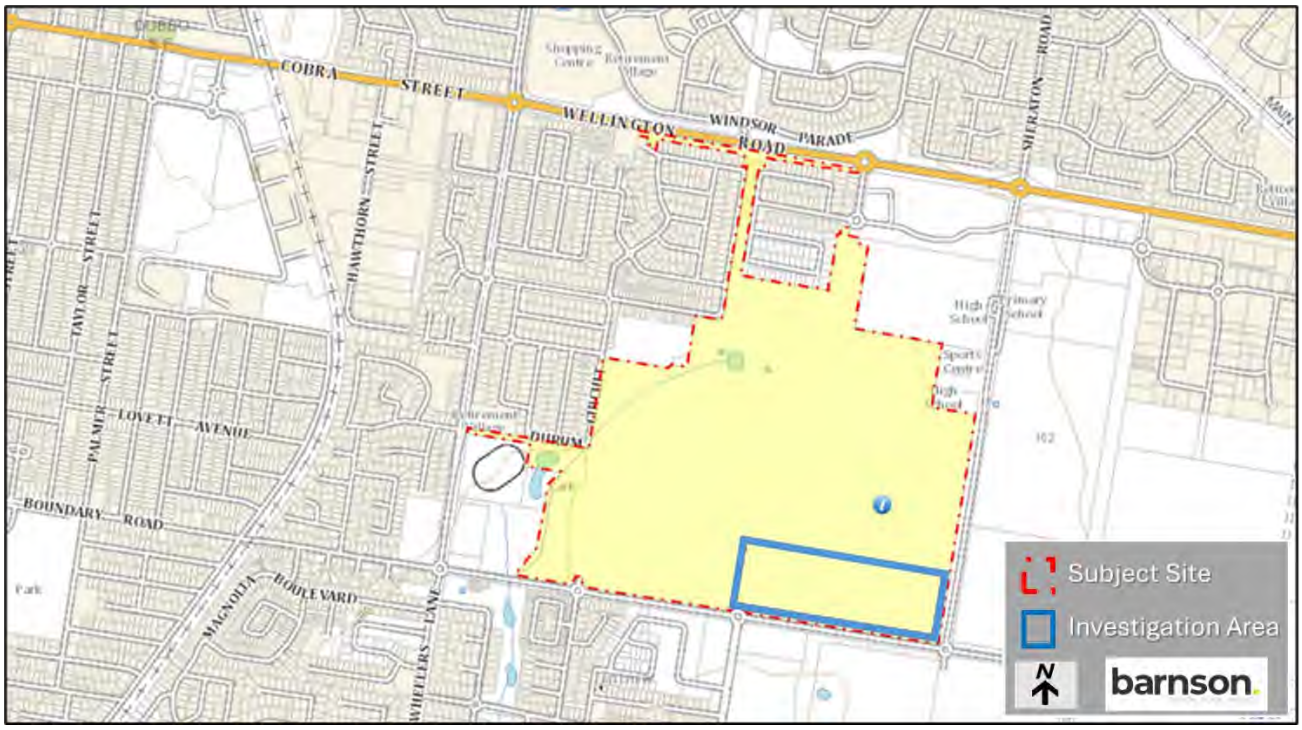

Figure 1.1: Location of the Subject Site

Source: Google Earth, accessed 13 March 2024

The State Environmental Planning Policy Resilience and Hazards (2021) states that when determining an application, a consent authority must determine if land is contaminated and, if so, whether the land is suitable for the intended purposes or whether remediation is required. Barnson undertook a PSI to identify potential contamination present at the Investigation Area.

1.2 Objectives

The objectives of the PSI are to:

- Identify potential contamination issues that may affect the site's suitability for use as future residential premises;
- Determine the potential risks and issues; and
- Assess the need for possible further investigations, remediation or management of any contamination issues identified.

1.3 Scope of Work

To meet the stated objectives, Barnson completed the following scope of work:

- Site identification including a review of site history, site condition, surrounding environment, geology, and hydrology.
- Desktop review of site history and assessment of potential sources of contamination.
- Development of a conceptual site model (CSM) with regard to contaminant sources and exposure pathways, based on information gathered from the data review.
- Site inspection to assess site conditions.
- Assessment of the risk/impact of the identified contamination sources within the context of the site and the CSM.
- Provide conclusions as to whether the site is suitable for intended development.

1.4 Purpose of this report

The purpose of this report is to document (with cognisance of the Guidelines for Consultants Reporting on Contaminated sites (NSW EPA, 2020)) the works undertaken as per Section 1.3 and to provide recommendations if further investigations are required.

1.5 Assumptions and Limitations

The following assumptions have been made in preparing this report:

- The nature of the intended future use of the site is as residential premises. This assumption forms the basis for the conceptual site model.
- All information pertaining to the contamination status of the site has been obtained through public record searches, a preliminary site inspection and analysis of confirmatory samples collected at the site. All documents and information in relation to the site, which were obtained from public records, are accepted to be correct and have not been independently verified or checked.

It should be recognised that even the most comprehensive site assessments may fail to direct all contamination on a site. This is because contaminants may be present in areas that were not previously surveyed or sampled or may migrate to areas that showed no signs of contamination when inspected.

Investigative works undertaken at the Investigation area by Barnson identified actual conditions only at those locations in which sampling and analysis were performed. Opinions regarding the conditions of the site have been expressed based on historical information and analytical data obtained and interpreted from previous assessments of the site. Barnson does not take responsibility for any consequences as a result of variations in site conditions.

2.0 SITE SETTING

2.1 Site Identification

A summary of the available information pertaining to the site is presented in Table 2.1.

Table 2.1: Site Setting Summary

Information	Details
Site address	Corner of Boundary Road and Sheraton Road, Dubbo NSW 2830
Subject Site (approx.)	123 hectares
Investigation Area (approx.)	10 hectares
Lot and Deposited Plan No.	Lot 200 in DP 1280301
Zoning	R2 – Low Density Residential
County	Lincoln
Parish	Dubbo
Local Government Area	Dubbo Regional Council

2.2 Environmental Setting

The environmental setting of the site is summarised in Table 2.2.

Table 2.2: Summary of Site Environmental Setting

Information	Details
Existing land use	The Investigation area currently house no structures or roads but has stockpiles of excavated material housed on it. The excavated material originates from elsewhere and is stored on site. The Investigation area is fenced, and access controlled.
Surrounding land uses	The Subject Site is adjoined by the Dubbo Christian School campus to the north-east. Land to the north and west of the Subject Site is being developed for residential land use, while land to the south and east currently unoccupied.

Topography	Topography is a descending slope from the northeast towards the south-west of the Subject Site where a low rise is located near the southwestern corner. The investigation area is located in the topographically lowest portion of the Subject Site along Boundary Road.
Geology	The 1:100 000 Geological Map of Dubbo, indicate that the Subject Site is underlain by the tertiary age basalt.
Soils	Surface soils are described as shallow, strong structured dark reddish-brown clay loam to light clay, which gradually changes to dark reddish-brown light to medium clay (pH 6.5 - 8.0). The origin of the clay is accepted to be the weathering of the olivine basalt minerals.
Groundwater	A review of existing groundwater bore records (WaterNSW, 2024) indicate three registered groundwater bores inside the boundary of the Subject Site (see Figure 2.1). Records for the two closest on-site boreholes (GW042266 and GW802554) indicate no registered use or information other than total depth. The third on-site bore (GW802624) has records indicating it as monitoring bore with total depth of 9m and Water Bearing Zone of 2m thick from 7 to 9m. Records indicate several off-site bores to the east and south of the investigation area, located within approximately 250m. Records for the closest boreholes (GW005558 and GW802528) indicate vastly different information. While the data for GW802528 indicate a total depth of 3m to basalt and a perched water table at depth 2 to 3m, data for GW005558 indicate a total depth of 58.9m with Water Bearing Zones (W.B.Z) at 26.2m to 33.8m and Standing Water Level (S.W.L) measured at 18.3m and yield of 0.08L/s. Figure 2.1 show the location of these boreholes. None of the boreholes within a 250m radius of the Investigation area are identified as for domestic use.
Local hydrology	The closest natural water body to the Subject Site is the Eulomogo Creek located at a distance of approximately 1.2km to the south. Any stormwater on the Subject Site would drain into surface soils and/or move in a southerly direction as overland runoff towards Boundary Road. .

2.3 General Site History

The Investigation Area is currently unoccupied, except for stockpiles of excavated material temporarily stored. The surface of the Investigation Area is mostly covered with pasture grass. The Investigation Area is fenced with several unpaved vehicle access tracks leading from the gate on Sheraton Road along the southern and eastern boundaries.

The Subject Site is assumed to previously have been used for agricultural activities, with historical aerial photos showing unoccupied land presumably used for grazing purposes. A copy of the historical aerial photos with the approximate area occupied by the Investigation Area outlined, are attached as Appendix A.

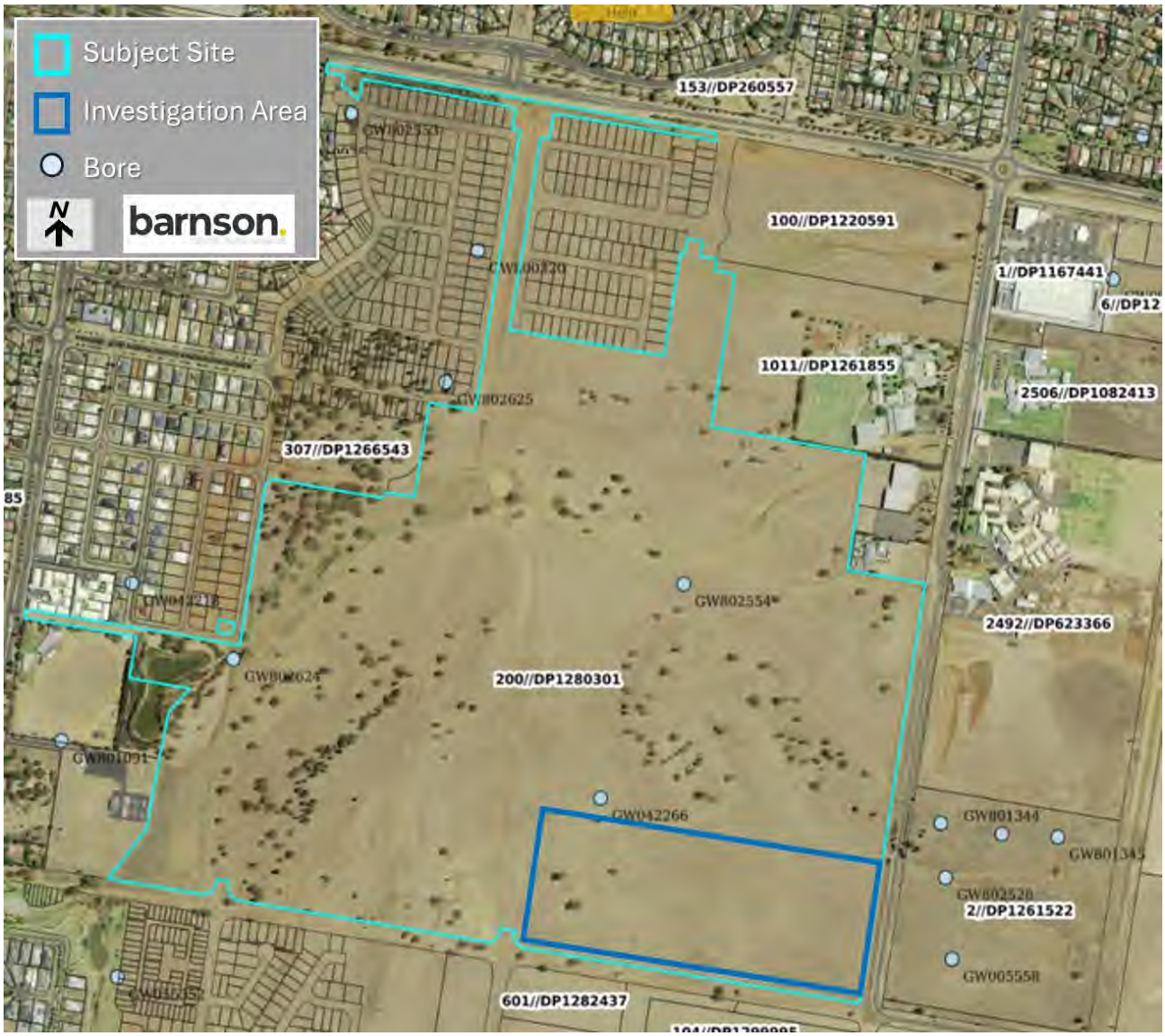

Figure 2.1: Groundwater bores near the Subject Site

The photos from 1964 to approximately 2013 show the Investigation Area as unoccupied land. From approximately 2018 construction started on Boundary Road and the Stream Avenue extension. In the aerial photo from 2019, a few stockpiles are visible to the west of the Stream Avenue extension. Although there has been some disturbed ground and stockpiles visible in this area since the 1980s, the stockpiles appear more prominent and seem to include more material in recent times.

From 2020 the construction of Boundary Road and other roads in the area has increased and several crushed rock stockpiles as well as what appears to be a mobile crusher plant is visible in the southern-central portion of the Investigation Area, along Boundary Road. In subsequent photos (2021-2022) the works, materials and equipment storage as well as stockpiles of materials extend to the south-east corner of the site and along the Sheraton Road fence line. Stockpiles in this area include crushed gravel and road base.

2.4 Historical Record of Site Contamination

Datasets maintained by the Office of Environment and Heritage (OEH) including notices under CLM Act, POEO Environment Protection License Register, and environmental incidents were reviewed.

- List of NSW contaminated sites notified to EPA – The sites appearing on the OEH "List of NSW contaminated sites notified to the EPA" indicate that the notifiers consider that the sites are contaminated and warrant reporting to EPA. However, the contamination may or may not be significant enough to warrant regulation by the EPA. The EPA needs to review information before it can make a determination as to whether the site warrants regulation. A search of the listing returned no record for the subject site.
- Contaminated Land Record of Notices – A site will be on the Contaminated Land Record of Notices only if the EPA has issued a regulatory notice in relation to the site under the *Contaminated Land Management Act 1997*. A search of the register in March 2024 returned no record for the subject site.

There is further no record of the subject site in any of the following databases:

- Former Gasworks Database
- EPA PFAS Investigation Program
- Defence PFAS Investigation & Management Program
- Air Services Australia National PFAS Management Program
- Defence 3 Year Regional Contamination Investigation Program

Although the Subject Site is not listed in any of the databases, it is known that the Southlakes residential development (on Lot 407 DP1248682, Lot 2600 DP1254306, Lots 400 and 403 DP1244669) located to the south of the investigation area was issued a cleanup notice for asbestos containing materials.

2.5 Previous Site Investigations

No information relating to any previous assessment of contamination at the Investigation Area was available for review.

2.6 Current Site Layout

Figure 2.2 presents a plan of the Investigation Are that is supplemented with photographs showing the different elements of the Site as it currently appears (Figure 2.3 to Figure 2.5). Figure 2.2 includes markers indicating the vantage point and direction of the photographs.

The Investigations Area remains unoccupied except for stockpiles of excavated material along the southern boundary. There are several unpaved vehicle paths traversing the site. The investigation area is fenced along the southern, eastern, and western boundary, and slightly beyond its proposed northern boundary.

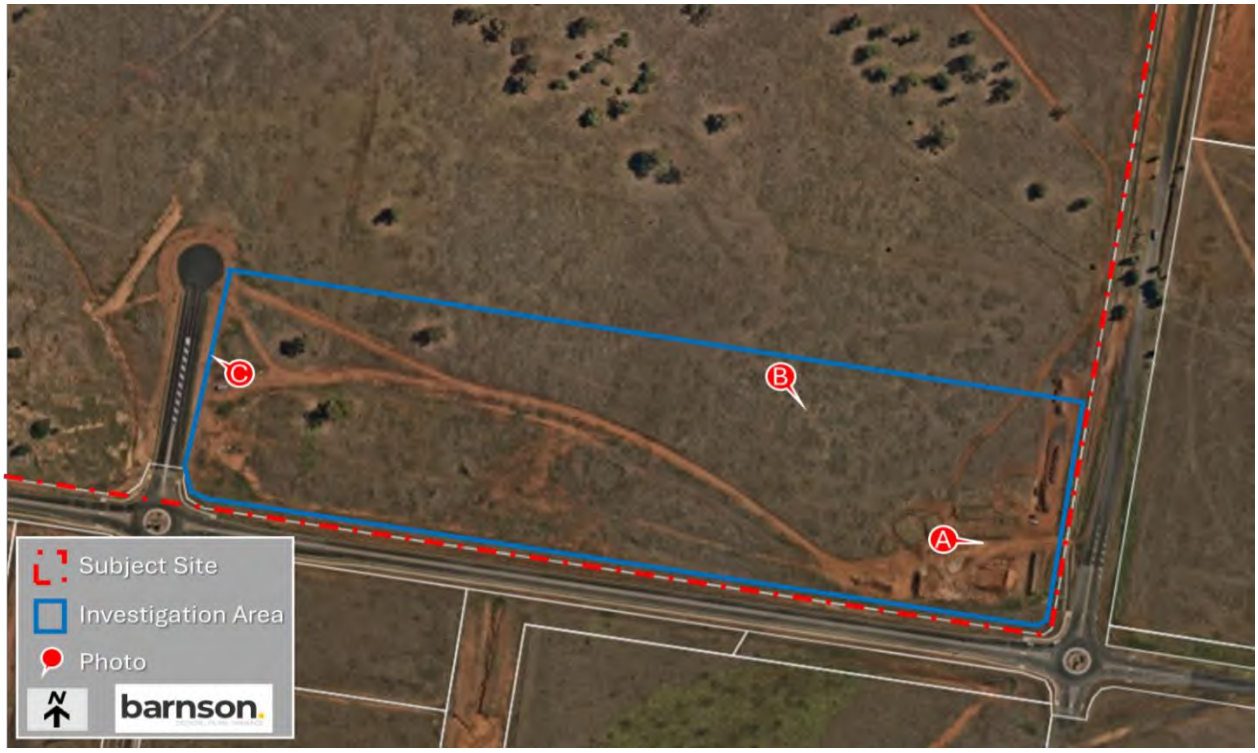

Figure 2.2: General site layout

Source: Nearmaps (accessed 13 March 2024)

Figure 2.3: Photo A – View of Investigation Area showing stockpiles of excavated material.

Figure 2.4: Photo B – From northern boundary of Investigation Area looking south.

Figure 2.5: Photo C – From Investigation Area looking west to Stream Avenue extension.

3.0 CONCEPTUAL SITE MODEL

3.1 General

A preliminary conceptual site model (CSM) was developed to provide an understanding of the likelihood for contaminants to be present and potential for impacts to occupants or visitors to the Investigation Area.

The CSM draws together the land use information for the site, with site specific geological, and contamination information to identify potential contamination sources, migration and exposure pathways and sensitive receptors.

3.2 Sources

Based on the findings of the desktop assessment, the following potential contamination sources were identified:

- Historical agricultural activities.

It is assumed that historically the Investigation Area and adjoining land has been utilised for livestock grazing. Potential sources of contamination associated with this activity include the use of pesticides and herbicides for the maintenance of grazing as well as the use of dips or sprays for the control of parasites on livestock.

Potential contaminants associated with these activities include pesticides, hydrocarbons, heavy metals and elevated nutrients.

- Vehicles and equipment

Road construction activities and the use of the site for the processing of roadbuilding materials, as well as the movement of vehicles on the site, evidenced by the clear unpaved roads between work areas shown in historical photos (see Appendix A) can be assumed to have involved the use of motorised vehicles and equipment. The use, storage, maintenance and refuelling of motorised equipment and vehicles has the potential to contribute to localised contamination of surface soils.

- Excavated materials and road building materials stockpiles

Excavated material may, depending on the source, include hazardous materials and contaminants including heavy metals, hydrocarbons and asbestos. Materials used in the construction of road surfaces may include bituminous materials which may include high molecular weight hydrocarbons.

- Hazardous materials on adjoining property

The Southlakes Residential Development to the south of the Investigation Area was issued a cleanup notice for asbestos containing material in 2020. This property is currently separated from the Investigation Area by Boundary Road. Notwithstanding due to proximity, asbestos containing material is investigated as a potential source of contamination.

3.3 Contaminants of Potential Concern

Considering the potential sources listed in Section 3.2, a wide variety of contaminants may be present.

With the road construction and associated materials processing and stockpiling activities considered the primary potential source of contamination, the residues of chemicals such as hydrocarbons (fuel and oil) as well as high molecular weight organic substances such as polynuclear aromatic hydrocarbons (PAHs) are accepted as the most likely contaminants.

In addition to this, the stockpiling of roadbuilding materials and excavated materials may have introduced contaminants such as heavy metals, hydrocarbons and hazardous materials such as asbestos to the surface soils of the site. Asbestos is also considered relevant to investigate because of the known contamination of the properties to the south of Boundary Road.

Based on this understanding of the site history and activities, the contaminants of potential concern identified for the investigation include:

- heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, and Zn);
- hydrocarbons (mainly fuel and lubricants);
- pesticides; and
- asbestos

3.4 Pathways

The primary pathway considered for this assessment is surface soils as it is the most likely medium where contamination could be encountered by future residents or visitors to the residential development. The various routes by which human receptors could potentially be exposed to the contaminants outlined above include:

- Inhalation of dust, fumes or fibres (asbestos);
- Dermal contact with contaminated soils; and
- Incidental ingestion of contaminated soils.

3.5 Receptors

Potential site receptors may include:

Human receptor populations

- Residents of the proposed residential development.
- Workers involved in the preparation of the Investigation Area and construction of the proposed development.
- Visitors to site (e.g. workers conducting maintenance, members of the public).

Environmental receptors such as surface water bodies and groundwater resources beneath the site are not considered at this time due to the distance and depth of such resources. Additionally, the potential level of contamination expected at the subject site is perceived to present a very low risk to the aquatic environment.

3.6 Potential for Contamination

Although activities were identified that could potentially have resulted in contamination of surface soils at the Subject Site, the type and quantity of contaminants introduced through these various sources are not expected to have led to significant contamination of the surface soils.

Table 3.1 summarises the potential areas of environmental concern based on the results of the desktop review.

Based on the results of the desktop assessment the overall likelihood for significant chemical contamination to be present at the Investigation Area is considered to be low.

Table 3.1: Potential areas of environmental concern

Description	Rationale	Potential Contaminants
Agricultural activities.	Areas used for grazing livestock may become contaminated with pesticides used on livestock for control of external parasites. Where persistent pesticides are used the small quantities entering the surface soil in this way could accumulate over time. It is further the most likely area where herbicides, insecticides and fertilizer may have been applied for combatting weeds and insects and increasing the yield of fodder crops.	Pesticides, heavy metals.
Vehicle and motorised equipment use.	Leaked oils, fuels and grease from vehicles and motorised equipment.	TPH, BTEX, PAHs, phenols, heavy metals.
Stockpiled excavated material and known contamination on nearby land	Potential presence of hazardous materials.	Heavy metals., petroleum hydrocarbons and asbestos.

4.0 SITE INVESTIGATION

4.1 General

Barnson conducted an inspection of the Subject Site on 5 February 2024. During the site inspection the following observations were made:

- The site is in general good order, is access controlled, and is being mowed regularly.
- The property is at present unoccupied and is mainly covered in pasture grass with scattered trees along the northern boundary (Figure 4.1). There are stockpiles of excavated material in the south eastern corner of the site (Figure 4.2) as well as remnants of road base aggregate with bitumen along the eastern boundary (Figure 4.3).
- The surface soils in all areas of the site that were visually inspected appeared unstained and all vegetation appeared in good condition. No odour or any indication of contamination was visible in any of the areas investigated, even the area with remnants of road base was unstained and the underlaying soils had no discernible odour.
- A single stockpile of material that appeared to contain demolition and general waste was observed near the southern boundary (see Figure 4.4). This is the only visible remnant of the materials processing and stockpiling undertaken in this area of the Site during the construction of Boundary Road (refer Appendix A, 2020 photo).

Figure 4.1: View of site looking south-east towards Boundary Road.

Figure 4.2: Stockpiles of excavated materials near south-eastern corner of the property.

Figure 4.3: Remnants of bitumen covered roadbase material along eastern boundary.

Figure 4.4: Stockpile of waste.

- No evidence of potentially hazardous materials or demolition waste were observed in any of the areas investigated at the property.
- A single shipping container remains near the Stream Avenue extension at the western boundary of the Investigation Area. The soil surrounding the container was inspected but no discoloration or indication of contamination was observed. Refer to Figure 4.5.

Figure 4.5: A single shipping container near the western boundary of the Investigation Area.

4.2 Confirmatory Sampling

The purpose of collecting confirmatory samples as part of the site inspection is to determine if any of the potential contaminants identified from the conceptual site model are present. The samples are not intended for statistically valid characterisation or quantification of contamination levels. The collection of surface soil samples at the site was therefore focussed on areas where contamination of the surface soil could most likely have occurred.

As part of the site inspection a total of fourteen (14) samples of soil were collected from 10 selected locations across the approximately 10ha of the property. The purpose of the samples is to determine the potential presence of chemical contamination. The locations were selected based on observed areas of disturbance (e.g. cleared areas and vehicle paths) and proximity to potentially contaminated land. The stockpiles of excavated material were not included in the sampling as it is understood that the stockpiles have been classified in accordance with the NSW EPA resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste Regulation (2014) and will be removed from site before development.

The following is a description of the samples collected. Figure 4.6 presents a summary of the sample locations.

- Sample location 1 was selected due to the presence of bitumen covered road aggregate.
- Sample location 2 was selected where recent excavations and heavy vehicle movements were evident.

- Sample location 3 was selected in the vehicle pathway along the stockpiles of excavated materials.
- Sample location 4 is further along this vehicle pathway and so is sample 5.
- Samples 6, 7 and 8 was selected to identify any contamination introduced through the road construction works recently undertaken along the Stream Avenue extension as well as any potential transfer of contaminated material from the land where hazardous materials were known to have been stockpiled.
- Sample location 9 is the stockpile of waste shown in Figure 4.4. Samples were collected to identify both chemical contaminants and hazardous materials (asbestos)
- Sample location 10 was selected in the undisturbed pasture grass cover of the site to identify any potential contamination relating to the former agricultural use of the property.

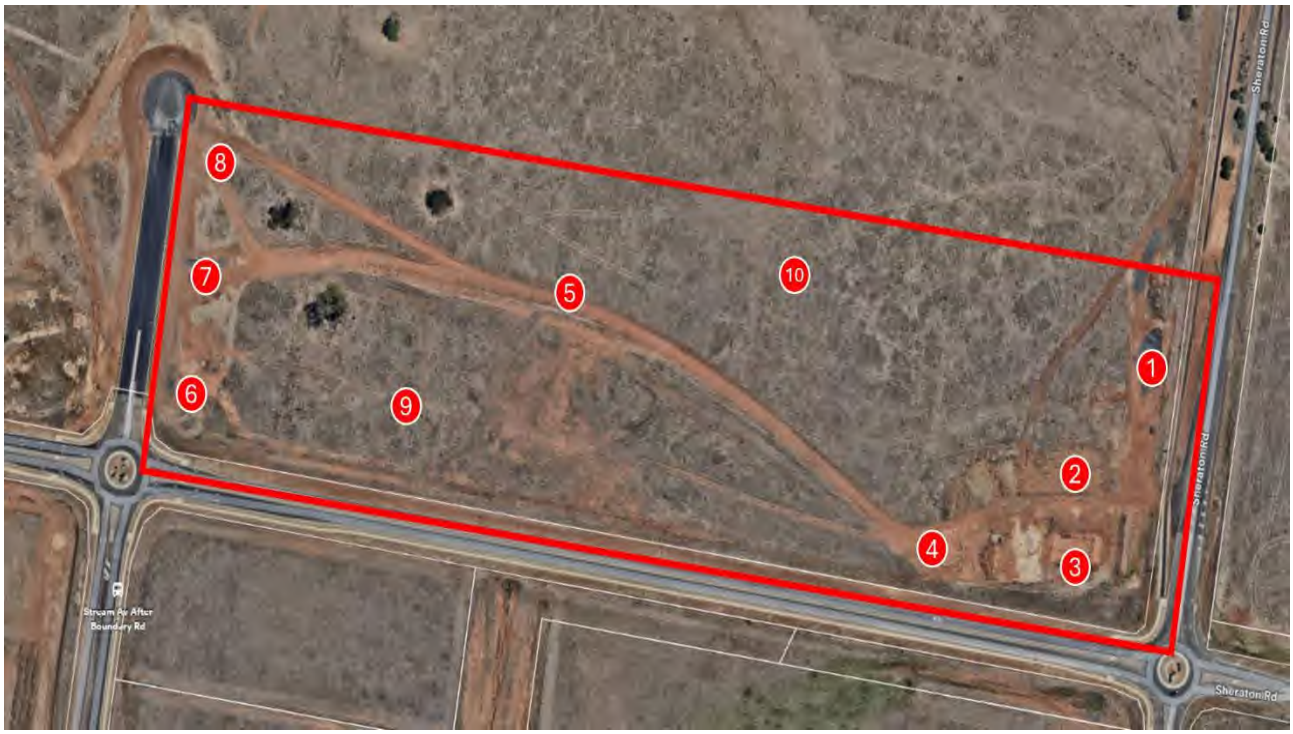

Figure 4.6: Sample Locations

The pattern followed for the soil sampling can be described as Judgement Sampling, where points are selected on the basis of the investigator's knowledge of the historical land use and likely distribution of contaminants at a site. It is an efficient sampling method for confirmatory sampling that utilises knowledge of the site history and field observations to direct sample collection (NSW EPA, 2020)

The surface soil samples were submitted to the Australian Laboratory Services (ALS) in Mudgee for determination of the following parameters:

- metallic element (cadmium, chromium, copper, lead, nickel and zinc) concentrations, including arsenic and mercury in soil;
- extraction with organic solvent and analysis of Total Recoverable Hydrocarbons (TRH) and Polynuclear Aromatic Hydrocarbons (PAHs);

- extraction with organic solvent and a pesticide analysis screen analysis including analysis of Organochlorine (OCP) Pesticides; and
- In addition, the two composite soil samples were submitted for inspection and identification of asbestos fibres.

4.3 Analytical Results

A copy of the laboratory report for the confirmatory samples is attached in Appendix B.

The results indicates that only low concentrations of metallic elements were detected in the surface soil samples. In all the surface soil samples, Total Recoverable Hydrocarbons (TRH), Polynuclear Aromatic Hydrocarbons as well as persistent pesticide and herbicide compounds are indicated as below the limits of detection.

The metals detected include chromium (Cr), copper (Cu), lead (Pb), nickel (Ni, and zinc (Zn). Concentrations of, arsenic, cadmium and mercury were all below detection. No asbestos was detected in any of the four samples of soil analysed.

Table 4.1 presents a summary of the elements detected above the limit of detection in surface soil samples.

4.4 Analytical Data Quality

Soil samples were collected in glass jars provided by the laboratory, refrigerated after collection and transported in an insulated container to the laboratory. Chain of custody was recorded for all samples. A copy of the signed sheet is attached as Appendix B.

Table 4.1: Summary of metals, pesticides and hydrocarbons detected in soil samples collected from the Subject Site.

	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Copper (Cu)	Lead (Pb)	Mercury (Hg)	Nickel (Ni)	Zinc (Zn)
TP-01	<5	<1	80	33	<5	<0.1	61	63
TP-02	<5	<1	32	20	<5	<0.1	27	43
TP-03	<5	<1	31	19	13	<0.1	24	25
TP-04	<5	<1	38	22	8	<0.1	31	35
TP-05	<5	<1	54	19	8	<0.1	26	28
TP-06	<5	<1	20	9	6	<0.1	14	20
TP-07	<5	<1	26	17	10	<0.1	18	36
TP-08	<5	<1	6	21	<5	<0.1	16	40
TP-09	<5	<1	18	26	8	<0.1	18	84
TP-10	<5	<1	24	20	6	<0.1	20	53

The analyses were undertaken at a NATA accredited laboratory. The laboratory quality control procedures in the form of duplicates as well as analyte and surrogate spikes were applied to all contaminant classes analysed. The results reported for the duplicate is within the Relative Percent Difference range of the acceptance criteria for a duplicate sample. The analyte spike recoveries reported for the different sets of organic analytes are indicated as within the acceptance criteria (see Appendix B).

All media appropriate to the objectives of this investigation have been adequately analysed and no idea of significant uncertainty exist. It is concluded that the data is usable for the purposes of the investigation.

5.0 ASSESSMENT

5.1 Assessment Criteria – Human Health Risk

Screening for human health and ecological risk, utilises published human health investigation levels (HILs) from the National Environment Protection (Assessment of Site Contamination) Measure (NEPC, 1999) to identify contaminant concentrations in soil that may pose a risk to future residents or people visiting the site.

HILs are scientifically based, generic assessment criteria designed to be used in the screening of potential risks to human health from chronic exposure to contaminants. HIL's are conservatively derived and are designed to be protective of human health under the majority of circumstances, soil types and human susceptibilities and thus represent a reasonable 'worst-case' scenario for specific land-use settings.

The HILs selected for evaluation of the Subject Site are those derived for a standard residential scenario (HIL-A), which assumes typical residential land use with garden/accessible soil (home grown produce <10% fruit and vegetable intake, and no poultry).

Table 5.1 presents a summary of the health-risk based criteria selected for assessment of the detected metal concentrations.

Table 5.1: Human health-risk screening levels.

Element	Health-based Investigation Levels HIL A Residential mg.kg-1
Arsenic (As)	100
Cadmium (Cd)	20
Chromium	NR
Copper (Cu)	6,000
Lead (Pb)	300
Mercury (Hg)	40
Nickel (Ni)	400
Zinc (Zn)	7,400

Note: NR=not relevant due to low human toxicity of Cr(III). NA=No applicable screening level.

It was confirmed that limits of detection reported by the laboratory are below the criteria values. All other contaminants analysed for in the soil samples that are reported below the limit of detection by the laboratory can therefore be excluded from further assessment.

5.2 Findings

- Direct comparison of the analytical results presented in Table 4.1 with the assessment criteria (refer Table 5.1) show that the detected metal concentrations in samples collected from the Investigation Area are well below residential health-risk based criteria values.
- The concentrations of the heavy metals detected at the Investigation Area are therefore considered representative of naturally occurring element abundance and do not indicate any contamination.
- The stockpiles of excavated materials and surface soils amongst the stockpiles was visually inspected and no hazardous materials were observed.
- The concentrations of all other potential contaminants investigated were reported as below the level of detection in the laboratory report.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

In accordance with the objectives detailed in Section 1.2, and based on the information contained within this assessment, the following conclusions are made (subject to the limitations in Section 1.5)

- Activities associated with the use of the Investigation Area, were identified as having a potential to contaminate surface soils.
- The following potential sources of contamination were identified:
  - Historical agricultural activities
  - Vehicles and equipment
  - Excavated materials and road building materials stockpiles
  - Hazardous materials on adjoining property
- A review of the available information indicated that there is a potential for environmental contamination to be present at the Investigation Area.
- A site investigation and confirmatory sampling conducted to determine the presence and significance of potential contamination associated with the identified sources, revealed that none of the contaminants investigated are present above health-risk based criteria in the surface soils of the Investigation Area.
- The screening criteria used in the evaluation of the contaminant concentrations were appropriately conservative and suitable for assessment of the proposed residential land use category.
- It is concluded that there are no contaminants present at the Investigation Area which are likely to present a risk of impact to the health of humans.

6.2 Recommendations

- Based on the findings of the desktop review and site investigation, it can be stated with a reasonable level of confidence that the contaminants detected at the Investigation Area pose no significant risk to the health of humans and the site can be considered suitable for the proposed residential development and land use.
- A Construction Environmental Management Plan (CEMP) must be prepared, prior to construction works being started. The purpose of the CEMP is for the management of excavated soils and should include procedures for the management of sediment and erosion.

- It is recommended that the excavated materials stockpiled at the site, as well as any material that will be excavated as part of the proposed development, be classified in accordance with the general solid waste (NSW EPA, 2014) and excavated natural material (NSW EPA, 2014a) guidelines (ENM Order), before being taken off site for disposal or application elsewhere.

7.0 REFERENCES

NEPC. (1999). *National Environment Protection (Assessment of Site Contamination) Measure (as amended, 2013).* National Environment Protection Council.

NSW EPA. (2014a). *Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014, The excavated natural material order 2014.* Sydney: NSW Environment Protection Authoroty.

NSW EPA. (2020). *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites.* NSW Environmental Protection Agency.

NSW EPA. (2020). *Sampling Design Part 1 - Application, Contaminated Land Guidelines.* Sydney: NSW EPA.

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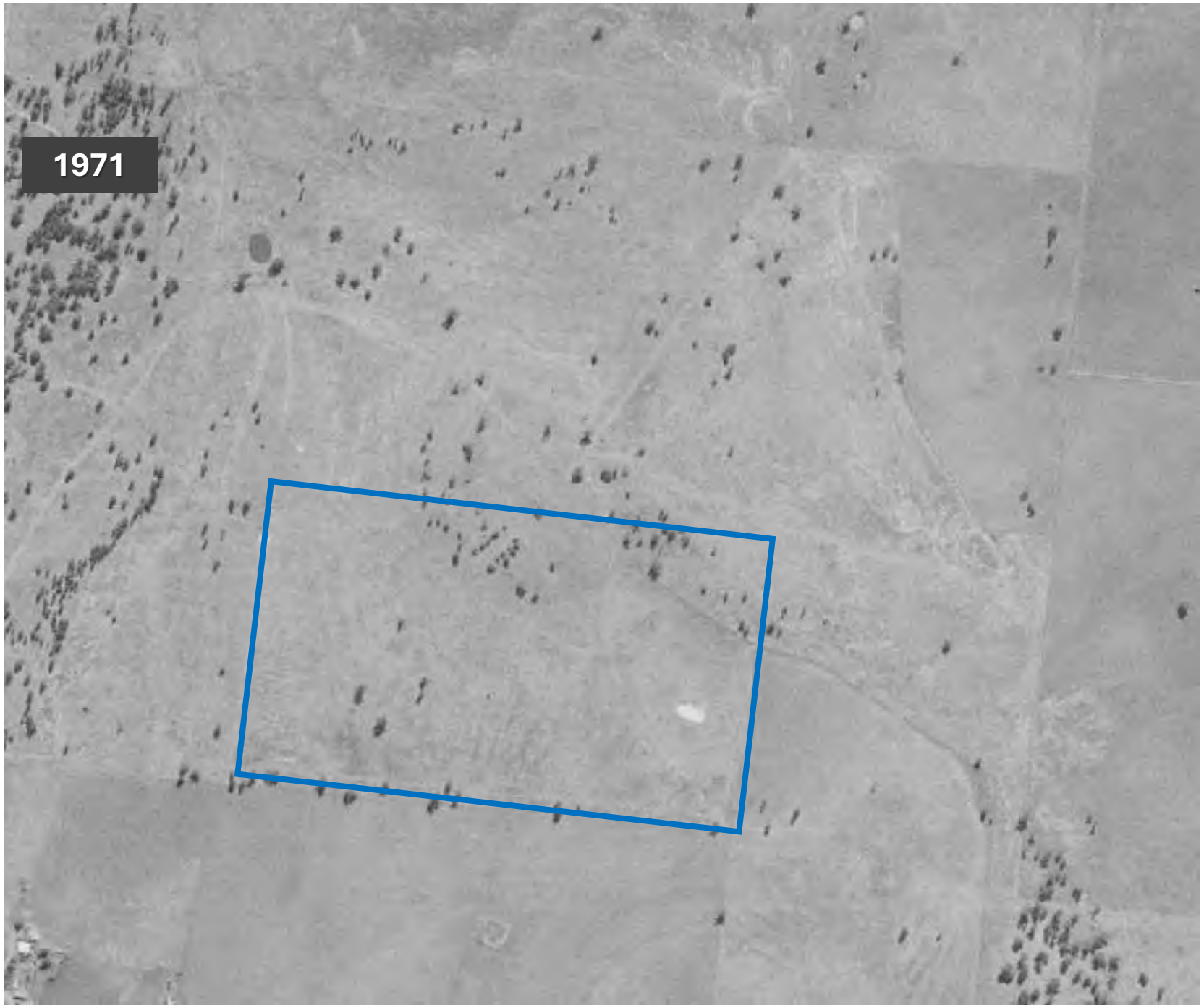
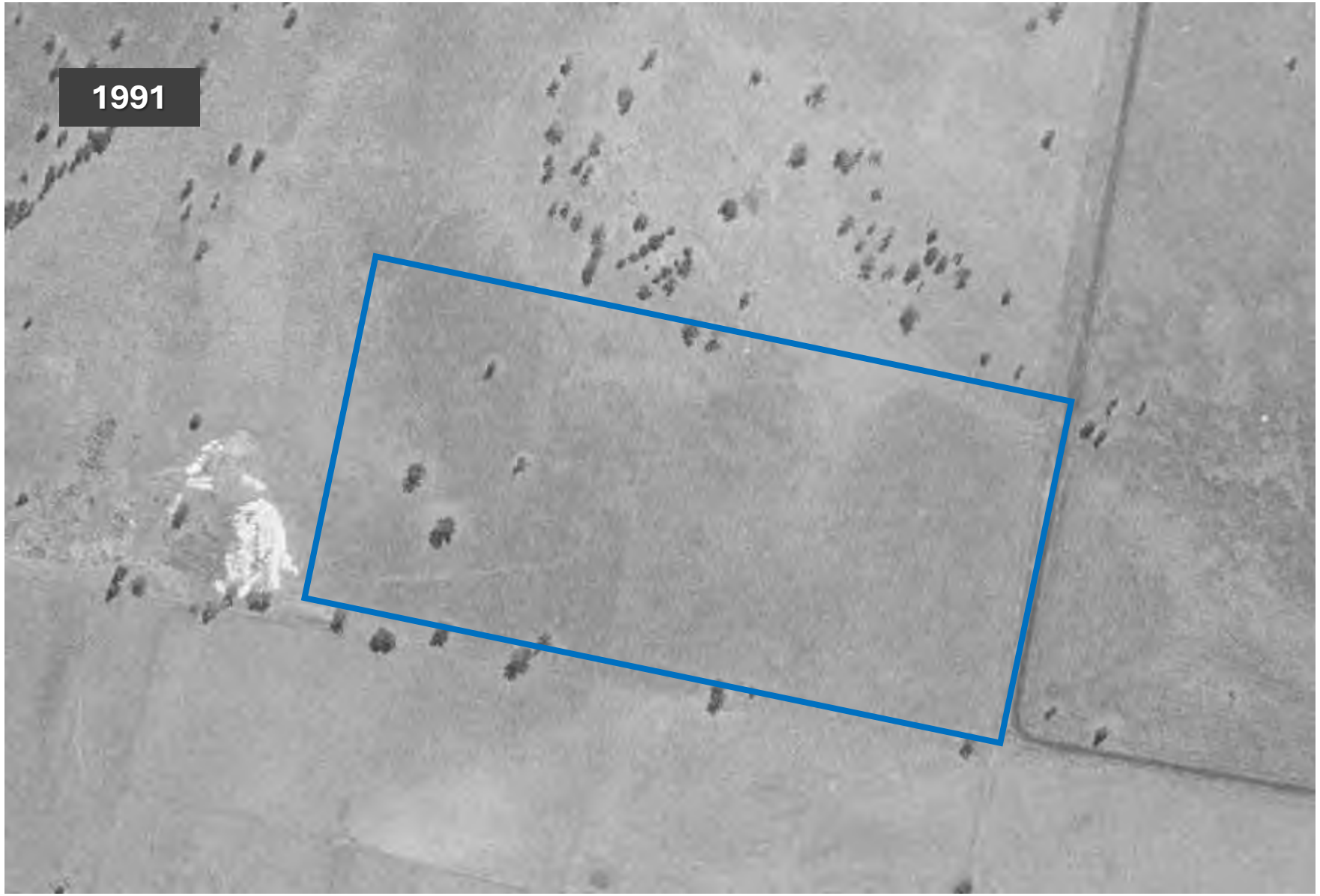
APPENDIX A

Historical Aerial Photographs


1964


1971


1980


1991


2006
Boundary Rd
Boundary Rd
Sheraton Rd
Stream Ave


2013
Boundary Rd
Stream Ave
Sheraton Rd


2018
Sheraton Rd
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Boundary Rd
Stream Ave


2019
Boundary Rd
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Sheraton Rd
Image © 2024 Maxar Technologies


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APPENDIX B

Chain of Custody and Laboratory Report

CERTIFICATE OF ANALYSIS

Work Order	: **ME2400241**	Page	: 1 of 12
Client	: **BARNSON**	Laboratory	: Environmental Division Mudgee
Contact	: Nardus Potgieter	Contact	: Mary Monds (ALS Mudgee)
Address	: Unit 4 108-110 Market Street MUDGEE NSW 2850	Address	: 1/29 Sydney Road Mudgee NSW Australia 2850
Telephone	: 0429 464 067	Telephone	: +61 2 6372 6735
Project	: Soil	Date Samples Received	: 06-Feb-2024 14:15
Order number	: ----	Date Analysis Commenced	: 07-Feb-2024
C-O-C number	: ----	Issue Date	: 14-Feb-2024 18:56
Sampler	: Nardus Potgieter (Client Sampler)		
Site	: Barnson		
Quote number	: SY/053/14		
No. of samples received	: 14		
No. of samples analysed	: 14		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
John Williams	Lab Technician	Newcastle - Asbestos, Mayfield West, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EP080: Poor matrix spike recovery due to sample heterogeneity. Confirmed by re-analysis.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP-01	TP-02	TP-03	TP-04	TP-05
				Sampling date / time	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00
Compound	CAS Number	LOR	Unit		ME2400241-001	ME2400241-002	ME2400241-003	ME2400241-004	ME2400241-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		4.6	1.2	3.3	4.4	3.3
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		80	32	31	38	54
Copper	7440-50-8	5	mg/kg		33	20	19	22	19
Lead	7439-92-1	5	mg/kg		<5	<5	13	8	8
Nickel	7440-02-0	2	mg/kg		61	27	24	31	26
Zinc	7440-66-6	5	mg/kg		63	43	25	35	28
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	----	----	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	----	----	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP-01	TP-02	TP-03	TP-04	TP-05
				Sampling date / time	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00
Compound	CAS Number	LOR	Unit		ME2400241-001	ME2400241-002	ME2400241-003	ME2400241-004	ME2400241-005
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	----	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	----	----	<0.2
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP-01	TP-02	TP-03	TP-04	TP-05
				Sampling date / time	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00
Compound	CAS Number	LOR	Unit		ME2400241-001	ME2400241-002	ME2400241-003	ME2400241-004	ME2400241-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	<50	<50	<50	<50
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP-01	TP-02	TP-03	TP-04	TP-05
				Sampling date / time	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00
Compound	CAS Number	LOR	Unit		ME2400241-001	ME2400241-002	ME2400241-003	ME2400241-004	ME2400241-005
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		**109**	**117**	**----**	**----**	**102**
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**75.0**	**74.1**	**----**	**----**	**70.5**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**81.9**	**80.1**	**----**	**----**	**68.1**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**82.3**	**78.8**	**79.4**	**75.0**	**73.2**
2-Chlorophenol-D4	93951-73-6	0.5	%		**85.4**	**82.3**	**83.2**	**81.3**	**79.4**
2.4.6-Tribromophenol	118-79-6	0.5	%		**76.2**	**72.1**	**70.0**	**71.6**	**75.3**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**88.1**	**83.6**	**85.4**	**82.7**	**81.0**
Anthracene-d10	1719-06-8	0.5	%		**102**	**98.4**	**98.0**	**97.7**	**96.0**
4-Terphenyl-d14	1718-51-0	0.5	%		**92.9**	**90.2**	**91.8**	**88.5**	**87.8**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**73.6**	**78.7**	**85.9**	**80.6**	**81.4**
Toluene-D8	2037-26-5	0.2	%		**87.1**	**89.8**	**101**	**88.6**	**95.5**
4-Bromofluorobenzene	460-00-4	0.2	%		**90.8**	**92.9**	**114**	**102**	**106**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP-06	TP-07	TP-08	TP-09	TP-10
				Sampling date / time	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00
Compound	CAS Number	LOR	Unit		ME2400241-006	ME2400241-007	ME2400241-008	ME2400241-009	ME2400241-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	2.7	<1.0	<1.0	3.2
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		20	26	6	18	24
Copper	7440-50-8	5	mg/kg		9	17	21	26	20
Lead	7439-92-1	5	mg/kg		6	10	<5	8	6
Nickel	7440-02-0	2	mg/kg		14	18	16	18	20
Zinc	7440-66-6	5	mg/kg		20	36	40	84	53
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		----	----	----	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	----	----	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	----	----	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		----	----	----	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		----	----	----	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		----	----	----	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		----	----	----	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		----	----	----	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	----	----	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		----	----	----	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		----	----	----	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	----	----	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		----	----	----	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		----	----	----	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP-06	TP-07	TP-08	TP-09	TP-10
				Sampling date / time	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00
Compound	CAS Number	LOR	Unit		ME2400241-006	ME2400241-007	ME2400241-008	ME2400241-009	ME2400241-010
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4.4`-DDE	72-55-9	0.05	mg/kg		----	----	----	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		----	----	----	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	----	----	<0.05	<0.05
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg		----	----	----	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		----	----	----	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	----	----	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	----	----	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		----	----	----	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		----	----	----	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		----	----	----	<0.2	<0.2
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		----	----	----	<0.05	<0.05
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		----	----	----	<0.05	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP-06	TP-07	TP-08	TP-09	TP-10
				Sampling date / time	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00
Compound	CAS Number	LOR	Unit		ME2400241-006	ME2400241-007	ME2400241-008	ME2400241-009	ME2400241-010
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	<50	<50	<50	<50
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP-06	TP-07	TP-08	TP-09	TP-10
				Sampling date / time	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00
Compound	CAS Number	LOR	Unit		ME2400241-006	ME2400241-007	ME2400241-008	ME2400241-009	ME2400241-010
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		----	----	----	**104**	**117**
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	----	----	**74.8**	**78.2**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	----	----	**87.4**	**82.8**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**79.6**	**76.0**	**72.6**	**75.1**	**78.3**
2-Chlorophenol-D4	93951-73-6	0.5	%		**85.9**	**82.2**	**76.8**	**80.7**	**81.4**
2.4.6-Tribromophenol	118-79-6	0.5	%		**79.4**	**80.4**	**67.4**	**80.8**	**77.0**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**88.4**	**84.5**	**81.1**	**81.7**	**83.0**
Anthracene-d10	1719-06-8	0.5	%		**103**	**98.2**	**94.2**	**94.7**	**96.7**
4-Terphenyl-d14	1718-51-0	0.5	%		**94.3**	**92.0**	**87.4**	**87.2**	**89.0**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**75.8**	**82.4**	**83.9**	**80.8**	**77.3**
Toluene-D8	2037-26-5	0.2	%		**87.9**	**116**	**99.0**	**97.0**	**83.3**
4-Bromofluorobenzene	460-00-4	0.2	%		**102**	**116**	**113**	**105**	**98.1**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP-06a	TP-07a	TP-08a	TP-09a	----
				Sampling date / time	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00	06-Feb-2024 00:00	----
Compound	CAS Number	LOR	Unit		ME2400241-011	ME2400241-012	ME2400241-013	ME2400241-014	--------
					Result	Result	Result	Result	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg		**No**	**No**	**No**	**No**	**----**
Asbestos (Trace)	1332-21-4	-	-		**No**	**No**	**No**	**No**	**----**
Asbestos Type	1332-21-4	-	--		**-**	**-**	**-**	**-**	**----**
Sample weight (dry)	----	0.01	g		**324**	**193**	**218**	**399**	**----**
APPROVED IDENTIFIER:	----	-	--		**J. WILLIAMS**	**J. WILLIAMS**	**J. WILLIAMS**	**J. WILLIAMS**	**----**
Synthetic Mineral Fibre	----	-	--		**No**	**No**	**No**	**No**	**----**
Organic Fibre	----	-	--		**No**	**No**	**No**	**No**	**----**

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Sample ID - Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	TP-06a - 06-Feb-2024 00:00	A soil sample.
EA200: Description	TP-07a - 06-Feb-2024 00:00	A soil sample.
EA200: Description	TP-08a - 06-Feb-2024 00:00	A soil sample.
EA200: Description	TP-09a - 06-Feb-2024 00:00	A soil sample.

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	63	125
Toluene-D8	2037-26-5	67	124
4-Bromofluorobenzene	460-00-4	66	131

Inter-Laboratory Testing

Analysis conducted by ALS Newcastle, NATA accreditation no. 825, site no. 1656 (Chemistry) 9854 (Biology).

(SOIL) EA200: AS 4964 - 2004 Identification of Asbestos in Soils

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

(SOIL) EP066: Polychlorinated Biphenyls (PCB)

(SOIL) EP066S: PCB Surrogate

(SOIL) EG005(ED093)T: Total Metals by ICP-AES

(SOIL) EG035T: Total Recoverable Mercury by FIMS

(SOIL) EP080/071: Total Petroleum Hydrocarbons

(SOIL) EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions

(SOIL) EP080: BTEXN

(SOIL) EP080S: TPH(V)/BTEX Surrogates

(SOIL) EP075(SIM)B: Polynuclear Aromatic Hydrocarbons

(SOIL) EP075(SIM)S: Phenolic Compound Surrogates

(SOIL) EP075(SIM)T: PAH Surrogates

(SOIL) EP068A: Organochlorine Pesticides (OC)

(SOIL) EP068T: Organophosphorus Pesticide Surrogate

(SOIL) EP068S: Organochlorine Pesticide Surrogate

Environmental Division
Mudgee
Work Order Reference
ME2400241

barnson

Unit 4 / 108-110 Market Street
Mudgee, NSW 2850

1300 BARNSON (1300 227 676)

generalenquiry@barnson.com.au

Telephone : 02 6372 6735

CHAIN OF CUSTODY AND ANALYTICAL REQUEST

Job Number	42896	Date	6 February 2024
Laboratory	ALS Mudgee	Report to	Nardus Potgieter npotgieter@barnson.com.au
Sample Temperature on Receipt		Notes	
25 °C	Signature:		

Sample ID	Sample Description	Sample Date	Sample type	Analysis request				
				1	2	3	4	5
TP-01	Surface soil	06/02/2023	Soil		X			
TP-02	Surface soil	06/02/2023	Soil	X				
TP-03	Surface soil	06/02/2023	Soil		X			
TP-04	Surface soil	06/02/2023	Soil		X			
TP-05	Surface soil	06/02/2023	Soil	X				
TP-06	Surface soil	06/02/2023	Soil		X			
TP-07	Surface soil	06/02/2023	Soil		X			
TP-08	Surface soil	06/02/2023	Soil		X			
TP-09	Surface soil	06/02/2023	Soil	X				
TP-10	Surface soil	06/02/2023	Soil	X				
TP-06a	Surface soil	06/02/2023	Soil			X		
TP-07a	Surface soil	06/02/2023	Soil			X		
TP-08a	Surface soil	06/02/2023	Soil			X		
TP-09a	Surface soil	06/02/2023	Soil			X		

Analysis request		Method Code
1	TRH (C6-C40) / BTEXN / PAH / OC / PCB / 8 Metals	S-8
2	TRH (C6-C40) / BTEXN / PAH / 8 Metals	S-26
3	Asbestos – in 50g Soil (Grab sample) presencefor free fibres	EA200G
4		
5		

Relinquished by / Affiliation	Accepted by / Affiliation	Date

	/ Barnson	/ ALS Mudgee	6 February 2024

1415

barnson.

APPENDIX E

Traffic Impact Statement

M^CLAREN TRAFFIC ENGINEERING

Address: Shop 7, 720 Old Princes Highway Sutherland NSW 2232
Postal: P.O Box 66 Sutherland NSW 1499

Telephone: +61 2 9521 7199
Web: www.mclarentraffic.com.au
Email: admin@mclarentraffic.com.au

Division of RAMTRANS Australia ABN: 45067491678 RPEQ: 19457

Transport Planning, Traffic Impact Assessments, Road Safety Audits, Expert Witness

27 May 2024 Reference: 231062.01FB

Barnson
Unit 1, 36 Darling Street
Dubbo NSW 2830
Attention: Jim Sarantzouklis

TRAFFIC IMPACT STATEMENT FOR THE
PROPOSED PLANNING PROPOSAL
AT A PORTION OF LOT 200 DP1280301, DUBBO

Dear Jim,

Reference is made to your request to provide a traffic impact statement with regard to the planning proposal covering a portion of Lot 200 DP1280301, Dubbo. The proposal involves the rezoning of a portion of the land (at the corner of Sheraton Road and Boundary Road), from its existing *R2 – Low Density Residential* to an *R1 – General Residential* zone.

The assessment is provided in **Sections 1 - 4** of this letter, with a summary of the relevant findings below:

- The parking and access design of the likely proposed land uses under *R1 – General Residential* zoning can be easily accommodated within the site. It will be a requirement at the DA and CC stage of each proposed development to assess the parking provision, driveway location and compliance with the relevant Australian Standards;
- The difference in traffic generation between R2 and R1 land zoning is anticipated to be marginal; nevertheless, it is expected that the surrounding road network will be able to comfortably accommodate this change in traffic generation, without any noticeable impact on the surrounding road network. In any case, it will be a requirement at DA stage of each proposed development to assess the traffic generation and its potential impact on the surrounding road network.

The area proposed to be rezoned is referred to as the “site” within this report. This report does not consider the remaining portions of Lot 200 DP1280301, as they will not be impacted by this proposal.

Section 5 of this traffic impact statement provides a review of how the proposal aligns with the objectives of the *Local Planning Direction 5.1 – Integrating Land Use and Transport*.

1 Site Location and Access

The location of the site is depicted on an aerial image in **Figure 1**. The characteristics of the site and the surrounding transport network are summarised in **Table 1**.

Site Location

FIGURE 1: SITE CONTEXT – AERIAL IMAGE

TABLE 1: SITE CONTEXT

Zoning	The site is currently zoned *R2 – Low Density Residential* under the Dubbo Regional Local Environmental Plan (DRLEP) 2012, whilst the proposal seeks to rezone the land to *R1 – General Residential*.
Roads Fronting Site	The site subject to the rezoning fronts the following road: • Boundary Road to the south (Unclassified COLLECTOR Road) • Sheraton Road to the east (Unclassified COLLECTOR Road) • Stream Avenue to the west (Unclassified LOCAL Road) Access to the site will be considered during the DA stage. However, safe and compliant road access can be achieved from any of the surrounding access roads.
State Planning Controls	The site is neither of sufficient size or capacity or fronted by or provided access via a classified road and is therefore not required to be referred to Transport for NSW (TfNSW) as part of the Development Application process.
Public Transport	The site is located within a 5-minute (400m) walking distance of bus stops (ID: 28301196 and 28301137) which services the 570 (Orana Mall to Dubbo CBD via Southlakes & South Dubbo) loop service provided by Dubbo Buslines 11 times a day. Dubbo Train Station is located approximately 5km to the north-west of the subject site which services the Western NSW – Regional Trains timetable, providing direct access from Central Station to Dubbo Station.
Future Road and Infrastructure Changes	The road network surrounding the site, including Boundary Road on the site's southern boundary has been subject to numerous road upgrades by Dubbo Regional Council.

2 Change in Permissible Land Uses

The proposed rezoning to *R1 – General Residential* will result in additional land uses being permissible on the subject site. **Table 2** outlines the key changes with respect to residential land uses.

TABLE 2: PERMISSIBLE LAND USE SUMMARY

Land Use	Permissible in R1	Permissible in R2
Attached Dwellings	**Yes**	**No**
Centre-based child care centre facilities	**Yes**	**Yes**
Dwelling Houses	**Yes**	**Yes**
Group Homes	**Yes**	**Yes**
Hostels	**Yes**	**No**
Multi Dwelling Housing	**Yes**	**No**
Residential Flat Building	**Yes**	**No**
Seniors Housing	**Yes**	**No**
Shop Top Housing	**Yes**	**No**

3 Parking and Access Design

3.1 Car Parking Provision

The provision of car parking associated with each proposed development located on the subject rezoned site will be reviewed and assessed in detail during the development application stage. Each individual proposal on the site is expected to meet their parking demands entirely within the bounds of their subject site. Per the Council's request, no parking should be permitted or replied upon along Boundary Road or Sheraton Road during any future development application.

Reference is made to the *Dubbo Development Control Plan 2013* (DDCP 2013), which designates the following parking rates as outlined in **Table 3** that may apply to a development approved under *R1 – General Residential* zoning.

TABLE 3: PERMISSIBLE LAND USE PARKING RATES

Land Use	Control	Rate
Dwelling House	DDCP 2013	*One space per one or two bedrooms;* *Two spaces per three or more bedrooms*
Dual Occupancies, Multi-Dwelling Housing and Semi-Attached Dwellings	DDCP 2013	*One space for one bedroom premises;* *Two spaces per two or more bedrooms*
Boarding Houses, Hostels and the like	DDCP 2013	*One space per manager* *One space per two staff onsite at any one time;* *and* *One space per bedroom*

Land Use	Control	Rate
Residential Flat Building	DDCP 2013	*One space per one bedroom unit;* *1.3 spaces per two bedroom unit;* *1.5 spaces in excess of two bedrooms; and* *One space for visitor parking for every four units or part thereof*
Residential Care Facilities	DDCP 2013 with reference to SEPP (Housing for Seniors or People with a Disability) 2004	*One parking space for each 10 beds in the residential care facility (or one parking space for each 15 beds if the facility provides care only for persons with dementia)* *plus, one parking space for each two persons to be employed in connection with the development and on duty at any one time.*
Hostels	DDCP 2013 with reference to SEPP (Housing for Seniors or People with a Disability) 2004	*One parking space suitable for an ambulance;* *One parking space for each five dwellings in the hostel plus one parking space for each two persons to be employed in connection with the development and on duty as any one time* *.plus 0.5 car spaces for each bedroom where the development application is made by a person other than a social housing provider.*
Self-Contained Dwelling	DDCP 2013 with reference to SEPP (Housing for Seniors or People with a Disability) 2004	*One car space for each five dwellings where the development application is made by, or is made by a person jointly with, a social housing provider.*

The provision of car parking will be confirmed in accordance with the applicable DCP parking rates or SEPP requirements, as the case may be, at the time of any proposed DA within the site. There is sufficient room on-site for the provision of adequate parking to achieve compliance with the relevant DCP car parking rates.

Vehicular access to the site should be achieved by a single vehicular access to Henty Drive. Per the Council's request, no direct access should be proposed to Sheraton Road or Boundary Road for any future proposed development on the rezone land/. The access arrangements, including any auxiliary lanes, alterations for sightlines or other treatments, must be assessed during the DA stage. These items will depend on the nature of the proposed development on the subject site.

3.2 Bicycle & Motorcycle Parking Requirements

DDCP 2013 does not require the provision of bicycle or motorcycle parking relevant to any of the likely land uses that could be proposed under the *R1—General Residential zoning.* The proposed change does not change the potential provision of bicycle or motorcycle parking. The site is not constrained by its ability to provide an adequate quantum of bicycle or motorcycle parking. In other words, the site could easily accommodate a potential development's demand for the provision of bicycle or motorcycle parking.

3.3 Servicing & Loading

It is expected that all servicing and loading will be able to occur in the same manner under R1 zoning as it would under R2 zoning. It is reiterated that each individual lot is subject to its own development application to assess the specific loading requirements of each development.

4 Traffic Generation and Impact

The traffic generation for the site has the potential to change after undergoing rezoning from *R2 – Low Density Residential* to *R1 – General Residential*. A summary of some of the typical traffic generation rates for the permissible land uses under R1 and R2 land zoning under the DRLEP 2012 is shown below in **Table 4**.

TABLE 4: PERMISSIBLE LAND USE TRAFFIC SUMMARY

Land Use	Peak Hour Traffic Generation Rate	Permissible in R1	Permissible in R2
Attached Dwellings	0.71 trips per dwelling (AM Peak) 0.78 trips per dwelling (PM Peak)	**Yes**	**No**
Dwelling Houses	0.71 trips per dwelling (AM Peak) 0.78 trips per dwelling (PM Peak)	**Yes**	**Yes**
Group Homes	First Principles Analysis	**Yes**	**Yes**
Hostels	First Principles Analysis	**Yes**	**No**
Multi Dwelling Housing	1-2 Bed: 0.4-0.5 trips per dwelling 3+ Bed: 0.5 – 0.65 trips per dwelling	**Yes**	**No**
Residential Flat Building	0.53 trips per dwelling (AM Peak) 0.32 trips per dwelling (PM Peak)	**Yes**	**No**
Seniors Housing	0.4 trips per dwelling	**Yes**	**No**
Shop Top Housing	Likely, 0.53 trips per dwelling (AM Peak) 0.32 trips per dwelling (PM Peak)	**Yes**	**No**

It is noted that any proposed development on the subject site will be subject to a detailed DA, which should assess the traffic impact of the proposal.

Due to the increased density permissible, the site could generate more traffic; however, the road network surrounding the site remains capable of handling the marginal increase in traffic generation. The rezoning is expected to result in only a marginal change to the approved impact on any nearby intersections and be readily accommodated within the existing road network.

The proposed rezoning is anticipated to have only a minimal impact in terms of traffic flow efficiency. There is not expected to be any change to road safety conditions as a result of this rezoning of land. It is reiterated that the detailed traffic impact of any proposal on the land shall be assessed during the DA stage to determine the traffic generation of the development and any impacts on the surrounding road network.

5 Local Planning Direction 5.1

Reference is made to the *Local Planning Direction 5.1 –Integrating Land Use and Transport*, which states the following objectives:

> ***Objectives***
>
> *The objective of this direction is to ensure that urban structures, building forms, land use locations, development designs, subdivisions and street layouts achieve the following planning objectives:*
>
> *(a) Improving access to housing, jobs, and services by walking, cycling and public transport, and*
>
> *(b) Increasing the choice of available transport and reducing dependency on cars, and*
>
> *(c) Reducing travel demand including the number of trips generated by development and the distances travelled, especially by car, and*
>
> *(d) Supporting the efficient and viable operation of public transport services; and*
>
> *(e) Providing for the efficient movement of freight.*

The proposed rezoning maintains the primary residential use of the subject site but also permits higher residential densities and other forms of residential accommodation (Hostels, Seniors Housing, Shop Top Housing etc.). These higher density residential uses are likely to increase the residential population within the site. While existing access to public transport is not impacted by this proposal, the increase in population density may slightly increase the demand for local public transport, allowing for additional services to be viable. Further consideration can be made at the development application stage to provide support for alternative travel modes such as public bus services. The proposal has no impact on freight.

6 Conclusion

Based upon the above assessment, the proposed rezoning of the subject site from *R2 – Low Density Residential* to *R1 – General Residential* is generally supported and will only result in a marginal change to traffic generation. The required parking provision of any proposed land use will be considered during the detailed development application stage, though it is expected that each individual proposal can easily meet the parking demand entirely within their respective sites.

Please contact the undersigned should you require further information or assistance.

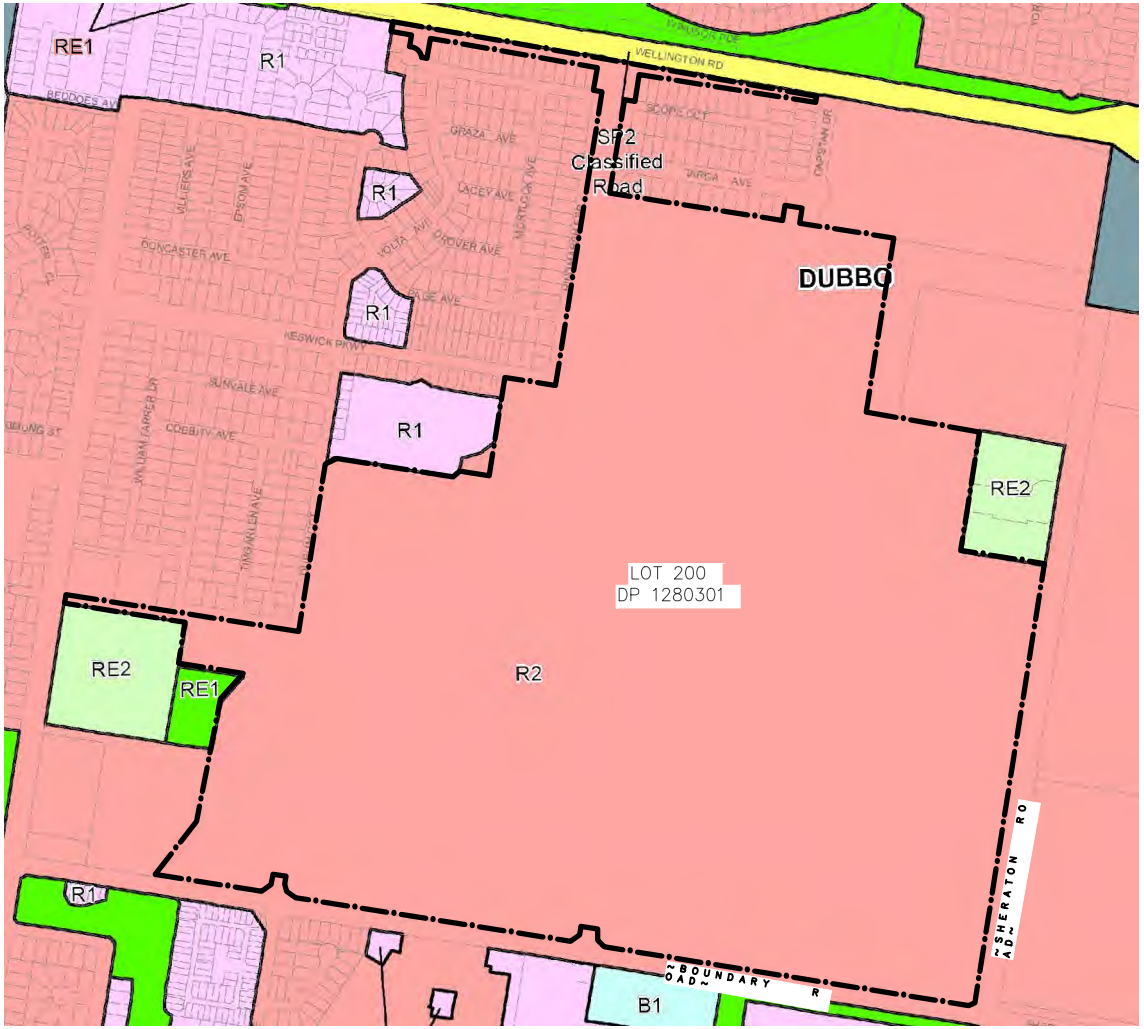
Yours faithfully
McLaren Traffic Engineering

Aaron Tomlins
Senior Traffic Engineer
BE(Hon)(Civil Engineering)/BCom
AMAITPM, GradIIEAust
TfNSW Accredited Level 1 Road Safety Auditor

barnson.

APPENDIX F

Planning Proposal Plan



01 EXISTING LAND ZONE PLAN

Scale 1 : 4000 @

0 40000 0000 160000 400000

Zone

- B1 Neighbourhood Centre
- B2 Local Centre
- B3 Commercial Core
- B4 Mixed Use
- B5 Business Development
- B6 Enterprise Corridor
- B7 Business Park
- E1 National Parks and Nature Reserves
- E2 Environmental Conservation
- E3 Environmental Management
- IN1 General Industrial
- IN2 Light Industrial
- IN3 Heavy Industrial
- R1 General Residential
- R2 Low Density Residential
- R5 Large Lot Residential
- RE1 Public Recreation
- RE2 Private Recreation
- RU1 Primary Production
- RU2 Rural Landscape
- RU3 Forestry
- RU4 Primary Production Small Lots
- RU5 Village
- SP2 Infrastructure
- SP3 Tourist
- W1 Natural Waterways
- W2 Recreational Waterways

PRELIMINARY

barnson
DESIGN . PLAN . MANAGE

BARNSON PTY LTD
address Unit 1, 36 Darling Street
Dubbo NSW 2830
phone 1300 BARNSON (1300 227 676)
email generalenquiry@barnson.com.au
web barnson.com.au

Rev.	Date.	Amendment.
A	25.01.2024	PRELIMINARY
B	04.06.2024	LEASE AREA ADDED

Project.
PROPOSED AREA OF WORKS

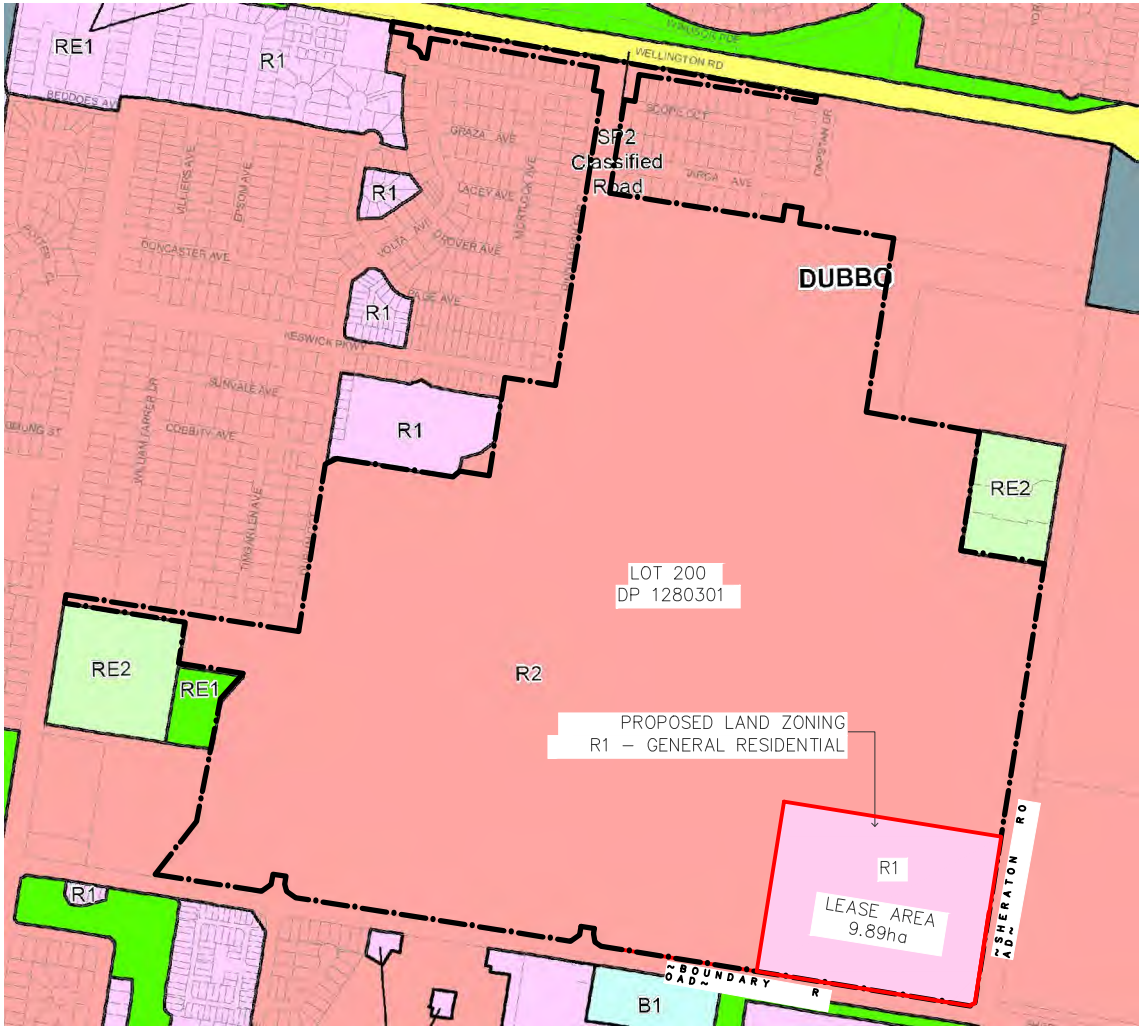
Site Address.
KESWICK ESTATE, DUBBO NSW 2830

Client.

Drawing Title.
EXISTING LAND ZONE PLAN

Scale. As indicated @ A1
Sheet. 01 of 03
Project No. 42896
Drawn. CR
Checked. –
Revision. B

Drawing No.
42896–AL01



02 PROPOSED LAND ZONE PLAN

Scale 1 : 4000 @

0 40000 0000 160000 400000

Zone

- B1 Neighbourhood Centre
- B2 Local Centre
- B3 Commercial Core
- B4 Mixed Use
- B5 Business Development
- B6 Enterprise Corridor
- B7 Business Park
- C1 National Parks and Nature Reserves
- C2 Environmental Conservation
- C3 Environmental Management
- IN1 General Industrial
- IN2 Light Industrial
- IN3 Heavy Industrial
- R1 General Residential
- R2 Low Density Residential
- R5 Large Lot Residential
- RE1 Public Recreation
- RE2 Private Recreation
- RU1 Primary Production
- RU2 Rural Landscape
- RU3 Forestry
- RU4 Primary Production Small Lots
- RU5 Village
- SP2 Infrastructure
- SP3 Tourist
- W1 Natural Waterways
- W2 Recreational Waterways

PRELIMINARY

barnson
DESIGN . PLAN . MANAGE

BARNSON PTY LTD
address Unit 1, 36 Darling Street
Dubbo NSW 2830
phone 1300 BARNSON (1300 227 676)
email generalenquiry@barnson.com.au
web barnson.com.au

Rev.	Date.	Amendment.
A	25.01.2024	PRELIMINARY
B	04.06.2024	LEASE AREA ADDED

Project.
PROPOSED AREA OF WORKS

Site Address.
KESWICK ESTATE, DUBBO NSW 2830

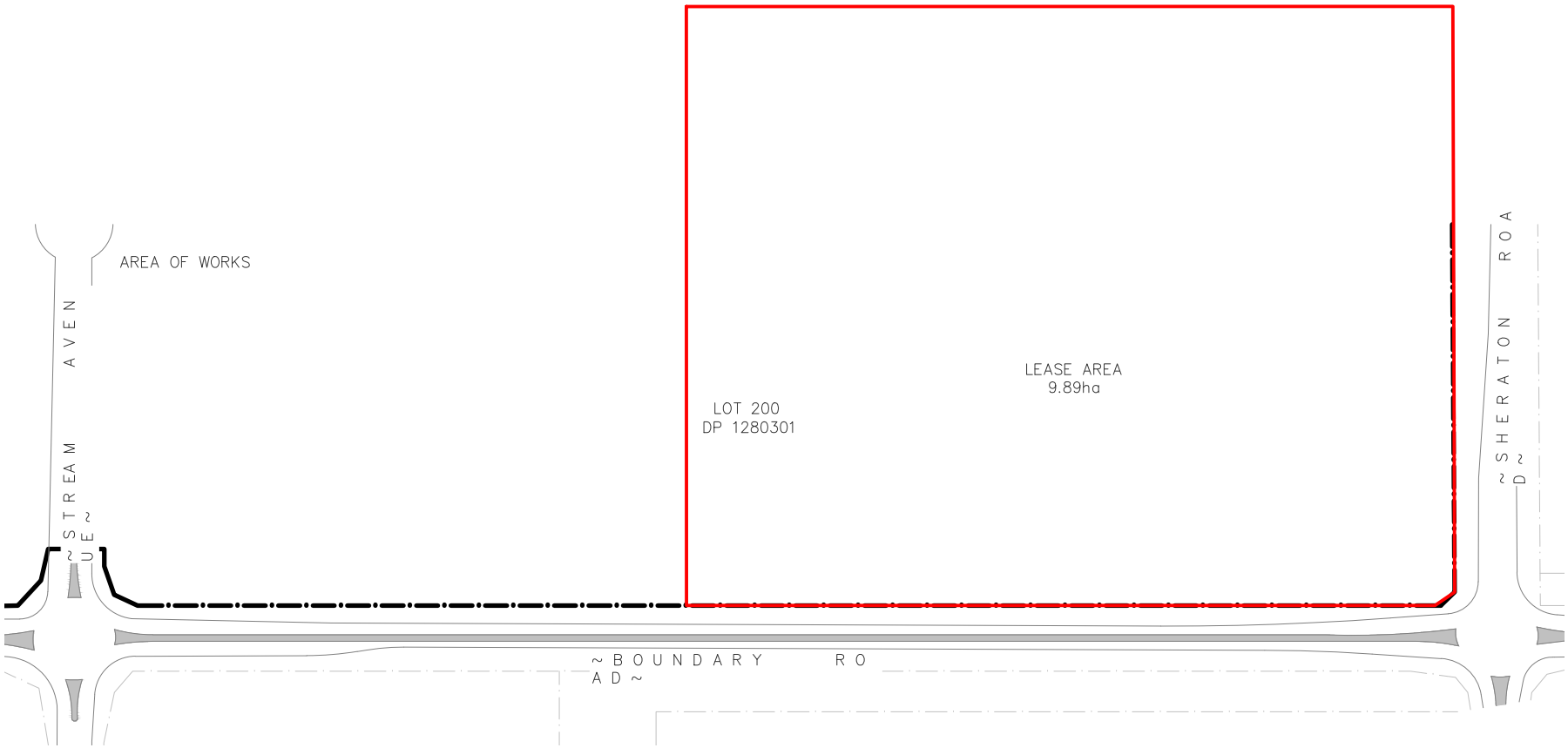
Client.

Drawing Title.
PROPOSED LAND ZONE PLAN

Scale. As indicated @ A1
Sheet. 02 of 03
Project No. 42896

Drawn. CR
Checked. –
Revision. B

Drawing No.
42896–AL02



03 PART SITE PLAN
Scale 1 : 1000 @ A1
0 10000 20000 40000 100000

LOCALITY

PRELIMINARY

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DESIGN . PLAN . MANAGE

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web barnson.com.au

Rev.	Date.	Amendment.
A	25.01.2024	PRELIMINARY
B	04.06.2024	LEASE AREA ADDED

Project.
PROPOSED AREA OF WORKS

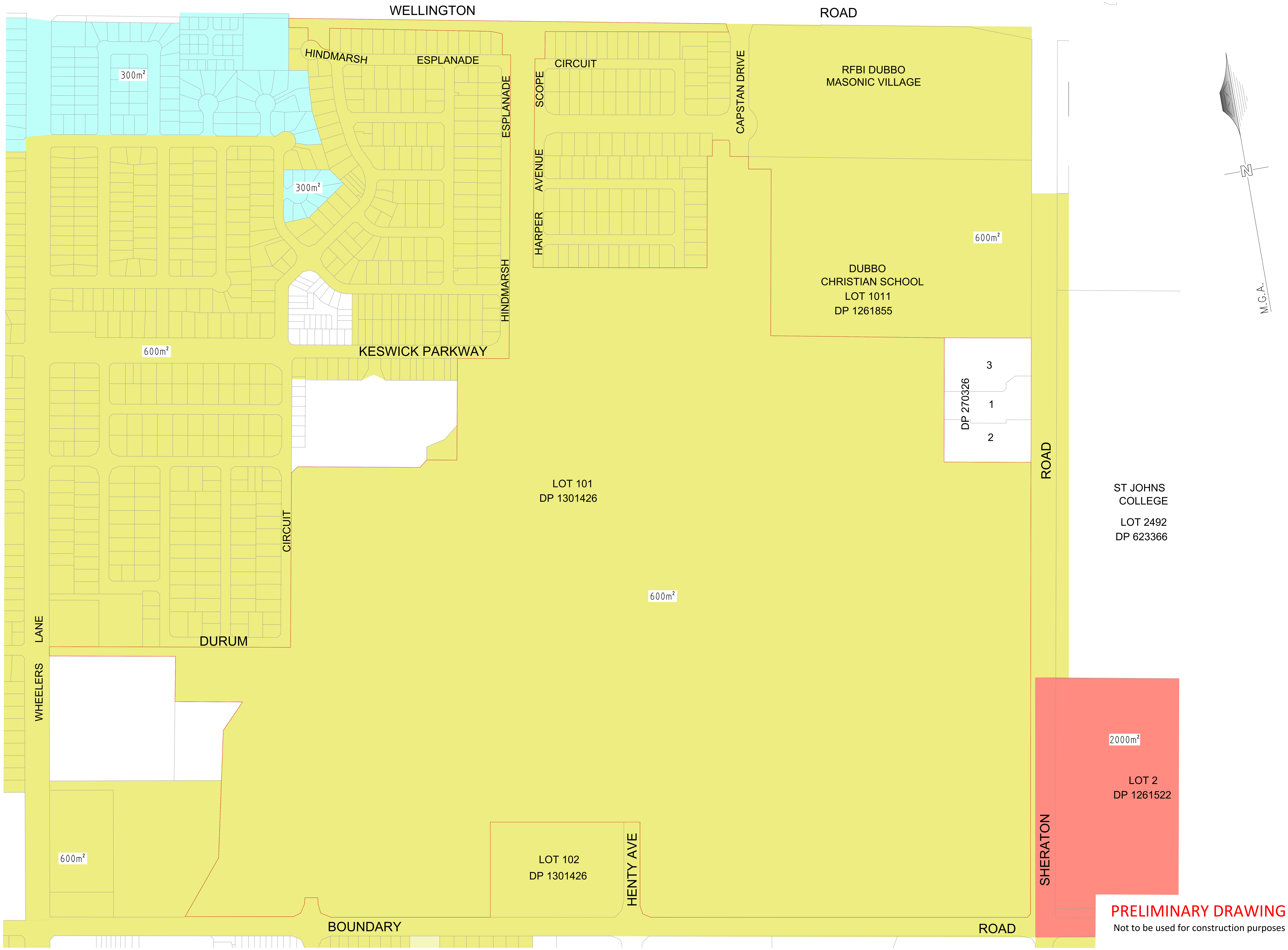
Site Address.
KESWICK ESTATE, DUBBO NSW 2830

Client.

Drawing Title.
PROPOSED SITE PLAN

Scale. As indicated @ A1
Sheet. 03 of 03
Project No. 42896
Drawn. CR
Checked. –
Revision. B

Drawing No.
42896–AL03



EXISTING LEP MAPPING
MINIMUM LOT SIZES

Minimum Lot Size (sq m)	
D	300
G	450
M	600
S	800
U	1,000
V	2,000
W	4,000
X1	6,000
X2	7,000
Y1	1 ha
Y2	1.5 ha
Z1	2 ha
Z2	3 ha
Z3	4 ha
AA1	5 ha
AA2	8 ha
AB1	10 ha
AB2	20 ha
AB3	25 ha
AB4	35 ha
AC	50 ha
AD	100 ha
AE	250 ha
AF	400 ha
AH	800 ha
AI	2,000 ha
	Refer to Clause 4.1 (3A) & 7.18

EXISTNG LEP MAPPING
ALLOTMENT SIZE PLAN
REDUCTION RATIO 1:3000 @ A1
1:6000 @ A3

SCALE 1:3000(A1)
0 20 40 80 120 160 200
0 20 40 80 120 160 200
SCALE 1:6000(A3)

PRELIMINARY DRAWING
Not to be used for construction purposes

barnson.
DESIGN . PLAN . MANAGE

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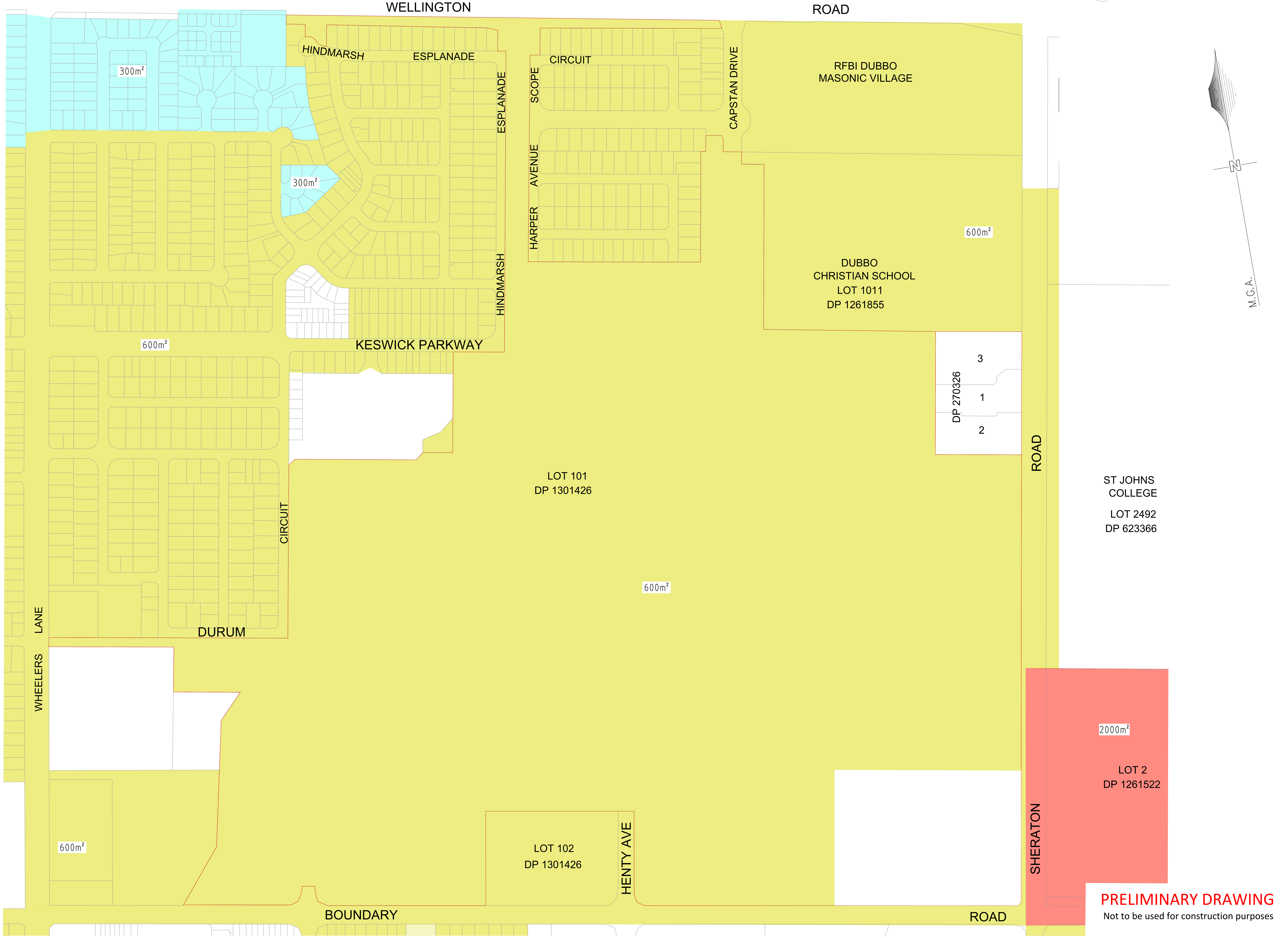
p: (02) 6651 2688
www.barnson.com.au

Client: SQUADRON ENERGY
Project: PLANNING PROPOSAL
KESWICK ESTATE - DUBBO
Drawing Title: EXISTING LEP MINIMUM ALLOTMENT SIZE PLAN
LOT 101 DP 1301426

Rev	Date	Amendment
A	19.03.2025	PRELIMINARY

Survey --
Certification
Drawn NS
Check JE
Original Sheet Size = A1
Drawing Number 42896_P01-01
Revision A



PROPOSED LEP MAPPING
MINIMUM LOT SIZES

Minimum Lot Size (sq m)	
D	300
G	450
M	600
S	800
U	1,000
V	2,000
W	4,000
X1	6,000
X2	7,000
Y1	1 ha
Y2	1.5 ha
Z1	2 ha
Z2	3 ha
Z3	4 ha
AA1	5 ha
AA2	8 ha
AB1	10 ha
AB2	20 ha
AB3	25 ha
AB4	35 ha
AC	50 ha
AD	100 ha
AE	250 ha
AF	400 ha
AH	800 ha
AI	2,000 ha
	Refer to Clause 4.1 (3A) & 7.18

PROPOSED LEP MAPPING
ALLOTMENT SIZE PLAN
REDUCTION RATIO 1:3000 @ A1
1:6000 @ A3

SCALE 1:3000(A1)
0 20 40 80 120 160 200
0 20 40 80 120 160 200
SCALE 1:6000(A3)

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Client: SQUADRON ENERGY
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KESWICK ESTATE - DUBBO
Drawing Title: PROPOSED LEP MINIMUM ALLOTMENT SIZE PLAN
LOT 101 DP 1301426

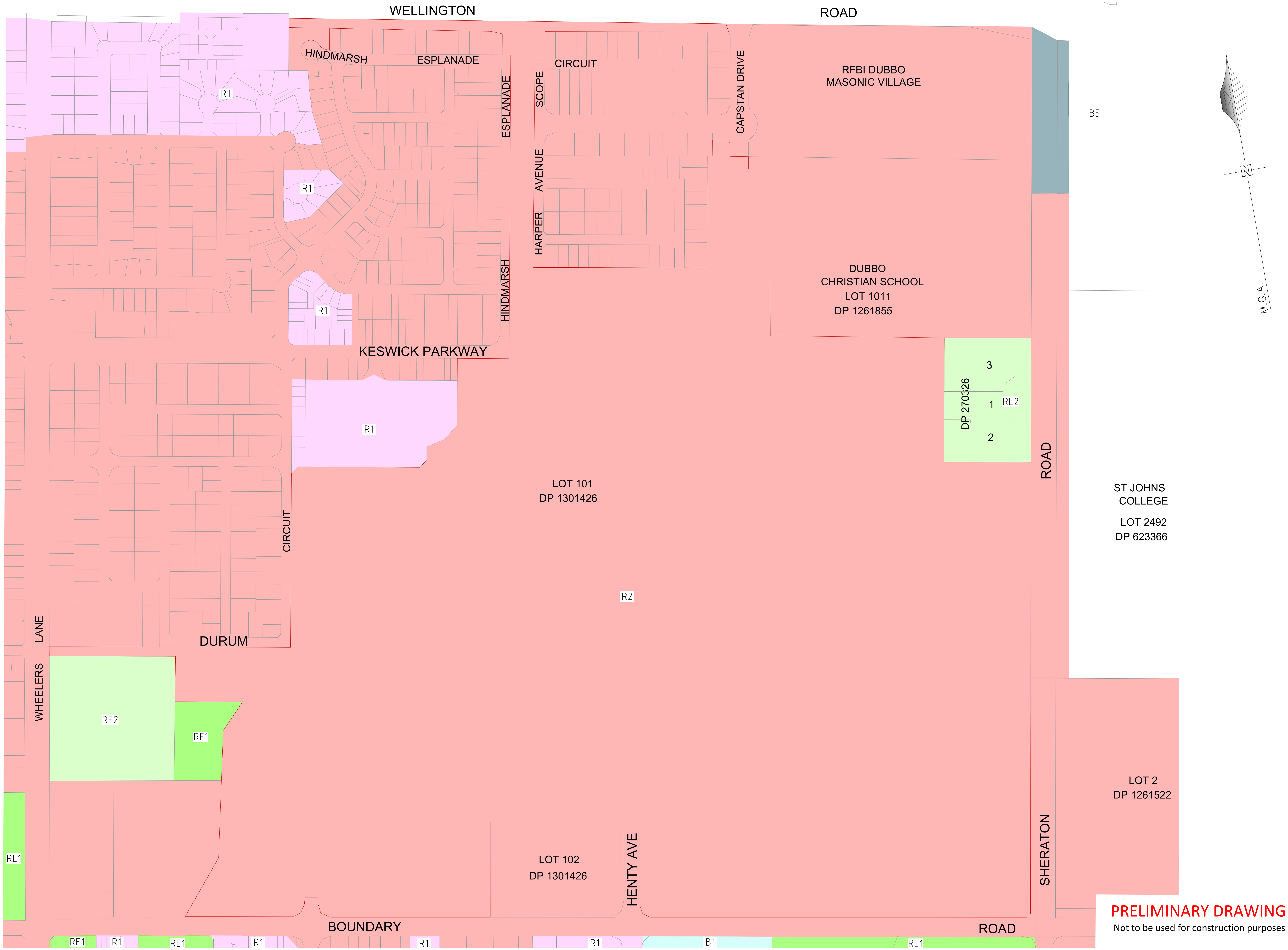
Rev	Date	Amendment
A	19.03.2025	PRELIMINARY

Survey --
Drawn NS
Check JE
Certification
Original Sheet Size = A1
Drawing Number 42896_P01-02
Revision A

EXISTING LEP LAND ZONING MAP

Zone

B1	Neighbourhood Centre
B2	Local Centre
B3	Commercial Core
B4	Mixed Use
B5	Business Development
B6	Enterprise Corridor
B7	Business Park
C1	National Parks and Nature Reserves
C2	Environmental Conservation
C3	Environmental Management
IN1	General Industrial
IN2	Light Industrial
IN3	Heavy Industrial
R1	General Residential
R2	Low Density Residential
R5	Large Lot Residential
RE1	Public Recreation
RE2	Private Recreation
RU1	Primary Production
RU2	Rural Landscape
RU3	Forestry
RU4	Primary Production Small Lots
RU5	Village
SP2	Infrastructure
SP3	Tourist
W1	Natural Waterways
W2	Recreational Waterways



EXISTING LEP LAND ZONING MAP PLAN

REDUCTION RATIO 1:3000 @ A1
1:6000 @ A3

SCALE 1:3000(A1)

0 20 40 80 120 160 200

0 20 40 80 120 160 200

SCALE 1:6000(A3)

PRELIMINARY DRAWING
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Client: SQUADRON ENERGY
Project: PLANNING PROPOSAL
KESWICK ESTATE - DUBBO
Drawing Title: EXISTING LAND ZONING MAP
LOT 101 DP 1301426

Rev	Date	Amendment
A	19.03.2025	PRELIMINARY

Survey --
Drawn NS
Check JE
Certification
Original Sheet Size = A1
Drawing Number 42896_P01-03
Revision A

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PROPOSED LAND ZONING MAP

Zone

- B1 Neighbourhood Centre
- B2 Local Centre
- B3 Commercial Core
- B4 Mixed Use
- B5 Business Development
- B6 Enterprise Corridor
- B7 Business Park
- C1 National Parks and Nature Reserves
- C2 Environmental Conservation
- C3 Environmental Management
- IN1 General Industrial
- IN2 Light Industrial
- IN3 Heavy Industrial
- R1 General Residential
- R2 Low Density Residential
- R5 Large Lot Residential
- RE1 Public Recreation
- RE2 Private Recreation
- RU1 Primary Production
- RU2 Rural Landscape
- RU3 Forestry
- RU4 Primary Production Small Lots
- RU5 Village
- SP2 Infrastructure
- SP3 Tourist
- W1 Natural Waterways
- W2 Recreational Waterways

WELLINGTON ROAD
HINDMARSH ESPLANADE
ESPLANADE
CIRCUIT
SCOPE
CAPSTAN DRIVE
AVENUE
HARPER
HINDMARSH
KESWICK PARKWAY
CIRCUIT
LANE
DURUM
WHEELERS
BOUNDARY
HENTY AVE
SHERATON
ROAD
ROAD
RFBI DUBBO
MASONIC VILLAGE
B5
DUBBO
CHRISTIAN SCHOOL
LOT 1011
DP 1261855
DP 270326
3
1
2
RE2
LOT 101
DP 1301426
ST JOHNS
COLLEGE
LOT 2492
DP 623366
LOT 2
DP 1261522
LOT 102
DP 1301426
R1
R2
RE1
RE2
B1
M.G.A.

PROPOSED LAND ZONING MAPPING PLAN

REDUCTION RATIO 1:3000 @ A1
1:6000 @ A3

SCALE 1:3000(A1)
0 20 40 80 120 160 200
0 20 40 80 120 160 200
SCALE 1:6000(A3)

PRELIMINARY DRAWING
Not to be used for construction purposes

barnson.
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Client: SQUADRON ENERGY
Project: PLANNING PROPOSAL
KESWICK ESTATE - DUBBO

Drawing Title: PROPOSED LAND ZONING MAP
LOT 101 DP 1301426

Rev	Date	Amendment
A	19.03.2025	PRELIMINARY

Survey --
Drawn NS
Check JE
Original Sheet Size = A1

Certification

Drawing Number 42896_P01-04

Revision A