



AEP

BIODIVERSITY | BUSHFIRE | ARBORICULTURE
NEWCASTLE SYDNEY CENTRAL COAST

Streamlined Biodiversity Development Assessment Report

Proposed Residential Subdivision

Stage 97 Waterford Living (Lot 9120 DP1295941 and Lot 9400 DP1313704)



**Prepared for: Avid Property Group
C/- ADW Johnson Pty Ltd**

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Revision

Revision	Date	Authors	BAAS No.
00	05/05/2026	Natalie Black	19076

Client Distribution

Revision	Date	Name	Organisation
00	05/05/2026	Mark Kelly	ADW Johnson

Executive Summary

Anderson Environment & Planning (AEP) was commissioned by ADW Johnson Pty Ltd on behalf of AVID Property Group (the Client) to undertake a Streamlined Biodiversity Development Assessment Report (SBDAR) for the Stage 97 Waterford Living Development at 2 Settlers Boulevard (Lot 9120 DP1295941 and Lot 9400 DP1313704) within Waterford Living Estate, Chisholm, NSW, 2322.

The Subject Land is located within the Maitland Local Government Area (LGA) in the Hunter Region of NSW, and both lots are zoned R1 – General Residential. The proposed development is for a residential subdivision within the entirety of Lot 9120 DP1295941 and partial section of Lot 9400 DP1313704, as part of proposed Stage 97 development within the Waterford Living Estate. The development will occur in two stages with Lot 9400 DP1313704 (Stage 97A hereafter) occurring first and Lot 9120 DP1295941 (Stage 97B hereafter) second.

Stage 97A occupies the eastern portion of the Subject Land and is characterised by a predominantly native tree canopy with a managed understory. Stage 97B forms the western portion of the Subject lands and contains an active café (the Kitchen at Waterford), managed lawn, a car park, and native garden bed.

Within the Subject Land, one (1) Plant Community Type (PCT) was identified:

- PCT 3433 – *Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest*

The proposal will impact the following:

- 0.51ha of native vegetation (PCT 3433);
- 0.79ha of planted vegetation assessed under the Biodiversity Assessment Method: Streamlined assessment module – Planted native vegetation; and
- 0.69ha of non-native vegetation and existing structures, including roads and pathways.

This PCT is commensurate with the BC Act listed Endangered Ecological Community (EEC), *Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions*.

This report has been prepared to meet the requirements of the Biodiversity Assessment Method 2020 (BAM) established under Section 6.7 of the NSW *Biodiversity Conservation Act 2016* (BC Act). This assessment utilises methods applicable to the “Streamlined Assessment Module for Small Area Developments”, detailed within the BAM, to identify biodiversity values inherent within the site, including known and potentially occurring threatened species and ecological communities, and quantifies impacts of the proposal upon these values.

Fauna and flora species recorded were typical of those expected in this locality and in this type of remnant habitat with minimal connectivity to surrounding vegetation offsite. No candidate Serious and Irreversible Impact (SAIL) fauna or flora species were identified during field surveys.

The project design has been developed to utilise, where possible, the areas of low biodiversity values that have been subjected to historic impacts and disturbances. Avoid and minimise has been considered through the development placement, and retention of eleven (11) native trees, representing approx. 0.09ha of native tree canopy as identified in Arborist Impact Assessment (AEP, 2025). Remaining impacts are proposed to be offset.

Residual impacts to native biodiversity were assessed within the Subject Land, resulting in the calculation of biodiversity offset credits obligations. The proposal will incur 12 biodiversity offset credits of *Lower Hunter Spotted Gum – Ironbark Forest* to offset 0.51ha of clearing of PCT 3433. Assessment of the proposal under other relevant Acts and environmental policy instruments where applicable has been undertaken (**Appendix E**), including but not limited to:

- *NSW Water Management Act 2000* (WM Act). The Subject Land does not contain any waterfront land, and no further assessment is required;
- *NSW Fisheries Management Act 1994* (FM Act). No water land occurs within the Subject Land. A Dredge and Reclamation Permit will not be required;
- *NSW State Environmental Planning Policy (Biodiversity and Conservation) 2021* (BC SEPP) *Chapter 4 Koala Habitat Protection 2021*. The proposal is subject to this section of the BC SEPP and a Koala Assessment Report was prepared. No impact to Koala is anticipated;
- *NSW State Environmental Planning Policy (Resilience and Hazards) 2021* (RH SEPP) *Chapter 2 Coastal Management*. The Subject Land is not mapped on the Coastal Management maps. No further assessment is required; and
- *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). A preliminary assessment of impacts to Matters of National Environmental Significance indicates that a referral under the EPBC Act is unlikely to be required.

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Shortened Terms

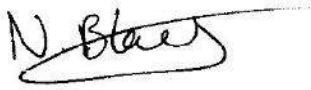
Assessment Area	Area within a 1500m buffer of the Subject Land.
APZ	Asset Protection Zone.
BAM	Biodiversity Assessment Method Order (2020) that determines: • Methodology applicable to quantifying biodiversity values inherent within a development site; • Avoid and mitigation efforts required to be employed as part of any development proposal; and • Number and class of credits required to offset residual impacts of the proposal upon the biodiversity values therein.
BC Act	<i>Biodiversity Conservation Act 2016 (NSW).</i>
Biodiversity Credit Report	Specifies the number and type of biodiversity credits required to offset the impacts of a development.
BAM Calculator	The online tool used to interpret site survey data and regional location information to quantify ecosystem and species credits required / generated at a development / stewardship site.
Biodiversity credits	Ecosystem or Species Credits required to offset the loss of biodiversity values on a development site.
Biodiversity offsets	Specific measures that are put in place to compensate for impacts on biodiversity values.
Biodiversity values	The composition, structure, and function of ecosystems, and threatened species, populations and ecological communities, and their habitats.
BRW	Biodiversity Risk Weighting.
CEEC	Critically Endangered Ecological Community.
Council	Maitland City Council.
DAWE	Former Commonwealth Department of Agricultural, Water and Environment.
CDCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water.
DCCEEW	NSW Department of Climate Change, the Environment and Water
DoEE	Former Commonwealth Department of Energy and the Environment.
DPE	Former NSW Department of Planning and Environment.
DPIE	Former NSW Department of Planning, Industry and Environment.
DPIRD	NSW Department of Primary Industries and Regional Development
Ecosystem credit	The class of biodiversity credits created or required for the impact on EECs, CEECs and threatened species habitat for species that can be reliably predicted to occur within a vegetation type.
EEC	Endangered Ecological Community.

EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i> .
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> .
IBRA	Interim Biogeographic Regionalisation for Australia.
LLS Act	NSW <i>Local Land Services Act 2013</i> .
HBT	Hollow-bearing tree as defined in the BAM.
OEH	Former NSW Office of Environment and Heritage.
PFC	Projected Foliage Cover.
SEARs	Secretary's Environmental Assessment Requirements.
SSD	State Significant Development.
Study Area	The Study Area includes all of Lot 9120 DP 1295941 and the south-western corner of Lot 9400 DP 1313704. The Study Area was investigated to identify areas suitable for development.
Subject Land	Is land subject to a development, activity or clearing proposal.
Species credit	Class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area based on habitat surrogates.
SVTM	NSW State Vegetation Type Map.
TBDC	Threatened Biodiversity Data Collection.
TEC	Threatened Ecological Community.
VIS	Vegetation Integrity Score.

Declarations

i. Certification under clause 6.15 *Biodiversity Conservation Act 2016*

I certify that this report has been prepared based on the requirements of, and information provided under, the Biodiversity Assessment Method and clause 6.15 of the *Biodiversity Conservation Act 2016* (BC Act).

Signature: 
Date: 05/05/2026
BAM Assessor Accreditation no: 19076

This SBDAR has been prepared to meet the requirements of the BAM 2020. **Appendix B** provides an assessment of compliance with the minimum information requirements outlined in BAM Appendix L.

Research was conducted under the following licences:

- NSW National Parks and Wildlife Service Scientific Investigation Licence SL101313;
- Animal Research Authority (Trim File No: 14/600(2)) issued by NSW Agriculture; and
- Animal Research Establishment Accreditation Number 80700.

As the principal author and certifier, I, Natalie Black (BAAS: 19076), make the following certification:

- This report has been written to comply with the requirements of the BAM 2020 and obligations outlined within the BAM Assessor Code of Conduct and includes, in the opinion of the writer, a true and accurate account of the species recorded, or considered likely to occur within the Study Area, and inferences of such for biodiversity credit calculations;
- Anderson Environment and Planning have no actual, potential or perceived conflicts of interest with AVID Property Group or ADW Johnson. Anderson Environment and Planning has received commercial payment for consulting services and assessment by AVID Property Group or ADW Johnson for this project;
- BAM Assessment methodology, as well as Commonwealth, state and local government policies and guidelines formed the basis of project surveying methodology, unless specified departures from industry standard guidelines are justified for scientific and/or animal ethics reasons;
- All research workers have complied with relevant laws and codes relating to the conduct of flora and fauna research, including the *Animal Research Act 1995*, *Biodiversity Conservation Act 2016* and the *Australian Code of Practice for the Care and Use of Animals for Scientific Purposes*; and
- This report has been written to comply with the requirements of the *Biodiversity Conservation Act 2016* and *Biodiversity Conservation Regulation 2017* as outlined in the below Table.

Principal Author and Certifier:

Natalie Black

Senior Environmental Manager

Anderson Environment & Planning

BAAS no. 19076

Calculator Ref: 00057954/BAAS19076/25/00057955

05 May 2026

Biodiversity Conservation Act, 2016 (BC, Act) Section 6.15 Currency of biodiversity assessment report	
1. A biodiversity assessment report cannot be submitted in connection with a relevant application unless the accredited person certifies in the report that the report has been prepared on the basis of the requirements of (and information provided under) the biodiversity assessment method as at a specified date and that date is within 14 days of the date the report is so submitted.	I, Natalie Black (BAAS: 19076) declare that I prepared the SBDAR for the relevant application on the basis of the requirements within BAM 2020 as at the specified date (below).
2. A relevant application is an application for planning approval, for vegetation clearing approval, for biodiversity certification or in respect of a biodiversity stewardship agreement.	Not applicable to this application.
<i>Biodiversity Conservation Regulation, 2017 (BC Regulations) Clause 6.8 Content of biodiversity development assessment reports (section 6.16)</i>	
A biodiversity development assessment report must include—	
1. the number and classes of biodiversity credits required to be retired in accordance with the like-for-like requirements of the offset rules, and	Addressed within Section 11 of this SBDAR and Appendix L .
2. the number and classes of biodiversity credits that could be retired in accordance with the variation rules (in any case in which the proponent of the development proposes to use the variation rules), and	Addressed within Section 11 of this SBDAR and Appendix L .
3. details of any proposal to fund a biodiversity conservation action in accordance with the offset rules, and	Not applicable to this application.
4. details of any ecological rehabilitation of a site impacted by mining under a mining lease that is proposed as a measure to offset or compensate for those impacts, and	Not applicable to this application.
5. the date of the report and the requisite certification under section 6.15 of the Act, and	As below.
6. details of the accreditation of the person preparing the report and of the qualifications and experience of any other person commissioned to conduct research or investigations that are relied on in preparing the report, and	As above and Appendix N .
7. any other information required by the biodiversity assessment method or ancillary rules to be included in the report.	Refer Appendices for contributing investigations, results and contributing reports prepared by other Professional consultants.
6.5 Ancillary rules of Environment Agency Head for purposes of biodiversity offset and variation rules	
(4) If the ancillary rules are changed, a biodiversity assessment report may, during the period of 90 days after the rules were changed, be prepared on the basis of the rules in force before the change, but only if the report states that it has been prepared on that basis.	This report has been prepared in accordance with all ancillary rules prior to 90 days from the date of certification. All ancillary rules after the 90 days have not been included in this assessment.

ii. Details and experience of author/s and contributors

This report was written and certified by Natalie Black (BAAS: 19076) of Anderson Environment & Planning. The below table acknowledges the Contributing Ecologists who undertook, fieldwork, research or investigations, data analysis, and mapping that are relied on in preparing the report.

Name	Position/Role and Qualifications	Tasks Performed
Natalie Black	Senior Environmental Manager / Works Coordinator BSc (Hons), Master Planning, Cert IV (TA) BAAS: 19076	Accredited Assessor, Contributor and conducting research or investigations that are relied on in preparing the report.
Brendon Young	Senior Ecologist BSc; Master Env Mgt (Water Resources); Grad cert Fish Cons and Mgt	Contributor, conducting research or investigations that are relied on in preparing the report.
Kathleen Bushell	Ecology Project Manager B.Sc. (Marine Bio & EnvSc Mgt) (Hons)	Contributor, conducting research or investigations that are relied on in preparing the report.
Stephen Curry	Ecologist/Botanist B.EnvSc & Mgt (Ecosystems and Biodiversity) Cert III, Dip - Cons & LndMgt	Contributor, conducting research or investigations that are relied on in preparing the report. Targeted threatened flora surveys and BAM Plot surveys.
Emma O'Dwyer-Hall	Ecologist B.EnvSc (Wildlife and Conservation Biology) (Hons)	Contributor, conducting research or investigations that are relied on in preparing the report.
Callum Reedman	Ecologist/Botanist Cert III, Dip - Cons & LndMgt	Contributor, conducting research or investigations that are relied on in preparing the report. Flora surveys.
Neve Eardley	Ecologist Bsc EnvSc & Mgt	Contributor, conducting research or investigations that are relied on in preparing the report.

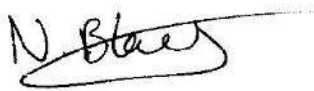
iii. Conflict of Interest

I declare that I have considered the circumstances and there is no actual, perceived or potential conflict of interest.

There are no known conflicts of interest between AEP staff or Directors and the proponent of the development or their agents. AEP has received commercial payment from AVID Property Group or ADW Johnson for provision of professional consulting services in the assessment and production of this SBDAR and other associated documents.

This declaration has been made in the interests of full disclosure to the decision-maker. Full disclosure has also been provided to the client.

Signature:

A handwritten signature in black ink, appearing to read 'N. Blais', is written over a horizontal line.

Signature:

Date: 05/05/2026

BAM Assessor Accreditation no: 19076

Stage 1 – Biodiversity Assessment

1.0 Introduction

1.1 Proposed Development

1.1.1 Development Overview

The proposed development is a Residential Subdivision within the entirety of Lot 9120 DP1295941 and the south-western section of Lot 9400 DP 1313704 as part of Stage 97 development within the Waterford Living Estate. The development will occur in two stages with Lot 9400 DP 1313704 (Stage 97A hereafter) occurring first and Lot 9120 DP1295941 (Stage 97B hereafter) second.

1.1.2 Location

The proposed development (the Subject Land) is located at 2 Settlers Boulevard (Lot 9120 DP1295941 and Lot 9400 DP 1313704) within Waterford Living Estate, Chisholm NSW 2322 (refer **Figure 1**). The Subject Land is situated within the Maitland Local Government Area (LGA) in the Hunter Region of NSW (refer **Figure 2**). Both Lots fall under R1 – General Residential under the Maitland Local Environmental Plan 2011 (LEP).

The location of the Subject Land in relation to the wider area is shown in **Figure 2**.

1.1.3 Proposed Development and the Subject Land

Stage 97A is situated within the eastern section of the Subject Land and is comprises predominantly native tree canopy with managed understory Stage 97B makes up the western end of the Subject Land and comprises of an active café (the Kitchen at Waterford), managed lawn, carpark and gardens.

The proposed development is for a residential subdivision and will include the following works:

- Demolishing of existing structures;
- Partial removal of existing exotic and native vegetation; and
- Subdivision and associated infrastructure.

The proposed development layout is shown in **Appendix A** and site details in **Table 1**.

The Subject Land totals 2.21ha (**Figure 1**). Retained native vegetation covers approx. 0.09ha. The operational and construction footprint cover approx. 2.12ha.

Table 1 – Site Details

Detail	Comments
Client	AVID Property Group
Address	Waterford Living Estate, 2 Settlers Boulevard Chisholm, 2322, NSW
Title(s)	Lot 9120 DP 4129594 and Lot 9400 DP 1313704
Study Area	The Study Area (2.21ha) encompasses the entirety of Lot 9120 DP 4129594 and the south-western section of Lot 9400 DP 1313704 (Figure 1).
Subject Land	The Subject Land (2.21ha) consists of the entirety of the Study Area, comprising the Development Boundary, which will include 14 proposed lots and a connecting road.
LGA	Maitland City Council

Detail	Comments
Zoning	R1 – General Residential (pub. 26-4-2023) under Maitland City Council Local Environmental Plan 2011 (pub. 21-4-2023).
Current Land Use	The Study Area consists of two (2) lots, each currently used in different ways. Lot 9400 DP 1313704 (Stage 97A) is a large parcel, of which only the small south-western corner lies within the Study Area. This portion supports native tree canopy with a partially managed understorey and is not currently used for any commercial or residential purpose. Lot 9120 DP 1295941 (Stage 97B) is used commercially and contains an operating café (The Kitchen at Waterford), Waterford Living by AVID Property Group, and a managed lawn and native garden that occupy most of the Site.
Surrounding Land Use	The Study Area is bounded by Raymond Terrace Road to the south, Settlers Boulevard to the west, and Cora Way to the north, all of which contain predominantly residential estates. To the east lies a wildlife 'opportunity corridor' mapped within the Maitland City Council Greening Plan, extending from south of Raymond Terrace Road to the far north. This corridor is separated from the Study Area by a strip of cleared land previously approved for development (Stage 71 and 72 of Waterford Living), located immediately adjacent to the Study Area.

1.1.4 Other Documentation

The following documentation relevant to biodiversity has been submitted with the proposed development:

- Arborist Impact Assessment (AEP, 2025); and
- Bushfire Assessment Report (AEP, 2026).



Figure 1 – Site Map



Figure 2 – Location Map

1.2 Biodiversity Offsets Scheme Entry

This SBDAR has been triggered as required under Clause 7.1 *Biodiversity Conservation Regulation, 2017* by the following thresholds:

- 1 (a) the clearing of native vegetation of an area declared by clause 7.2 as exceeding the threshold, or
- 1 (b) the clearing of native vegetation, or other action prescribed by clause 6.1, on land included on the Biodiversity Values Map published under clause 7.3.

Area Clearing Threshold

The Area Clearing threshold trigger is defined as follows; “The area threshold varies depending on the minimum lot size (shown in the Lot Size Maps made under the relevant Local Environmental Plan (LEP)), or actual lot size (where there is no minimum lot size provided for the relevant land under the LEP). The area threshold applies to all proposed native vegetation clearing associated with a development proposal”.

The minimum lot size within the Study Area has been specified in the LEP as 450m², which falls within the minimum lot size category of <1ha and consequently the area clearing threshold of **0.25 ha** applies (refer **Table 2**). The development requires the removal of approximately 0.51ha of native vegetation which triggers assessment under the BOS. The BAM Streamlined assessment module – Planted native vegetation was utilised to assess 0.79ha of planted native vegetation and was not included in the clearing threshold assessment.

Table 2 – Area Clearing Thresholds (BC Act)

Minimum Lot Size	Threshold for Clearing, above which the BOS applies
< 1ha	>0.25ha
1ha to <40ha	>0.5ha.
40ha to <1000ha	>1.0ha
>1000ha	>2ha

In accordance with Appendix C: Streamlined assessment module – Small area of the BAM, the impact to native vegetation is less than the applicable area clearing limit of 1.0ha, such that this module can be used to assess the proposal.

Biodiversity Values Map

The Biodiversity Values Map (BV Map) identifies land with high biodiversity value, as defined by the *Biodiversity Conservation Regulation 2017*. The Biodiversity Offsets Scheme (BOS) applies to all local developments, major projects, or the clearing of native vegetation where the SEPP (Vegetation in Non-Rural Areas) 2017 applies. Any of these will require entry into the BOS if they occur on land mapped on the BV Map. Exempt and complying development or private native forestry are not subject to the Biodiversity Offsets Scheme.

The Subject Land does not contain BV Mapped land (refer **Appendix C - Biodiversity Values Map and Threshold Report**). As such, no impacts to BV mapped land will occur as part of this development, and entry into the BOS has not been triggered by impacts to BV Mapped Land.

Assessment Scope

As the area clearing threshold has been exceeded, a BDAR is required and is eligible to be produced under the provisions of the streamlined assessment module for small area developments of the BAM.

1.3 Excluded Impacts

The site contains land excluded from the LLS Act under the NSW *Local Land Services Act 2013* (LLS Act). The Native Vegetation Regulatory Map (NVR Map) is still in a draft stage; this draft was first published on 5 October 2022 and updated 7 February 2025 and there are currently two interim maps:

- *In force*: Transitional Native Vegetation Regulatory Map (DCCEEW 2024e); and
- *No legal effect*: Draft Native Vegetation Regulatory Map (DCCEEW 2024f).

Category 1 - exempt land does not occur within the Study Area.

1.4 Matters of National Environmental Significance

A Protected Matters Search of an area of 5km radius of the Subject Land was conducted in April 2026 for Matters of National Environmental Significance as relevant to the EPBC Act. The following Matters of National Significance are considered in this assessment.

World Heritage Properties:

The site is not a World Heritage area and is not in proximity to any such area.

National Heritage Places:

The site is not a National Heritage place, and it is not in proximity to any such place.

Wetlands of International Significance (declared Ramsar wetlands):

The Study Area is located approximately 9-10km upstream of one (1) Wetland of International Significance – the Hunter Estuary Wetlands. The Study Area is not within nor adjacent to the wetland; therefore, the development is not likely to have an impact on the wetland.

Great Barrier Reef Marine Park:

The site is not part of, or within close proximity to, the Great Barrier Reef Marine Park.

Commonwealth Marine Areas:

The site is not part of, or within close proximity to, any Commonwealth Marine Area.

Threatened Ecological Communities:

From a search of the EPBC Act Protected Matters database:

Two (2) Critically Endangered Ecological Communities (CEECs) were considered likely to or may occur within a 5km radius of the Study Area:

- *Central Hunter Valley eucalypt forest and woodland*; and
- *River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria*.

Three (3) listed Endangered Ecological Communities (EECs) were considered likely to or may occur within a 5km radius of the Study Area:

- *Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community*;
- *Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland*; and

- *Kurri sand swamp woodland of the Sydney Basin bioregion.*

PCT 3433 is not associated with any EPBC Act listed Threatened Ecological Communities (TECs). Further investigation was undertaken to determine if PCT 3433 contains similarities to EPBC Act listed TECs identified in the Protected Matters Search. There were similarities noted between aspects of PCT 3433 and the EPBC Act listed Critically Endangered Ecological Community (CEEC) *Central Hunter Valley eucalypt forest and woodland*. However, the presence of contra-indicative species such as *Eucalyptus acmenoides* within BAM plot data (**Appendix I**) indicates that the vegetation community within the Subject Land is not commensurate with the EPBC Act listed CEEC (refer **Table 10**). No further assessment is necessary.

Threatened Species:

The EPBC Act Protected Matters database search found 61 listed threatened species recorded within a 5km radius of the Study Area. Using local BioNet records within the 1500m Assessment Area (**Figure 5**), the species list was narrowed down to five (5) potential listed species with potential to occur on Site. A likelihood of occupancy assessment was then conducted using field inspections/surveys and Historic BioNet records and species information. The complete assessment is found in **Appendix D**.

Due to the highly degraded nature of the Study Area no threatened species listed under the EPBC Act are considered likely to occupy the site to a degree that they would be impacted by this development.

Migratory Species:

The EPBC Act Protected Matters database search found 28 listed migratory species have potential to utilise the site on an irregular basis. Thirteen (13) of these are listed as EPBC Act threatened species and of these only two (2) contain BioNet records within a 1500m radius (the assessment area) of the Study Area; these have been assessed above. The limited number and sporadic nature of records close to the Study Area appear to reflect opportunistic rather than regular use of any habitat considered of importance to any threatened species.

It is not considered that the development of this land is likely to significantly affect the availability of potential habitat for such mobile species, or disrupt migratory patterns.

EPBC Act Assessment Conclusion:

No Matters of National Environmental Significance (specifically in this instance threatened species, threatened ecological communities or listed migratory species) are expected to be impacted upon significantly as a result of the proposal. Therefore, an EPBC Act Referral is considered unlikely to be required.

1.5 Information Sources

Information and spatial data provided within this SBDAR has been compiled from various sources, including:

- Aerial Photograph Interpretation (API) of the site and surrounding locality (Google, Bing, Nearmap);
- Current and historical photographs of the Study Area;
- Survey data collected within the Study Area (June - July 2025);
- Draft and Transitional Native Vegetation Regulatory (NVR) Map;
- Land-use mapping which identifies existing and historical agricultural land use in New South Wales under the Australian Land Use and Management (ALUM) Classification as shown in the NSW Landuse Map (2017);

- State survey guidelines (DPIE 2020a, DPIE 2020c, DPIE 2021, DPE 2022);
- *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities. Working Draft* (DEC, 2004).
- *NSW State Vegetation Type Map* (DCCEEW, 2025);
- eSPADE Soil profiles and Data (<https://www.environment.nsw.gov.au/eSpade2Webapp>);
- NSW DCCEEW BAM – Important Areas Map to determine whether the site is mapped as Swift Parrot, Regent Honeyeater, Migratory Shorebird and/or Plains-wanderer Important Areas;
- PlantNET NSW (<http://plantnet.rbgsyd.nsw.gov.au/>);
- Anecdotal records;
- Review of flora and fauna records held by the DCCEEW Atlas of NSW Wildlife within a 10km x 10km polygon with the Subject Land at the centroid (April 2026) and within the wider Maitland LGA; and
- Review of flora and fauna records held by the DCCEEW Protected Matters Search Tool within a 5km radius of the site (April 2026).

2.0 Methods

2.1 Site Context Methods

2.1.1 Landscape Features

Landscape features were identified according to Section 3.1 of the BAM using a combination of desktop review and field survey methods. This included:

- Review of International Biographic Regionalisation for Australia (IBRA) regions and subregions;
- Assessment of habitat connectivity;
- Assessment of rivers, streams, estuaries and wetlands;
- Review of the register of Areas of Outstanding Biodiversity Value;
- Identifying vegetation types, dominant canopy, mid-storey and groundcover species;
- Defining vegetation formation and class; and
- Assessing landform and landscape design.

Habitat assessment field surveys were conducted in June 2025 and included

- General assessment of habitat values via a walkover of the Subject Land;
- Hollow-bearing tree survey and search for stick nests; and
- Assessment of the presence of water features, ground logs and bush rocks.

2.1.2 Native Vegetation Cover

The percentage native vegetation cover was assessed according to Section 3.2 of the BAM, and a 1500m buffer was applied to the edge of the Study Area. Native vegetation was ground-truthed within the Study Area through field surveys in June - July 2025.

Native vegetation within the broader 1500m was identified through the analysis of vegetation datasets and satellite imagery, as shown in **Figure 2**.

2.2 Native Vegetation

2.2.1 Existing Information

Plant Community Types (PCTs) within the Subject Land were determined according to BAM Section 4.2. The State Vegetation Type Map (SVTM) was interrogated to determine the likely ecological communities present within the site as shown in **Figure 3**.

Ground-truthing of vegetation by AEP in June 2025 was the primary source of data for PCT determination in the present assessment. This included an assessment of dominant species, landscape position, geomorphology, and vegetation structure. All vegetation communities within the Subject Land were identified and assessed against relevant Threatened Ecological Communities (TECs).

An assessment of the BC Act listed EEC associated with the PCT identified on site is provided in **Section 4.2.6** of this report.

2.2.2 Mapping Native Vegetation Extent

Flora surveys were undertaken by AEP in June 2025 to ground-truth native vegetation, determine PCTs and condition classes, derive vegetation community types, and meet relevant survey guidelines. This involved the use of plot-based surveys is described in Section 2.2.3.

2.2.3 Plot-Based Floristics Surveys

Plot-based floristic surveys were undertaken by AEP in June 2025 to identify the most likely PCTs within the Subject Land. The surveys were stratified and targeted to assess the expected environmental variation and address any gaps in existing mapping and information. Surveys included:

- Ground-truthing of regional vegetation mapping to identify all vegetation communities present onsite as well as segregate vegetation zones according to condition and current management practices;
- Identification of all vascular plant species encountered during fieldwork. Subject Land coverage was both systematic to ensure all key points of the site were checked, and therein the Random Meander Technique (Cropper 1993) was utilised to maximise species encountered;
- The plot-based floristic vegetation survey is based on a 20m × 20m plot (or 400m² equivalent for linear areas). The assessor must assess the plot for the information contained in Table 1 of the BAM and record the data in the SBDAR;
- Two (2) BAM plots and one (1) Rapid Data Point (RDP) were undertaken within the Subject Land by AEP within remnant native vegetation and apparent vegetation zones. All plots were located randomly following a preliminary site inspection. Minor modifications to plot locations were made on site due to factors such as ecotones and proximity to disturbed edges.

A summary of the plot data and field sheets are provided in **Appendix I**. The location of BAM plots and ground-truthed vegetation mapping is provided in **Figure 4**.

2.2.4 Vegetation Integrity Survey

The total area of each vegetation zone was calculated using ArcGIS Pro spatial analytics software, and the minimum number of BAM plots required was based on Table 3 of the BAM. BAM plots were located within parts of the vegetation zone that were most representative.

2.3 Threatened Flora Survey Methods

2.3.1 Review of Existing Information

A review of literature and datasets was undertaken to develop a list of species to be targeted during the threatened flora species surveys including:

- NSW BioNet Atlas – search within the Assessment Area. Further consideration was given to species that have been recorded with the Maitland LGA;
- Protected Matters Search Tool (PMST) (DCCEEW 2026) within a 5km buffer;
- NSW BioNet Threatened Biodiversity Data Collection (TBDC); and
- The Biodiversity Assessment Method Calculator (BAM-C).

Surveys were undertaken in compliance with applicable guidelines, namely *Surveying threatened plants and their habitats - NSW survey guide for the Biodiversity Assessment Method* (DPIE, 2020). Flora species were assessed against the habitat features identified within the Subject Land to determine the suitability of the area to support these species. This involved cross-referencing species information in

the TBDC and scientific literature with relevant information from the site. The small area module only requires assessment of species listed as at risk of SAIL.

2.3.2 Habitat Constraints Assessment

Habitats and microhabitats were assessed in June 2025 to identify specific habitats and microhabitats for threatened species within the Subject Land. Exclusions were made based on habitat constraints, geographic limitations, or microhabitat requirements.

2.3.3 Field Surveys

Vegetation surveys were conducted from June 2025 to July 2025 by AEP Ecologists. Threatened flora surveys were undertaken for candidate SAIL species in accordance with the BAM and methods described in the threatened flora survey guidelines where relevant (DPIE 2020). Threatened flora surveys were conducted within areas of suitable habitat within the Subject Land as shown in **Figure 5**.

2.4 Threatened Fauna Survey Methods

2.4.1 Review of Existing Information

Threatened fauna were surveyed utilising information sources described in Section 2.3.

2.4.2 Habitat Constraints Assessment

Habitat assessment was undertaken by AEP in June 2025 which involved analysis of specific habitats that could be used by threatened species such as hollows, Koala feed trees, Hollow Bearing Trees (HBTs) watercourses, rocky outcrops and other features that could be utilised by threatened species.

The following candidate threatened species were excluded from assessment based on habitat constraints, geographic limitations, or microhabitat requirements, as further detailed in **Section 5.1.2**:

- Brush-tailed Rock-wallaby (*Petrogale penicillata*);
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*);
- Large-eared Pied Bat (*Chalinolobus dwyeri*);
- Little Bent-winged Bat (*Miniopterus australis*);
- Eastern Cave Bat (*Vespadelus troungtoni*);
- Regent Honeyeater (*Anthochaera phrygia*); and
- Swift Parrot (*Lathamus discolor*).

2.4.3 Field Surveys

Fauna surveys were conducted in June 2025. Threatened fauna surveys were undertaken in accordance with the BAM and methods described in the following guidelines:

- NSW Department of Environment and Conservation (2004) *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities*;
- NSW Department of Planning and Environment (2022) *Koala (Phascolarctos cinereus) Biodiversity Assessment Method Survey Guide*;
- NSW Department of Planning, Industry and Environment (2021) *'Species credit' threatened bats and their habitats NSW survey guide for the Biodiversity Assessment Method*

2.5 Weather Conditions

The surveys undertaken and the environmental conditions during field surveys are shown in **Table 3**.

Table 3 – Environmental Conditions during Threatened Species Surveys

Survey Undertaken	Date	Time	Temp (°C) min & max	Max Wind Gust (km/h)	Rainfall mm	Other Condition if Relevant
<i>Eucalyptus pumila</i> (Pokolbin Mallee) 20m-40m Transects	30/07/2025	1100-1215	12.5	20	0.4mm	N/A

2.5.1 Limitations

This site is subject to heavy ongoing management, with vegetation regularly slashed and minimal groundcover present. Furthermore, the site is heavily fragmented, bounded by roads, cleared areas, fences from adjacent areas of higher quality bushland, which limits recruitment of local fauna into the site. Therefore, this site is much more likely to be used by highly mobile fauna species as opposed to any requiring direct site access.

Research was conducted under the following licences:

- NSW National Parks and Wildlife Service Scientific Investigation Licence SL101313;
- Animal Research Authority (Trim File No: 14/600(2)) issued by NSW Agriculture; and
- Animal Research Establishment Accreditation Number 80700.

3.0 Site Context

3.1 Assessment Area

The Assessment Area for the Project includes the Subject Land (proposal footprint) and the land located within 1500m of the site as shown in **Figure 2**. The Assessment Area is approximately 795ha and primarily consists of residential buildings to the north-east and south-west, farmland to the north west and a marginal bushland corridor moving through the centre of the Assessment Area.

3.2 Landscape Features

Landscaped features within the Assessment Area and Subject Land are depicted in **Figure 2**, and discussed in further detail in **Table 4**.

Table 4 – Landscape Feature Assessment

Landscape Feature	Assessment
IBRA	Sydney Basin
Sub-IBRA	Hunter
Rivers and Streams	There are no mapped hydroareas or hydrolines within the Study Area or Subject Land. As such, assessments under the <i>Fisheries Management Act 1994</i> and the <i>NSW Water Management Act 2000</i> are not required for this development.
Wetlands	No Wetlands (listed or otherwise) are mapped within the Study Area or Subject Land. Coastal Wetland mapping published under <i>Chapter 2 Coastal Management of State Environmental Planning Policy Planning (Resilience and Hazards 2021)</i> indicates the occurrence of coastal wetlands approx. 1.2km east of the Subject Land. The wetlands are known locally as Woodberry Swamp.
Native Vegetation Extent	The Native vegetation extent within the Assessment Area is 234.56ha (29.51%). Within the Subject Land, one (1) PCT was identified – PCT 3433: <i>Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest</i> – Poor (0.74 ha). Additionally, 0.79 ha of Planted Native Vegetation (<i>Cynodon Dactylon</i> grassland) is present within the Subject Land.
Connectivity Features	Habitat value within the broader Study Area is minimal, with the highest level of habitat value located within the south-east corner of the site where a native canopy is located with a managed and cleared understory. Connectivity within the Study Area to habitat on adjacent lots is minimal. The west and north of the site is bounded by residential houses located within the Waterford living estate. The south of the site is bounded by Raymon Terrace Road, fragmenting the site from an intact bushland which forms part of the wildlife “opportunity corridor” (discuss further below). Approximately 130m east of the Study Area is a strip of intact bushland which has been mapped as a wildlife “opportunity corridor” within the Maitland City Council Greening Plan 2002. This wildlife corridor spans to the far north and far south of the assessment area (down past Raymond Terrace Road), which forms the majority of native vegetation within the Assessment area and has already been mitigated from impact within the Waterford Living Stage 71 & 72 plans as per the approved <i>Stage 71 & 72 Waterford Living</i>

Landscape Feature	Assessment
	<i>Biodiversity Development Assessment Report</i> submitted by Kleinfelder in October 2022.
Karst, Caves, Crevices, Cliffs, Rock and other Geological Features of Significance	There are no karst, caves, crevices, cliffs, rocks or other geological features of significance in either the Study Area or the Assessment Area.
Geology and Soils (eSPADE)	The Study Area is mapped as occurring on the Beresfield residual soil landscape (Matthei, 1995). The Beresfield (be) soil landscape is described as occurring on undulating low hills and rises on Permian sediments in the East Maitland Hills region. Slope gradients 3–15%, local relief to 50 m, elevation is 20–50 m. Partially cleared tall open-forest. Soils are moderately deep, and the dominant materials include: friable brownish black loam, hard-setting dull yellowish brown sandy loam, pedal brown plastic mottled clay, reddish brown plastic pedal clay and gleyed “puggy” silty clay. This soil landscape occurs over the Permian Tomago Coal Measures and Permian Mulbring Siltstone geology (Matthei, 1995).
NSW Landscape	The Study Area occurs within the Newcastle Coastal Ramp NSW Landscape. Key features are: • Undulating lowlands and low to steep hills on complex patterns of faulted and gently folded Carboniferous conglomerate, lithic sandstone, felspathic sandstone, and mudstone, general elevation 50 to 275m, local relief 40 to 150m. • Stony red texture-contrast soils on steep slopes, yellow and brown texture-contrast soils on lower slopes and deep dark clay loams along streams. Woodland of <i>Corymbia maculata</i> (Spotted Gum), <i>Eucalyptus tereticornis</i> (Forest Red Gum), <i>Eucalyptus sideroxylon</i> (Red Ironbark), <i>Eucalyptus acmenoides</i> (White Mahogany), <i>Eucalyptus canaliculata</i> (Large-fruited Grey Gum), with sub-tropical rainforest elements in sheltered gullies. Similar eucalypts with <i>Allocasuarina torulosa</i> (Forest Oak) and grasses on lower slopes, merging to forest of <i>Angophora costata</i> (Smooth-barked Apple), <i>Corymbia gummifera</i> (Red Bloodwood), Blackbutt (<i>Eucalyptus pilularis</i>) with <i>Pteridium esculentum</i> (Bracken) and grasses nearer the coast. (DECC 2002).
Soil hazard features	The Beresfield residual landscape in which the Study Area occurs is described as having a high foundation hazard, water erosion hazard, seasonal waterlogging and high run-on on localised lower slopes, highly acid soils of low fertility.
Features identified by the Secretary’s Environmental Assessment Requirements (SEARs)	The proposal is not a major project.
Areas of Outstanding Biodiversity Value (AOBV) under the BC Act	No AOBV are present on the Subject Land or Assessment Area.

3.3 Native Vegetation Cover

Native vegetation cover within the assessment area is estimated to be 794.95ha, determined from the SVTM (DCCEEW, 2025), aerial imagery and ground-truthed surveys by AEP within the Study Area and the surrounding locality. **Table 5** summarises the extent of native vegetation cover within the assessment area, as shown in **Figure 2**.

Table 5 – Native Vegetation Cover in the Assessment Area

Assessment area (ha)	794.95
Total area of native vegetation cover (ha)	234.56
Percentage of native vegetation cover (%)	29.51% (rounded to 30% as the BAM-C only accepts whole numbers)
Class (0-10, >10-30, >30-70 or >70%)	>10-30

4.0 Native Vegetation, Threatened Ecological Communities and Vegetation Integrity

4.1 Native Vegetation Extent

The native vegetation extent on the Subject Land includes all areas of native vegetation. This extends to native ground cover and tree canopy cover. According to the SVTM (DCCEEW, 2025), the Native Vegetation Extent within the Subject Land is 0.56ha.

State Vegetation Type Mapping (SVTM) identified the following Plant Community Types (PCTs) within the Subject Land:

- PCT 3433 – *Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest* (approx. 0.56ha); and
- PCT 0 – Not Classified (approx. 1.45ha).

The extent of mapped Plant Community Types (PCTs) within the Study Area and surrounding locality is shown in **Figure 3**

4.1.1 Changes to the Mapped Native Vegetation Extent

Ground-truthing provided a more granular representation of native vegetation present (**Figure 8**) within the Subject Land and differed from the SVTM. The following PCT was identified within the Study Area:

- PCT 3433 – *Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest* (0.74ha).

Further discussion of the assessment of the PCT present onsite and segregation into separate Vegetation Zones (VZs) based on condition is provided in **Section 4.2**.

Ground-truthing is shown in **Figure 4**.

4.1.2 Areas that are not Native Vegetation

Areas within the Subject Land that comprise non-native vegetation include buildings, exotic managed lawn, carpark and roads and gardens. An additional portion of the site has been assessed under the Planted Native Module and is considered not native vegetation.



Figure 3 – State Vegetation Type Map



Figure 4 – Ground-truthed Vegetation

4.2 Plant Community Types

4.2.1 Overview

Vegetation within the Subject Land has been assessed as aligning with the BioNet Vegetation Classification PCT identified within **Table 6** and its extent is shown in **Figure 4**. Each unique section of vegetation has been segregated into a vegetation zone. Detailed description of the PCT on site and other vegetation zones is provided in the following subsections. Review of floristic data concluded that Plots and PCTs were associated as follows:

Table 6 – PCTs Identified within the Subject Land

PCT ID	PCT Name	Subject Land Area
3433	Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest	0.74ha

The residue of the Subject Land is composed of structures and developed land (0.53ha), patches of non-native managed gardens (0.16ha), and planted native vegetation (0.79ha) assessed under the Streamlined Assessment Module for Planted Native Vegetation the BAM (**Appendix F**).

4.2.1.1 PCT Determination and Vegetation Zones Process

The BAM requires the identification of the PCT or the most likely PCTs, and all TECs, on the Subject Land. The identification must be in accordance with the NSW PCT classification as described in the BioNet Vegetation Classification system. The identification of TECs must be consistent with the relevant NSW Threatened Species Scientific Committee Final Determinations.

The Plot to PCT Tool data is used to inform AEP's PCT determination process. In the PCT determination process, AEP utilised the NSW Government BioNet Vegetation Classification webpage including the PCT Data and Bulk Export data spreadsheet to determine the most likely PCTs. The following outlines the process:

1. Determine the extent of native vegetation on the State Vegetation Type Map;
2. Determine the IBRA region and IBRA subregion. This step assists in discounting PCTs that are not likely to be found in the locality;
3. Determine the NSW Landscape. A map needs to be generated for this step as there may be multiply landscapes that intersect with the Subject Land; and
4. Use the floristic results from the BAM plots, filtering from canopy species through to mid and ground stratum species. Using the BioNet Vegetation Classification is critical in this stage where the frequency of the species present is the leading contributor to refining the PCT as confirmation of presence and absence is identified within this step.

The above steps allow the narrowing of the potential PCTs considered. Then further assessment is required:

5. Using the BioNet Vegetation Classification and details collected in the field, further assessment of both the vegetation formation and class must be undertaken to ensure the species present are a representation of the community in the Subject Land. For example, some species such as *Eucalyptus robusta*, can be found in both Dry Sclerophyll Forests and Forested Wetlands, which will significantly alter the PCT if not assessed accurately;
6. Determination of LGA, as there are particular plant communities that are restricted to or excluded from certain LGAs;
7. Geographical restrictions and elevation are researched. These factors play a significant role in soil types and climatic conditions which impacts the location of flora within NSW;

8. AEP uses E-Spade to determine the local soil types to assist with refining the PCTs; and
9. Other habitat restrictions such as rainfall, tidal, riparian zones, etc are also researched against the BioNet Vegetation Classification results and data collected on site.

The above steps are generally undertaken in order to ensure the PCTs within the Subject Land are an accurate reflection of the vegetation communities occurring within the areas.

4.2.1.2 Plot to PCT Tool

Assessment of vegetation on site using BAM plot data was undertaken using the Plot to PCT Tool. The following results were produced:

Plot 1:

- 4023 *Coastal Valleys Riparian Forest;*
- 3328 *Lower Hunter Red Gum-Paperbark Riverflat Forest;*
- 4024 *Cumberland Blue Box Riverflat Forest;*
- 4025 *Cumberland Red Gum Riverflat Forest; and*
- 4073 *Lower North Hinterland River Oak Forest.*

Plot 2:

- 4089 *Namoi-Upper Hunter River Red Gum Forest;*
- 3975 *Southern Lower Floodplain Freshwater Wetland;*
- 4088 *Southwest Riverflat Red Gum Forest;*
- 4081 *Northwest River Oak-River Red Gum Forest; and*
- 3958 *Castlereagh Gravel Sedgeland.*

The output from the Plot to PCT Tool is attached as **Appendix J**.

4.2.2 PCT 3433 – Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest

4.2.2.1 PCT 3433 – Overview

PCT 3433 was selected as the ‘best fit’ to represent the vegetation (**Table 7**).

Table 7 – PCT 3433

PCT ID	3433
PCT Name	<i>Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest</i>
Vegetation Formation	Dry Sclerophyll Forests (Shrub/grass sub-formation)
Vegetation Class	Hunter-Macleay Dry Sclerophyll Forests
Percent cleared value (%)	68.60ha
Extent within Subject Land (ha)	0.74ha

This PCT is present in the eastern section of the Subject Land at the interface of neighbouring properties which have previously been cleared for residential development. An additional section of this PCT is present within the south-western corner of the Subject Land. The vegetation community present is dominated by *Corymbia maculata* with frequent occurrence of *Eucalyptus paniculata* and sporadic presence of *Eucalyptus moluccana* and *Eucalyptus acmenoides*. Mid-stratum is sparse and heavily disturbed, featuring occasional regrowth of shrubs such as *Bursaria spinosa*. The ground-stratum is similarly subject to high levels of disturbance, likely resulting from clearing to the east of the Subject Land. Dominant species within the ground-stratum include non-native and non-endemic grasses such as *Cenchrus clandestinus*, *Cynodon dactylon* and *Lolium perenne*. Native groundcover species are present within this stratum, typically with very low foliage cover. These species include *Entolasia stricta*, *Microlaena stipoides*, *Dichondra repens*, *Echinopogon caespitosus* and *Lobelia purpurascens*. The section of VZ1 located within the south-western corner of the Subject Land comprises younger growth vegetation which has likely been recently planted for aesthetic value. Species present in the south-western section include *Corymbia maculata*, *Allocasuarina littoralis*, *Acacia parvipinnula*, *Doryanthes excelsa*, *Lomandra filiformis* and *Lomandra longifolia*.

4.2.2.2 Condition States

PCT 3433 occurs in one (1) condition state within the Subject Land, vegetation zone 1 (VZ1), which is Poor (**Plates 1-3**). BAM Plot 1 was undertaken within this vegetation condition which can be described as a highly disturbed version of PCT 3433. This vegetation condition is almost solely represented by the canopy species, with some incidence of native grass and forb species within the lower stratum. The lower stratum largely comprises exotic grass species *Cenchrus clandestinum*, *Lolium perenne* and the non-endemic grass species *Cynodon dactylon*, which has been planted as turf. The mid-stratum is largely absent from this vegetation condition. This vegetation condition comprises 0.74ha of the Subject Land.

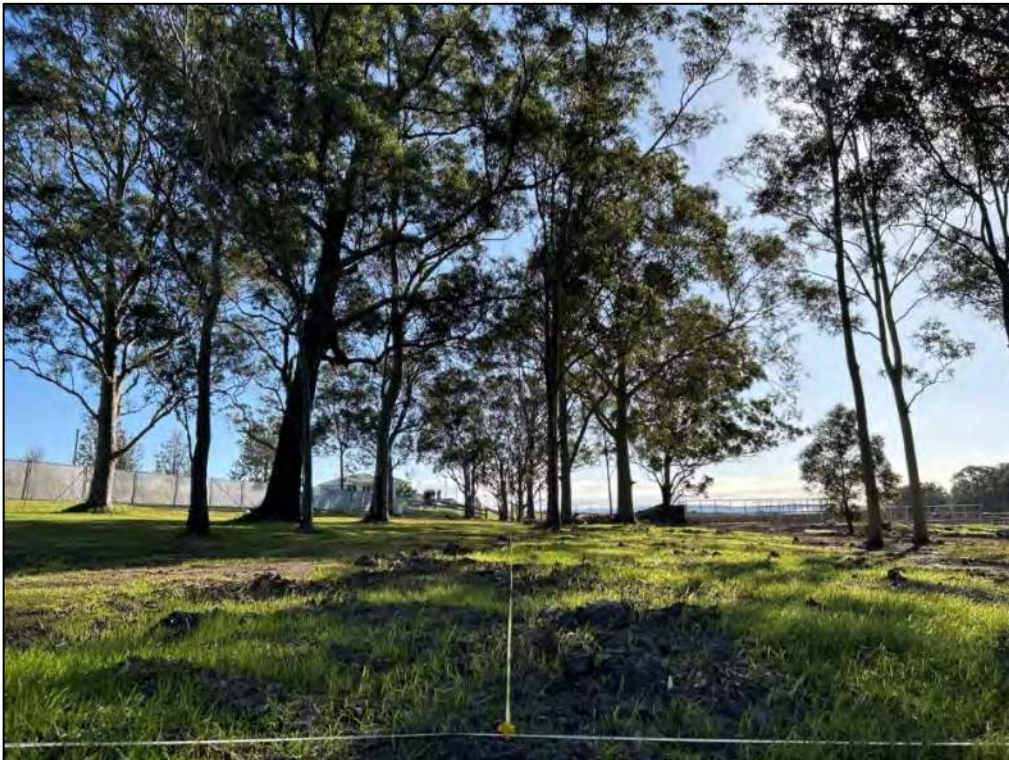


Plate 1: PCT 3433 – Poor condition, Start of BAM Plot 1



Plate 2: PCT 3433 – Poor Condition, End of BAM Plot 1



Plate 3: South-western section of PCT 3433

4.2.2.3 Justification of PCT 3433 Selection

An evidence-based justification of the decision pathway used in identification of the PCT is provided in Table 8.

Table 8 – Decision Pathway for PCT 3433 – Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest

Search Term	Selection
IBRA Bioregion	Sydney Basin
IBRA Sub-region	Hunter
Tree Growth Form Group	<i>Corymbia maculata</i> and <i>Eucalyptus paniculata</i>
Vegetation Formation	Dry Sclerophyll Forests
Lithology and Substrate	Permian Mulbring Sandstone (Maitland Group) - Sandy loam to heavy clay soils
Results	3432, 3433, 3435, 3436, 3441, 3442, 3444, 3446, 3581, 3605, 3634
Shrub Growth Form Group	<i>Bursaria spinosa</i> The vegetation community present within the Subject Land has been extensively disturbed by prior clearing, which has resulted in a very sparse mid-stratum. The only example of mid-stratum species within BAM plot data is a low foliage cover of <i>Bursaria spinosa</i> .
Results	No Change
Grass & Grass-like Growth Form Group	<i>Entolasia stricta</i> , <i>Microlaena stipoides</i> and <i>Echinopogon caespitosus</i> As previously mentioned, this vegetation community is influenced by extensive clearing to the east of the Subject Land which has resulted in very low foliage cover of native grass species. The grass species listed above are the most frequently occurring within plot data and the wider vegetation community, and thus have been compared to diagnostic species associated with relevant PCTs.
Results	3433, 3444, 3446
PCT determination	The PCT determination for this vegetation community was difficult due to its highly disturbed nature and the lack of dominant native diagnostic species. This PCT determination has been based on the best fit assemblage of species within the canopy stratum and dominance of grass and grass-like and forb species. There is considerable floristic overlap between the 3 PCTs especially within the lower-stratum.
PCT 3444 – Discarded	PCT 3444 was discarded due to the absence of diagnostic canopy species from the Subject Land. The Scientific Description associated with PCT 3444 lists the Ironbark species, <i>Eucalyptus crebra</i> , <i>Eucalyptus fibrosa</i> or <i>Eucalyptus fergusonii</i> as almost always present within the vegetation community. The Ironbark species present within this vegetation community, <i>Eucalyptus paniculata</i> , is not diagnostic of PCT 3444. Furthermore, <i>Eucalyptus punctata</i> , which is diagnostic of PCT 3444, is absent from the Subject Land. The mid-stratum is largely absent from this vegetation community, however <i>Bursaria spinulosa</i> is diagnostic of PCT 3444 and has been considered within this PCT determination. There is a considerable overlap of diagnostic grass and forb species present in the ground stratum including <i>Entolasia stricta</i> and <i>Dianella revoluta</i> . However, by comparison, there is a more significant floristic overlap demonstrated with other potential PCTs. Soil characteristics on site are described as clays derived from Permian Mulbring Sandstone, which is consistent with PCT 3444. However, it is not considered to be

Search Term	Selection
	the best fit for this community as there are more appropriate representations within other potential PCTs. Based on the aforementioned characteristics, this PCT was not considered to be a good fit for the vegetation present onsite.
PCT 3446 – Discarded	PCT 3446 was discarded largely due to the lack of <i>Eucalyptus tereticornis</i> from the canopy stratum. While there is a sound overlap of diagnostic species present, including <i>Corymbia maculata</i>, <i>Eucalyptus paniculata</i> and <i>Eucalyptus moluccana</i>, the lack of <i>Eucalyptus tereticornis</i> indicates that PCT 3446 is unlikely to be considered best fit for the vegetation community on site. The shrub, <i>Bursaria spinosa</i>, is the only mid-stratum species recorded within relevant BAM plot data. <i>Bursaria spinosa</i> is not referenced in the Scientific Description associated with PCT 3446, and is not considered diagnostic of this PCT. The ground-stratum contains a low level of overlap with diagnostic species, including <i>Lobelia purpurascens</i>, <i>Microlaena stipoides</i>, and <i>Dichondra repens</i>. Comparison with diagnostic species associated with other potential PCTs indicates that PCT 3446 is not considered to be best-fit to describe the vegetation community within the Subject Land. PCT 3446 is associated with a range of lithologies and substrates, which includes soils derived from Permian Mulbring Sandstone. Due to the aforementioned alignment with diagnostic flora assemblage, this PCT is still not considered to be best-fit to describe the vegetation community within the Subject Land. Based on the aforementioned characteristics, this PCT was not considered to be a good fit for the vegetation present onsite.
Result – PCT 3433	PCT 3433 was selected as the best fit to represent the vegetation onsite based on the following characteristics. Compared with the vegetation description of other potential PCTs, PCT 3433 contains the most appropriate description of the structural attributes of the vegetation community on site. This PCT is described as a sclerophyll open forest with a layer of dry and soft leaved shrubs. Diagnostic canopy species mentioned in the Scientific Description include <i>Corymbia maculata</i>, <i>Eucalyptus paniculata</i> and <i>Eucalyptus acmenoides</i>. The mid-stratum within this vegetation community is highly disturbed, however the only shrub species identified during BAM Plots, <i>Bursaria spinosa</i>, is diagnostic of PCT 3433. Compared to other potential PCTs, PCT 3433 contains the highest overlap of diagnostic native ground-stratum species. The highly disturbed ground-stratum on site includes low foliage cover of <i>Entolasia stricta</i>, <i>Dichondra repens</i>, <i>Lobelia purpurascens</i> and <i>Microlaena stipoides</i>, all of which are diagnostic of PCT 3433. Clay soils derived from Permian Mulbring Sandstone are present within the Subject Land which is associated with PCT 3433. PCT 3433 has been mapped within the Subject Land by DCCEEW (2025). Given the above characteristics, PCT 3433 is considered to be the best fit for the relevant vegetation community present within the Subject Land.

4.2.2.4 PCT 3433 Alignment with BC Act TECs

PCT 3433 is associated with the BC Act listed EEC *Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions*. Further assessment has been undertaken in **Table 9** in order to determine if PCT 3433 as it occurs in the Subject Land, is commensurate with the BC Act listed EEC.

Table 9 – PCT 3433 Assessment of Association with EEC: *Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions*

Characteristics	Assessment of Vegetation Community – Subject Land
Definition of EEC: <i>Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions</i> is the name given to the ecological community that occurs principally on Permian geology in the central to lower Hunter Valley. The Permian substrates most commonly supporting the community belong to the Dalwood Group, the Maitland Group and the Greta and Tomago Coal Measures, although smaller areas of the community may also occur on the Permian Singleton and Newcastle Coal Measures and the Triassic Narrabeen Group (NSW Department of Mines 1966, 1969).	The vegetation community within the Subject Land is located within the Sydney Basin and occurs upon Permian Geology in the Lower Hunter Valley. The geology present is Mulbring Sandstone, which is a sub-unit of the Maitland Group.
Soils: The community is strongly associated with, though not restricted to, the yellow podsolic and solodic soils of the Lower Hunter soil landscapes of Aberdare, Branxton and Neath (Kovac and Lawrie 1991). These substrates are said to produce ‘moderately fertile’ soils (Kovac and Lawrie 1991).	The soil landscape within the Subject Land is Beresfield. This soil landscape contains yellow podsolic and solodic soils mentioned in the TEC characteristics.
EEC specific assemblage of species: • <i>Acacia parvipinnula</i> • <i>Aristida vagans</i> • <i>Billardiera scandens</i> • <i>Bursaria spinosa</i> • <i>Callistemon linearifolius</i> • <i>Cheilanthes sieberi</i> subsp. <i>sieberi</i> • <i>Correa reflexa</i> • <i>Corymbia maculata</i> • <i>Daviesia ulicifolia</i> • <i>Denhamia silvestris</i> • <i>Dianella revoluta</i> var. <i>revoluta</i> • <i>Dichelachne micrantha</i> • <i>Entolasia stricta</i> • <i>Eragrostis brownii</i> • <i>Eucalyptus fibrosa</i> • <i>Eucalyptus punctata</i> • <i>Glycine clandestina</i> • <i>Goodenia rotundifolia</i> • <i>Grevillea montana</i> • <i>Grevillea parviflora</i> subsp. <i>parviflora</i> • <i>Hardenbergia violacea</i>	Upper stratum present: <i>Corymbia maculata</i> Mid stratum present: <i>Bursaria spinosa</i> Ground stratum present: <i>Dianella revoluta</i>, <i>Entolasia stricta</i>, <i>Microlaena stipoides</i>, <i>Paspalidium distans</i>, <i>Lobelia purpurascens</i> (<i>Pratia purpurascens</i>).

Characteristics	Assessment of Vegetation Community – Subject Land
• <i>Lepidosperma laterale</i> • <i>Leptospermum parvifolium</i> • <i>Lissanthe strigosa</i> • <i>Lomandra filiformis</i> • <i>Lomandra multiflora</i> • <i>Macrozamia flexuosa</i> • <i>Melaleuca decora</i> • <i>Melaleuca nodosa</i> • <i>Microlaena stipoides</i> • <i>Opercularia diphyllo</i> • <i>Ozothamnus diosmifolius</i> • <i>Panicum simile</i> • <i>Paspalidium distans</i> • <i>Persoonia linearis</i> • <i>Phyllanthus hirtellus</i> • <i>Platysace ericoides</i> • <i>Podolobium ilicifolium</i> • <i>Pomax umbellata</i> • <i>Pratia purpurascens</i> • <i>Pultenaea spinosa</i> • <i>Rytidosperma pallidum</i> • <i>Themeda triandra</i> • <i>Vernonia cinerea</i> var. <i>cinerea</i>	
Local Government Area Distribution: This EEC is restricted to a range of approximately 65 km by 35 km centred on the Cessnock – Beresfield area in the Central and Lower Hunter Valley (NPWS 2000). Within this range, the community was once widespread. A fragmented core of the community still occurs between Cessnock and Beresfield. Remnants occur within the Local Government Areas of Cessnock, Maitland, Singleton, Lake Macquarie, Newcastle, and Port Stephens but may also occur elsewhere within the bioregion. Outliers are also present on the eastern escarpment of Pokolbin and Corrabare State Forests on Narrabeen Sandstone. This EEC belongs to a complex of ecological communities, but is identified as a distinct assemblage of species. Other assemblages that may include spotted gum as a dominant species, have geographically distinct distributions outside the core area where this community primarily occurs (Cessnock – Beresfield). These other assemblages include: Coastal Foothills Spotted Gum – Ironbark Forest, Seaham Spotted Gum – Ironbark Forest and Central Hunter Spotted Gum – Ironbark – Grey Box Forest (NPWS 2000). <i>Eucalyptus fibrosa</i>, <i>Acacia parvipinnula</i> and prickly shrub species occur more frequently or in greater abundance in Lower Hunter Spotted Gum – Ironbark Forest than in the other communities above. North of the Hunter River and other parts of the Hunter valley indicate the existence of another distinct assemblage dominated by spotted gums and	The vegetation community present within the Subject Land is located within the Maitland LGA. The name of PCT 3433 is <i>Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest</i>, which is consistent with example PCTs mentioned in the TEC characteristics.

Characteristics	Assessment of Vegetation Community – Subject Land
ironbarks on Carboniferous sediments of the footslopes of the Barrington plateau. Lower Hunter Spotted Gum – Ironbark Forest in the Sydney Basin Bioregion belongs to the Hunter - Macleay Dry Sclerophyll Forests vegetation class of Keith (2004).	
Is the PCT associated with this EEC (Yes or No)?	Yes
Is the PCT EPBC Act listed under a different CEEC or EEC name (Yes or No)?	No
Detailed Justification of Assessment: PCT 3433 is located within the applicable bioregion of Sydney Basin. It is situated upon Permian Mulbring Sandstone which is a sub-unit of the Maitland Group, an applicable geological unit. While PCT 3433 is not situated upon one of the associated soil landscapes, the Beresfield landscape which is present on site, contains similar characteristics to soil landscapes which are associated with the BC Act listed EEC. These soil characteristics include the presence of yellow podsollic and solodic soils. There are seven (7) species present within the relevant vegetation community which are considered to be diagnostic of the BC Act listed EEC. These species are comprised of one (1) canopy species, one (1) mid-stratum species and five (5) ground stratum species. While this overlap is relatively low in comparison to the full EEC assemblage, there is no threshold of species identified within the description for the BC Act listed EEC. Furthermore, the historic disturbance present within the Subject Land has likely resulted in the removal of species which are associated with the BC Act EEC. Thus, the seven species which overlap with the EEC assemblage are considered sufficient in classifying PCT 3433 as commensurate with the BC Act listed TEC. The vegetation community onsite is located within the applicable geographic region and is contained within the Maitland LGA. Given the above information, PCT 3433 is considered to be commensurate with the BC Act listed EEC <i>Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions</i>	
Referral Requirements: EPBC Act Listing Status: Not Listed Action: There is no EPBC Act listed TEC associated with the above community. No further assessment was therefore required.	

4.2.2.5 Alignment of PCT 3433 with EPBC Act TECs

PCT 3433 is not associated with any EPBC Act listed TECs. A protected matters search was conducted to identify any EPBC Act listed TECs which have the potential to occur within proximity to the Subject Land. The following EPBC Act listed TECs were identified within 5km from the Subject Land:

- *Central Hunter Valley eucalypt forest and woodland*; Listed Critically Endangered Under the EPBC Act;
- *River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria*; Listed Critically Endangered Under the EPBC Act;
- *Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community*; Listed Endangered Under the EPBC Act;
- *Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland*; Listed Endangered Under the EPBC Act; and
- *Kurri sand swamp woodland of the Sydney Basin bioregion* Listed Endangered Under the EPBC Act.

Most of the aforementioned TECs have been excluded from further assessment based on factors such as species assemblage, landscape, soil or dominant lithology. However, the TEC Critically Endangered Ecological Community (CEEC) *Central Hunter Valley eucalypt forest and woodland* warrants further assessment. Assessment of PCT 3433 against key diagnostic characteristics of the EPBC Act listed CEEC is outlined in **Table 10** below.

Table 10 – Assessment of PCT 3433 against key diagnostic characteristics of *Central Hunter Valley Eucalypt Forest and woodland*

Key Diagnostic Characteristics of CEEC	Assessment of Vegetation Community – Subject Land
In order to be considered a Matter of National Environmental Significance under the EPBC Act, areas of the ecological community must meet: - the Key diagnostic characteristics (in Section 1.5.1); AND - at least the minimum Condition thresholds for Moderate quality (i.e. for class C or D, in Section 1.5.3).	
It occurs in the Hunter River catchment (typically called the Hunter Valley region) AND;	Yes, the Subject Land is located in the Hunter River catchment
It typically occurs on lower hillslopes and low ridges, or valley floors in undulating country; on soils derived from Permian sedimentary rocks; AND;	The site occurs on lower hillslopes in undulating country, on Permian sedimentary rocks within the Beresfield (be) soil landscape.
It does not occur on alluvial flats, river terraces, aeolian sands, Triassic sediments, or escarpments; AND;	This area within the Subject Land does not occur on alluvial flats, river terraces or Triassic sediments or escarpments.
It is woodland or forest, with a projected canopy cover of trees of 10% or more; or with a native tree density of at least 10 native tree stems per 0.5 ha (at least 20 native tree stems/ha) that are at least one metre in height; AND;	PCT 3433 presents as a woodland community with a canopy cover greater than 10%. There are at least 10 native trees per 0.5ha.
The canopy of the ecological community is dominated by one or more of the following four eucalypt species: <i>Eucalyptus crebra</i> (narrow-leaved ironbark), <i>Corymbia maculata</i> (syn. <i>E. maculata</i>) (spotted gum), <i>E. dawsonii</i> (slaty gum) and <i>E. moluccana</i> (grey box); OR a fifth species, <i>Allocasuarina luehmannii</i> (bulloak, buloke) dominates in combination with one or more of the above four eucalypt species, in sites previously dominated by one or more of the above four eucalypt species; AND;	PCT 3433 is dominated by <i>Corymbia maculata</i> with frequent occurrence of <i>Eucalyptus moluccana</i> . These species are consistent with the EPBC Act listed CEEC.
<i>Allocasuarina torulosa</i> (forest oak/ she-oak, rose she-oak/oak), <i>Eucalyptus acmenoides</i> (white mahogany) and <i>E. fibrosa</i> (red/broad-leaved ironbark) are largely absent from the canopy of a patch	<i>Eucalyptus acmenoides</i> is present within the vegetation community. This species is contra-indicative of the EPBC Act listed CEEC.
A ground layer is present (although it may vary in development and composition), as a sparse to thick layer of native grasses and other native herbs and/or native shrubs.	A predominantly and diverse native ground layer is present, comprised of grasses and forbs. The mid-stratum is very shrubs sparse.

Key Diagnostic Characteristics of CEEC	Assessment of Vegetation Community – Subject Land
Result: The Subject Land is located in the Hunter River catchment on lower hillslopes in undulating country, on Permian sedimentary rocks within the Beresfield (be) soil landscape. PCT 3433 does not occur on alluvial flats, river terraces or Triassic sediments or escarpments. PCT 3433 presents as a woodland community with a canopy cover greater than 10%. There are at least 10 native trees per 0.5ha. It is dominated by <i>Corymbia maculata</i> with frequent occurrence of <i>Eucalyptus moluccana</i>. <i>Eucalyptus acmenoides</i> is present within the canopy of the vegetation community which is contra-indicative of the EPBC Act listed CEEC. Therefore, PCT 3433 is not considered to be commensurate with the EPBC Act listed CEEC <i>Central Hunter Valley Eucalypt Forest and woodland</i>. No further assessment is required.	

4.2.3 Areas of Planted Vegetation

As previously mentioned, some areas within the Subject Land have been historically cleared and landscaped, largely with non-endemic native species such as *Cynodon dactylon*. These areas have been separated into Vegetation Zones (VZs) based on their structure and composition.

4.2.3.1 *Cynodon dactylon* Planted Native Vegetation

This VZ is located within the western sections of the Subject Land and is largely dominated by the non-endemic grass species *Cynodon dactylon*. **Plate 4** indicates conditions within this zone. Evidence suggests that it is regularly maintained as a lawn area which surrounds the adjacent café and land sales office. In addition to *C. dactylon*, it features frequent incidence of exotic grass and forb species such as *Cenchrus clandestinus* (Kikuyu), *Modiola caroliana* (Mallow), *Plantago lanceolata* (Ribwort Plantain) and *Soliva sessilis* (Bindii).

The determination of the vegetation within this VZ as being planted native is detailed in **Appendix F**.



Plate 4: VZ2 – Start of BAM Plot 2

4.2.3.2 Non-native Vegetation

Non-native vegetation is present within the central-northern section of the Subject Land. This vegetation zone is characterised by ornamental non-native species which are generally associated with landscaped gardens or public open spaces. Species present within this area include *Malus* sp. (Domestic Apple), *Salvia elegans* (Pineapple Sage), *Salvia rosmarinus* (Culinary Rosemary) *Pennisetum* sp. (Foxtail Grass), *Plumeria* sp. (Frangipani) and *Cenchrus clandestinus* (Kikuyu). **Plate 5** and **Plate 6** show the vegetation condition within this area.

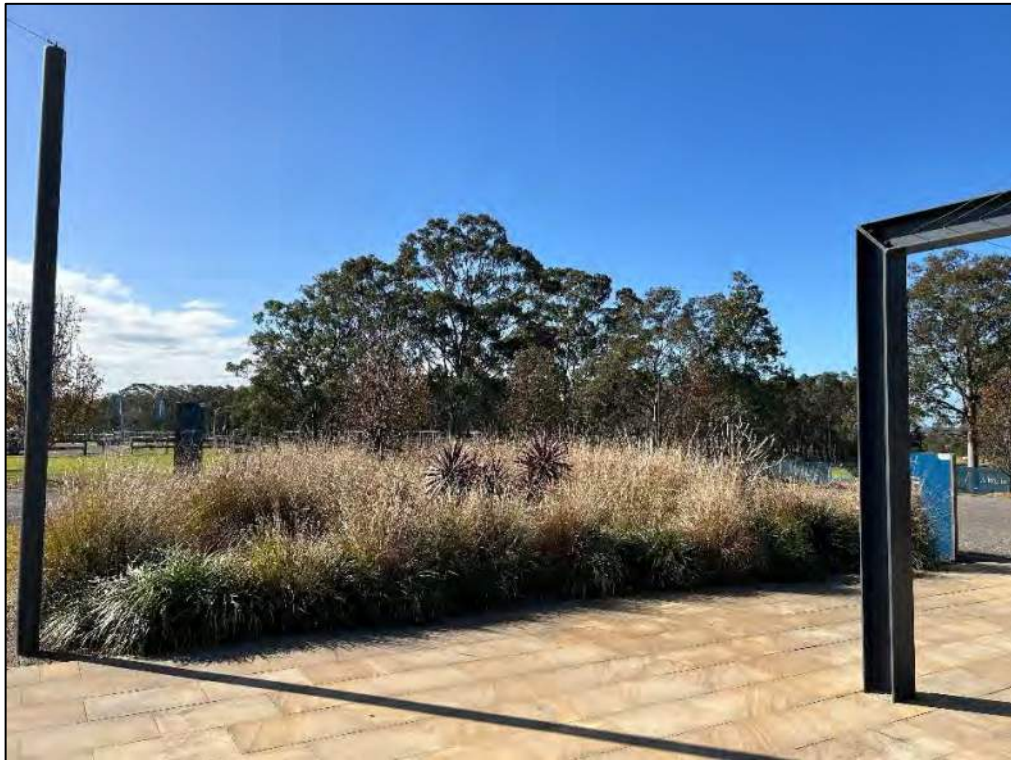


Plate 5: Example of non-native vegetation



Plate 6: Exotic lawn and garden beds comprising non-native vegetation

4.3 Threatened Ecological Communities

The following TECs in **Table 10** have been identified within the Subject Land as described above.

Table 11 – TECs within the Study Area

TEC Name	Profile ID	BC Act Status	EPBC Act Status	Associated Vegetation Zones within the Subject Land	Area Within Study Area
BC Act listed <i>EEC Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions.</i>	20127	Endangered	N/A	3433 (Poor)	0.74ha

4.4 Vegetation Zones

Condition classes based on the aforementioned VI Scores were allocated as follows:

- VZ1 – PCT 3433.

Table 11 provides a summary of Vegetation Zones and associated areas identified throughout the Subject Land.

Table 12 described how patch size classes were identified and assessed. Patch size classes are identified in accordance with BAM Subsection 4.3.2 which states 'A patch is an area of native vegetation that occurs on the Subject Land and includes native vegetation that has a gap of less than 100m from the next area of native vegetation'. While some areas of the landscape within the Assessment area are degraded, there is moderate connectivity (fragmentation between trees <100m) to surrounding bushland and the vegetation zones have been designated a patch size of greater than 100ha.

Table 12 – Summary of Vegetation Zones Areas

Zone	Vegetation Community	Condition	Study Area (Ha)	Subject Land (Ha)	Subject Land Impacted (Ha)	Subject Land Retained (Ha)
1	PCT 3433	Poor	0.74	0.74	0.51	0.09
Total Native Vegetation (ha)			0.74	0.74	0.51	0.09
Planted Native Vegetation			0.79	0.79	0.79	0
Non-native Vegetation			0.16	0.16	0.16	0
Infrastructure/ Cleared			0.53	0.53	0.53	0
Total Non-Native Vegetation (ha)			1.48	1.48	1.48	0
Total (ha)			2.21	2.21	2.12	0.09

*Discrepancies in numbers are due to rounding.

Table 13 – Vegetation Zones and Patch Size

Vegetation Zone ID (BAM-C)	PCT	Condition/Other Defining Feature	Area (ha) on Subject Land	Proposed Area (ha) of Impact	Patch Size Class (select multiple if areas of native vegetation are discontinuous)	No. Vegetation Integrity Plots Required	No. Vegetation Integrity Plots Completed	No. Vegetation Integrity Plots Used in Assessment	Plot IDs of Vegetation Integrity Plots Used in Assessment
VZ1	PCT 3433-Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest	3433_Poor	0.74	0.51	☐ <5 ha ☐ 5–24 ha ☐ 25–100 ha ☒ >100 ha	1	1	1	BAM Plot 1

The extent of the PCT within the Subject Land is provided in **Figure 4**.

4.5 Vegetation Integrity (Vegetation Condition)

The PCTs within the Subject Land have been established through the analysis of data collected. The following assessment and development of vegetation zones have been carried out through the modification of methods used to establish PCT and the vegetation zones are described below.

AEP botanists assessed the vegetation for potential vegetation zones and conditions when the BAM Plots were undertaken, and this information was used to assist with the development of the Vegetation Zones within the identified PCTs. The BAM plot data was entered independently into the BAM-C, where the application of the vegetation conditions was allocated. AEP uses the continuous non-linear approach based on the Weibull function, as outlined in State of NSW and Office of Environment and Heritage, 2017, *Native Vegetation Integrity Benchmarks*, where conditions are allocated based on 0 being lowest and 100 being the highest of benchmark respectively, allowing the below conditions to be allocated to each BAM plot individually (refer **Appendix I**):

- 70 – 100 Good;
- 50 – 69 Moderate;
- 35 – 49 Poor;
- 25 - 34 Degraded;
- 17 - 24 Highly Degraded; and
- < 17 Severely Degraded.

The individual BAM plot VIS were assessed allowing the vegetation zones within the above condition classes to be grouped together and entered into the BAM-C for further assessment.

4.5.1 Vegetation Integrity Survey Plots

The minimum number of plots required for each vegetation zone were met in accordance with the BAM. Vegetation plots undertaken in the wider Study Area have been excluded from the assessment and not utilised within the BAM-C (Plot 2), as they do not represent vegetation that can be assigned to a PCT. Relevant data, however, has been presented below for reference. Findings for these assessments are still considered when discussing 'Avoid and Minimise' principles and associations with ecological communities.

4.5.2 Scores

Vegetation scores as assessed within the Subject Land are provided in **Table 13** below. As described above, BAM Plots 1 and 2 were used to assess condition of the impact area, with Plot 2 not being utilised within the BAM-C as the vegetation was determined to not be associated with a PCT. Therefore, vegetation conditions are based on Plot 1 for assessment and generation of credits.

Table 14 – Vegetation Integrity Scores for PCT 3433 - Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest

Vegetation Zone ID	Composition Condition Score	Structure Condition Score	Function Condition Score (where relevant)	Vegetation Integrity Score	Hollow Bearing Trees Present?
VZ1	49.5	29	65.7	45.5	Y

4.5.3 Use of Benchmark Data

Benchmark data was sourced from the NSW BioNet Vegetation Classification system for PCT 3433.

5.0 Habitat Suitability for Threatened Species

5.1 Identification of Threatened Species for Assessment

5.1.1 Ecosystem Credit Species

As detailed in **Sections 2.3** and **2.4**, both desktop and habitat assessments were undertaken to identify the potential use of the Subject Land by threatened fauna. A total of 36 ecosystem or dual credit species were identified as occurring within the PCT, of these 33 have been retained for further assessment, as described in **Table 14**.

Table 15: Predicted Ecosystem Credit Species

Scientific Name	Common Name	Listing Status		Dual Credit Species	Source (BAM-C, TBDC, Previous Survey, Current Survey)	Species Retained for Further Assessment?	Reason for Exclusion from Further Assessment	Vegetation Zone ID Species Retained within, Including PCT ID	Sensitivity to Gain Class
		BC Act	EPBC Act						
<i>Anthochaera phrygia</i>	Regent Honeyeater	Critically Endangered	Critically Endangered	Yes	BAM-C	Yes	N/A	VZ1 (PCT3433)	High
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	Vulnerable	Not Listed	No	BAM-C	Yes	N/A	VZ1	Moderate
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	Endangered	Endangered	Yes	BAM-C	Yes	N/A	VZ1	Moderate
<i>Calyptorhynchus lathami lathami</i>	South-eastern Glossy Black-Cockatoo	Vulnerable	Vulnerable	Yes	BAM-C	No	The Subject land does not contain the required Habitat constraints (Allocasuarina and casuarina species) required for the South-eastern Glossy Black-Cockatoo. Thus, as per the <i>Section 5.2.2(2b)</i> of the	N/A	High

Scientific Name	Common Name	Listing Status		Dual Credit Species	Source (BAM-C, TBDC, Previous Survey, Current Survey)	Species Retained for Further Assessment?	Reason for Exclusion from Further Assessment	Vegetation Zone ID Species Retained within, Including PCT ID	Sensitivity to Gain Class
		BC Act	EPBC Act						
							BAM 2020 no further assessment is required.		
<i>Chthonicola sagittata</i>	Speckled Warbler	Vulnerable	Not Listed	No	BAM-C	Yes	N/A	VZ1	High
<i>Circus assimilis</i>	Spotted Harrier	Vulnerable	Not Listed	No	BAM-C	Yes	N/A	VZ1	Moderate
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)	Vulnerable	Vulnerable	No	BAM-C	Yes	N/A	VZ1	High
<i>Daphoenositta chrysoptera</i>	Varied Sittella	Vulnerable	Not Listed	No	BAM-C	Yes	N/A	VZ1	Moderate
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	Vulnerable	Endangered	No	BAM-C	Yes	N/A	VZ1	High
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	Endangered	Not Listed	No	BAM-C	No	The Subject land does not contain the required Habitat constraints (Swamps, Lakes, Open Waterbodies etc within 300m) required for the Black-Necked-Stork. Thus, as per the Section 5.2.2(2b) of the BAM 2020 no further assessment is required.	N/A	Moderate

Scientific Name	Common Name	Listing Status		Dual Credit Species	Source (BAM-C, TBDC, Previous Survey, Current Survey)	Species Retained for Further Assessment?	Reason for Exclusion from Further Assessment	Vegetation Zone ID Species Retained within, Including PCT ID	Sensitivity to Gain Class
		BC Act	EPBC Act						
<i>Falco subniger</i>	Black Falcon	Vulnerable	Not Listed	No	BAM-C	Yes	N/A	VZ1	Moderate
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	Vulnerable	Not Listed	No	BAM-C	Yes	N/A	VZ1	High
<i>Glossopsitta pusilla</i>	Little Lorikeet	Vulnerable	Not Listed	No	BAM-C	Yes	N/A	VZ1	High
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	Vulnerable	Not Listed	Yes	BAM-C	Yes	N/A	VZ1	High
<i>Hieraaetus morphnoides</i>	Little Eagle	Vulnerable	Not Listed	Yes	BAM-C	Yes	N/A	VZ1	Moderate
<i>Hirundapus caudacutus</i>	White-throated Needle-tail	Vulnerable	Vulnerable	No	BAM-C	Yes	N/A	VZ1	High
<i>Ixobrychus flavicollis</i>	Black Bittern	Vulnerable	Not Listed	No	BAM-C	No	The Subject land does not contain the required Habitat constraints (Land within 40m of freshwater/estuarine wetlands) required for the Black Bittern. Thus, as per the Section 5.2.2(2b) of the BAM 2020 no further assessment is required.	N/A	Moderate

Scientific Name	Common Name	Listing Status		Dual Credit Species	Source (BAM-C, TBDC, Previous Survey, Current Survey)	Species Retained for Further Assessment?	Reason for Exclusion from Further Assessment	Vegetation Zone ID Species Retained within, Including PCT ID	Sensitivity to Gain Class
		BC Act	EPBC Act						
<i>Gallinago hardwickii</i>	Latham's Snipe, Japanese Snipe	Vulnerable	Vulnerable	No	BAM-C	Yes	N/A	VZ1	High
<i>Lathamus discolor</i>	Swift Parrot	Endangered	Critically Endangered	Yes	BAM-C	Yes	N/A	VZ1	Moderate
<i>Limicola falcinellus</i>	Broad-billed Sandpiper	Vulnerable	Not Listed	No	BAM-C	Yes	N/A	VZ1	High
<i>Lophoictinia isura</i>	Square-tailed Kite	Vulnerable	Not Listed	Yes	BAM-C	Yes	N/A	VZ1	Moderate
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater (eastern subspecies)	Vulnerable	Not Listed	No	BAM-C	Yes	N/A	VZ1	Moderate
<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tailed Bat	Vulnerable	Not Listed	No	BAM-C	Yes	N/A	VZ1	High
<i>Miniopterus australis</i>	Little Bent-winged Bat	Vulnerable	Not Listed	Yes	BAM-C	Yes	N/A	VZ1	High
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	Vulnerable	Not Listed	Yes	BAM-C	Yes	N/A	VZ1	High

Scientific Name	Common Name	Listing Status		Dual Credit Species	Source (BAM-C, TBDC, Previous Survey, Current Survey)	Species Retained for Further Assessment?	Reason for Exclusion from Further Assessment	Vegetation Zone ID Species Retained within, Including PCT ID	Sensitivity to Gain Class
		BC Act	EPBC Act						
<i>Neophema pulchella</i>	Turquoise Parrot	Vulnerable	Not Listed	No	BAM-C	Yes	N/A	VZ1	High
<i>Nyctophilus corbeni</i>	Corben's Long-eared Bat	Vulnerable	Vulnerable	No	BAM-C	Yes	N/A	VZ1	High
<i>Pandion cristatus</i>	Eastern Osprey	Vulnerable	Not Listed	Yes	BAM-C	Yes	N/A	VZ1	Moderate
<i>Petroica boodang</i>	Scarlet Robin	Vulnerable	Not Listed	No	BAM-C	Yes	N/A	VZ1	High
<i>Petroica phoenicea</i>	Flame Robin	Vulnerable	Not Listed	No	BAM-C	Yes	N/A	VZ1	Moderate
<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler (eastern subspecies)	Vulnerable	Not Listed	No	BAM-C	Yes	N/A	VZ1	Moderate
<i>Pseudomys novaehollandiae</i>	New Holland Mouse	Vulnerable	Vulnerable	No	BAM-C	Yes	N/A	VZ1	High
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	Vulnerable	Vulnerable	Yes	BAM-C	Yes	N/A	VZ1	High
<i>Saccolaimus flaviventris</i>	Yellow-bellied	Vulnerable	Not Listed	No	BAM-C	Yes	N/A	VZ1	High

Scientific Name	Common Name	Listing Status		Dual Credit Species	Source (BAM-C, TBDC, Previous Survey, Current Survey)	Species Retained for Further Assessment?	Reason for Exclusion from Further Assessment	Vegetation Zone ID Species Retained within, Including PCT ID	Sensitivity to Gain Class
		BC Act	EPBC Act						
	Sheathtail-bat								
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	Vulnerable	Not Listed	No	BAM-C	Yes	N/A	VZ1	High
<i>Stagonopleura guttata</i>	Diamond Firetail	Vulnerable	Vulnerable	No		Yes	N/A	VZ1	Moderate
<i>Tyto longimembris</i>	Eastern Grass Owl	Vulnerable	Not Listed	No		Yes	N/A	VZ1	Moderate

5.1.2 Species Credit Species

A total of nine (9) candidate species credit species were returned by the BAM-C for assessment, of which two (2) were retained for assessment. These are outlined in **Table 15** below.

Table 16 – Candidate Species Credit Species

Scientific Name	Common Name	Listing status		Source (BAM-C, TBDC, Previous Survey, Current Survey)	Species retained for further assessment?	Reason for exclusion	Vegetation zone ID species retained in
		BC Act	EPBC Act				
Flora							
<i>Eucalyptus pumila</i>	Pokolbin Mallee	Vulnerable	Vulnerable	BAM-C	Yes	N/A	3433 – Poor
Aves							
<i>Anthochaera phrygia</i>	Regent Honeyeater	Critically Endangered	Critically Endangered	BAM-C	No	The Subject Land is not mapped as important habitat for Regent Honey Eater, therefore none of the habitat requirements are present within the Subject Land. Thus, as per <i>Section 5.2.2 (2a)</i> of BAM 2020, no further assessment is required, and there is no potential trigger for SAIL	N/A
<i>Lathamus discolor</i>	Swift Parrot	Endangered	Critically Endangered	BAM-C	No	The Subject Land is not mapped as important habitat for Swift Parrot, therefore none of the habitat requirements are present within the Subject Land. Thus, as	N/A

Scientific Name	Common Name	Listing status		Source (BAM-C, TBDC, Previous Survey, Current Survey)	Species retained for further assessment?	Reason for exclusion	Vegetation zone ID species retained in
		BC Act	EPBC Act				
						per <i>Section 5.2.2 (2a)</i> of BAM 2020, no further assessment is required, and there is no potential trigger for SAI	
<i>Tyto tenebricosa</i>	Sooty Owl	Vulnerable	Not Listed	BAM-C	No	The native vegetation cover within the Assessment area is less than the minimum class required for Sooty Owl (>70%). Thus, as per the <i>Section 5.2.1 (2d)</i> of BAM 2020, no further assessment is required, and no potential trigger of an SAI	N/A
Mammalia							
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	Endangered	Endangered	BAM-C	No	As per Appendix C Table 13 Item 5.2 of the BAM, "Candidate species credit species that are not at risk of an SAI and are not incidentally recorded on the subject land do not require further assessment." As per the TBDC notes for this species, the SAI	N/A

Scientific Name	Common Name	Listing status		Source (BAM-C, TBDC, Previous Survey, Current Survey)	Species retained for further assessment?	Reason for exclusion	Vegetation zone ID species retained in
		BC Act	EPBC Act				
						component for Large-eared Pied-bat is listed under Principle 4 as "Caves and other similar structures" of which there are none on site. Therefore, there is no risk of SAI and the species does not require assessment.	
<i>Miniopterus australis</i>	Little Bent-winged Bat	Vulnerable	Not Listed	BAM-C	No	The Subject Land does not contain cave, tunnel, mine, culvert or other structure known to be used for breeding Thus, as per the Section 5.2.2(2b) the BAM 2020, no habitat requirements for the Little Bent-winged Bat are present on the entire Subject Land. No further assessment is required for that species. No potential trigger for SAI	N/A
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	Vulnerable	Not Listed	BAM-C	No	The Subject Land does not contain caves; cave, tunnel, mine, culvert or other structure known to be used for breeding	N/A

Scientific Name	Common Name	Listing status		Source (BAM-C, TBDC, Previous Survey, Current Survey)	Species retained for further assessment?	Reason for exclusion	Vegetation zone ID species retained in
		BC Act	EPBC Act				
						Thus, as per the Section 5.2.2(2b) the BAM 2020, no habitat requirements for the Large Bent-winged Bat are present on the entire Subject Land. No further assessment is required for that species. No potential trigger for SAI	
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	Endangered	Vulnerable	BAM-C	No	The Subject Land contains no rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or cliff lines occurring within 1km of the site. Thus, as per Section 5.2.2(2b) the BAM 2020, no habitat requirements for the Brush-tailed Rock-wallaby are present on the entire Subject Land. Therefore, no further assessment is required. No potential trigger for SAI	N/A
<i>Vespadelus troughtoni</i>	Eastern Cave Bat	Vulnerable	Not Listed	BAM-C	No	The Subject Land does not contain caves and is not located within two	N/A

Scientific Name	Common Name	Listing status		Source (BAM-C, TBDC, Previous Survey, Current Survey)	Species retained for further assessment?	Reason for exclusion	Vegetation zone ID species retained in
		BC Act	EPBC Act				
						kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, crevices or boulder piles, or within two kilometres of old mines, tunnels, old buildings or sheds.	

5.2 Presence of Candidate Species Credit Species

From the remaining list of candidate species credit species, one (1) threatened species, *Eucalyptus pumila*, has been retained for further assessment.

Note that for streamlined assessments, only SALLs are considered. In addition, BioNet species records within the 1500m assessment area were assessed for additional species to survey for (**Figure 5**). No other threatened species were determined to be present within the Study Area or Subject Land.

5.3 Habitat Assessment

5.3.1 Habitat Trees

Eight (8) hollows in three (3) hollow-bearing trees (HBTs) considered to have potential habitat for native fauna guilds were recorded within the Subject Land (refer **Table 17**). HBTs within the Subject Land were found generally to be in good health.

No extra-large hollows, or hollows considered suitable for Forest Owls, were observed within the site. Only one hollow of medium size was observed, which was being utilised by an Eastern Rosella and therefore unlikely to be utilised by any threatened fauna species. Additionally, no stick nests, active or otherwise, were observed during field surveys.

No hollows considered suitable forest owl breeding habitat were recorded on site. Although the site is highly degraded, the open nature of the Subject Land and suitable movement corridor running adjacent to the site, indicates the Subject Land may represent marginal foraging habitat.

HBT locations are shown in **Figure 4**.

Table 17 – Hollow Bearing Tree Details

HBT ID (AIA Tag)	Species	DBH (cm)	Hollows					Other Habitat Features	Retained / Remove
			XS	S	M	L	XL		
HBT-01 (25)	<i>Corymbia maculata</i>	56	3	0	0	0	0	Suitable for Microbats	Removed
HBT-03 (49)	Stag	36	2	0	1	0	0	Eastern Rosellas nesting in Medium sized Hollow	Removed
HBT-04 (66)	<i>Eucalyptus moluccana</i>	76	1	1	0	0	0	Not much rotting, lots of broken off limbs, but not much hollowing	Retain
Total			6	1	1	0	0	Total HBTs Removed	2
Total Hollows			8						



Figure 5 – Threatened Species BioNet Atlas Records

5.3.2 Other Habitat Features

The Subject Land possesses a few additional habitat features, albeit of minimal ecological value. Ground habitat in the form of landscaping rocks and piles of fallen branches and debris create suitable habitat for small reptiles. The abundance of eucalypts and open grassland does provide a source for native pollinators and foraging habitat for mobile bird and microbat species, as well as the open space bordered by trees providing breeding habitat for numerous insect species. Planted apple trees located within the western section of the site further provides foraging habitat for highly mobile bird and bat species.

Small forms of thick understory are also present within native vegetation present in the south-eastern corner and north-eastern vegetation edge of the site. However, both these sections contain movement barriers in the form of fences and metal barriers, as well being highly fragmented from other aspect of the site, making them unsuitable for ground dwelling mammals.

5.4 Threatened Species Surveys

Targeted threatened species surveys were conducted in July 2025. The survey methodology was undertaken as per **Table 17**. The survey effort is shown in **Figure 6** and **Figure 7**.

Table 18 – Threatened Species Surveys for Candidate Species in the Subject Land

Threatened Flora Species Surveys for Candidate Species in the Subject Land							
Scientific Name	Common Name	Threatened Flora Species Surveys				Present	Further Assessment Required (BAM Subsections 5.2.5 and 5.2.6)
		Survey Method	Timing of Survey – within Recommended Period?		Effort (hours & no. people)		
<i>Eucalyptus pumila</i>	Pokolbin Mallee	20-40m transects	☒ Yes 30/07/2025	☐ No	1hour 25minutes, 1 staff	No	No

Additional details on the survey requirements for each species are provided below. A list of all flora observed on site is provided in **Appendix G**, and a list of all fauna incidentally observed on site whilst undertaking surveys or via deployed equipment is provided in **Appendix H**. Site photographs are located in **Appendix K**.

Eucalyptus pumila

Eucalyptus pumila (Pokolbin Mallee) can be surveyed at all times throughout the year, using transects at 20m separation in dense vegetation and up to 40m separation in open vegetation. It is a highly restricted species, known only on northwest-facing sandstone slopes of the Broken Back Range and Singleton Army Base. Flowering has been recorded in February, April, June and August (EUCLID, 2020), though due to its highly restricted distribution, little of *E. pumila*'s ecology is known.

According to the TBDC, *Eucalyptus pumila* is a mallee-form eucalypt which grows to 6m high. It has smooth bark which sheds in strips and is coppery in colour, though weathers to become greyish. Adult leaves are lanceolate to falcate, up to 16cm long and 2.5cm wide and are glossy green on both sides. Inflorescences are axillary, white in colour and 7-flowered. Buds are stalked, up to 12mm long and 9mm in diameter. Fruits are hemispherical and shortly stalked, 6-7mm long and 7-9mm in diameter, with four (4) exerted valves.

5.5 Expert Reports

No expert reports have been used in place of threatened species surveys.

5.6 Area or Count, and Location of Suitable Habitat for a Species Credit Species

No threatened fauna species were identified within the Subject Land as species credit species.



Figure 6 – Flora Survey Effort



Figure 7 – Fauna Survey Effort

6.0 Identifying Prescribed Impacts

Prescribed impacts are defined in clause 6.1 of the *Biodiversity Conservation Regulation 2017*, and are additional impacts on threatened species that need to be considered and assessed when a development is proposed. These can include loss of habitat, fragmentation, and other indirect impacts which may affect threatened species. Refer **Table 18** for prescribed impact assessment.

Table 19 – Prescribed Impacts Identified

Feature	Present	Description of Feature Characteristics and Location	Threatened Entities that Use, are Likely to Use, or are Part of the Habitat Feature.
Karst, caves, crevices, cliffs, rocks or other geological features of significance	☐ Yes / ☒ No	There are no karsts, caves, crevices, cliffs, rocks or other geological features of significance within the Subject Land.	N/A
Rocks	☐ Yes / ☒ No		N/A
Human-made structures	☒ Yes / ☐ No	The Subject Land currently contains a café and sales office, in the north-west of the Subject Land, as well as paved areas, a sealed road and carpark providing access to the buildings. However, no structures are present that are likely to provide habitat to threatened species.	The structures present are currently well maintained, highly utilised and unlikely to provide suitable habitat for any threatened flora or fauna species. Additionally, no threatened entities were observed utilising these features during habitat assessment conducted by AEP
Non-native vegetation	☒ Yes / ☐ No	The native sections identified as PCT 3433 (located within the eastern and south-western sections of the Subject Land- 0.74ha) are dominated by exotic ground-cover species classed as General Biosecurity Duties under the NSW Weed Wise Priority Weeds of the Hunter. None of these have been classed as priority weed. These same species are also scattered throughout the managed lawn (<i>Cydondon dactylon</i> dominant planted-native - 0.79ha) located within the centre of the site. Lastly a 0.16ha area of managed garden containing scattered apple trees, exists to the north-west of the site.	Outside of providing foraging habitat for pollinator species, the exotic groundcover within the Study Area provides little in biodiversity value and are unlikely to be utilised by any threatened species. The planted Apple trees have potential to provide opportunistic foraging habitat to threatened species such Grey-headed Flying-fox.
Habitat connectivity and movement of threatened species that maintains their lifecycle	☒ Yes / ☐ No	Habitat connectivity within the Subject Land and to adjacent ecosystems is minimal. The Study Area has been heavily managed, which has resulted in a lack of understorey and midstory vegetation, resulting in almost no	No threatened entities were identified utilising the Subject Land. Due to the absence of understorey and midstory connectivity, the site is unlikely to be utilised as a movement corridor

Feature	Present	Description of Feature Characteristics and Location	Threatened Entities that Use, are Likely to Use, or are Part of the Habitat Feature.
		connectivity terrestrial dwelling fauna within the site and to surrounding ecosystems. The canopy present within the site is moderately fragmented from surrounding intact vegetation by Raymond Terrace Road to the south and a cleared construction site directly to the east. Approximately 130m east of the Study Area is a strip of intact bushland which has been mapped as a wildlife “opportunity corridor” within the Maitland City council Greening Plan. This wildlife corridor spans to the far north and far south of the assessment area (down past Raymond Terrace Road), which forms the majority of native vegetation within the Assessment Area and has already been mitigated from impact within the Waterford Living Stage 71 & 72 plans as per the approved <i>Stage 71 & 72 Waterford Living Biodiversity Development Assessment Report</i> submitted by Kleinfelder in October 2022	by any terrestrial threatened fauna. Given the barriers in place between the site and the more intact habitat corridor to the east, the only threatened arboreal fauna likely to utilise the site to any significant degree would be highly mobile, and most likely only to an opportunistic degree.
Waterbodies, water quality and hydrological processes	☐ Yes / ☒ No	There are no waterbodies present within the Subject Land, or within the surrounding environment that may be impacted by the development.	N/A
Wind turbine strikes (wind farm development only)	☐ Yes / ☒ No	N/A	N/A
Vehicle strikes	☒ Yes / ☐ No	The proposed development includes the construction of several dwellings and a connecting road through the site. The road enters from Cora Way in the North and exits the Subject Land to the east towards and area of future stage development. The site is situated adjacent to Raymond Terrace Road.	No threatened entities were identified to be utilising the Subject Land. While there is potential for the site to be utilised intermittently by more mobile species, the increase in risk of vehicle strikes is unlikely to be significant, as the proposed development is a small residential road and not expected to greatly increase vehicle activity within the Study Area or traffic along Raymond Terrace Rd.

Stage 2 Impact assessment (Biodiversity Values and Prescribed Impacts)

7.0 Avoid and Minimise Impacts

To demonstrate the application is consistent with the BAM, the project has applied the hierarchy of Avoid, Minimise and Offset.

7.1 Avoidance Summary

In order to avoid impacts to native vegetation, the proponent has strategically chosen a site containing mostly infrastructure, non-native or planted native vegetation. Within the design process, an Arborist Impact Assessment (AIA) was conducted, advising measures to avoid the removal of eleven (11) trees within the Subject Land, thus allowing the retention of 0.06 ha of the BC Act Listed EEC *Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions*. A total of four (4) HBTs were identified within the Subject Land of which one (1) will be retained. A total of 0.51ha of this vegetation will be removed, which includes two (2) HBTs deemed unavoidable under the proposed development footprint. A third HBT was proposed for retention. However, is recommended for removal by the AIA (AEP, 2025) as the hollow occurs in a dead stag tree and represents a safety risk due to poor tree structure. The area has been assessed as unlikely to provide optimal habitat for threatened species, however could provide opportunistic foraging habitat for potential nearby threatened species populations, such as Forest Owls (Sooty Owl and Powerful Owl) and the Grey-Headed Flying Fox and so minimisation measures will need to be implemented for these species. Clearance and pre-clearance protocols will be put in place to identify and minimise any potential impact on fauna species utilising the site during construction works.

7.1.1 Minimise Summary

The chosen lots of the development contain minimal high-quality vegetation in comparison to surrounding areas, already minimising impacts to higher quality vegetation.

As part of the design process, the proponent sought to minimise impacts to the higher quality areas of native vegetation within the site. The subdivision boundary was designed to enable minimisation of tree disturbance and retention of eleven (11) trees (AEP, 2025). These trees will be subject to tree protection measures to minimise disturbance and enable retention. Further minimisation of impacts to potential foraging habitat on site can be achieved by replacing foraging vegetation (native ground-covers and locally occurring *Eucalyptus* species) by incorporating these or similar species into the landscape design and mitigating biodiversity loss.

Further details of Avoid and Minimisation have been provided below, outlining the application of the Avoid and Minimise Hierarchy in finer detail.

7.1.2 Offset Summary

Following the application of Avoid and Minimise, the project will offset any impacts to native vegetation through the retirement of credits. Further detail has been provided within **Section 9** of this report.

7.2 Avoid and Minimise Direct and Indirect Impacts

7.2.1 Project Location

The site and dimensions of the proposed development are the result of a carefully considered design process, prioritising the avoidance and minimisation of impacts to areas with high biodiversity value.

The development predominantly utilises cleared and disturbed land, already developed with several structures. The areas of native vegetation within the Study Area (0.74 ha) are dominated predominantly by canopy trees, with a managed and sparse understory (located to the east of the site) and a small section of native ground-cover vegetation within a divided garden bed (to the south-west of the site). As such, the native vegetation has been classed as poor under the VIS. Remaining vegetation consists of an area of *Cynodon dactylon* dominated planted native vegetation, currently managed as a lawn. The chosen Subject Land is therefore considered to contain low biodiversity value.

Connectivity within the Study Area is limited to the Eastern portion of the site, containing a mature canopy of PCT 3433 in poor condition. This area boasts moderate connectivity, with a moderate canopy of mature trees for movement of arboreal and more mobile species. However, dispersal is limited for other species, due to the absent mid story and degraded understory.

Connectivity between the site and surrounding area is somewhat limited by dispersal barriers, with Raymond terrace road directly adjacent to the South of the site, and an area of cleared land approved for residential development to the east. As previously stated, a wildlife “opportunity corridor” as mapped within Maitland City councils greening plan is located approx. 130m to the east of the site and provides majority of the native vegetation and therefore biodiversity value within the assessment area. Impacts to this area have previously been mitigated within the wider Waterford Living project, as it was assessed and avoided within the approved *Stage 71 & 72 Waterford Living Biodiversity Development Assessment Report* submitted by Kleinfelder in October 2022. The current development will therefore have minimal impact on habitat connectivity to areas of high value habitat.

No mapped hydrolines or waterways are proposed to be impacted as a result of the development, with no waterbodies occurring within the Study Area.

Manmade structures within the site consist of an existing café, site office and shade structure, as well as associated paved areas, an access road and carpark. These occur within the north west of the site and will be impacted by the development. These structures are highly utilised and maintained and are unlikely to provide suitable habitat for threatened species and local flora and fauna in general.

In summary, the project is located in an area of disturbed and managed land in an urban area. Habitat within the Study Area is restricted to degraded native vegetation with a moderate canopy. This area is scheduled to be impacted by the proposed development, which will reduce habitat availability for mobile species in the area. The poor quality of the vegetation on site, and dispersal barriers indicate impacts to habitat and biodiversity value of the surrounding area will be minimal.

7.2.2 Project Design

As detailed in **Section 6.1.1**, the project location has limited biodiversity value, with habitat restricted to an area of canopy trees that have minimal connectivity to surrounding bushland. A total of 62 trees were identified within the Subject Land. As part of the Biodiversity Assessment the proposal is required to demonstrate the Principles of Avoid, Minimise and Offset, and as such an AIA was conducted to determine which trees could be retained under the current development plan. Of the 62 trees, eleven (11) were identified for retention along the south and east boundaries and within the proposed lots. Measures will be taken to minimise disturbance to trees during construction by implementation of a Tree Protection Plan, including establishment of fencing for tree protection.

The native-vegetation on site has been identified to be commensurate with the BC-Act listed *EEC Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions*, with 0.51ha predicted to be impacted by the development and 0.09ha retained as result of the above-mentioned retained trees.

As outlined in **Section 6.2.1**, habitat values and connectivity within the Subject Land are minimal, during construction, the proposed development is unlikely to displace any threatened entities. Four (4)

HBTs were identified on site, all of which are set to be impacted by the development and will require removal, reducing habitat available to mobile species (birds and microbats) occupying the locality. One of these hollows were being utilised by a pair of eastern rosellas and preclearance measures will need to be implemented to mitigate impacts during clearance.

7.2.2.1 Water quality and Hydrology

- An Erosion and Sedimentation Control Plan (ESCP) should be prepared for the proposal following guidelines from Landcom (2004), as well as a Stormwater Management Plan (SMP);
- Best practice erosion and sedimentation controls should be put in place to limit offsite movement of materials into the adjacent vegetation; and
- Erosion and sedimentation controls should be checked daily and maintained in working order especially after rain events.

No waterfront land (including rivers) was found within 40m of the proposed development. Therefore, no further consideration of the WM Act was needed.

7.2.2.2 Protection and management of retained vegetation

- For the clearing phase, retained vegetation located on the edges of the development footprint will be delineated by flagging tape, fencing and signage indicating an environmental protection zone. This will allow fauna to egress the development area as needed. Following the completion of clearing works, permanent delineation features such as logs should be installed to protect the retained vegetation during operational phase of the development;
- Prior to construction commencing, the Project Ecologist will inspect the exclusion flagging tape alignment to ensure it adequately delineates the areas of retained trees and vegetation from the development footprint;
- No machinery or material is to be stored within retained vegetation or within the dripline of retained trees;
- Trees to be removed are to be felled in the opposite direction of the retained vegetation where possible;
- A Tree Protection Plan will be implemented from recommendations within the Arborist Report with final development design and Landscape Plans.
- Vegetation clearing immediately adjacent to the retained lands should be undertaken at the direction of the Project Arborist to provide advice on minimising impacts to retained trees;
- Effective weed control should be used on site, ensuring that appropriate methods are used to eliminate and dispose of high threat exotic weeds and highly competitive weeds; and
- The Subject Land occurs within Bushfire Prone Land, and contains Vegetation Buffer areas. All mitigation measures for bushfire shall comply with the required standards (*Planning for Bushfire Protection*, 2019).

7.2.2.3 Fencing

- No additional barbed wire fencing is to be constructed or used within the Subject Land;
- Fencing within the Subject Land is to prevent incursions by fauna into the construction site; and following completion of the development, fencing should be designed to allow free movement of fauna within all retained lands; and

- Permanent fencing for the development should exclude access by the general public but include gates for access for site management activities including bush regenerators, vegetation and nest box/BMP monitoring.

7.2.2.4 General clearance and construction

The following measures are provided to help mitigate impacts of the construction and ongoing operation of the proposed development on the biodiversity values on adjoining land:

- Vegetation clearing is to be timed to avoid cold weather periods where overnight temperatures are forecast to be less than 12°C if microbats are present. Cold weather is likely to make it difficult for resident hollow dependent fauna to successfully relocate. This is particularly relevant for low body-weight species;
- A staged approach to clearing is to be undertaken to provide fauna the opportunity to disperse outside the area of impact. Staging to include;
 - o Phase 1 Clearing: Underscrubbing;
 - o Phase 2 Clearing: Removal of non-habitat trees; and
 - o Phase 3 Clearing: Removal of habitat and connecting trees.
- All clearing works (Stage 1, 2 and 3) are to be undertaken under the supervision of the Project Ecologist;
- Clearing should occur in a direction from previously disturbed lands towards retained lands;
- Vegetation clearing immediately adjacent to the retained lands should be undertaken at the direction of the Project Arborist to provide advice on minimising impacts to retained trees;
- Implement clearing protocols, including pre-clearance surveys to identify habitat and vegetation to be retained;
- All clearing works are to be attended by a suitable equipped and experienced ecologist to deal appropriately with any displaced fauna species;
- Any fauna rescued during vegetation clearing is to be assessed for injuries, and subsequently released to a suitable nearby location; this may require holding fauna until dusk for release in accordance with relevant animal ethics licencing and standards;
- If any fauna is injured during vegetation clearing, they are to be taken promptly to a nearby veterinarian or suitable wildlife carer contact;
- In addition, prior to clearing of any vegetation, an ecologist is to inspect the area for any signs of resident fauna requiring attention, and in particular nesting birds. Where such is identified, appropriate strategies are to be developed and instigated to minimise impacts. Pre-clearance surveys to include diurnal surveys, stag watching and nocturnal surveys;
- Civil Construction staff are to be inducted into pre-clearing and clearing protocols, and to identify environmental features for protection;
- All cleared vegetation is to be mulched on site and spread to help stabilise any exposed soil and minimise offsite movement of biomass. Live mulch and topsoil of local provenance is an ideal way to begin rehabilitation of retained lands. Fallen timber and hollow logs identified to be retained to be relocated into the retained lands;
- Plantings will be incorporated in the landscape design of the proposed development site to provide future resources for native fauna in the area;

- Implement hygiene protocols for machinery are to prevent the spread of weeds outside the development site;
- Protocols within the Construction Environmental Management Plan (CEMP) to manage Acid Sulfate Soils (if the project is likely to expose Acid Sulfate Soils);
- Best practice erosion and sedimentation (ERSED) and dust suppression control methods are to be adopted, monitored and maintained throughout any vegetation clearing works, particularly for downstream areas. Such are to be in accordance with “Soils and Construction – Managing Urban Stormwater” published by Landcom;
- Incorporation of Water Sensitive Urban Design (WSUD) principles within stormwater infrastructure is to occur to minimise downstream hydrology changes; and
- Any bushfire protection measures in the form of Asset Protection Zones (APZs) or defensible space are to be incorporated within the development footprint to avoid requirements for additional vegetation removal in surrounding areas.

7.3 Other Measures Considered

No other measures have been considered as part of the proposal.

7.4 Avoid and Minimise Prescribed Impacts

7.4.1 Project Location

As outlined in **Section 7.2.1**, and **7.2.2** the location of the proposed development strategically avoids impacts on sensitive environmental features. Due to its highly disturbed state, the Subject Land provides little in quality habitat, vegetation and connectivity to surrounding areas.

7.4.2 Project Design

The project has gone through an iterative design process which has located the proposed development within an area of disturbed urban land, avoiding native vegetation where possible. The final design seeks to utilise areas of non-native vegetation and previously developed areas, retaining trees within the vegetated area where possible.

As outlined in **Table 6**, the Subject Land contains limited prescribed features, with the existing human-made dwellings providing little in the range of biodiversity value and habitat for threatened species. No waterbodies, caves, karsts or other abiotic natural features are present within the Subject Land. Although some connectivity will be lost due to the development, it is considered minimal in comparison to the available wildlife “opportunity corridor” located east of the site.

7.5 Summary of Measures to Avoid and Minimise Impacts

Table 19 describes the Avoidance and Minimisation measures implemented for direct, indirect and prescribed impacts on site.

Table 20 – Avoidance and Minimisation Measures for Direct, Indirect and Prescribed Impacts

Action	Outcome	Timing	Responsibility
Design iterations	The initial design of the proposed development sought to avoid native vegetation impacts where possible. Underground service trench placement was altered, to reduce encroachment on retained trees and minimise impacts. Approximately 0.51ha of PCT 3433 – Poor will be impacted.	Design phase	Proponent
Retention of native vegetation	An area of 0.09ha of PCT 3433 is to be retained, including eleven (11) trees which are proposed for retention. The remaining trees could not be avoided and are scheduled for removal.	Design phase	Proponent
Avoidance of Hollow Bearing Trees	Two (2) trees containing, medium and small hollows are proposed to be impacted by the development. A single dead stag tree containing a hollow will also be removed as recommended by the AIA (AEP, 2025) due to safety concerns. One (1) HBT, comprising an extra small and small hollow are proposed to be retained. Preclearance measures will be implemented to translocate roosting birds, as well as the presence of supervising ecologist during all removal of HBTs to prevent impacts to potential inhabiting fauna.	Pre-construction, during construction	Proponent Project Ecologist
Human made structures	Several structures are to be removed. The habitat value of these structures, are considered minimal (refer Section 7.3.2). Pre-clearance surveys (for microbats, etc.) are not considered required.	Pre-construction	Proponent
Non-native vegetation	Non-native vegetation is to be removed. The planted Apple trees within the Subject Land are likely to provide opportunistic foraging habitat for threatened bat species with historical records within the Subject Land. Mitigation measures such as replacement of Apple trees incorporated into landscape designs should be implemented to reduce potential impacts to foraging habitat.	Pre-construction, during construction	Proponent
Avoidance of riparian areas	None identified within the Subject Land.	N/A	N/A
Avoidance of TECs	PCT 3433 on site was assessed to be commensurate with the State listed		Proponent

Action	Outcome	Timing	Responsibility
	EEC, <i>Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions</i> . 0.09ha of this EEC is proposed to be retained, and 0.51ha impacted.		
General Clearance and Construction principles	Measures to mitigate impacts of clearance and construction works on the biodiversity values on adjoining land will be undertaken as a part of the proposed development.	Construction	Proponent and Project Ecologist

8.0 Impact Assessment

8.1 Direct Impacts

8.1.1 Residual Direct Impacts

Residual impacts on native vegetation associated with the development have been reduced following the avoidance measures detailed above. Potential threatened species impacts have been reduced through minimisation measures. In total, the proposal would impact approximately 0.51ha of native vegetation as summarised in **Table 20** below.

Table 21 – Summary of Residual Impacts

Direct Impact	BC Act Status	EPBC Act Status	SAll Entity	Project Phase/Timing of Impact	Extent (ha)
Removal of 0.51ha of PCT 3433 – Poor	Commensurate with EEC - <i>Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions</i>	Does not conform to EPBC Act criteria	No	Construction	0.51

8.1.2 Change in Vegetation Integrity Scores

Residual impacts on vegetation condition after avoidance and minimisation measures have been carried out are documented in **Table 21**.

Table 22 – Impacts to Vegetation Integrity

Vegetation Zone	PCT ID	Area (ha)	Before Development				After Development				Change
			Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	Change in VI score
VZ1	3433	0.51	49.5	29	65.7	45.5	0	0	0	0	- 45.5

8.2 Indirect Impacts

Indirect impacts have been assessed with respect to each stage of the project. Possible indirect impacts are primarily associated within the construction phase, and future impacts will be mitigated through measures provided in this report (refer **Table 22**).

Table 23 – Summary of Residual Indirect Impacts

Indirect Impact	Impacted Entities	Extent (ha)	Frequency	Duration	Project Phase/ Timing of Impact	Likelihood and Consequences
Indirect impacts to adjacent vegetation associated with construction works	PCT 3433	N/A	Dust, damage to vegetation, soil disturbance, and other indirect impacts associated with construction	Short term	Construction	Indirect impacts to retained vegetation within the Study Area are considered unlikely during construction. TPZ will be established surrounding all retained trees, and watering and tree care works are to be implemented around tree 12 where TPZ encroachment occurs.
Weed invasion and edge effects	PCT 3433 Surrounding landscape	N/A	During construction	Short term	Construction	The vegetation in the Subject Land is already highly managed and impacted by weeds. Additional edge effects from the development are not expected to be significant. While edge effects, such as changes in vegetation structure, increased exotic plant growth, and altered fauna behaviour, can result from construction activities, the site and surrounding areas have already been extensively cleared and managed and as such are unlikely to be further impacted. However as there is intact vegetation adjacent to the site, and the incursion of priority weeds by machinery can create wider impacts to biodiversity, biosecurity measures should be implemented on footwear and machinery entering the site from outside environments.
Pests and pathogens	N/A	N/A	During construction	Short term	Construction	Construction activities can potentially introduce or spread pathogens like Phytophthora (<i>Phytophthora cinnamomi</i>), Myrtle Rust (<i>Austropuccinia psidii</i>), and Chytrid fungus (<i>Batrachochytrium dendrobatidis</i>) into native vegetation. The risk

Indirect Impact	Impacted Entities	Extent (ha)	Frequency	Duration	Project Phase/ Timing of Impact	Likelihood and Consequences
						of impact from these pathogens is low due to the already disturbed nature and moderate human use of the Subject Land.
Noise, light, dust and vibration	N/A	N/A	During construction	Short term	Construction/operation	The site is located within a heavily urbanised area with disturbance from noise, light and vibration occurring from houses within the estate and traffic along Raymond Terrace Road and surrounding smaller streets. Although construction activities will temporarily increase noise, dust and vibration during the construction phase, as there are current construction works occurring within the adjacent lot, the development is unlikely to add much in the way of disturbance, to nearby fauna species. However, in order to avoid accumulative impacts, disturbances created by noise, light, vibration and dust should be incorporated and managed under the CEMP. Under appropriate management measures, the disturbance to fauna on site and in the nearby corridor is likely to be low.
Sedimentation and erosion	N/A	N/A	During construction/ operation	Short term/long term	Construction/operation	The Subject Land does not contain any hydrolines or natural waterbodies. However, the development still has the potential to alter the quantity and quality of surface and ground water flows. Appropriate Erosion and Sediment Control Plans should be implemented as part of any approval to ensure this is managed as part of construction works.

8.3 Prescribed Impacts

Prescribed impacts relevant to the proposal are described below.

8.3.1 Karst, Caves, Crevices, Cliffs, Rocks or other Geological Features of Significance

No features of geological significance, such as karst, caves, crevices, cliffs, rocks and other geological features of significance supporting threatened species and ecological communities; are present on site. Therefore, no prescribed impacts to these features are relevant to this proposal.

8.3.2 Human-made Structures

The project involves the removal of an existing café, Waterford Living Estate site office and associated road/ paved areas. These features are well-maintained and unlikely to provide suitable habitat for threatened species and local flora and fauna in general.

The project involves the construction of several residential dwellings across the site as well as a paved access road through the eastern area of the site. These activities will be temporary and localised to the Site area, and are not anticipated to impact any threatened entities as identified within this report.

8.3.3 Non-Native Vegetation

A small area (0.16ha) of non-native planted vegetation is present within the north west of the Study Area, within this are scattered planted Apple trees, which could provide some opportunistic foraging habitat to threatened species such as Grey-headed Flying-fox.

Additionally, the native vegetation within the Study Area is dominated by exotic ground-cover species classed as General Biosecurity Duty under the NSW Weed Wise Priority Weeds of the Hunter. None of these have been classed as priority weeds. These same species are also scattered throughout the managed lawn (*Cydodon dactylon* dominant planted-native - 0.79ha) located within the centre of the site. Outside of providing foraging habitat for pollinator species, these species provide little in biodiversity value and are unlikely to be utilised by any threatened species.

No non-native vegetation is proposed to be retained within the Subject Land, and thus in order to mitigate potential impacts, replacement of Apple trees or plants of similar value, should be incorporated into the landscaping design.

Habitat connectivity within the Subject Land and to adjacent ecosystems is minimal. The Study Area has been heavily managed, which has resulted in a lack of understorey and midstory vegetation, resulting in almost no connectivity terrestrial dwelling fauna within the site and to surrounding ecosystems. The canopy present within the site is moderately fragmented from surrounding intact vegetation by Raymond Terrace Road to the south and a cleared construction site directly to the east.

Due to the absence of understory and midstory connectivity, the site is unlikely to be utilised as a movement corridor by any terrestrial threatened fauna. Given the barriers in place between the site and the more intact habitat corridor to the east, the only threatened arboreal fauna likely to utilise the site to any significant degree would be highly mobile, and most likely only to an opportunistic degree.

Therefore, the prescribed impacts as a result of the proposed development are considered minimal.

8.4 Mitigating Residual Impacts – Management Measures and Implementation

Proposed measures to mitigate residual indirect impacts on habitat are detailed in **Table 23**.

Table 24 – Summary of Proposed Mitigation and Management Measure for Residual Impacts

Mitigation Measure	Method/Technique	Timing	Frequency	Responsibility	Likely Efficacy	MNES
Indirect impacts to adjacent vegetation associated with construction works	Temporary fencing between the Subject Land and avoided lands, including TPZs around retained trees.	Construction	Once before work begins	Construction contractor / Project Manager	High (Low risk of failure)	N/A
Weed invasion and edge effects	Temporary fencing between the Subject Land and avoided lands as well as implementation of biosecurity measures during construction.	Construction	Once before work begins	Construction contractor	High (Low risk of failure)	N/A
Pests and pathogens	Appropriate hygiene practices including equipment and machine washdowns.	Construction	Continuous during construction	Construction contractor	High (Low risk of failure)	N/A
Noise, light and vibration	Follow appropriate construction regulations/guidelines, implement appropriate plans. Minimise excessive noise and light spill in the evening to reduce disturbance to nocturnal species.	Construction	Continuous during construction	Construction contractor	High (Low risk of failure)	N/A
Sedimentation and erosion	Implement appropriate soil and erosion control measures, as well as appropriate stormwater management and water sensitive urban design.	Pre-construction / construction	Continuous during construction	Construction contractor / Project Manager	High (Low risk of failure)	N/A



Figure 8 – Final impacts likely to occur on the subject land

9.0 Serious and Irreversible Impacts

9.1 Assessment for Serious and Irreversible (SAIL) Impacts on Biodiversity Values

The determination of a serious and irreversible impact (SAIL) on biodiversity values must be made by the decision-maker, following assessment of the proposed impacts against the four principles outlined in the *Biodiversity Conservation Regulation 2017*. This section identifies which biodiversity values could be at risk of an SAIL due to the Project and evaluates the impact's extent and severity.

Regent Honeyeater (*Anthochaera phrygia*), Swift Parrot (*Lathamus discolor*), Sooty Owl (*Tyto tenebricosa*), Little Bent-winged Bat (*Miniopterus australis*), Large Bent-winged Bat (*Miniopterus orianae oceanensis*) and Brush-tailed Rock-wallaby (*Petrogale penicillata*) were identified as candidate species by the BAM-C. Upon assessment of the TBCD requirements for these species, according to the BAM, they were discounted (refer **Table 15**).

Targeted field surveys were conducted for the remaining candidate species, *Eucalyptus pumila* (Polkobin Mallee). *Eucalyptus pumila* was not identified during targeted field survey.

10.0 Impact Summary

10.1 Determining an Offset Requirement for Impacts

10.1.1 Impacts on Native Vegetation and TECs or ECs (Ecosystem Credits)

Impacts on native vegetation that require an offset are provided in **Tables 24** and **Figure 9**.

Table 25 – Impacts for PCTs that Require Offset – Ecosystem Credits

Vegetation Zone	PCT Name	Current VIS	VIS Loss	Impact Area (ha)	TEC Association	Sensitivity to Loss	Sensitivity to Gain	Biodiversity Risk Weight	Potential SAIL	Ecosystem Credits
VZ1	PCT 3433: <i>Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest</i>	45.5	-45.5	0.74	<i>BC Act EEC- Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions</i>	High	High	2	No	12
Total Ecosystem Credits										12

10.1.2 Impacts on Candidate Species (Species Credits)

No impacts on Threatened Species are incurred by the proposed development.

10.2 Impacts that do not need Further Assessment

Areas which will be impacted by the Project but do not need further assessment for ecosystem credits are identified in **Table 25** and **Figure 9**.

Table 26 – Impacts that do not need Further Assessment for Ecosystem Credits

Impact	Extent within Subject Land	Justification why no further Assessment is Required
Clearing of Infrastructure	0.33	Area devoid of vegetation due to existing infrastructure.
Clearing of non-native vegetation	0.16	Exotic Ground story vegetation, providing little habitat value for threatened species. Area of managed garden consisting of planted exotic species, small area providing limited habitat opportunities. Planted trees may provide some marginal habitat, however high value native trees have been identified and retained as part of the avoidance strategy.
Clearing of <i>Cynodon Dactylon</i> planted native grassland	0.79	Area of planted and highly managed lawn, providing limited habitat opportunities.



Figure 9 – Thresholds for assessing and offsetting impacts

11.0 Biodiversity Credit Report

The following biodiversity offset credit obligation is incurred by the proposed development (refer **Table 26**). Credit reports are provided in **Appendix L**.

Table 27 – Ecosystem Credit Class and Matching Credit Profile

Ecosystem Credit	Attributes shared with matching credits						
	PCT Name	PCT Vegetation Class	PCT Vegetation Formation	Associated TEC	Offset Trading Group (BAM Section 10.2, Tables 4 & 5)	Hollow Bearing Trees Present?	IBRA Subregion
16	3433 - Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest	Hunter-Macleay Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrub/grass sub-formation)	BC Act listed EEC: Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	Yes	Hunter, or Any IBRA subregion that is within 100 kilometres of the outer edge of the impacted site.

12.0 References

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Appendix A – Proposed Development Plan

DEVELOPMENT APPLICATION

WATERFORD - STAGE 97

LOT 9120 IN D.P.1295941, LOT 9400 IN D.P.1313704

CORA WAY, CHISHOLM



INDEX OF DRAWINGS

DRAWING No.	TITLE NAME
DA-101	COVER SHEET & DRAWING INDEX
DA-102	LOCALITY PLAN - MAITLAND LGA
DA-103	LOCALITY PLAN - LOCAL CONTEXT
DA-104	EXISTING SITE NATURAL SURFACE PLAN
DA-105	OVERALL MASTERPLAN
DA-106	LOT SIZE PLAN
DA-107	ZONING & FLOOD MAPPING PLAN
DA-108	LOT DIVERSITY PLAN
DA-109	ACID SULPHATE SOILS MAPPING PLAN
DA-110	WALKABILITY PLAN
DA-111	BUILDING ENVELOPE PLAN
DA-112	BUILDING ENVELOPE PLAN - DETAIL SHEET 1
DA-113	BUILDING ENVELOPE PLAN - DETAIL SHEET 2

NOT FOR CONSTRUCTION

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
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drawing title:

COVER SHEET &
DRAWING INDEX

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council: MAITLAND CITY COUNCIL

dwg ref: 190433(97)-DA-101

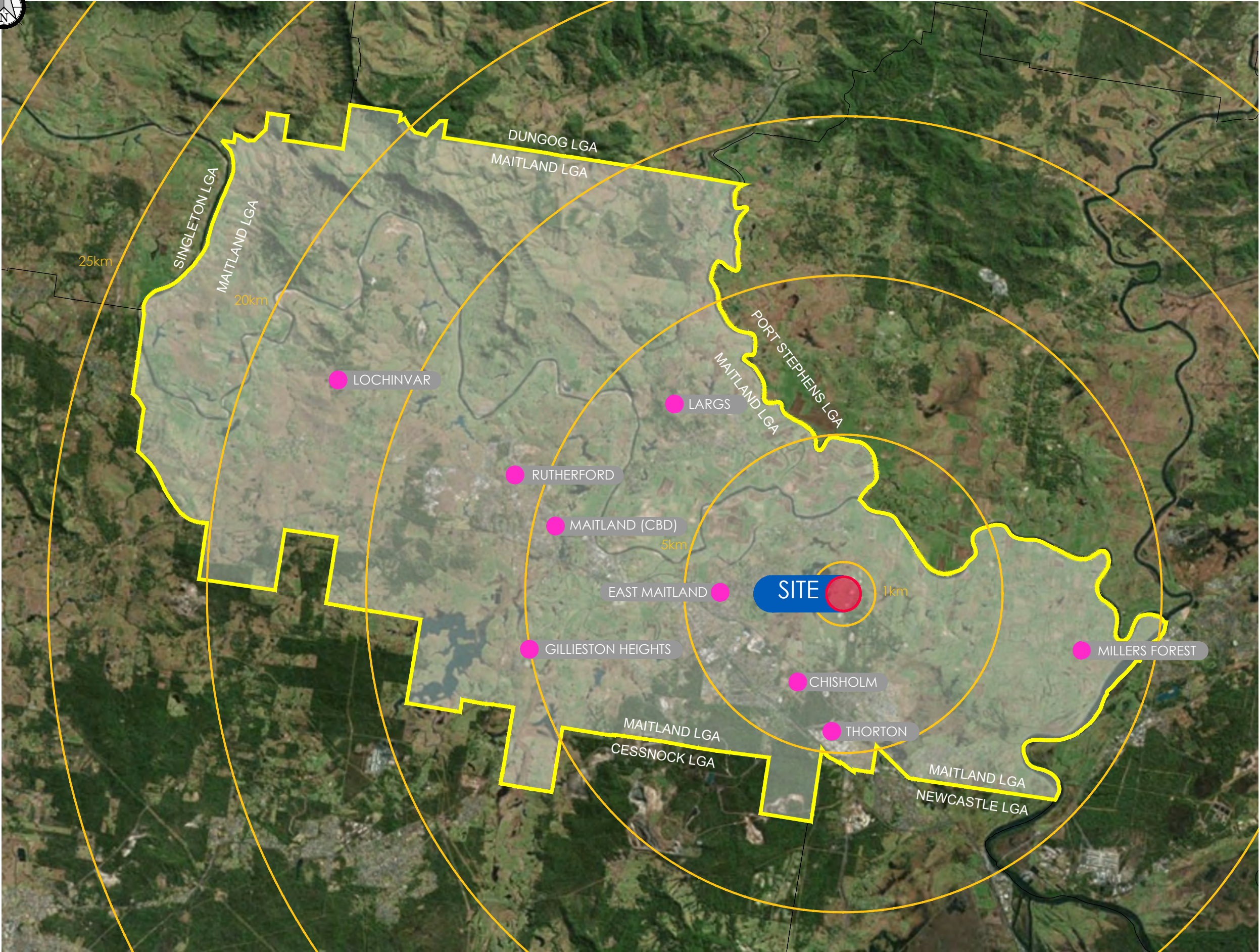
client:

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drawing title:

LOCALITY PLAN
MAITLAND LGA

location:

CHISHOLM

council:

MAITLAND CITY COUNCIL

dwg ref:

190433(97)-DA-102

client:

AVID

Property Group

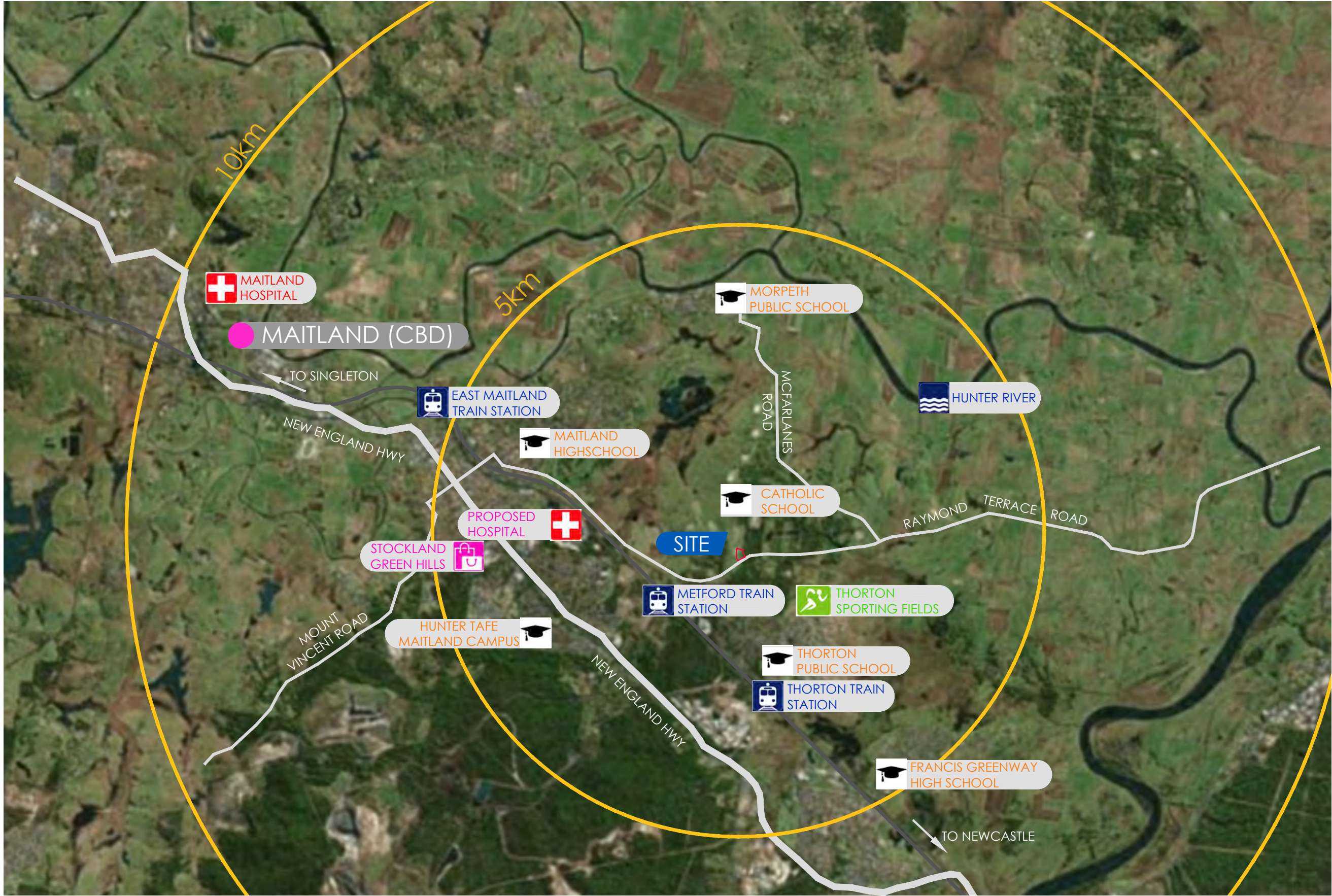
adw

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ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
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- civil engineering
- infrastructure
- superintendency
- social impact
- town planning
- surveying
- development feasibility
- visualisation
- urban design

NOT FOR CONSTRUCTION

drawing title:
LOCALITY PLAN
LOCAL CONTEXT

location: CHISHOLM

council: MAITLAND CITY COUNCIL

dwg ref: 190433(97)-DA-103

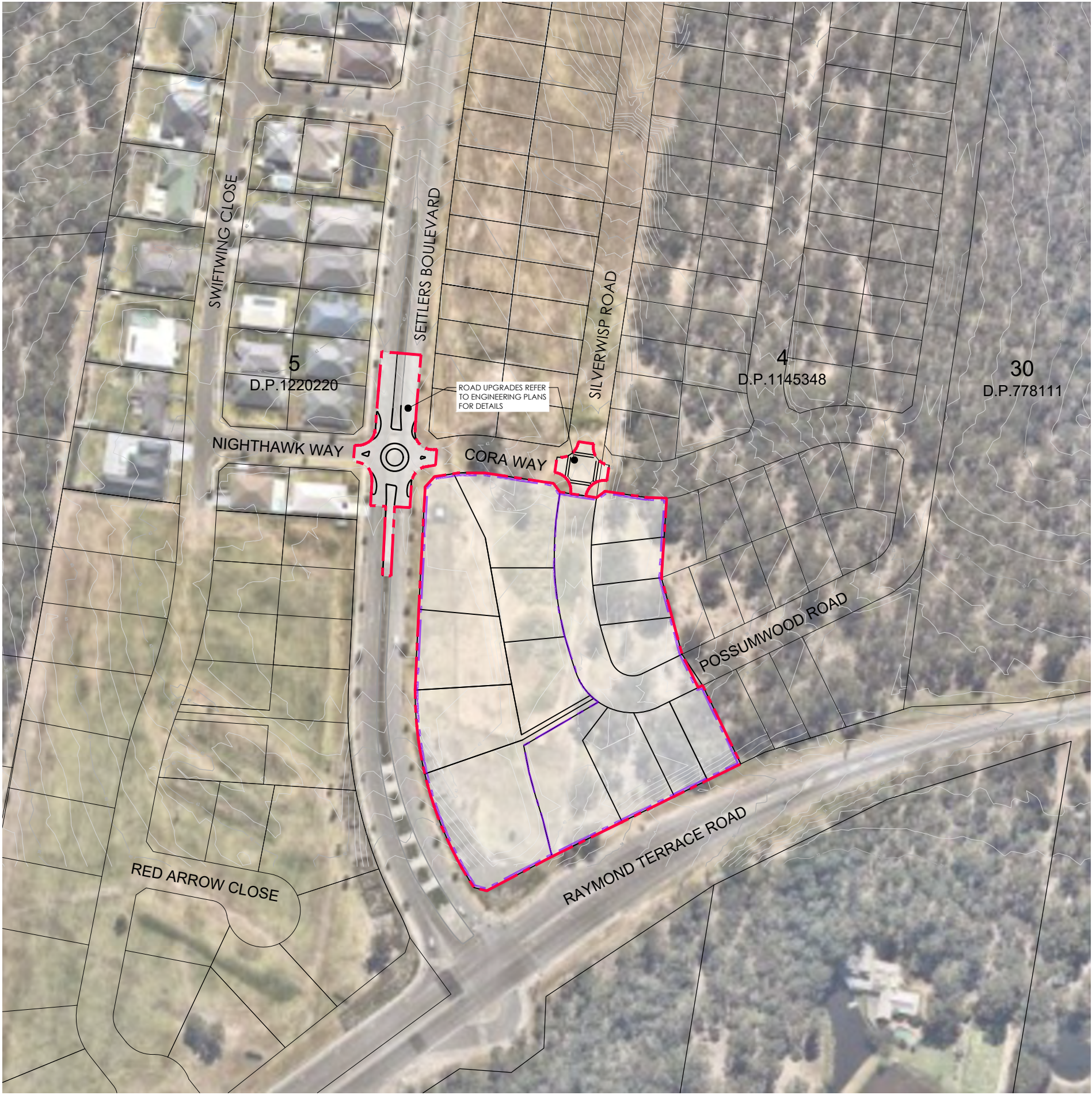
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LEGEND

SITE CADASTRAL BOUNDARY

PROPOSED DEVELOPMENT APPLICATION

PROPOSED STAGE BOUNDARY

EXISTING BOUNDARY

FUTURE BOUNDARY (APPROVED)

PROPOSED BOUNDARY

NOT FOR CONSTRUCTION

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drawing title:

EXISTING SITE NATURAL
SURFACE PLAN

location: CHISHOLM

council: MAITLAND CITY COUNCIL

dwg ref: 190433(97)-DA-104

client:

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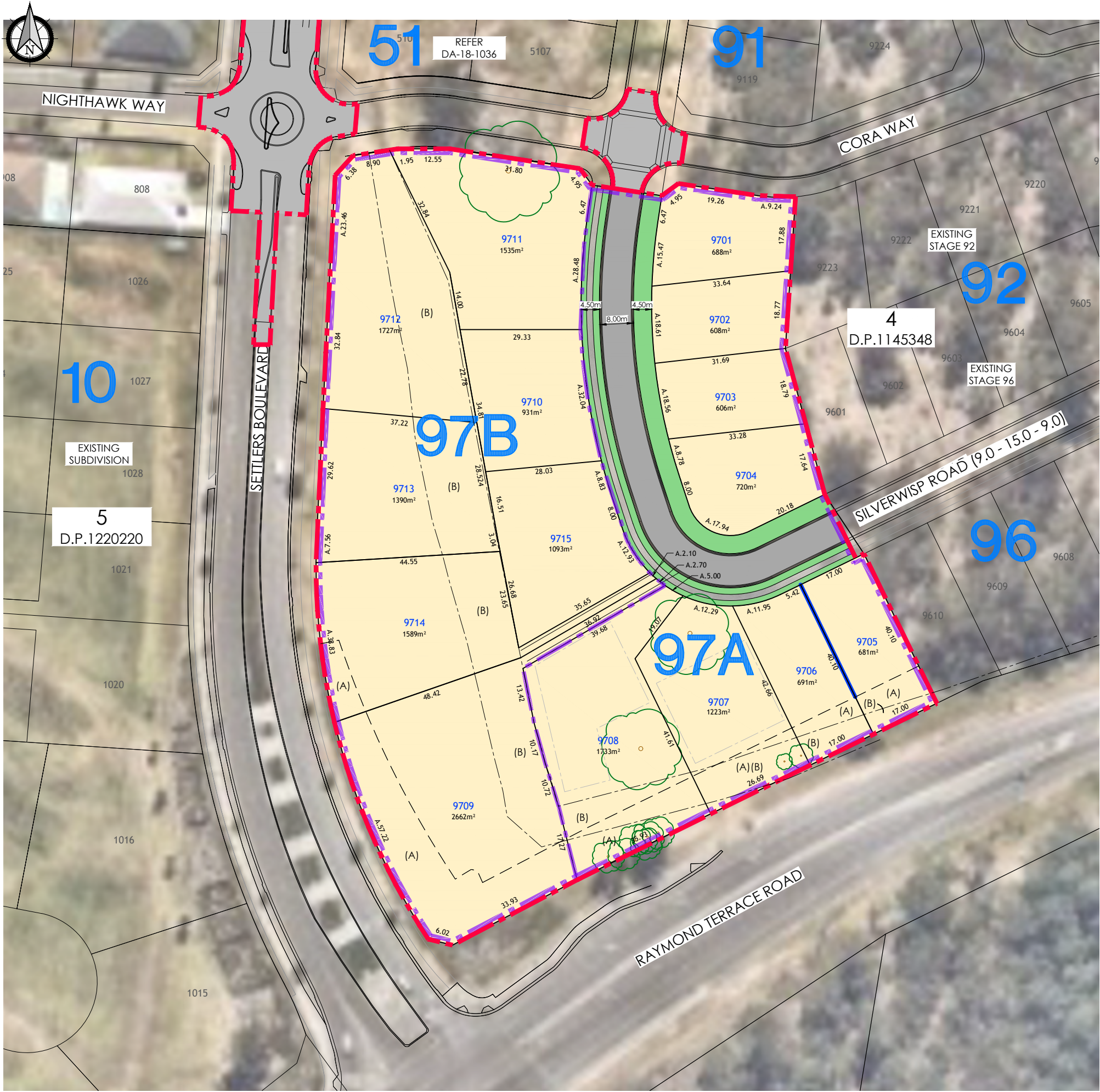


TABLE	
STAGE 97A	8 LOTS
STAGE 97B	7 LOTS
TOTAL	15 LOTS

LEGEND

SITE CADASTRAL BOUNDARY

PROPOSED DEVELOPMENT APPLICATION

PROPOSED STAGE BOUNDARY

EXISTING BOUNDARY

FUTURE BOUNDARY (APPROVED)

PROPOSED BOUNDARY

31

STAGE NUMBER

PROPOSED LOTS

RESIDUE LOT

BUILDING ENVELOPE

(A) LANDSCAPE EASEMENT
(B) SERVICE EASEMENT

- GENERAL NOTES:-
- REFER TO CONCEPT ENGINEERING PLAN 190433(97)-CENG-401 FOR TEMPORARY SERVICING ARRANGEMENTS.

NOT FOR CONSTRUCTION

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OVERALL MASTERPLAN

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council: MAITLAND CITY COUNCIL

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client:

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Property Group

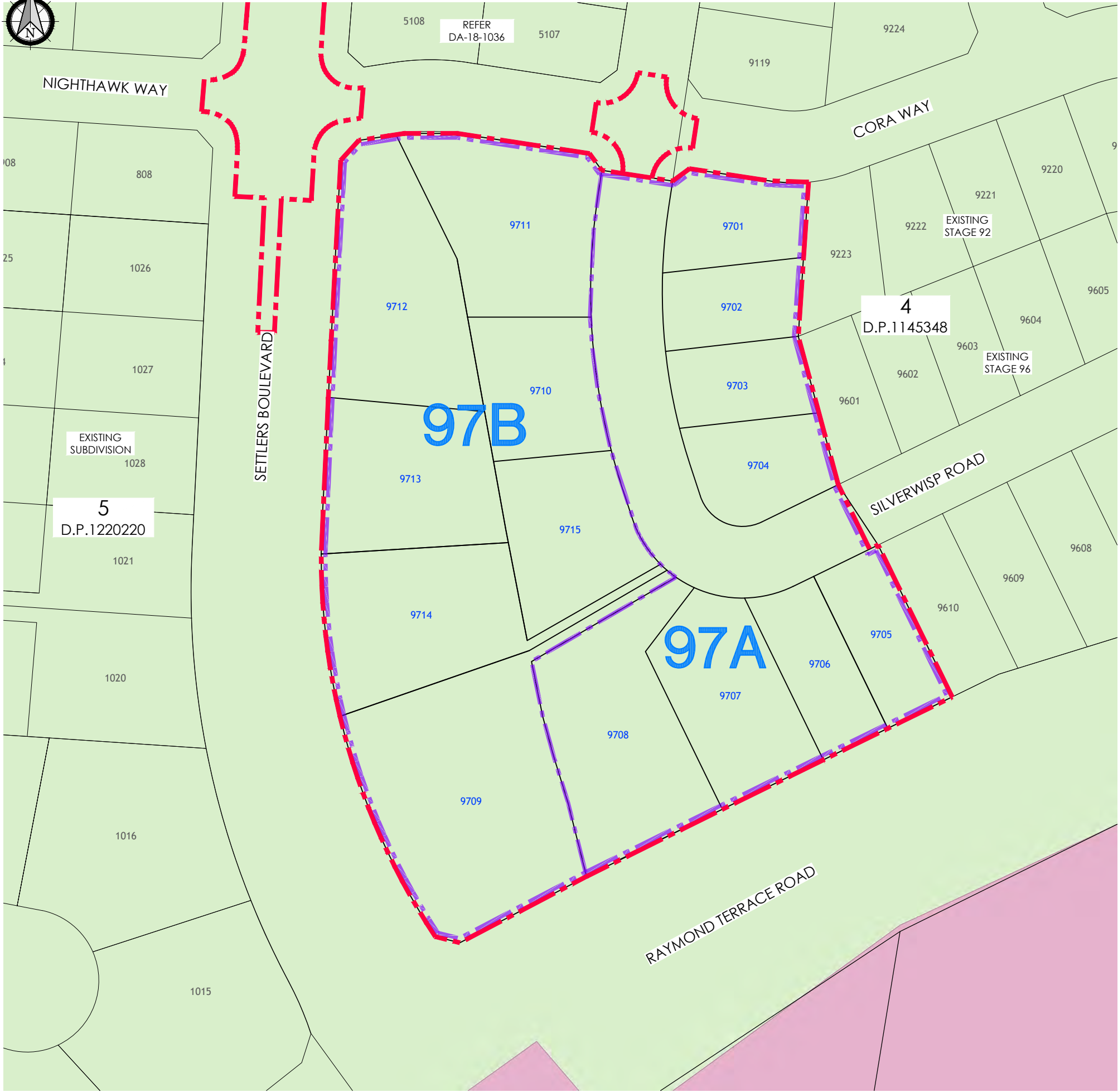
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LEGEND

SITE CADASTRAL BOUNDARY

PROPOSED DEVELOPMENT APPLICATION

PROPOSED STAGE BOUNDARY

EXISTING BOUNDARY

FUTURE BOUNDARY (APPROVED)

PROPOSED BOUNDARY

MINIMUM LOT SIZE (sq m)
G = 450

MINIMUM LOT SIZE (sq m)
AB2 = 400000

NOT FOR CONSTRUCTION

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drawing title:

LOT SIZE PLAN

location:

CHISHOLM

council:

MAITLAND CITY COUNCIL

dwg ref:

190433(97)-DA-106

client:

AVID

Property Group

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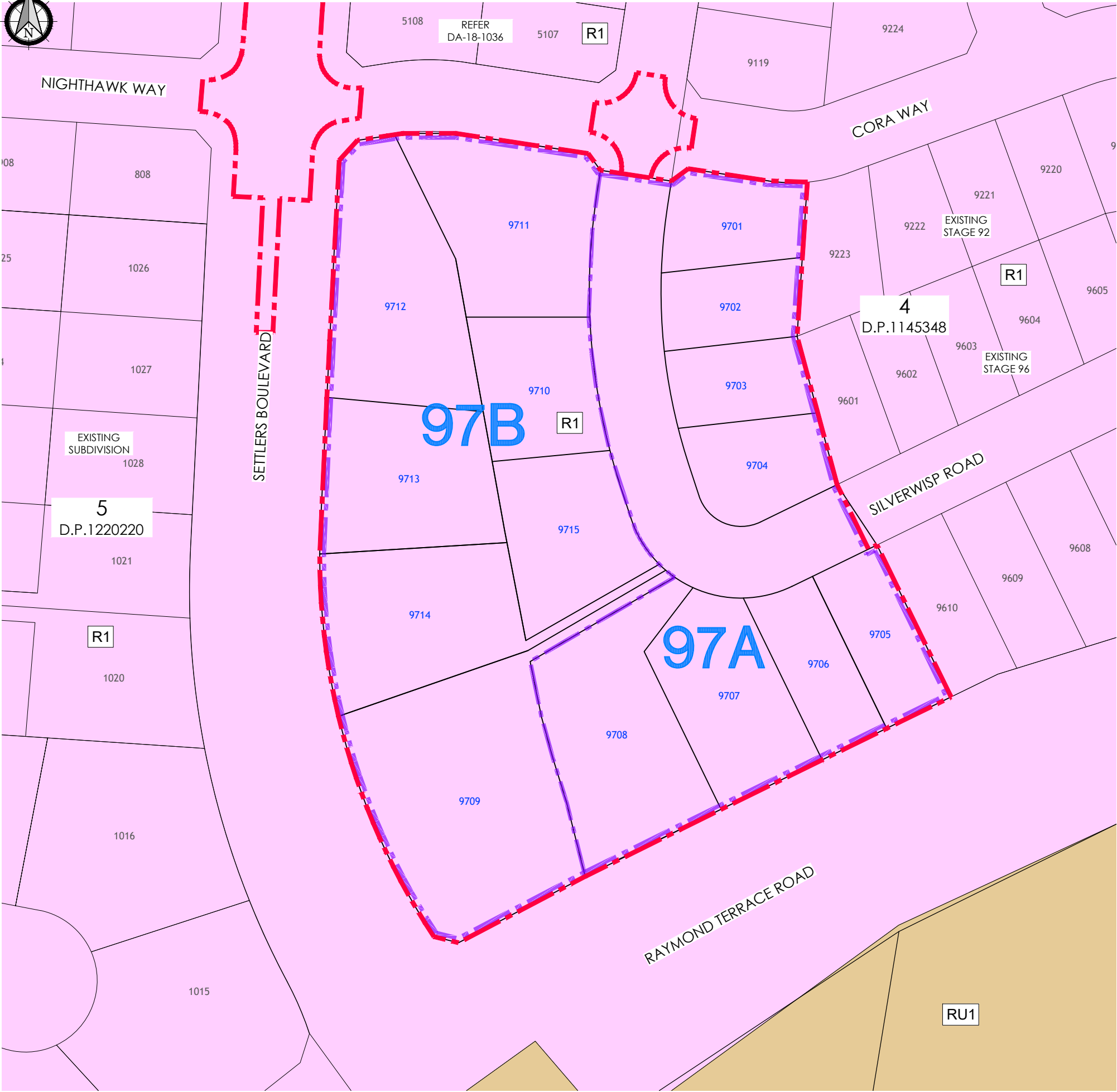
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LEGEND

LIMIT OF WORKS BOUNDARY
STAGE BOUNDARY
PROPOSED LOT BOUNDARY
EXISTING LOT BOUNDARY
MCC FLOOD LEVEL (APPROX.)

81

STAGE NUMBER

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

E4

Environmental Living

IN1

General Industrial

IN2

Light Industrial

R1

General Residential

R2

Low Density Residential

R3

Medium Density Residential

R5

Large Lot Residential

RE1

Public Recreation

RE2

Private Recreation

RU1

Primary Production

RU2

Rural Landscape

RU3

Forestry

RU5

Village

RU6

Transition

SP1

Special Activities

SP2

Infrastructure

SP3

Tourist

W1

Natural Waterways

W2

Recreational Waterways

DM

Deferred Matter

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	29.04.2026	INITIAL ISSUE	BWe	MK	DATUM: GDA2020 MGA56 CONTOUR INTERVAL:	A1 1:500 0 12.5 25.0m A3 1:1000	NOTE : PLANS ARE PREPARED IN COLOUR

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

NOT FOR CONSTRUCTION

drawing title:

ZONING & FLOOD
MAPPING PLAN

location: CHISHOLM

council: MAITLAND CITY COUNCIL

dwg ref: 190433(97)-DA-107

client:

AVID
Property Group



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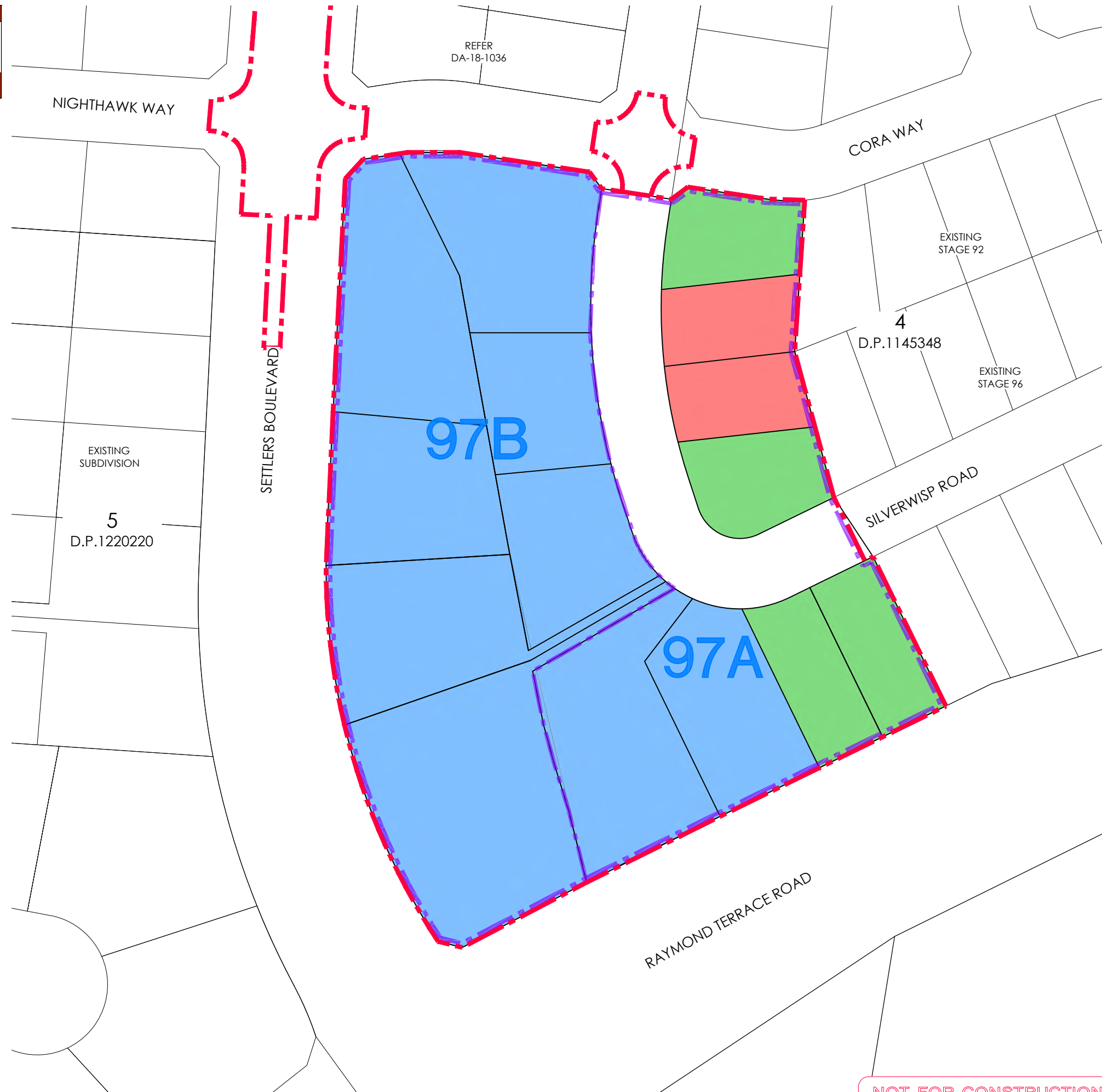


LEGEND	LOT SIZE (m²)	QUANTITY
	450-550	0
	550-650	2
	650-750	4
	750+	9
TOTAL LOTS		15
TOTAL DEVELOPABLE AREA		1.79Ha

LEGEND

- LIMIT OF WORKS BOUNDARY (represented by a red dashed line)
- STAGE BOUNDARY (represented by a blue dashed line)
- PROPOSED LOT BOUNDARY (represented by a solid black line)
- EXISTING LOT BOUNDARY (represented by a solid grey line)

81 STAGE NUMBER



NOT FOR CONSTRUCTION

ver.	date	comment	drawn	pm	level information	scale (A1 original size)
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notes
NOTE : PLANS ARE PREPARED IN COLOUR

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

drawing title:

LOT DIVERSITY PLAN

location: CHISHOLM

council: MAITLAND CITY COUNCIL

dwg ref: 190433(97)-DA-108

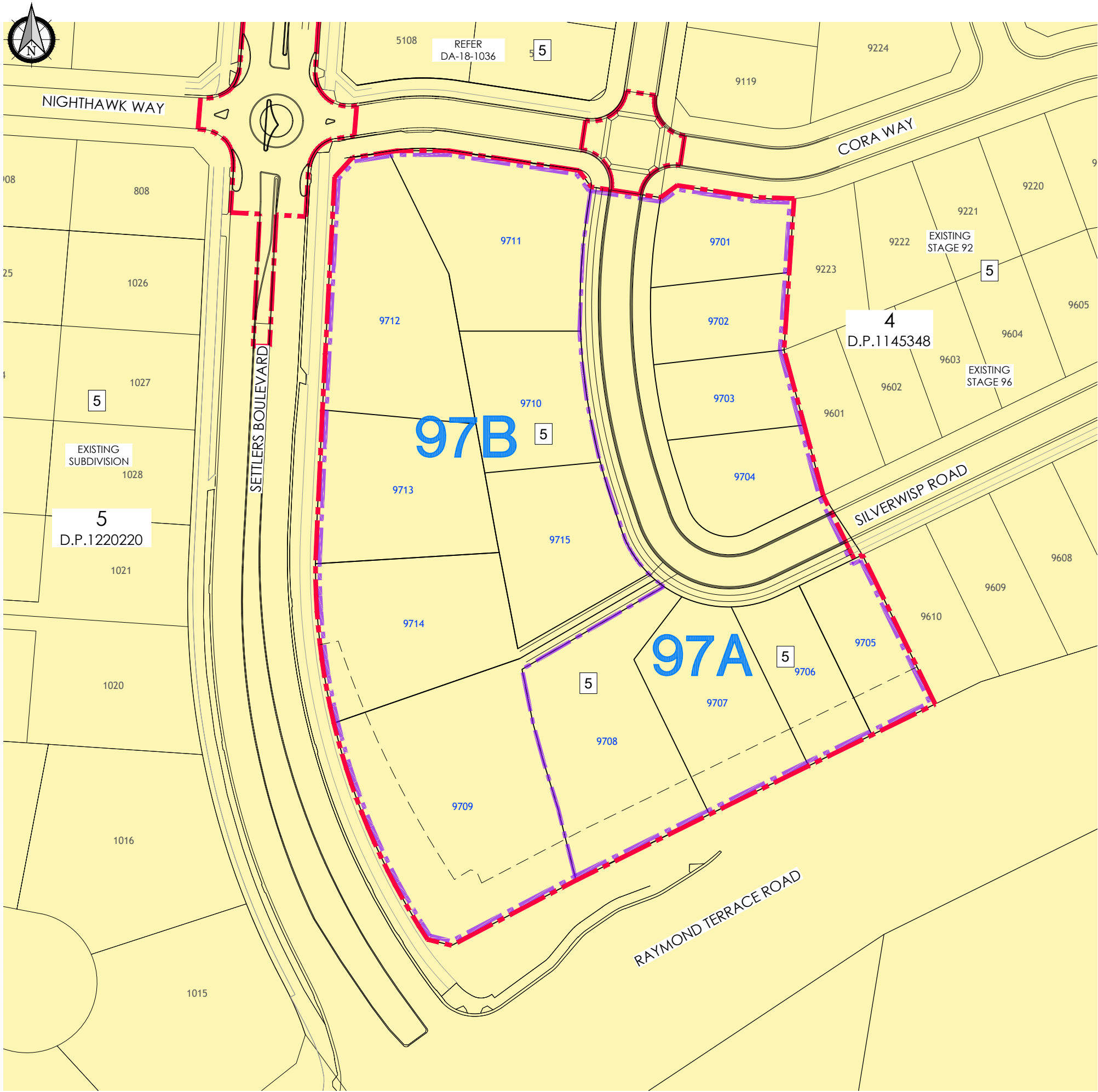
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LEGEND

81

STAGE NUMBER

1

ACID SULPHATE SOILS - CLASS 1

2

ACID SULPHATE SOILS - CLASS 2

3

ACID SULPHATE SOILS - CLASS 3

4

ACID SULPHATE SOILS - CLASS 4

5

ACID SULPHATE SOILS - CLASS 5

NOT FOR CONSTRUCTION

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
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• project management • civil engineering • infrastructure • superintendency • social impact • town planning • surveying • development feasibility • visualisation • urban design							

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drawing title:

ACID SULPHATE
SOILS MAPPING
PLAN

location:

CHISHOLM

council:

MAITLAND CITY COUNCIL

dwg ref:

190433(97)-DA-109

client:

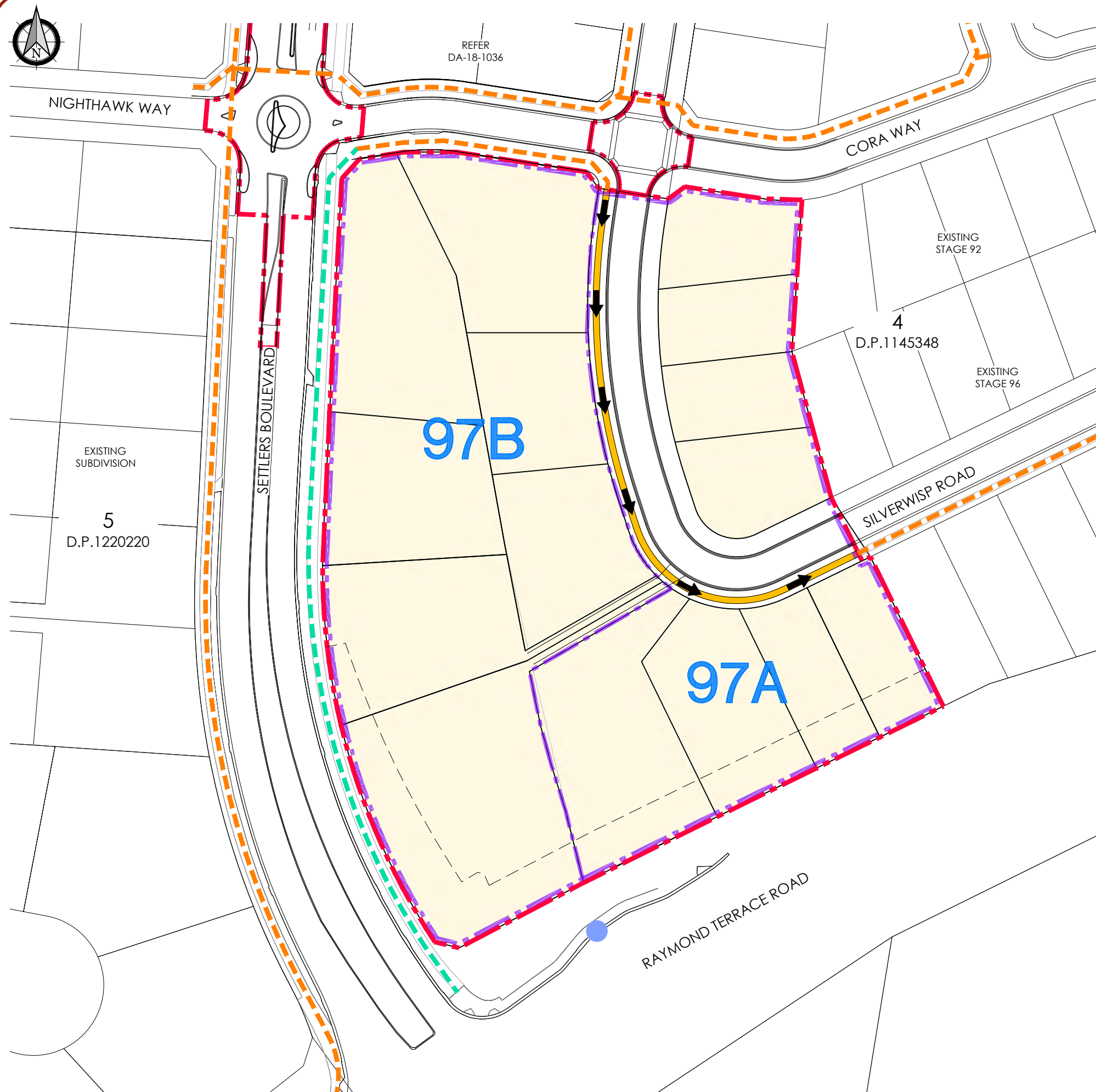
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LEGEND

- PROPOSED DEVELOPMENT APPLICATION
- PROPOSED STAGE BOUNDARY
- PROPOSED LOT BOUNDARY
- EXISTING LOT BOUNDARY
- EXISTING 1.5m WIDE FOOTPATH
- EXISTING 2.5m WIDE SHARED PATH
- EXISTING 3.0m SHARED PATH
- PROPOSED 1.5m WIDE FOOTPATH
- PROPOSED 2.5m WIDE SHARED PATH
- PROPOSED 3.0m SHARED PATH

81
 DESIRED WALKING ROUTE
 COMMUNITY HUB

EXISTING BUS STOP
 FUTURE BUS STOP

400m RADIUS FROM BUS STOP

NOT FOR CONSTRUCTION

ver.	date	comment	drawn	pm	level information	scale (A1 original size)
A	29.04.2026	INITIAL ISSUE	BWe	MK	DATUM: GDA2020 MGA56 CONTIGUOUS INTERPOLATION	

notes
NOTE : PLANS ARE PREPARED IN COLOUR

NOTE : PLANS ARE PREPARED IN COLOUR

town planning • surveying • development feasibility • visualisation • urban design

drawing title:

WALKABILITY PLAN

location: CHISHOLM

council: MAITLAND CITY COUNCIL

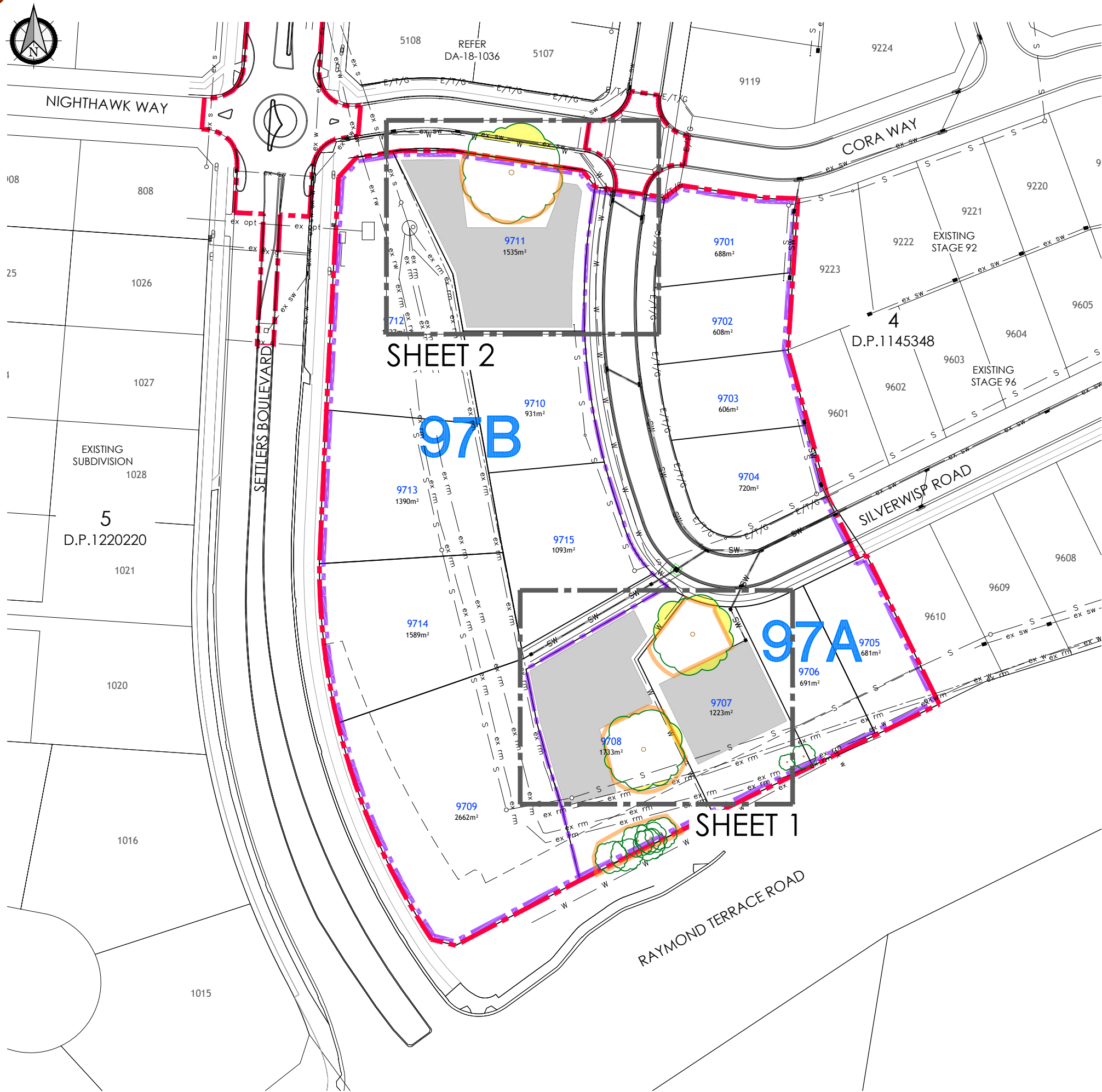
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client:



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LEGEND

PROPOSED DEVELOPMENT APPLICATION

PROPOSED STAGE BOUNDARY

PROPOSED LOT BOUNDARY

EXISTING LOT BOUNDARY

TREE TO BE RETAINED

TREE IMPACT AREA

NOT FOR CONSTRUCTION

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	29.04.2026	INITIAL ISSUE	BWe	MK	DATUM: GDA2020 MGA56 CONTOUR INTERVAL:	A1 0 12.5 25.0m 1:500 1:1000	NOTE: PLANS ARE PREPARED IN COLOUR

project management

civil engineering

infrastructure

superintendency

social impact

town planning

surveying

development feasibility

visualisation

urban design

drawing title:

BUILDING
ENVELOPE PLAN

location: CHISHOLM

council: MAITLAND CITY COUNCIL

dwg ref: 190433(97)-DA-111

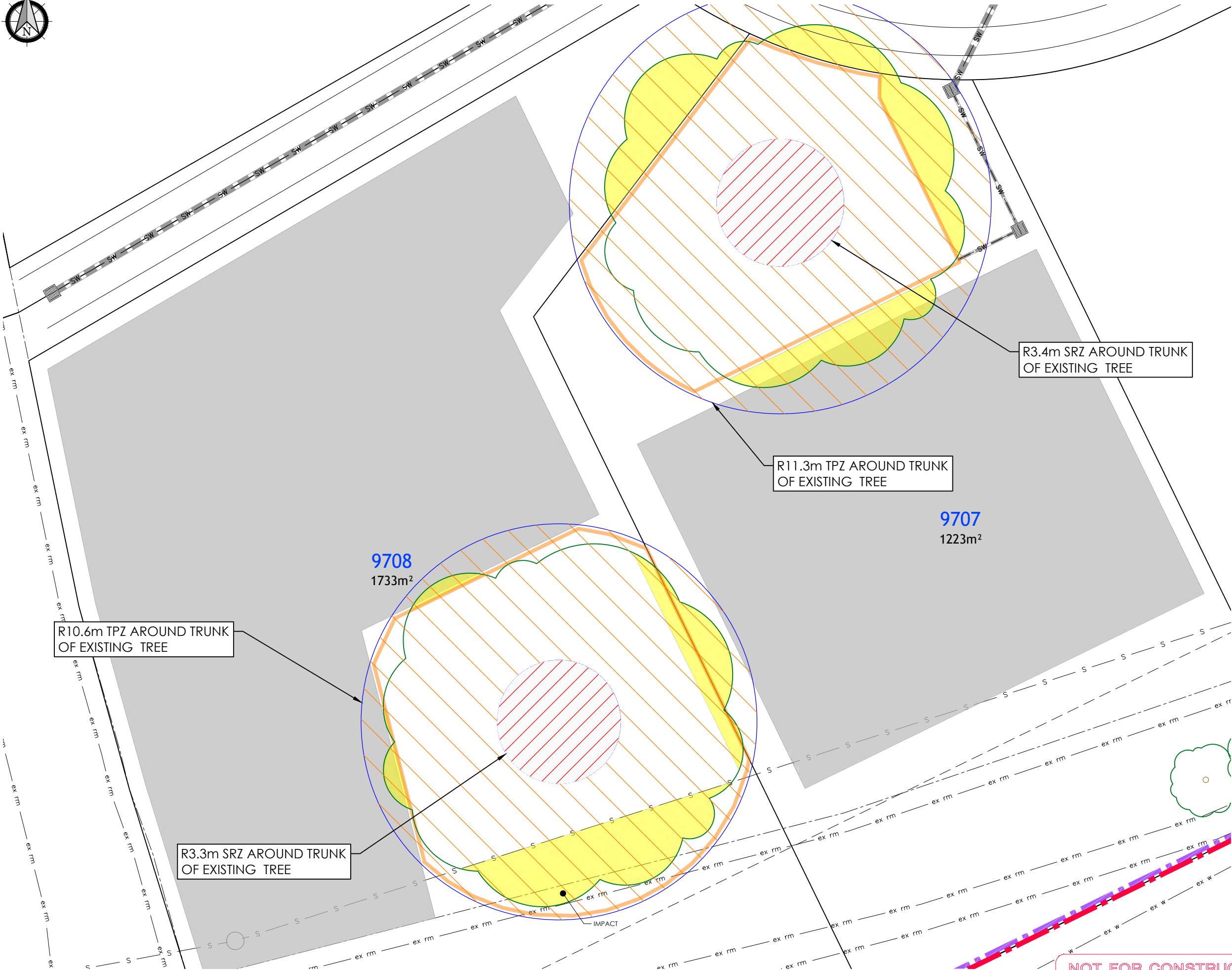
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LEGEND

PROPOSED DEVELOPMENT APPLICATION

PROPOSED STAGE BOUNDARY

PROPOSED LOT BOUNDARY

EXISTING LOT BOUNDARY

TREE TO BE RETAINED

TREE IMPACT AREA

TREE PROTECTION ZONE (TPZ)

STRUCTURAL ROOT ZONE (SRZ)

NO WORKS UNLESS OTHERWISE NOTED

WORKS AND BUILDINGS PERMISSIBLE SUBJECT TO ARBORIST ASSESSMENT

TYPICAL DETAIL

N.T.S.

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	29.04.2026	INITIAL ISSUE	BWe	MK	DATUM: GDA2020 MGA56 CONTOUR INTERVAL:	A1 0 12.5 25.0m 1:500 A3 1:1000	NOTE: PLANS ARE PREPARED IN COLOUR

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

drawing title:

BUILDING ENVELOPE PLAN
DETAIL SHEET 1

location:

CHISHOLM

council:

MAITLAND CITY COUNCIL

dwg ref:

190433(97)-DA-112

client:

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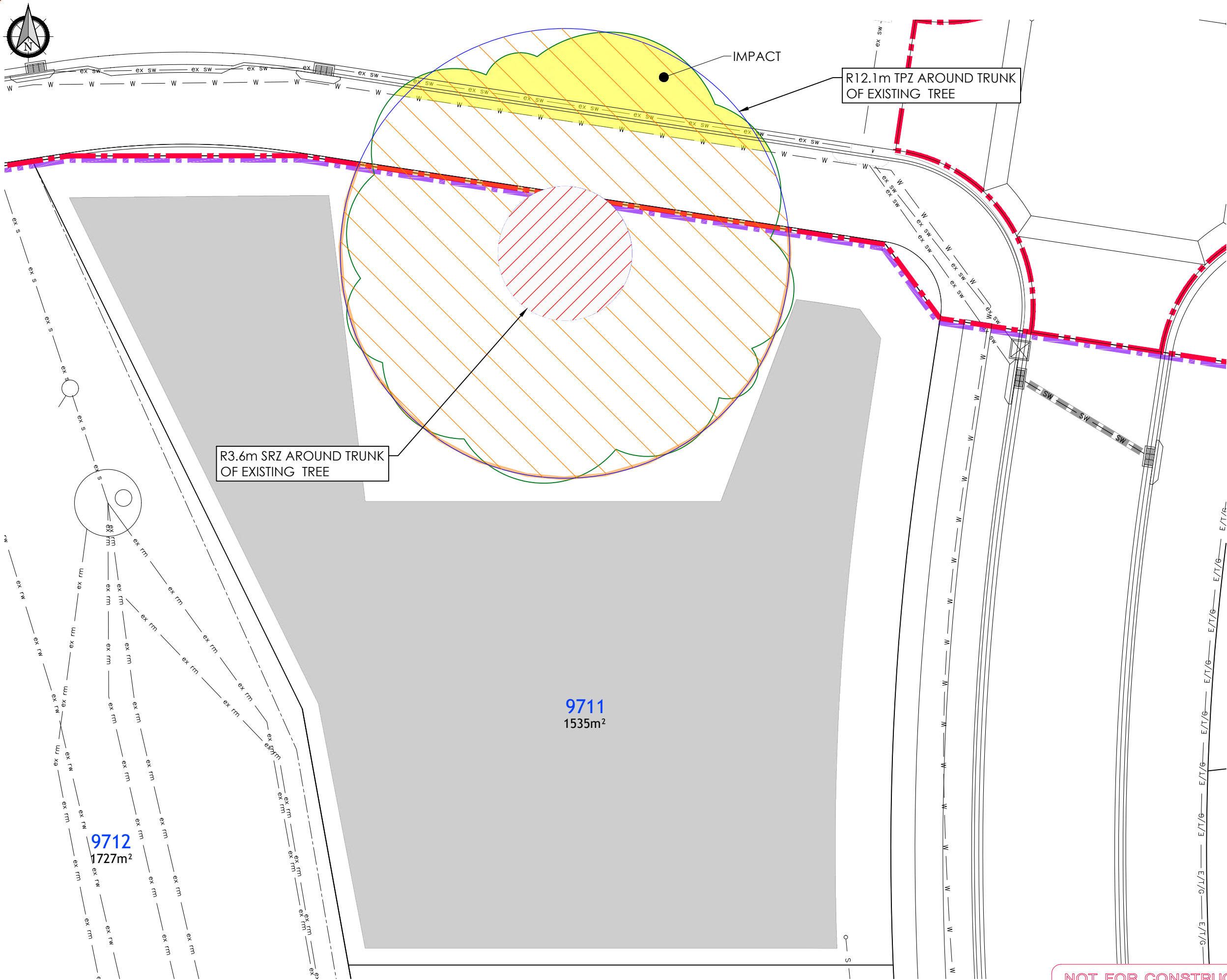
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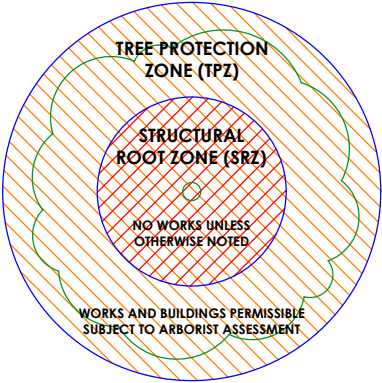
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LEGEND

- PROPOSED DEVELOPMENT APPLICATION
- PROPOSED STAGE BOUNDARY
- PROPOSED LOT BOUNDARY
- EXISTING LOT BOUNDARY
- TREE TO BE RETAINED
- TREE IMPACT AREA



TYPICAL DETAIL
N.T.S.

NOT FOR CONSTRUCTION

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	29.04.2026	INITIAL ISSUE	BWe	MK	DATUM: GDA2020 MGA56 CONTOUR INTERVAL:	A1 0 12.5 25.0m 1:500 A3 1:1000	NOTE: PLANS ARE PREPARED IN COLOUR

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

drawing title:
**BUILDING
ENVELOPE PLAN
DETAIL SHEET 2**

location: CHISHOLM

council: MAITLAND CITY COUNCIL

dwg ref: 190433(97)-DA-113

client:

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Appendix B – BDAR Requirements Compliance

Biodiversity Development Assessment Report: Streamlined Assessment Module (Small Area)

BAM Reference	Information	BDAR Section	Completed
Report			
Introduction - Chapters 2 and 3	Introduction to the biodiversity assessment including: brief description of proposed development identification of Subject Land boundary, including: operational footprint and construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure general description of the Subject Land	1.1.1, 1.1.2	✓
	Sources of information used in the assessment, including reports and spatial data	1.5	✓
	Identification of assessment method applied (i.e., linear or site-based)	2.2	✓
Landscape - Section 3.1, 3.2 and Appendix E	General description of Subject Land topographic and hydrological setting, geology and soils	3.2	✓
	Percent native vegetation cover in the assessment area (as described in BAM Subsection 3.2(4.))	3.2	✓
	IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.))	3.2	✓
	Rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3–4.) and Appendix E)	3.2 Figure 2	✓
	Wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(4.))	3.2 Figure 2	✓
	Connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.))	3.2 Figure 2	✓
	Areas of geological significance and soil hazard features (as described in BAM Subsections 3.1.3(7.) and 3.1.3(10.))	3.2 Figure 2	✓
Native vegetation, TECs and vegetation integrity - Chapter 4	Patch size (in accordance with BAM Subsection 4.3.2)	4.4 Table 12	✓

BAM Reference	Information	BDAR Section	Completed
	Identification of the dominant PCT on the Subject Land and extent (ha) with justification of method used (existing information or plot-based survey data)	4.2.2	✓
	Identification of any TEC associated with the PCT (BAM Subsection 4.2.2)	1.5, 4.2.2.4	✓
	Estimate of percent cleared value of dominant PCT (BAM Subsection 4.2.1(5.))	4.2.2.1	✓
	Identification of any TEC on site that is not associated with the dominant PCT (Note: This TEC is required to be assessed and offset.)	N/A	
	Equivalence with mapping units of previous vegetation maps reviewed as part of the assessment (i.e., equivalent mapping units)	N/A	✓
	Vegetation integrity of the PCT(s) on the Subject Land as individual vegetation zones	4.5	✓
	Justification for how this was determined (i.e., qualitatively by observing values for the condition attributes set out in Table 2 of the BAM or quantitatively by collecting field data for the condition attributes at a plot in accordance with BAM Subsection 4.3.4)	4.5	✓
	Use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsections 4.3.3(5.)) Where use of more appropriate local benchmark data is proposed (as described in BAM Subsection 1.4.2, BAM Subsection 4.3.3(5.) and BAM Appendix A): - identify the PCT or vegetation class for which local benchmark data will be applied - identify published sources of local benchmark data (if benchmarks obtained from published sources) - describe methods of local benchmark data collection (if reference plots used to determine local benchmark data) - provide justification for use of local data rather than BioNet Vegetation Classification benchmark values	4.5.3	✓
Chapter 5 and Section 9.1	Describe the review of existing information and any field survey undertaken to assess habitat constraints and microhabitats for threatened species within the Subject Land	5.4	✓
	Determination of the suite of threatened species likely to occur on or use the proposed site according to Steps 1 and 2 in BAM Section 5.2 including species to be assessed for ecosystem credits and the list of species to be assessed for species credits	5.1	✓

BAM Reference	Information	BDAR Section	Completed
	List of ecosystem credit species derived from the TBDC (as described in BAM Subsections 5.2.1 and 5.2.2) with justification for the exclusion of any ecosystem credit species based on habitat constraints (as described in BAM Subsection 5.2.2)	5.1.1	✓
	Identification of candidate species credit species that are at risk of an SAI and therefore, must be further assessed (BAM Section 9.1). Note: Candidate species credit species that are not at risk of an SAI and not incidentally recorded on the Subject Land do not require further assessment.	5.1.2	✓
	For candidate species credit species that are at risk of an SAI, a description of the species, any habitat constraints or microhabitats associated with the species on the Subject Land and information used to create the species polygon/s in accordance with Steps 3 to 5 of BAM Section 5.2 including: - justification for determining that a candidate species credit species at risk of an SAI is unlikely to have suitable habitat on the Subject Land or specific vegetation zone (based on a field assessment of the Subject Land and published literature or an expert report prepared in accordance with Box 3 of the BAM) - determination of the presence of remaining candidate species credit species at risk of an SAI (by assuming presence, conducting a threatened species survey or an expert report). - Note: If the Subject Land is mapped on an important habitat map for a species, or for a component of its habitat, the Subject Land is considered to have suitable habitat for the species to be present. - species polygons identifying the location and area of suitable habitat for each candidate threatened species at risk of an SAI that is recorded on the Subject Land and is measured by area, OR - species polygons identifying the area of suitable habitat and targeted surveys identifying the count and location of individuals on the Subject Land for each candidate threatened flora species at risk of an SAI that is recorded on the Subject Land and is measured by count - species polygons for each threatened species identified on the Subject Land that is not at risk of an SAI (i.e., incidentally observed during site visit)	5.4	✓
	Determination of habitat condition within species polygon/s for each threatened species (measured by area) at risk of an SAI or incidentally observed during the site visit (Step 6 of BAM Section 5.2)	5.6	✓

BAM Reference	Information	BDAR Section	Completed
	For flora species credit species at risk of an SAIL or incidentally observed during site visit, provide a count, or an estimation, of the number of individual plants present on the Subject Land (as described in BAM Subsection 5.2.5(4.))	N/A	
Prescribed impacts Chapter 6	Any prescribed impacts from the small area proposal must be set out in the BDAR consistent with Appendix K	6.0	✓
Avoid and minimise impacts – Chapter 7	Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposal location in accordance with Chapter 7, including an analysis of alternative: • modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology • alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location • alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed site	7.2	✓
	Describe efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design (as described in BAM Subsections 7.1.2 and 7.2.2	7.2.2	✓
	Identification of any other site constraints that the proponent has considered in determining the location and design of the proposal (as described in BAM Subsection 7.2.1(3.))	7.3	✓
Assessment of Impacts - Chapter 8, Section 8.1 and 8.2	Determine the impacts on native vegetation and threatened species habitat, including: • description of direct impacts of clearing of native vegetation, threatened ecological communities and threatened species habitat (as described in BAM Sections 8.1) • description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal (as described in BAM Subsection 8.2	8.1	✓
Mitigation and Management of Impacts - Chapter 8, Section 8.4 and 8.5	Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Subsections 8.4.1 and 8.4.2, including (as described in BAM Subsection 8.4.1(2.): • techniques, timing, frequency and responsibility • identify measures for which there is risk of failure • evaluate the risk and consequence of any residual impacts	7.2.2	✓

BAM Reference	Information	BDAR Section	Completed
	document any adaptive management strategy proposed		
	Identification of measures for mitigating impacts related to: displacement of resident fauna (as described in BAM Subsection 8.4.1) indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1(3.)) mitigating prescribed biodiversity impacts (as described in BAM Subsection 8.4.2)	7.2, 7.5, 8.4	✓
	Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5)	N/A	
Thresholds for assessing and offsetting the impacts of the proposal - Chapter 9	Information from the TBDC and/or other sources to report on the current status of threatened species, threatened populations at risk of an SAI and TEC/s for the proposal, and	9.1	✓
	Report on impacts of the proposal on TEC/s in accordance with BAM Subsection 9.2.1	10.1	✓
	Report on impacts of the proposal on threatened species and/or threatened populations at risk of an SAI in accordance with BAM Section 9.1	9.1	✓
	Identification of impacts requiring offset in accordance with BAM Section 9.2	10.1.2	✓
	Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1(3.)	N/A	
	Identification of areas not requiring assessment in accordance with BAM Section 9.3	10.2	✓
Applying the no net loss standard - Chapter 10	Description of the impact on PCTs/TECs	2.2, 4.2, 10.1	✓
	Description of the impact on threatened species at risk of an SAI or incidentally observed via site visit	N/A	
	Number of ecosystem credits required for impacts on biodiversity values according to BAM Subsection 9	10.1.1	✓
	Number of species credits required for impacts on biodiversity values according to BAM Subsection 10.1.3, including any species credit species that has been incidentally observed on the Subject Land Note: Species credits for any species at risk of an SAI are calculated in the event that the decision-maker forms the opinion that the proposed impact is unlikely to be serious and irreversible and therefore can be offset.	10.1.2	✓

BAM Reference	Information	BDAR Section	Completed
	Identification of credit class for ecosystem credits and species credits according to BAM Section 10.2 (this can be generated from BAM-C)	10	✓
Maps			
Introduction - Chapters 2 and 3	Map of the Subject Land boundary showing the final proposal footprint, including the construction footprint for any clearing associated with temporary/ancillary construction facilities and infrastructure.	Figure 1	✓
Landscape - Section 3.1, 3.2 and Appendix E	Site Map • boundary of Subject Land • cadastre of Subject Land • landscape features identified in BAM Subsection 3.1.3 • areas of outstanding biodiversity value within the Subject Land	Figure 2	✓
	Location Map - digital aerial photography at 1:1,000 scale or finer boundary of Subject Land: • 1500 m buffer area or 500 m buffer for linear development • landscape features identified in BAM Subsection 3.1.3 • additional detail (e.g., local government area boundaries) relevant at this scale • areas of outstanding biodiversity value within the assessment area	Figure 2	✓
	Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or • IBRA bioregions and subregions • rivers, streams and estuaries • wetlands and important wetlands • connectivity of different areas of habitat • areas of geological significance and soil hazard features	Figure 2	✓
Native vegetation, TECs and vegetation integrity - Chapter 4	Map of native vegetation extent for the Subject Land (as described in BAM Section 3.1)	Figure 3, 4	✓
	Map of PCT/vegetation zones within the Subject Land (as described in BAM Section 4.2(1.))	Figure 4	✓

BAM Reference	Information	BDAR Section	Completed
	Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCT boundaries	Figure 4	✓
	Map of TEC distribution on the Subject Land	Figure 4	✓
	Patch size of native vegetation (as described in BAM Subsection 4.3.2)	N/A	
Chapter 5 and Section 9.1	Map of species credit species records within the Subject Land and species polygons for flora and fauna species at risk of an SAII or incidentally observed during the site visit (as described in BAM Subsection 5.2.5(1–7.))	NA	
Prescribed impacts Chapter 6	If relevant, maps showing location of any prescribed impact features (i.e., karst, caves, crevices, cliffs, rocks, humanmade structures, etc.)	NA	
Avoid and minimise impacts – Chapter 7	Map of final proposal footprint, including construction and operation	Appendix A	✓
	Maps demonstrating indirect impact zones where applicable	N/A	✓
Assessment of Impacts - Chapter 8, Section 8.1 and 8.2	No Maps		
Mitigation and Management of Impacts - Chapter 8, Section 8.4 and 8.5	No Maps		
Thresholds for assessing and offsetting the impacts of the proposal - Chapter 9	Map showing the extent of TECs at risk of an SAII within the Subject Land	N/A	✓
	Map showing the location of threatened species at risk of an SAII within the Subject Land	N/A	
	Map showing location of: - impacts requiring offset - impacts not requiring offset - areas not requiring assessment	Figure 9	✓
Applying the no net loss standard - Chapter 10	No Maps		

BAM Reference	Information	BDAR Section	Completed
Tables			
Native vegetation, TECs and vegetation integrity - Chapter 4	Table of current vegetation integrity scores for vegetation zone within the site including: - composition condition score - structure condition score - function condition score	Table 13	✓
	Report from BAM-C including vegetation integrity scores (BAM Section 4.4)	Appendix L	✓
Chapter 5 and Section 9.1	Table showing ecosystem credit species in accordance with BAM Subsection 5.1.1, and: identifying any ecosystem credit species removed from the list of species on the basis of further assessment in accordance with BAM Subsections 5.2.2 and 5.2.3 identifying the class of each species (BAM Section 5.4)	Table 25	✓
	Table detailing species credit species within the Subject Land at risk of an SAI (BAM Section 9.1) or incidentally observed during the site visit including any associated habitat feature/components and its abundance (flora)/extent of habitat (flora and fauna) and biodiversity risk weighting (BAM Sections 5.2–5.4)	Table 26	✓
Prescribed impacts Chapter 6	Table showing the prescribed impacts.	Table 19	✓
Avoid and minimise impacts – Chapter 7	Table of measures to be implemented before, during and after construction to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility	Table 20	✓
Assessment of Impacts - Chapter 8, Section 8.1 and 8.2	Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts	Table 22	✓
Mitigation and Management of Impacts - Chapter 8, Section 8.4 and 8.5	Table of measures to be implemented before, during and after construction to mitigate and manage impacts of the proposal, including action, outcome, timing and responsibility	Table 24	✓

BAM Reference	Information	BDAR Section	Completed
Thresholds for assessing and offsetting the impacts of the proposal - Chapter 9	No Tables		
Applying the no net loss standard - Chapter 10	Table of BC Act listing status for PCTs and threatened species requiring offset	Table 26	✓
	Table of PCTs requiring offset and number of ecosystem credits required (Subsection 10.2.1)	Table 25	✓
	Table of species at risk of an SAIL or incidentally observed on site assessed for species credits and the number of credits required	Table 26	
	BAM-C credit report	Appendix L	✓
Data			
Landscape - Section 3.1, 3.2 and Appendix E	All report maps as separate jpeg files / Individual digital shape files of: • Subject Land boundary • assessment area (i.e., buffer area) boundary • cadastral boundary of Subject Land • areas of native vegetation cover • areas of habitat connectivity	Attached Files	✓
Native vegetation, TECs and vegetation integrity - Chapter 4	All report maps as separate jpeg files • Plot field data (MS Excel format) • Digital shape files for all maps and spatial data • Field data sheets (if relevant) for determining vegetation integrity (BAM Subsection 4.3.4)		✓
Chapter 5 and Section 9.1	• Digital shape files of species polygons • Species polygon map in jpeg format • Expert reports and any supporting data used to support conclusions of the expert report • Field data sheets (if relevant) for threatened species surveys		✓

BAM Reference	Information	BDAR Section	Completed
Prescribed impacts Chapter 6	- If relevant, digital shape files of prescribed impact feature locations - Prescribed impact features map in jpeg format		✓
Avoid and minimise impacts – Chapter 7	Digital shape files of: - final proposal footprint - direct and indirect impact zones - Maps in jpeg format		✓
Assessment of Impacts - Chapter 8, Section 8.1 and 8.2			✓
Mitigation and Management of Impacts - Chapter 8, Section 8.4 and 8.5			✓
Thresholds for assessing and offsetting the impacts of the proposal - Chapter 9	Digital shape files of: extent of TECs at risk of an SAI within the Subject Land threatened species at risk of an SAI within the Subject Land boundary of impacts requiring offset boundary of impacts not requiring offset boundary of areas not requiring assessment Maps in jpeg format		✓
Applying the no net loss standard - Chapter 10			✓

Appendix C – Biodiversity Values Map and Threshold Tool Report

Biodiversity Values Map and Threshold Report

This report is generated using the Biodiversity Values Map and Threshold (BMAT) tool. The BMAT tool is used by proponents to supply evidence to your local council to determine whether or not a Biodiversity Development Assessment Report (BDAR) is required under [the Biodiversity Conservation Regulation 2017 \(Cl. 7.2 & 7.3\)](#).

The report provides results for the proposed development footprint area identified by the user and displayed within the blue boundary on the map.

There are two pathways for determining whether a BDAR is required for the proposed development:

1. Is there Biodiversity Values Mapping?
2. Is the 'clearing of native vegetation area threshold' exceeded?

Biodiversity Values Map and Threshold Report		
Date of Report Generation		05/05/2026 12:17 PM
1. Biodiversity Values (BV) Map - Results Summary (Biodiversity Conservation Regulation Section 7.3)		
1.1	Does the development Footprint intersect with BV mapping?	no
1.2	Was <u>ALL</u> BV Mapping within the development footprint added in the last 90 days? (dark purple mapping only, no light purple mapping present)	no
1.3	Date of expiry of dark purple 90 day mapping	N/A
1.4	Is the Biodiversity Values Map threshold exceeded?	no
2. Area Clearing Threshold - Results Summary (Biodiversity Conservation Regulation Section 7.2)		
2.1	Size of the development or clearing footprint	27,513.7 sqm
2.2	Native Vegetation Area Clearing Estimate (NVACE) (within development/clearing footprint)	10,313.8 sqm
2.3	Method for determining Minimum Lot Size	LEP
2.4	Minimum Lot Size (10,000sqm = 1ha)	450 sqm
2.5	Area Clearing Threshold (10,000sqm = 1ha)	2,500 sqm
2.6	Does the estimate exceed the Area Clearing Threshold? (NVACE results are an estimate and can be reviewed using the Guidance)	yes
REPORT RESULT: Is the Biodiversity Offset Scheme (BOS) Threshold exceeded for the proposed development footprint area? (Your local council will determine if a BDAR is required)		yes

What do I do with this report?

- If the result above indicates the BOS Threshold has been exceeded, your local council may require a Biodiversity Development Assessment Report with your development application. Seek further advice from Council. An accredited assessor can apply the Biodiversity Assessment Method and prepare a BDAR for you. For a list of accredited assessors go to: <https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor>.
- If the result above indicates the BOS Threshold has not been exceeded, you may not require a Biodiversity Development Assessment Report. This BMAT report can be provided to Council to support your development application. Council can advise how the area clearing threshold results should be considered. Council will review these results and make a determination if a BDAR is required. Council may ask you to review the area clearing threshold results. You may also be required to assess whether the development is “likely to significantly affect threatened species” as determined under the test in Section 7.3 of the *Biodiversity Conservation Act 2016*.
- If a BDAR is not required by Council, you may still require a permit to clear vegetation from your local council.
- If all Biodiversity Values mapping within your development footprint was less than 90 days old, i.e. areas are displayed as dark purple on the BV map, a BDAR may not be required if your Development Application is submitted within that 90 day period. Any BV mapping less than 90 days old on this report will expire on the date provided in Line item 1.3 above.

For more detailed advice about actions required, refer to the Interpreting the evaluation report section of the [Biodiversity Values Map Threshold Tool User Guide](#) .

Review Options:

- If you believe the Biodiversity Values mapping is incorrect please refer to our [BV Map Review webpage](#) for further information.
- If you or Council disagree with the area clearing threshold estimate results from the NVACE in Line Item 2.6 above (i.e. area of Native Vegetation within the Development footprint proposed to be cleared), review the results using the [Guide for reviewing area clearing threshold results from the BMAT Tool](#).

Acknowledgement

I, as the applicant for this development, submit that I have correctly depicted the area that will be impacted or likely to be impacted as a result of the proposed development.

Signature: _____

(Typing your name in the signature field will be considered as your signature for the purposes of this form)

Date: _____

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Biodiversity Values Map and Threshold Tool

The Biodiversity Values (BV) Map and Threshold Tool identifies land with high biodiversity value, particularly sensitive to impacts from development and clearing.

The BV map forms part of the Biodiversity Offsets Scheme threshold, which is one of the factors for determining whether the Scheme applies to a clearing or development proposal. You have used the Threshold Tool in the map viewer to generate this BV Threshold Report for your nominated area. This report calculates results for your proposed development footprint and indicates whether Council may require you to engage an accredited assessor to prepare a Biodiversity Development Assessment Report (BDAR) for your development.

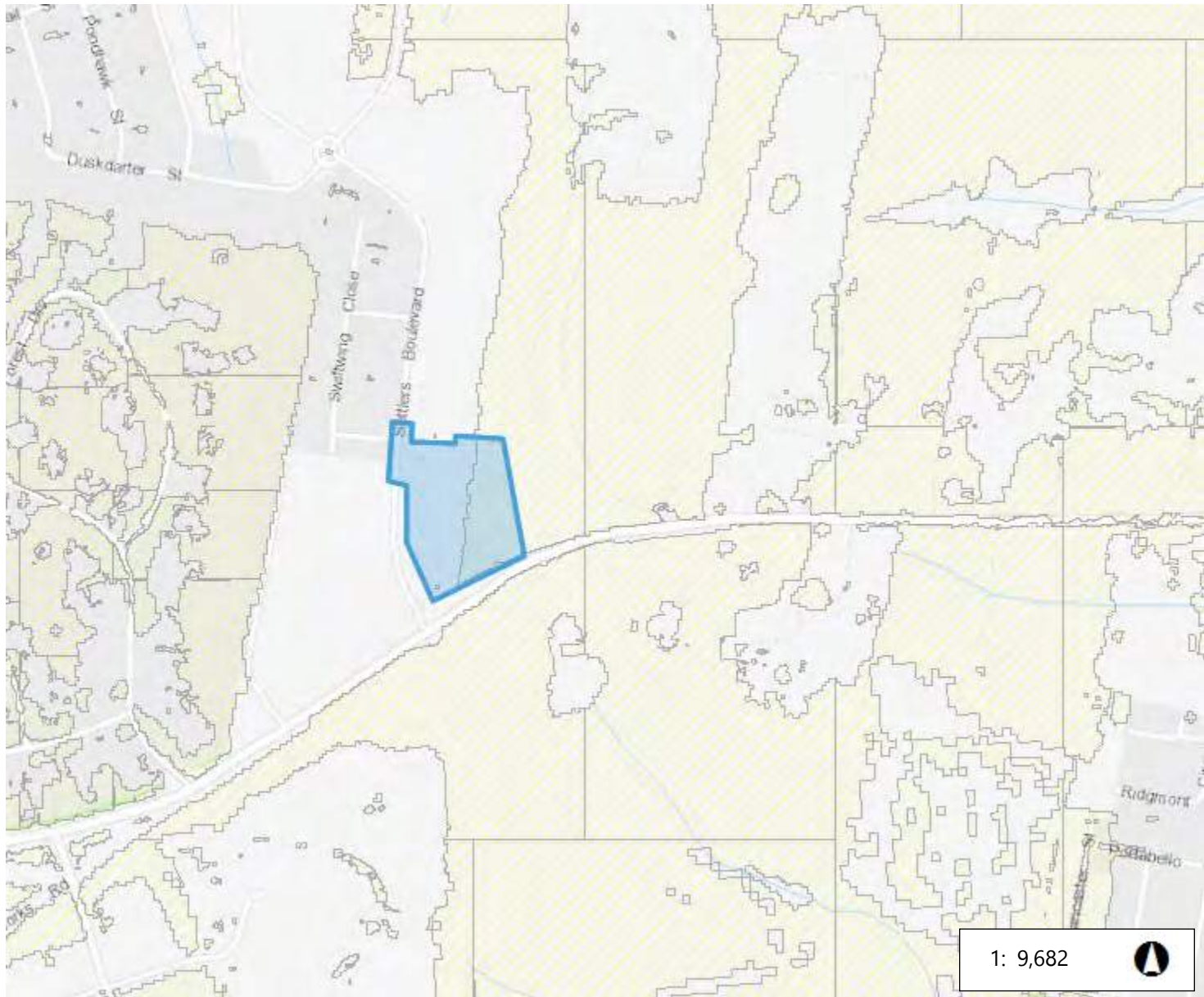
This report may be used as evidence for development applications submitted to councils. You may also use this report when considering native vegetation clearing under the State Environmental Planning Policy (Biodiversity and Conservation) 2021 - Chapter 2 vegetation in non-rural areas.

What's new? For more information about the latest updates to the Biodiversity Values Map and Threshold Tool go to the updates section on the [Biodiversity Values Map webpage](#).

Map Review: Landholders can request a review of the BV Map where they consider there is an error in the mapping on their property. For more information about the map review process and an application form for a review go to the [Biodiversity Values Map Review webpage](#).

If you need help using this map tool see our [Biodiversity Values Map and Threshold Tool User Guide](#) or contact the Map Review Team at map.review@environment.nsw.gov.au or on 1800 001 490.

Biodiversity Values Map



491.8 0 245.91 491.8 Metres

WGS_1984_Web_Mercator_Auxiliary_Sphere

Legend

-  Biodiversity Values that have been mapped for more than 90 days
-  Biodiversity Values added within last 90 days
-  Native Vegetation Area Clearing Estimate (NVACE)
-  Development area selected by proponent

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This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Imagery © Airbus DS/Spot Image 2016

© NSW Department of Customer Service, Basemaps 2019

© NSW Department of Planning and Environment

The results provided in this tool are generated using the best available mapping and knowledge of species habitat requirements.

This map is valid as at the date the report was generated. Checking the [Biodiversity Values Map viewer](#) for mapping updates is recommended.

Appendix D – EPBC Act Threatened Entities Assessment

EPBC Act Assessment

Table – EPBC Listed Species Assessment

Scientific Name	Common Name	EPBC Status	No. of Local Records (Within the 1500m Assessment Buffer)	Most Recent Record	Assessment
Aves					
<i>Calidris ferruginea</i>	Curlew Sandpiper	Vulnerable	2	18/02/2029	The Curlew Sandpiper is a migratory, shorebird, typically occupying fresh and hypersaline environments, foraging along the edges of mudflats, coastal and inland wetlands and sewage ponds. intertidal mudflats. They are omnivorous, foraging on seeds worms, molluscs, crustacean and insects. They do not breed in Australia, and occur only during their non-breeding period. There have been two records of the c\Curlew Sandpiper within 1500m's of Study Area, both records in 2019 and situated nearby known wetland environments. The Study Area is not considered a wetland and does not contain any waterbodies permanent or otherwise. It is therefore not considered to contain suitable habitat and this species is not likely to inhabit the Study Area to any significant degree. Thus, a Commonwealth referral is not recommended.
<i>Gallinago hardwickii</i>	Latham's Snipe	Vulnerable	3	10/03/2005	Latham's Snipe is an omnivorous non-breeding migrant, which occupies Australia during warmer months within freshwater wetlands with thick vegetation. They forage in mudflats feeding on seeds and plant material, worms, spiders and insects, some molluscs, isopods and centipedes. There have been three (3) records of this species, all within 2005 and all situated within wetland environments. The Study Area is not considered a wetland and due to the degraded nature of the Site does not contain thick midstory vegetation. It is therefore not considered to contain suitable habitat and this species is not considered likely to inhabit the Study Area to any significant degree. Thus, a Commonwealth referral is not recommended.
<i>Lathamus discolor</i>	Swift Parrot	Critically Endangered	1	1/01/2023	The Swift Parrot is a non-breeding migrant of South-eastern Australia, Occupying eucalyptus woodlands and forests with abundance in flowering eucalypts and lerp infestations. They favour winter flowering eucalypts such as <i>Eucalyptus robusta</i> (Swamp Mahogany), <i>Corymbia maculata</i> (Spotted Gum), <i>Corymbia gummifera</i> (Red Bloodwood), <i>Eucalyptus tereticornis</i> (Forest Red Gum), <i>Eucalyptus sideroxylon</i> (Mugga Ironbark), and <i>Eucalyptus albens</i> (White Box). BioNet records indicate one (1) record of this species, within the Assessment Area, recorded in January 2023. There is suitable foraging habitat on Site in the form of winter flowering <i>Corymbia maculata</i> (Spotted Gum) and therefore there is potential for this species to occupy the Study Area. Targeted Diurnal surveys conducted in July 2025 did not record this species, or show signs of potential occupancy. Suitable foraging habitat, also, only makes up a small proportion if the Subject Land and no connectivity to previous known vegetation patches is present. Therefore, the proposed development is not likely to impact this species population to a significant degree. Thus, a Commonwealth referral is not recommended
Mammals					
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat, Large Pied Bat	Endangered	1	25/06/2024	The Large-eared Pied Bat roosts in sandstone cliffs, escarpments, caves, rock overhangs. It typically forages within a few kilometres of roost sites, primarily in dwell-timbered area containing gullies. BioNet records indicate one record within the Assessment Area, located probably erroneously within the Subject Land (record from June 2024). This record has been noted as 'potential' in BioNet. The Subject Land do not contain suitable roosting habitat such as karst systems, caves, cliffs or rocky outcrops, nor are there any within 2km of the Study Area. Furthermore, the Study Area does not contain suitable habitat due to the lack of gullies and well-timbered habitat on Site. Therefore, it is unlikely for this occupy the Study Area to any significant degree, and the historical record is most likely either the species in transit. Thus, a Commonwealth referral is not recommended
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	Vulnerable	7	25/06/2024	The Grey-headed Flying-fox, is a generalist species occurring in temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Their roost camps are located within 20km of foraging habitat and commonly found in gullies, close to water, in dense canopy vegetation. They generally forage on the nectar and pollen of native trees, in particular Eucalypts, Banksia, as well as fruits of rainforest trees and vines and cultivated gardens and fruit crops (opportunisticly). This species has been recorded 7 times within the Assessment Area, with the most recent record in June 2024 and located within the Study Area. Field surveys did not record any roost camps located on Site, and due to the degraded nature of the Site, it is not considered suitable breeding or roosting habitat for this species. There is suitable foraging for this species in the form of foraging <i>Eucalypts</i>, <i>Melaleucas</i> and planted Apple trees and as targeted nocturnal surveys have not been conducted, a precautionary approach must be taken to assume that this species is utilising the Site for foraging purposes. Although there is suitable foraging habitat on Site, as well as historic records of this species on Site, due to the highly mobile nature of this species, and abundance of better foraging habitat nearby, it is unlikely that this development will impact this species to any significant degree. Thus, a Commonwealth referral is not recommended

Appendix E – Other Legislation

State Environmental Planning Policy (Biodiversity and Conservation) 2021

The aims of Chapter 4 – Koala Protection 2021 are to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline.

The land which comprises the Subject Land does not have an approved koala plan of management. According to the BC SEPP 2021, the policy applies if:

4.9 Development assessment process—no approved koala plan of management for land

- (1) *This clause applies to land to which this Policy applies if the land—*
- (a) *has an area of at least 1 hectare (including adjoining land within the same ownership), and*
 - (b) *does not have an approved koala plan of management applying to the land.*
- (5) *However, despite subclauses (3) and (4), the council may grant development consent if the applicant provides to the council –*
- (a) *information, prepared by a suitably qualified and experienced person, the council is satisfied demonstrates that the land subject of the development application –*
 - i. *does not include any trees belonging to the koala use tree species listed in Schedule 3 for the relevant koala management area, or*
 - ii. *is not core koala habitat,*

In regards to identifying core koala habitat, core koala habitat is defined as;

- (a) *an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or*
- (b) *an area of land which has been assessed by a qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years.*

Koala Investigation Results

The Study Area covers an area of approximately 2.21ha and does not have an approved koala plan of management. Therefore, the BC SEPP 2021 applies and additional assessments were required to satisfy the Development Assessment Process.

Further investigations were undertaken to determine if Koalas were present on site, and to determine if the site was core Koala habitat as per the definitions above.

Survey effort for Koalas included:

- Habitat assessment on the 26th June, 2025;
- Spot Assessment Technique (SAT) x1 within Subject Land on 26th June, 2025;

Targeted surveys did not identify any sign of koala utilisation of the Subject Land. Habitat assessments on site identified that trees belonging to the koala use tree species listed in Schedule 3 for the relevant koala management area (Central Coast) were located on site. Desktop assessment of local records in BioNet Atlas showed one (1) Koala record within 2.5km of the Subject Land within the last 18 years (2021), but none were recorded within the Subject Land.

Therefore, due to the presence of Koala feed trees and nearby BioNet records, a Tier 2 Assessment has been undertaken.

Tier 2 Assessment

Part A: Presence of highly suitable Koala Habitat

An assessment of BioNet showed only one (1) record within 2.5km of the Study Area in the last 18 years. The record occurred in 2021 and is located approx. 2km south from the site. This makes the Subject Land a core Koala habitat as per definition above.

Part B Assessment

1) Koala Presence – Spot Assessment Technique

1x Spot Assessment Technique (SAT) was conducted within the Subject Land on 26th June, 2025;

ii) Koala Records

Records within these maximum distances must only be considered after a careful examination of the broader landscape. That is, within areas of contiguous habitat or between areas of habitat with connectivity. For example, a record from 2.5km from the Subject Land must not be used if natural or artificial landscape features would prevent koalas from the area with the record ever moving to the site (e.g., due to large rivers, roads, fences or built-up areas).

As stated above, only one (1) BioNet record occurs within 2.5km from the Study Area within the last 18 years.

The single BioNet record from 2021 is located approximately 2km south of the Study Area. Connectivity between the record and the Subject Land is limited, with a trainline, fences and a high trafficked main road (Raymond Terrace Road) providing barriers to movement between these areas. Some higher quality vegetation is present in the surrounding area, in particular a wildlife 'Opportunity corridor' located to the East of the Subject Lands. However, access to this area from the Subject Land is limited by an area of cleared land approved for development directly adjacent to the site. Further vegetation in the surrounding area is patchy, with connecting corridors narrow and disrupted by roads and urban areas, further limiting dispersal capabilities. Additionally, the record is a roadside koala death, indicating difficulty moving safely through the landscape past roads and trainlines.

Due to a lack of connectivity between the Study Area and higher quality habitat for Koalas, it is considered unlikely the Subject Land is considered Core Koala Habitat; however, taking a precautionary approach, a Koala Assessment Report has been prepared (**Table 1**).

Table 1 - Koala Assessment Table

Principles	Criteria	Assessment
Introduction	Describe the nature of the proposed development.	The proposed development includes a multi-lot subdivision, with a driveway extending from Cora Way down through the North-eastern section of the site.
	Define how the SEPP applies to the proposed development.	Refer above to Tier 1 and Tier 2 Assessment.

Principles	Criteria	Assessment
Koala habitat values – addressing criteria 1 and 2	Describe the site area, including the general environment and condition, location and extent of the development area and any other areas that may be directly or indirectly impacted by the proposed development.	The Subject Land comprises 2.21ha. Development would entail the removal or modification of approx. 0.51ha of native vegetation in one (1) condition (poor), ground-truthed as PCT 3343: <i>Hunter Coast Foothills Spotted Gum-Ironbark Forest</i>. The proposal has been designed to avoid or mitigate as many impacts to biodiversity as possible under the Avoid and Minimise principle as set out in BAM 2020. This includes the retention of eleven (11) trees listed as koala use trees.
	Provide details of koala survey as undertaken in accordance with Appendix C. This should include details of the results of the koala surveys, including how the site area meets the definition of core koala habitat and mapping that shows habitat areas and koala records within the site area and adjoining areas.	As above in the Tier 1 and Tier 2 Assessment. Detailed targeted surveys have been undertaken. Including: - Habitat assessment on the 26th June, 2025; - Spot Assessment Technique (SAT) x1 within Subject Land & Study Area on 26th June, 2025; No Koalas were observed during targeted surveys. All canopy trees (four species) were identified to be schedule 3 Koala Use trees under the Central Coast Management Region. No Schedule 1 Koala use Trees were observed occurring on site.
	Describe the site context (including mapping showing habitat that might be associated with vegetation in the adjoining landscape and records within the vicinity of the site area) and provide an analysis of the koala habitat values (including how koalas might use the site area and the relative importance of the site area to a local koala population).	As above in the Tier 1 and Tier 2 Assessment. PCT 3343 was identified within the Study Area, as shown in Ground-truthed vegetation mapping. This PCT contains multiple Schedule 3 listed trees, including <i>Corymbia maculata</i>, <i>Eucalyptus acmenoides</i>, <i>Eucalyptus moluccana</i> and <i>Eucalyptus siderophloia</i> which are present within the Subject Lands. However, given that surveys failed to find evidence of Koala usage or habitation within the Subject Lands, and connectivity to these trees from surrounding areas is limited, it is considered that there is no current local population present that would utilise the site.
Measures taken to avoid impacts to koalas – addressing criteria 3, 4, 5, 6, 7 and 8	Describe the site selection process, including how koala habitat was taken into account and any avoidance outcomes achieved through this process.	The site was chosen due to its heavy historical management and development modifications, existing in a state in which native vegetation is highly disturbed. Mid- and understorey vegetation is largely absent and connectivity value to surrounding bushland is minimal. To ensure avoidance of potential impacts to koalas, 11 trees identified to be Koala use
	Describe how the proposed development avoids or minimises direct	

Principles	Criteria	Assessment
	impacts to koala habitat and habitat function within the site area.	trees are proposed to be retained, which are situated along the edges of the site ensuring connectivity retention (however minimal).
Analysis of potential impacts – addressing criteria 9	Identify the residual direct impacts to koalas and koala habitat within the site area, including the nature and extent of impacts and the likely implications for the viability of a local koala population.	Surveys failed to find any sign of koala presence within the Study Area. As such, residual impacts to Koalas are considered unlikely, especially with consideration of the limited connectivity to higher quality habitat areas. The proposed removal of 0.51ha of native vegetation is unlikely to significantly impact the availability of Koala habitat in the broader area.
	Identify the relevant potential indirect impacts to koalas and koala habitat within the site area and adjacent habitat areas, including the nature and extent of potential indirect impacts and the likely implications for the viability of a local koala population.	Desktop and field surveys did not produce evidence of a local koala population in the Study Area or surrounds. The development is proposed on lands that have been disturbed/ managed with minimal connectivity to higher quality habitat. With this in consideration, it is unlikely that any local koala populations will be indirectly impacted by the proposed development.
Plan to manage and protect koalas and their habitat – addressing criteria 10, 11, 12 and 13	Describe the management measures that will be implemented as part of proposed construction and operations to manage the direct and indirect impacts identified. These measures should be outcomes focussed and include performance targets.	As stated above, the proposed development occurs on lands that have been disturbed/ managed with minimal connectivity to higher quality habitat, of which, no evidence of koala usage was recorded. Hence, impacts on local koala populations are not expected to occur.
	Describe any compensatory measures that will be delivered, including an analysis of the suitability of these measures against criteria 9 and 10.	No specific koala offsets required because there was no identified koala population that could utilise the site.
	Outline a plan for monitoring, adaptive management and reporting against the key outcomes and performance targets.	Not applicable, as no local koala population is likely to be present.

Conclusion

Surveys and desktop assessments of the Subject Land did not identify any signs of Koala presence, including scats and scratch marks. A review of BioNet records revealed only one (1) koala sighting within 2.5km of the site in the past 18 years, indicating a paucity of recent records in the area. Additionally, the site has limited connectivity to higher-quality koala habitat due to a matrix of roads, developments and trainlines. Given these factors, it is considered unlikely that the Subject Land supports a resident Koala population or serves as Core Koala Habitat.

State Environment Planning Policy (Resilience and Hazards) 2021

The aim of *Chapter 2 – Coastal Management of SEPP (Biodiversity and Conservation) 2021*, is to promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the Coastal Management Act 2016, including the management objectives for each coastal management area, by:

- (a) Managing development in the coastal zone and protecting the environmental assets of the coast;
- (b) Establishing a framework for land use planning to guide decision-making in the coastal zone; and
- (c) Mapping the 4 coastal management areas that comprise the NSW coastal zone for the purpose of the definitions in the Coastal Management Act 2016.

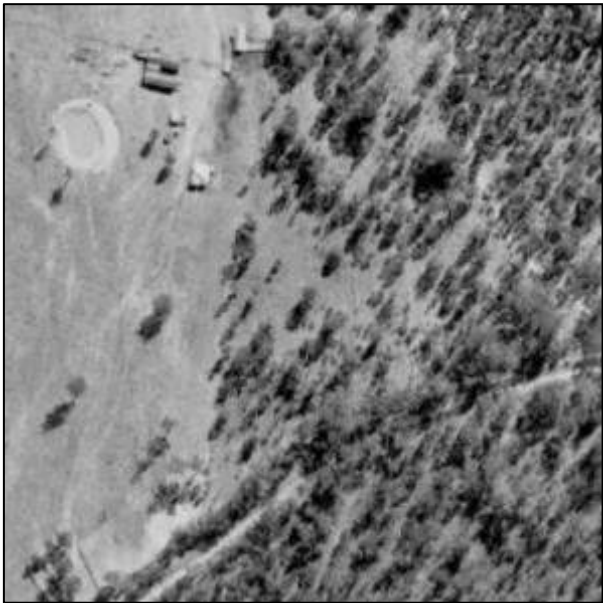
Investigations in accordance with the State Environmental Planning Policy (Resilience and Hazards) 2021 (R&H SEPP) found that the Subject Land is not mapped on the Coastal Management maps, and therefore do not require further assessment. However, a Stormwater Management Plan must be developed to demonstrate that both the quality and quantity of stormwater leaving the site is not affected by the proposed development. Additionally, the development must consider the principles of Urban Sensitive Design.

Appendix F – Planted Native Vegetation Assessment

Biodiversity Assessment Method (BAM) Appendix D: Streamlined Assessment Module- Planted Native Vegetation

As outlined in **Sections 4.2** and **4.3**, an area of planted native vegetation was identified within the study area. The area consists of 0.79ha of *Cynodon dactylon* dominated native grassland, currently managed as a lawn. An assessment was undertaken in accordance with *Appendix D: Streamlined Assessment Module – Planted Native Vegetation of BAM 2020* (Planted Native Module). The assessment is documented in the table below and follows D1 – Decision-making Key as outlined in the Planted Native Module.

D.1 – Decision-making key

Assessment Criteria	Site Assessment
Question 1 – Does the planted native vegetation occur within an area that contains a mosaic of planted and remnant native vegetation and which can be reasonably assigned to a PCT known to occur in the same IBRA subregion as the proposal?	Ground-truthing surveys indicate that the planted native vegetation is not located within a mosaic of native vegetation and cannot be reasonably assigned to a PCT known to occur in the applicable IBRA Bioregion. Historical imagery and photos of the planted native vegetation in the landscape indicate that the area has previously been cleared and utilised for agricultural purposes. It has more recently been subject to landscaping practices and is currently present as a maintained lawn.
Documentation indicating the vegetation is planted	Historical imagery of the Subject Land has been retrieved from NSW Government Historical Imagery (2020) which indicates a significant level of disturbance across the western section of the Subject Land since 1966.
Historical Imagery of Subject Land	
Condition of Subject Land in 1966 Imagery from 1966 indicates that the Subject Land has historically been utilised for agricultural purposes. The section of planted native vegetation appears to contain scattered trees. Remnant vegetation is present in the east which appears to cease at the lot boundary.	

Assessment Criteria	Site Assessment
Condition of Subject Land in 1976 Imagery from 1976 shows that the Subject Land contained sheds in the western section which were likely utilised for agricultural purposes. The scattered trees indicated in the 1966 imagery are still present in the south of the planted native section. The remnant vegetation in the east is present and ceases at the lot boundary.	
Condition of Subject Land in 1993 The landuse demonstrated by imagery from 1993 appears similar to 1976 imagery. There appears to be fewer scattered trees located within the south of the planted native section.	

Assessment Criteria	Site Assessment
Current condition of Subject Land Current landuse within the Subject Land has been significantly altered since 1993. The land is no longer used for agricultural purposes and exhibits features consistent with landscaping. The scattered trees present in previous imagery are now absent and have been replaced by planted natives in the south west. The <i>Cynodon dactylon</i> grassland appears to have been recently mowed which indicates that this is a regularly maintained grassland.	
Planted Native vegetation in the Landscape	
Condition of Remnant Native section (east of Subject Land) Conditions within the remnant section of vegetation show a relatively sparse canopy and a low diversity of native grasses and forbs. This is in contrast to the planted native area which lacks a canopy and is dominated by one (1) species of grass, <i>Cynodon dactylon</i>.	

Assessment Criteria	Site Assessment
Condition of Planted Native section The area of planted native vegetation is dominated by <i>Cynodon dactylon</i> and contains sporadic incidence of non-native species.	
Land-use contextual information	The planted native section of vegetation within the Subject Land is currently used as a maintained lawn. It is located adjacent to an operating café and land sales office. The carpark for these establishments is located directly north of the planted native vegetation. Remnant vegetation is located to the east and ceases at the lot boundary which is consistent with conditions depicted in historic imagery.
Question 2 – Is the planted native vegetation: - Planted for the purpose of environmental rehabilitation or restoration under an existing conservation obligation listed in BAM Section 11.9(2.), and - The primary objective was to replace or regenerate a plant community type or a threatened plant species population or its habitat?	Evidence documented by historical imagery and a comparison of conditions between the remnant and planted native sections of the Subject Land indicates that the planted native vegetation section was not planted for environmental rehabilitation or restoration purposes. Such projects require rehabilitation through reintroduction of a diverse range of native species, typically with the intention of reconstructing a canopy, mid and lower-stratum upon a degraded site. Furthermore, the primary objective of installing the planted native section was to provide a maintained lawn space for aesthetic and landscaping purposes.
Question 3 – Is the planted or translocated native vegetation individuals of a threatened species or other native species planted or translocated for the purpose of providing threatened species habitat under one of the following: - A species recovery project; - Saving our Species project; - Other types of government funded restoration project; - Condition of consent for a development approval that required those species to be	No threatened species were identified within the Subject Land during targeted surveys nor was the vegetation present considered to be suitable habitat for any threatened species within the locality. Therefore, no threatened species have been translocated as part of works associated with this planted native vegetation. As previously mentioned, provision of habitat for threatened species typically requires the reconstruction of a canopy, mid and lower stratum. Considering the planted native vegetation consists of a single grass species, this area is not considered suitable habitat for any threatened species present within the locality.

Assessment Criteria	Site Assessment
planted or translocated for the purpose of providing threatened species habitat; • Legal obligation as part of a condition or ruling of court; • Ecological rehabilitation to re-establish a PCT or TEC that was, or is carried out under a mine operations plan, or • Approved vegetation management plan?	
Question 4 – Was the planted native vegetation (including individuals of a threatened flora species) undertaken voluntarily for revegetation, environmental rehabilitation or restoration without a legal obligation to secure or provide for management of the native vegetation?	The planted native vegetation was not undertaken voluntarily, for revegetation, environmental rehabilitation or restoration without a legal obligation to secure or provide for management of the native vegetation. As previously stated, revegetation programs typically require restoration of canopy, mid and lower stratum vegetation to provide suitable habitat for native species and improve biodiversity. The planted native vegetation present within the Subject Land consists of one native species, <i>Cynodon dactylon</i>, which has been planted for landscaping purposes.
Question 5 – Is the native vegetation (including individuals of a threatened flora species) planted for functional, aesthetic, horticultural or plantation forestry purposes?	Yes, the planted native vegetation section has been planted for landscaping purposes.
Question 6 – Is the planted native vegetation a species listed as a widely cultivated native species on a list approved by the Secretary of the department (or an officer authorised by the Secretary)?	Yes, <i>Cynodon dactylon</i> is listed as a widely cultivated native species on a list approved by the Secretary of the department.

The information contained within the table above indicates that the section of *Cynodon dactylon* present within the Subject Land meets the criteria to be assessed under the Planted Native Module.

Appendix G – Flora List

Family	Scientific Name	Common Name
Asphodelaceae	<i>Dianella revoluta</i>	Blueberry Lily
Asteraceae	<i>Bidens pilosa</i> *	Cobbler's Pegs
Asteraceae	<i>Cirsium vulgare</i> *	Spear Thistle
Asteraceae	<i>Gamochaeta calviceps</i> *	Cudweed
Asteraceae	<i>Hypochaeris radicata</i> *	Catsear
Asteraceae	<i>Senecio madagascariensis</i> *	Fireweed
Asteraceae	<i>Soliva sessilis</i> *	Bindyi
Asteraceae	<i>Taraxacum officinale</i> *	Dandelion
Brassicaceae	<i>Rorippa laciniata</i>	-
Campanulaceae	<i>Lobelia purpurascens</i>	Whiteroot
Caryophyllaceae	<i>Stellaria media</i> *	Common Chickweed
Chenopodiaceae	<i>Einadia hastata</i>	Berry Saltbush
Commelinaceae	<i>Commelina cyanea</i>	Scurvy Weed
Convolvulaceae	<i>Dichondra repens</i>	Kidney Weed
Fabaceae (Faboideae)	<i>Medicago lupulina</i> *	Black Medic
Fabaceae (Faboideae)	<i>Trifolium repens</i> *	White Clover
Fabaceae (Faboideae)	<i>Vicia sativa</i> *	Common vetch
Goodeniaceae	<i>Goodenia heterophylla</i>	-
Juncaceae	<i>Juncus cognatus</i> *	-
Lamiaceae	<i>Mentha</i> spp.	-
Lamiaceae	<i>Plectranthus parviflorus</i>	-
Lomandraceae	<i>Lomandra bracteata</i>	Mat-rush
Malvaceae	<i>Modiola caroliniana</i> *	Red-flowered Mallow
Malvaceae	<i>Sida rhombifolia</i> *	Paddy's Lucerne
Myrtaceae	<i>Corymbia maculata</i>	Spotted Gum
Myrtaceae	<i>Eucalyptus acmenoides</i>	White Mahogany
Myrtaceae	<i>Eucalyptus moluccana</i>	Grey Box
Myrtaceae	<i>Eucalyptus paniculata</i>	Grey Ironbark
Oxalidaceae	<i>Oxalis perennans</i>	-
Pittosporaceae	<i>Bursaria spinosa</i>	Native Blackthorn
Plantaginaceae	<i>Plantago lanceolata</i> *	Lamb's Tongues
Poaceae	<i>Axonopus fissifolius</i> *	Narrow-leaved Carpet Grass
Poaceae	<i>Cenchrus clandestinus</i> *	Kikuyu Grass*
Poaceae	<i>Cynodon dactylon</i>	Common Couch
Poaceae	<i>Echinopogon caespitosus</i>	Bushy Hedgehog-grass

Family	Scientific Name	Common Name
Poaceae	<i>Ehrharta erecta</i> *	Panic Veldtgrass
Poaceae	<i>Entolasia marginata</i>	Bordered Panic
Poaceae	<i>Lolium perenne</i> *	Perennial Ryegrass
Poaceae	<i>Microlaena stipoides</i>	Weeping Grass
Poaceae	<i>Paspalidium distans</i>	-
Poaceae	<i>Paspalum dilatatum</i> *	Paspalum
Poaceae	<i>Poa annua</i> *	Winter Grass
Polygonaceae	<i>Rumex crispus</i> *	Curled Dock
Primulaceae	<i>Lysimachia arvensis</i> *	Scarlet Pimpernel
Rubiaceae	<i>Richardia stellaris</i> *	-
Verbenaceae	<i>Verbena bonariensis</i> *	Purpletop*

Appendix H – Fauna Species List

Observed Fauna Species List

The following list includes fauna species that could be reasonably expected to occur on the Subject Land at some point, given site attributes and location.

Threatened species listed under the BC Act or the EPBC Act are indicated in **bold font**.

Surveyed Observations used within Site:

- Observed (O);
- Heard (W);
- Scat (P);
- Miscellaneous (M);
- Track/scratchings (F);
- Nest (E); and
- Burrow (FB).

Bat Records used within Site:

- Observed (O);
- Definitely (D);
- Possible or within Species Group (P); and
- Likely (L).

Survey Equipment used to observe fauna within the Subject Land:

- Anabat (U);
- Songmeter (AR);
- Camera Trap (Q);

Scientific Name	Common Name	NSW status	Comm. status	Surveyed Observations
Avifauna				
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Not Listed	Not Listed	OW
<i>Threskiornis spinicollis</i>	Straw-necked Ibis	Not Listed	Not Listed	OW
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Not Listed	Not Listed	OW
<i>Platycercus adscitus eximius x venustus</i>	Eastern Rosella/Northern Rosella hybrid	Not Listed	Not Listed	OW, E
<i>Gymnorhina tibicen</i>	Australian Magpie	Not Listed	Not Listed	OW
<i>Grallina cyanoleuca</i>	Magpie-lark	Not Listed	Not Listed	OW
<i>Psephotus haematotus</i>	Red-rumped Parrot	Not Listed	Not Listed	OW
<i>Glossopsitta concinna</i>	Musk Lorikeet	Not Listed	Not Listed	OW
<i>Eolophus roseicapilla</i>	Galah	Not Listed	Not Listed	OW
<i>Cacatua sanguinea</i>	Little Corella	Not Listed	Not Listed	OW
<i>Falco cenchroides cenchroides</i>	Nankeen Kestrel	Not Listed	Not Listed	OW
<i>Cracticus nigrogularis</i>	Pied Butcherbird	Not Listed	Not Listed	W
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Not Listed	Not Listed	OW
Mammals				
<i>Macropus giganteus</i>	Eastern Grey Kangaroo	Not Listed	Not Listed	OW, P
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	Endangered	Endangered	U
<i>Vespadelus troughtoni</i>	Eastern Cave Bat	Vulnerable	Not Listed	U

Appendix I – Vegetation Survey Data

Plot no: 1 Job: Waterford Stage 97 Job no: 5629 Date: 26/06/25 Observers: SIC

Mapped Regional Vegetation community:

3433

Upper stratum	Unknown (Comment)	C	Ab	Mid stratum	(Comment)	C	Ab	Lower stratum	(Comment)	C	Ab
Corymbia maculata	Corymbia maculata	15	5	Bursaria spinosa	Bursaria	0.1	2	Cenchrus	Cenchrus	10	100
Eucalyptus paniculata	Eucalyptus siderophloia	5	1					Lolium perenne	Lolium perenne	5	100
Eucalyptus moluccana	Eucalyptus moluccana	3	2					Cynodon dactylon	Cynodon dactylon	20	500
Eucalyptus acmenoides	Stringybark sample	2	1					Trifolium repens	Trifolium repens	0.5	50
								Plantago lanceolata	Plantago	1	100
								Entolasia marginata	Entolasia stricta	0.1	10
								Echinopogon	Echinopogon	0.1	5
								Bidens pilosa	Bidens pilosa	0.3	50
								Vicia sativa	Vetch	0.1	5
								Sida rhombifolia	Sida rhombifolia	0.1	5
								Hypochaeris	Hypochaeris Radi	0.1	5
								Lobelia	Lobelia	0.2	5
								Lomandra bracteata	Lomandra glauca	0.1	5
								Plectranthus	Plectranthus	0.1	5
								Microlaena stipoides	Microlaena	0.5	50
								Paspalum dilatatum	Paspalum	0.2	10
								Commelina cyanea	Commelina cyanea	0.1	5
								Oxalis perennans	Oxalis perennans	0.1	5
								Ehrharta erecta	Ehrharta erecta	2	50
								Rumex crispus	Rumex crispus	0.1	5
								Gamochaeta	Gamochaeta	0.1	5
								Senecio	Senecio	0.1	5
								Axonopus fissifolius	Axonopus	0.1	5
								Mentha spp.	Exotic mint	0.1	5
								Dichondra repens	Dichondra repens	3	100
								Juncus cognatus	Juncus cognatus	0.1	20
								Goodenia	Goodenia	0.1	5
								Einadia hastata	Einadia hastata	0.1	5
								Dianella revoluta	Dianella revoluta	0.1	5
								Paspalidium distans	Paspalidium	0.1	5

Arrival time:	09:15		Departure time:	10:30	Weather:	Fine, sunny. light breeze.	photos (one landscape, one portrait) taken	Done	GPS points taken	Done
Start	372,303	6374052	End	372,299	6374103	Zone:	56	Bearing:	345	
Tree Stem Size Class	Presence(TRUE)/Absence(F	Number	Count of	Leaf Litter Cover within 5 x 1m2 sub-plots						
< 5 cm	TRUE		3		Leaf	Live	Bare ground	Rocks	Other	Total
5 - 9 cm	FALSE			1	5	5	80	5	5	100
10 – 19 cm	FALSE			2	10	75	15	0	0	100
20 – 29 cm	TRUE		Length of logs	3	10	55	35	0	0	100
30 – 49cm	TRUE	4	16	4	15	65	20	0	0	100
50 -79cm	TRUE	2		5	5	60	35	0	0	100
>80cm	TRUE	1		Average	9	52	37	1	1	100
Plot Disturbance: (weediness, clearing, erosion, edge effects, grazing, fire, other)										
Highly disturbed area adjacent to development area. Clearing has encroached into veg community.										
Habitat features, comments and incidental fauna observations:										
Frequent presence of hollows, rosellas and lorikeets observed using some.										

Plot no:	2	Job:	Waterford Stage 97	Job no:	5629	Date:	26/06/25	Observers:	SJC
Mapped Regional Vegetation community:	N/A								

[illegible]

Arrival time:	11:00		Departure time:	11:45	Weather:	13.3	photos (one landscape, one portrait) taken	Done	GPS points taken	Done
Start	372,229	6374068	End	372,261	6374033	Zone:	56	Bearing:	325	
Tree Stem Size Class	Presence(TRUE)/Absence(F	Number	Count of	Leaf Litter Cover within 5 x 1m2 sub-plots						
< 5 cm	FALSE		0		Leaf	Live	Bare ground	Rocks	Other	Total
5 - 9 cm	FALSE			1	1	99	0	0	0	100
10 – 19 cm	FALSE			2	2	98	0	0	0	100
20 – 29 cm	FALSE		Length of logs	3	0.1	99.9	0	0	0	100
30 – 49cm	FALSE	0	0	4	1	99	0	0	0	100
50 -79cm	FALSE	0		5	2	98	0	0	0	100
>80cm	FALSE	0		Average	1.22	98.78	0	0	0	100
Plot Disturbance: (weediness, clearing, erosion, edge effects, grazing, fire, other)										
Managed grassland, largely native.										
Habitat features, comments and incidental fauna observations:										
Little to no discernible habitat.										

Appendix J – Plot to PCT Tool Results

Exported from the Plot to PCT Assignment Tool on 30/06/2025. PCT data are Eastern NSW PCT Classification version C2.0.
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Row_No	Site_No	PCT_ID	PCT_Name	PCT_Match	Distance_to_Centroid	Elevation	Rainfall	Temperature
	1 Plot 1		4023 Coastal Valleys Riparian Forest	PCT_Match1		0.686 Within	Above	Above
	3 Plot 1		3328 Lower Hunter Red Gum-Paperbark Riverflat Forest	PCT_Match2		0.704 Within	Above	Above
	5 Plot 1		4024 Cumberland Blue Box Riverflat Forest	PCT_Match3		0.728 Above	Above	Above
	7 Plot 1		4025 Cumberland Red Gum Riverflat Forest	PCT_Match4		0.731 Within	Above	Above
	9 Plot 1		4073 Lower North Hinterland River Oak Forest	PCT_Match5		0.731 Within	Within	Above
	2 Plot 2		4089 Namoi-Upper Hunter River Red Gum Forest	PCT_Match1		0.704 Within	Above	Within
	4 Plot 2		3975 Southern Lower Floodplain Freshwater Wetland	PCT_Match2		0.845 Above	Within	Above
	6 Plot 2		4088 Southwest Riverflat Red Gum Forest	PCT_Match3		0.857 Below	Above	Above
	8 Plot 2		4081 Northwest River Oak-River Red Gum Forest	PCT_Match4		0.864 Below	Above	Above
	10 Plot 2		3958 Castlereagh Gravel Sedgeland	PCT_Match5		0.886 Above	Above	Above

Appendix K – Site Photographs

BAM Plot Photos

Plot ID	BAM Plot Photos	
	Start	End
Plot 1: PCT 3433 – Poor	 Plate 1: BAM Plot 1 Start	 Plate 2: BAM Plot 1 End
Plot 2: PCT 3433 – Poor	 Plate 3: BAM Plot 2 Start	 Plate 4: BAM Plot 2 End



Above: PCT 3433 trees along fence line in the south-eastern corner of the Study Area, facing west

Below: Managed grassland (Planted Native - *Cydodon dactylon* dominant) within the centre of the Study area, facing south.





Above: Infrastructure and clearing along the north-east boundary of the Study Area

Below: Managed garden beds in the south-western corner of the Study Area





Above: Termite nest on tree 3 within the Subject Land

Below: Infrastructure and pathway associated with the café present within the Study Area



Appendix L – Credit Reports

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00057954/BAAS19076/25/00057955	5629 - Waterford Stage 97	09/04/2026
Assessor Name	Report Created	BAM Data version *
Natalie S Black	05/05/2026	Current classification (live - default) (94)
Assessor Number	BAM Case Status	Date Finalised
BAAS19076	Finalised	05/05/2026
Assessment Revision	BOS entry trigger	Assessment Type
0	BOS Threshold: Area clearing threshold	Part 4 Developments (Small Area)

* 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 SAIL	Ecosystem credits

Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest											
1	3433_Clas sname1	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	45.5	45.5	0.51	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00	12
										Subtotal	12
										Total	12

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
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BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00057954/BAAS19076/25/00057955	5629 - Waterford Stage 97	09/04/2026
Assessor Name	Assessor Number	BAM Data version *
Natalie S Black	BAAS19076	Current classification (live - default) (94)
Proponent Names	Report Created	BAM Case Status
	05/05/2026	Finalised
Assessment Revision	BOS entry trigger	Assessment Type
0	BOS Threshold: Area clearing threshold	Part 4 Developments (Small Area)
Date 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.	
05/05/2026		

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		
Species		
Nil		

Additional Information for Approval

Assessment Id	Proposal Name
00057954/BAAS19076/25/00057955	5629 - Waterford Stage 97



BAM Biodiversity Credit Report (Like for like)

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT

No Changes

Predicted Threatened Species Not On Site

Name

Calyptrorhynchus lathami lathami / South-eastern Glossy Black-Cockatoo

Ephippiorhynchus asiaticus / Black-necked Stork

Ixobrychus flavicollis / Black Bittern

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3433-Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	0.5	12	0	12



BAM Biodiversity Credit Report (Like for like)

3433-Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest	Like-for-like credit retirement options					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions This includes PCT's: 3433, 3442, 3443, 3444, 4158	-	3433_Classname1	Yes	12	Hunter, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

No Species Credit Data

Credit Retirement Options

Like-for-like credit retirement options

Appendix M – CVs



NATALIE BLACK

Senior Ecologist

Profile Summary

Natalie works with AEP in the role of Senior Environmental Manager. She has extensive knowledge in environmental management, environmental planning, fisheries, aquatic and riparian environments, and report writing and assessment. With a detailed understanding of planning, catchment management, coastal management and rehabilitation. Natalie has had a successful career with both state and local government in conservation, planning and field investigation roles. Natalie has also gained extensive communication skills and project management through her previous career in lecturing in a range of course with a focus on environmental management and environmental legislation. Her background and experience in the ecological and planning fields is utilised in a diverse array of application in her current role.

Natalie Black is a conservation detection dog handler and is currently working with her purpose breed working English Springer Spaniel "Gus" who is currently trained to detect Koala scat, Forest Owl pellets and Cane Toads.

Academic Qualifications

- Bachelor of Science (Hon.) Sustainable Resource Management and Marine Science - University of Newcastle 2001
- Master Planning - University of Technology Sydney 2007
- Certificate IV Training and Assessment - TAFE 2012
- BAM Assessor; accreditation number: BAAS19076

Training, Licences and Professional Memberships

- NSW Class C Driver's Licence
- First Aid (Provide First Aid HLTAID011)
- Evidence Gathering and Legal Process, Australian Institute of Environmental Health
- Conflict Resolution Course (LGSA)
- Report Writing Course (LGSA)
- Powerful Presentation (LGSA)
- NSW Rural Fire Services Bush Fire Assessment
- Relocation of Threatened Species, Botanical Gardens Sydney
- Sustainable Home Assessment Reduction Revolution
- Flora and Fauna Survey Assessments Niche Environment and Heritage



Professional Experience

Senior Environmental Manager / Works Coordinator Anderson Environment & Planning Newcastle NSW	2019 – Present
Principal Environmental Planner Black Earth Newcastle NSW	2010 – 2019
Senior Lecturer Hunter TAFE Hunter Region NSW	2010 – 2019
Natural Resource Manager and Development Assessment Officer Lismore City Council Lismore NSW	2003 - 2010
Fish Passage Expert NSW Department of Primary Industries Ballina NSW	2002 – 2003
Conservation Officer NSW Department of Primary Industries Crows Nest NSW	2000 – 2002
Volunteer NSW Fisheries Varied Roles Port Stephens NSW	1998 - 2000

Relevant Project Experience

Ecological Surveys

- Target surveys for *Thelymitra adorata* Halloran; Wyee, Wadalba;
- Target surveys for *Melaleuca biconvexa* Mardi, , Halloran; Wyee, Wadalba
- Target surveys for *Tetratheca juncea* Hillsborough, Mardi, Thornton, Warners Bay;
- Target surveys for *Rhodamnia rubescens* Hillsborough, Mardi, Thornton, Stuarts Point, South West Rocks,
- Target Survey for Cumberpalin Snail and Dural Snail, Rouse Hill
- Target Search for seagrass and threatened marine fauna, Stuarts Point, South West Rocks, Lake Macquarie, Peat Island,
- Powerful Owl nest locating and monitoring: Salamander Bay



- Spot Analysis Techniques surveys: Lismore, Wallsend, Salamander Bay, North Arm Cove, Warnervale, Hamlyn Terrace, Wyee, Charlestown, Chisholm, Gillieston Heights, Mount Vincent, Hillsborough;
- Surveys for Squirrel Glider (*Petaurus norfolcensis*) Wadalba, Rouse Hill, Claremount Meadows, Wyee, Hillsborough, South West Rocks, Stuart Point;
- Frog Surveys: Lismore, Wallsend, Salamander Bay, North Arm Cove, Warnervale, Hamlyn Terrace, Wyee, Charlestown, Chisholm, Hillsborough Rouse Hill, Kariong, Wadalba,

Ecological Assessment

- Accredited Assessor for approved Biodiversity Development Assessment Reports:
- *Teraglin Village, Chain Valley Bay;*
- *Railway Road, Warnervale;*
- *McFarlane's Road, Chisholm;*
- *Fairlands Road, Medowie;*
- *Raymond Terrace Road Chisholm,*
- *Annangrove Road, Rouse Hill*
- *Richmond Road, Marsden Park,*
- *Claremount Meadows,*
- *Newcastle Golf Course, Fern Bay,*
- *Newell Highway, Gilgandra*
- *Narromine Road, Dubbo*
- Ecological Assessment Report for Proposed Modification to Approved Western Rail Coal Unloader At Pipers Flat;
- Infrastructure Ecology Reports;
- *Wyee Water Main;*
- *Mardi Water Main;*
- *Wyee Rising Main;*
- *Mardi Rising Main;*
- Summerhill Waste Facility Recycling Plant

Ecological Offsets and Monitoring

- Biodiversity Stewardship Agreements including:
- *Hillsborough*
- *Blueys Beach,*
- *Allandale,*
- *South-West Rocks.*
- Biodiversity Management Plans / Vegetation Management Plan / Wildlife Management Strategies
- *VMP for Proposed Modification to Approved Western Rail Coal Unloader At Pipers Flat;*
- *VMP / WMS / Dewatering Plan for Wyee for 23ha Offset lands*
- *VMP Rouse Hill Commercial Development.*
- *BMP – Claremount Meadows Commercial Development.*



Planning – Approved Reviews of Environmental Factors

- South West Rocks Installation of Seawall,
- Lake Macquarie upgrade of carpark, boat ramp and jetty,
- Demolition of two (2) jetties Peat Island,
- Stuart Point upgrades to caravan park including boat ramp.
- Wyee Rising Main
- Anambah Recycling Facility

Bushfire Threat Assessments

- Kempsey Correctional Facility for upgrade
- Stuarts Point Caravan Park for upgrades
- Claremount Meadows for a Commercial development included Daycare, and service station
- Batlow for a Service Station
- Lovedale for a change of use to Brewery



BRENDON YOUNG

Project Manager

Profile Summary

Brendon works with AEP in the role of Project Manager and Ecologist/Aquatic Ecologist. He graduated with a Bachelor of Applied Science (Fisheries w/Honours), a Masters in Environmental Management and Graduate Certificate in Fish Conservation and Management. Brendon has previously worked in large retail operations in staff and budget/data management, reporting and quality assurance which adds to the experience that he currently contributes to the AEP team.

Academic Qualifications

Charles Sturt University

- Master of Environmental Management (Water Resources) 2023
- Graduate Certificate of Fish Conservation and Management 2022

University of Tasmania

- Bachelor of Applied Science (Fisheries) with Honours

Training, Licences and Professional Memberships

- NSW Class C Driver's Licence
- WHS NSW Construction Induction White Card
- First Aid (Provide First Aid HLTAID011)

Professional Experience

Project Manager/Aquatic Ecologist Anderson Environment & Planning Newcastle NSW	Jan 2024 – Present
Project Lead/Ecologist Anderson Environment & Planning Newcastle NSW	Oct 2023 – Jan 2024
Ecologist Anderson Environment & Planning Newcastle NSW	Sept 2022 – Oct 2023
Department Manager Woolworths Pty Ltd	2013 - 2022
Produce Quality Control Officer Woolworths Pty Ltd	Mar 2019 - Oct 2019

Relevant Project Experience

Ecological Surveys

- Watercourse Assessment with the NRAR Waterfront Land Tool in Hunter Valley, Central Coast, Midcoast and Dubbo regions.
- Key Fish Habitat surveys at Karuah River Port Stephens, Hunter River Lochinvar and Chisholm, Manning River Tibbuc and Lachlan River Stubbo.
- Dip netting for *Mogurnda adspersa* in Lochinvar, Tibbuc, Chisholm and Stubbo.



- Seagrass and Mangrove surveys in Port Stephens.
- Targeted, systematic transects for threatened flora species.
- Deployment of Camera Traps, Songmeter and Anabats across central Coast and Hunter Valley regions for targeted survey.
- Spot Assessment Technique surveys: Halloran, Windella, Ourimbah, Chisholm.
- Weed mapping: Taree, Ourimbah, Hunter Valley.

University

- Training with aquatic sampling techniques such as seine nets, gill nets and fyke nets.
- Training in the use of mist netting, bat harp traps, Elliot traps, pitfall traps and camera traps.
- Identification of fish, reptiles, insects, and plants to species level through honours research and other projects while studying.

Ecological Assessment

- Riparian and watercourse assessment with the Waterfront Land Tool in the Hunter Valley, Central Coast, Sydney and Hastings regions.
- Preparation of Vegetation Management Plans in the Hunter Valley, Central Coast and Midcoast regions.
- Bushfire Threat Assessment in accordance with PBP 2019 at various sites across the Hunter Valley and Central Coast regions.
- Assist with Arborists assessments in Central Coast, Sydney, Mudgee and Hunter Valley Regions.

Ecological Monitoring

- Primary contributing author for Garden Suburbs Biodiversity Stewardship Site Assessment Report and associated Management Plan.

Publications

- Courtney, A.J., Schemel B.L., Wallace, R., Campbell, M.J., Mayer, D.G. and Young, B. (2005) *Reducing the impact of Queensland's trawl fisheries on protected sea snakes*. FRDC Project No. 2005/053. Queensland Government.

CALLUM REEDMAN

Ecologist

Profile Summary

Callum works with AEP in the role of Ecologist. Callum has over 6 years of experience in the environmental industry, having previously worked within the Natural Area Restoration field as a Bush Regenerator, participating in a variety of environmental restoration projects across multiple LGAs, coupled with a history of community environmental volunteering.

Due to Callum's proficiency in flora recognition and identification ascertained from the Natural Area Restoration field as a Bush Regenerator, Callum's primary focus is the undertaking of Biodiversity Assessment Method (BAM) Flora Plots, BMP and VMP required Flora and Baseline Monitoring Plots and Targeted Flora Surveys for Listed State and Federal flora species and threatened ecosystems. Callum is also proficient in the data interpretation required by the BAM, including PCT Determination, Description and TEC Assessment at the State and Federal levels for EAR, SBDAR, BDAR, BMP and VMP reporting requirements.

Academic Qualifications

- Diploma of Conservation & Land Management - TAFE NSW (2022)
- Certificate III in Conservation & Land Management - Hunter TAFE (2016)

Training, Licences and Professional Memberships

- NSW Class C Driver's Licence
- WHS NSW Construction Induction White Card
- Prepare to work safely in the construction industry (CPCWHS1001)
- First Aid
- Provide CPR (HLTAID009)
- Provide basic emergency life support (HLTAID010)
- Provide First Aid (HLTAID011)
- AQF3 CHEMCert Chemical Application Certificate
- Transport and store chemicals (AHCCHM304)
- Manual fumigation for vertebrate and invertebrate pests (AHCCHM305A)
- Prepare and apply chemicals to control pest, weeds and diseases (AHCCHM307)
- Chainsaw Operation Certificate
- Operate and maintain chainsaws (AHCMMOM213)
- Fell small trees (AHCPCM203)
- 4wd Certificate
- Operate four wheel drive vehicle on unsealed roads (FWPCOT3325)
- Robson Civil Projects Annual Project Induction
- MetroMix Quarry – Able Concrete Site Induction
- Code of Conduct Certificate



Professional Experience

Ecologist Anderson Environment & Planning Newcastle NSW	2022 – Present
Casual Bushcare Supervisor Complete Staff Solutions Newcastle NSW	2022 - Present
Casual Bush Regenerator Trees In Newcastle Newcastle NSW	2021 - 2021
Casual Ecologist Anderson Environment & Planning Newcastle NSW	2021 - 2022
Bush Regenerator Australian Facilities Landscapes Sydney NSW	2020 - 2021
Casual Bushcare Supervisor Lane Cove Council Sydney NSW	2020 - Present
Bush Regenerator Lake Macquarie City Council Lake Macquarie NSW	2017 - 2020
Green Army Participant Conservation Volunteers Australia Australia	2014 - 2015

Relevant Project Experience

Ecological Survey Experience:

- Targeted Flora Surveys, Infrastructure, Hunter Gas Pipeline, Various locations (Newcastle LGA – Narrabri LGA), March 2023 – Present:
 - Delmar impar* – Striped Legless Lizard
 - Cymbidium canaliculatum* – Tiger Orchid
 - Eucalyptus camaldulensis* – River Red Gum
 - Digitaria porrecta* – Finger Panic Grass

- *Dichanthium setosum* – Blue grass
- *Rutidosia heterogama* – Heath Wrinklewort
- *Acacia pendula* – Weeping Myall Wattle
- *Eucalyptus glaucina* – Slaty Redgum
- Equipment Deployment - ScoutGuard BolyTrail Cameras and Wildlife Acoustics Song Meter Minis for the Hunter Gas Pipeline, Various locations (Newcastle LGA – Narrabri LGA) March 2023 – Present
- Preclearance Surveys, Waterford, Chisholm, March 2021
- Equipment Deployment – ScoutGuard BolyTrail Cameras and Wildlife Acoustics Song Meter SM4 Acoustic Recorder -, Seaspray Circuit, Wallabi Point, BDAR, 2021
- Koala Spot Assessment Technique (SATs) Hunter Gas Pipeline, Various locations (Newcastle LGA – Narrabri LGA) March 2023 – Present
- Koala Call Playback, Residential Subdivision, Seaspray Circuit, Wallabi Point, BDAR, 2021
- *Rhizanthella slateri* Targeted Flora Surveys, Industrial Subdivision, Pile Road, Somersby, BDAR, September 2023
- Equipment Deployment – Titley Scientific Anabat Express and Anabat Swift, Residential Development, Bruce Crescent, Wallarah, SBDAR, December 2023.
- Targeted Fauna Surveys, Frogs, Quarry Expansion, MetroMix Quarries Pty Ltd., Teralba, BDAR, February 2024
- Targeted Flora Surveys, *Corybas dowlingii* – Fleet Street, Salamander Bay, BDAR, June 2021
- Diurnal bird surveys for the Glossy Black-Cockatoo, *Calyptrorhynchus lathamii*, Residential Subdivision, Blueys Beach, BDAR August 2023

Ecological Assessment Experience:

- Biodiversity Assessment Method (BAM) Flora Plots, Residential Subdivision, Cessnock Road, Gillieston Heights SBDAR, July 2022
- Biodiversity Assessment Method (BAM) Flora Plots, Infrastructure, Hunter Gas Pipeline, Various locations Newcastle LGA – Narrabri LGA, March 2023 – Present
- Biodiversity Assessment Method (BAM) Flora Plots, Jarrett Street, Kilaben Bay, SBDAR, 2023
- Biodiversity Assessment Method (BAM) Flora Plots, Rixs Creek Service Centre, Rixs Creek, Preliminary Ecological Advice, May 2024
- Biodiversity Assessment Method (BAM) Flora Plots, Bruce Crescent, Wallarah, July 2023
- Biodiversity Assessment Method (BAM) Flora Plots Residential Subdivision, BDAR, Freemans Drive, Cooranbong, October 2022
- Biodiversity Assessment Method (BAM) Flora Plots, Mountain Road, Halloran, BDAR, July 2022
- Biodiversity Assessment Method (BAM) Flora Plots Bruce Crescent, Wallarah, July 2023
- Biodiversity Assessment Method (BAM) Flora Plots, Sparks Road, Halloran, October-November 2022
- Biodiversity Assessment Method (BAM) Flora Plots, Thompson Vale Road, Doyalson, BCAR & Eco Constraints Advice March 2023
- Biodiversity Assessment Method (BAM) Flora Plots, Eden Estates, Elemore Vale & Wallsend, BDAR, March 2021



- Biodiversity Assessment Method (BAM) Flora Plots, Pile Road, Somersby, BDAR, September 2023
- Biodiversity Assessment Method (BAM) Flora Plots, Myoora Road, Somersby, SBDAR, April 2024
- Biodiversity Assessment Method (BAM) Flora Plots, Bryant Drive, Tuggerah, EAR & SBDAR, July 2022, April 2024
- Biodiversity Assessment Method (BAM) Flora Plots, The Lakes Way, Charlotte Bay, Plots, BDAR, August 2023; March 2024

Ecological Monitoring Experience:

- Baseline BAM Flora Monitoring Plots, North Head for the Sydney Harbour Federation Trust, January 2024.
- Baseline Flora Monitoring Plots, Waterford Chisholm BMP Lands, April 2023
- Baseline Flora Monitoring Plots, Hakone Road, Woongarah, 2023
- Biodiversity Assessment Method (BAM) Flora Plots, Northams Road, Ellalong, BSSAR 2021
- Biodiversity Assessment Method (BAM) Flora Plots, Lovedale Road, Allandale, BSSAR, 2022

Publications:

Balkenhol, N., Beranek, C., Clulow, J., Hayward M. W., King J-P., Mahony, M., Meyer, N, F. V., Reedman, C., (2021) *Large area used by squirrel gliders in an urban area, uncovered using GPS telemetry*. Ecology and Evolution 11(12): 7147–7153, June 2021.

EMMA O'DWYER-HALL

Ecologist

Profile Summary

Emma is an Ecologist at Anderson Environment and Planning (AEP), joining in January 2024. Emma has a Bachelor of Environmental Science: Wildlife and conservation Biology gained from Deakin University, with an Honours studying the impact of Fire History on Autumn calling frogs in the Otway's National Park. Emma has five years professional experience in pest species research and management (with both flora and fauna) in both the private and public sector, along with a wide range of non-professional experience in field research, public engagement, wildlife-rescue and wildlife-husbandry. Since joining AEP, Emma has enjoyed gaining skills and knowledge in Ecological assessments Ecological field surveys and legislations. Emma has a special interest in pest species management, data management and amphibian and invertebrate ecology.

Academic Qualifications

- Bachelor of Environmental Science (Wildlife and Conservation Biology) Deakin University, 2017
- Environmental Science (Honours) Deakin University, 2019

Training, Licences and Professional Memberships

- NSW Class C Driver's Licence
- WHS NSW Construction Induction White Card
- First Aid (Provide First Aid HLTAID011)
- Venomous Snake Handling Training
- Hunter Wildlife Rescuer (Wombat Mange treatment and Flying-Fox training)
- Safety around aircrafts (helicopter) training

Professional Experience

Ecologist Anderson Environment & Planning Newcastle NSW	2023 – Present
Research and Ecology Intern Conservation Ecology Centre (CEC / NGO)	2021
Field Crew Supervisor - Clerk Grade 7/8 NSW Department of Primary Industry - Wild European Honeybee Baiting Management (WEHBM)	2022 - 2023
Technical Officer Vertebrate Pest Research Unit NSW Department of Primary Industries	2021 - 2022
Crew Member Toolijooa Environmental Restoration/ Bushland Regeneration	2020 - 2021
Crew Member / Leading Hand Flora Victoria Regeneration and Management of Grasslands	2018 - 2020
Honours Student Deakin University Honours Program, Research on impact of fire History on Autumn Calling Frogs on the Otway National Park	2019

Relevant Project Experience

Ecological Surveys

- Radio Tracking Koalas, Powerful Owls and Bearded devils with Deakin University (Numerous PHD research surveys) (2016-2018)
- Testing Flight Initiation Distance in shorebirds at Melbourne Western Treatment plant with Deakin University (December 2019)
- Medium size mammal trapping on Tasmanian devils Department of Primary industries, Parks, Water and Environment (DPIPWE) / Save the Tasmanian Devil Program in Maria Island (January 2017).
- Call Playback ; on the Southern Toadlet in the Otway's National Park for Deakin University (Honours project- March- May 2019) ;and on Powerful owl, Masked Owl, Barking Owl and Koalas for AEP in numerous locations across the Central Coast and Hunter regions of NSW (February 2024 to present)
- Nocturnal frog surveys for; numerous Autumn calling frogs in the Otway's National Park for Deakin University (Honours project- March- May 2019); and Green and Golden Bell frog and green thighed tree frog, for AEP in Lochinvar NSW (April 2024)
- Elliot Trapping with; Deakin University in the Otway's National Park (October 2016); and the Conservation Ecology Centre (CEC) in the Otway's National Park (January- April 2021).
- Sweep netting for invertebrates with the CEC in the Otway's National Park (January- April 2021).

- Camera Trapping with; the CEC in the Otway's National Park (January- April 2021); and AEP in Murrundii NSW
- Pitfall Trapping for small marsupials and reptiles in Yathong National park with the Department of Primary Industries (DPI) (October 2021)
- Areal surveys- visual and using thermal imagery- for invertebrate pest species with the DPI industries within numerous locations across NSW (June 2021- September 2022).
- Threatened species, tree, grass and reptile surveys via 10-20 m transects with AEP in Quirindi, and Murrundii (February 2024- present)
- Nocturnal spotlight surveys with AEP in numerous locations across the Hunter and Central Coast NSW.

Ecological Assessment

- Ecological Assessment (2024)
- Ecological Assessment Report (2024)

Ecological Monitoring

- Monitoring the helmeted honey eater with the Friends of the Helmeted Honey eater regenerative feeding program (January 2017 to January 2019)
- Monitoring the population and health of the Tasmanian Devil insurance population on Maria Island with the DPIWE (January 2017)
- Monitoring the impact of feral cat baiting on native species biodiversity in Yathong National Park with the DPI (October 2021- March 2022)
- Monitoring Vertebrate pest populations and the impact of thermal imaging technologies on their populations with the DPI (June 2021- November 2022)
- Monitoring European Honey Bees for the DPI (November 2022 to November 2023).
- Vegetation monitoring for Vegetation Management Plans (VMP) and Biodiversity Management Plans (BMP) for AEP (January 2024 to present)

Publications

- Thermal-assisted aerial culling (TAAC) for improved control of vertebrate pest animal populations



KATHLEEN BUSHELL

Ecologist

Profile Summary

Kathleen has worked with AEP in the role of Ecologist since 2022. She graduated with a Bachelor of Science (Hons) majoring in Marine Biology, and Environmental Management. At the University of Newcastle, Kathleen was a research assistant working with threatened species (i.e., Green and Golden Bell Frog) in various projects, and was a casual academic involved in researching Indigenous Conservation Management, predator-prey dynamics, and marine ecology. Kathleen has assisted with teaching at the University of Newcastle, and was an educator with Take 3 for the Sea.

Kathleen's interests and experience includes flora, fauna and fungi survey requirements, ultrasonic survey and call identifications, research, and reporting (including the implementation of the NSW Biodiversity Assessment Method and other legislation).

With these skills and interest Kathleen is involved in a diverse range of projects across AEP including Biodiversity Assessments, Ecological Assessments, Data Analysis and Mapping, Bushfire Threat Assessments, and general implementation and understanding of guidelines and legislations.

Academic Qualifications

- Bachelor of Science (Hons), University of Newcastle, NSW. Marine Biology, and Environmental Science & Management.

Training, Licences and Professional Memberships

- NSW Class C Driver's Licence. Experienced manual and 4WD operator
- WHS NSW Construction Induction White Card
- First Aid (Provide First Aid HLTAID011)
- Geographic Information Systems ArcGIS, QGIS various providers
- SSI Open Water Scuba Licence
- Microchipping fauna
- MMO (Marine Mammal Observer Course)
- Australian Marine Sciences Association (AMSA): Member
- FungiMap: Member
- Ecological Consultants Association (ECA): Practising Member



Professional Experience

Ecology Project Manager Anderson Environment & Planning Newcastle NSW	2025 – Present
Ecologist Anderson Environment & Planning Newcastle NSW	2022 – 2025
Casual Academic The University of Newcastle Newcastle	2022 - 2022
Research Assistant - GGBF Surveys & Monitoring The University of Newcastle Newcastle	2017 - 2021
LiDAR Data Quality Analyst Anditi Newcastle	2020 - 2021
Educator Take 3 for the Sea Central Coast	2018 - 2021

Relevant Project Experience

Ecological Surveys

- Surveys for fauna species including visual and auditory frog surveys, harp-net and ultrasonic call surveys for microbats, nocturnal surveys for amphibians, mammals and aves;
- Surveys for flora species including targeted hand searches and transects;
- Surveys for fungi including targeted transects;
- Trapping and translocation work with amphibians, mammals, and reptiles;
- Camera trapping, acoustic detection and call playback surveys;
- Habitat assessments for flora, fauna, and fungi species;
- Mark-Recapture Studies (including microchipping) for amphibians and mammals;
- Genetic Surveys (including skin swaps and tissue clipping) for amphibians;
- Behavioural Studies (including breeding behaviour, movement, predator-prey interactions and responses to environmental changes);
- Community Surveys (including assessing species richness, relocation and movement across large scale habitats); and
- Restoration of habitat (including planting and building of habitats).

Ecological Assessment

- Fauna survey and identification utilising camera traps and audio technology;
- Fungi survey and identification;
- Call analysis and identification for threatened microbats and frogs;
- Habitat Quality Assessment (including assessment of vegetation, functions, water quality, weather components);
- Vegetation Surveys (including assessing vegetation composition, diversity and structure);
- Predator and Prey Surveys (including assessing for Gambusia, and incidental observations of predatory species);
- Disease Monitoring (including skin swabs for chytridiomycosis); and
- Anthropogenic Disturbance Assessment (including impacts of human activities such as habitat destruction and reconstruction).

Ecological Monitoring

- Restoration Ecology of the Green and Golden Bell Frog (UoN, Michael Mahony);
- Status of Green and Golden Bell Frogs in Port of Newcastle managed zones of Kooragang Island (UoN, Alex Callen and John Gould);
- Marine ecology surveys to inform the production of Ecological Reports within NSW, and internationally;
- Ecological field survey, covering terrestrial flora and fauna, to inform the production of Ecological Reports within NSW;
- Assessment of sites using the Biodiversity Assessment Method (BAM) for the production of Biodiversity Assessment Reports (BDAR);
- Assessment of development proposals against the provisions of the EPBC Act, Koala Plans of Management, SEPP 44 and SEPP Koala Habitat Protection, Coastal Management SEPP and other associated legislative requirements; and
- Analysis, reporting and restoration ecology of frog species relating to conservation and development within Australia.
- Preparation of Squirrel Glider Management Plan and GIS – detailed designs and pole height and location at Cessnock.
- Preparation of Squirrel Glider Pole location and GIS – detailed designs and pole height and location at Hillsborough.

Additional Project Experience

- GIS analysis and mapping for ecological reports, bushfire threat assessments, stewardship reporting and monitoring, management planning and development pathway planning and constraints assessment.



NEVE EARDLEY

Ecologist

Profile Summary

Neve Eardley works with AEP in the role of Ecologist. She completed a Bachelor of Environmental Science and Management, majoring in Ecosystems and Biodiversity in 2025, and has worked for AEP since August 2025. Neve has gained experience in a variety of ecological survey techniques, report writing and data management through her studies, volunteer work, study placement and ongoing work with Anderson Environment and Planning (AEP).

Academic Qualifications

- Bachelor of Environmental Science and Management (with distinction) – University of Newcastle, 2025.

Training, Licences and Professional Memberships

- NSW Class C Driver's Licence
- WHS NSW Construction Induction White Card
- First Aid (Provide First Aid HLTAID009/010/011)

Professional Experience

Ecologist Anderson Environment & Planning Newcastle NSW	2025 – Present
Volunteer Newcastle City Council Landcare	2024 – 2025
Retail Assistant Scoop Wholefoods Newcastle NSW	2022 – 2025
Front of House Muchos Mexican Newcastle NSW	2022 – 2025

Relevant Project Experience

Ecological Surveys

- Camera trapping surveys for ground and arboreal species including deployment, collection and analysis. (Various Sites across Newcastle, April 2025 to Present - Including volunteer study placement at AEP).
- Biodiversity Assessment Methodology (BAM) plot assistance and training. (Various Sites across Newcastle and Central Coast, April 2025 to Present - Including volunteer study placement at AEP).
- Targeted 10m Flora Transect Surveys for a variety of threatened species. (Central Coast Sites April 2025 to Present - Including volunteer study placement at AEP).
- Nocturnal Arboreal Mammal Spotlighting Surveys (University of Newcastle, 2024).

**Ecological Assessment**

- Contributing author of Biodiversity Development Assessment Reports (Darrawank, 2025).

Ecological Monitoring

- Water Quality Parameter Testing and Habitat Assessments (University of Newcastle, Estuarine - Smiths Lake, 2024, Fresh Water - Chichester and Williams River catchments, 2023).
- Nest Box Inspection utilising pole camera, species identification and monitoring training (Thornton, April - July 2025 - Volunteer).
- Invasive Weed extent monitoring and identification of key concern areas at Landcare site (Merewether 2024-2025 - Volunteer).



STEPHEN CURRY

Ecologist

Profile Summary

Stephen currently works as an Ecologist for AEP. He has completed a Bachelor of Environmental Science and Management at The University of Newcastle, in addition to Certificate III and Diploma in Conservation and Land Management at Hunter TAFE. Stephen has worked as a Bush Regenerator for over four years, while supervising Central Coast Council Landcare volunteer groups for two years. Throughout his studies and work experiences, Stephen has developed a considerable set of skills and knowledge related to botany, and he is always striving to refine and improve these skills.

Academic Qualifications

- Bachelor of Environmental Science & Management (Ecosystems and Biodiversity Major) – University of Newcastle, 2024
- Diploma of Conservation and Land Management – TAFE, 2018
- Certificate III in Conservation and Land Management
- Bachelor of Education Studies – University of Newcastle, 2016

Training, Licences and Professional Memberships

- NSW Class C Driver's Licence
- WHS QLD Construction Induction White Card
- Provide First Aid HLTAID011
- AQF3 Chemical Accreditation
- Operate four-wheel drive vehicle on unsealed roads
- Australian Native Plant Society NSW: Member

Professional Experience

Ecologist Anderson Environment & Planning Newcastle NSW	2022 – Present
Bushcare Volunteer Supervisor Central Coast Council Gosford NSW	2022 - 2024
Bush Regenerator Community Environment Network Ourimbah NSW	2018 - 2022

Relevant Project Experience

Ecological Surveys

- Targeted surveys for *Dicanthium setosum* and *Digitaria porrecta* in the Hunter Valley and Liverpool Plains regions;
- Targeted surveys for *Eucalyptus glaucina* in the Hunter Valley Region;

- Targeted surveys for threatened forb and shrub species within the Central Coast and Lower Hunter Regions.
- Targeted surveys for Threatened orchid species in the Hunter and Central Coast Regions;
- Placement, monitoring and retrieval of camera traps for a range of targeted fauna surveys;
- Monitoring local Dasyurid populations for response to predation from feral or introduced species in the Lake Macquarie region;
- Targeted surveys for forest Owls in the Central Coast Region;
- Targeted surveys for Giant Dragonfly in the Lake Macquarie and Mid-North Coast Regions

Ecological Assessment

- Undertaken BAM floristic surveys for various ecological reports:
 - The Lakes Way, Charlotte Bay;
 - Cowhill Road, Lochinvar;
 - Edison Road, Wagga Wagga;
 - Myall Road, Cardiff;
 - Boomerang Drive, Bluey's Beach;
 - Denton Close, Windella;
 - Middle Arm Road, Goulburn;
 - Brickworks Road, Thornton;
 - The Lakes Way, Forster;
 - Pacific Highway, Tuggerah;
 - Waterford Stage 97, Chisholm;
 - Magometon and Tallegar Creek, Coonamble.
 - Various extensive vegetation surveys within the Hunter Valley and Liverpool Plains regions.

Ecological Monitoring

- Radcliffe Wyee VMP Monitoring;
- Hakone Road, Wadalba;
- Glenning Valley VMP Monitoring.
- BSA Site Myall Road, Garden Suburb;
- Calala Lane, Tamworth.