Biodiversity Development Assessment Report

82 Chapmans Rd, Tuncurry

Prepared for

Allam MHE Developments No. 2 Pty Ltd

Final Report / December 2024

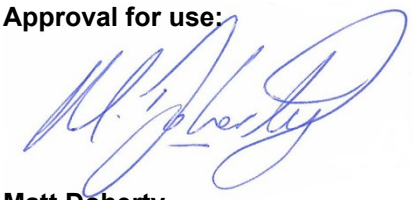
02 4054 9539
info@mjdenvironmental.com.au
PO Box 360 Waratah NSW 2298
MJDenvironmental.com.au

DOCUMENT CONTROL

Project Particulars			
Project Name	**82 Chapmans Road, Tuncurry**		
Job Number	**22055**		
Client	**Allam MHE Developments Pty Ltd**		
Status	**Final**		
Version	**Date**	**Author**	**Details**
1	06/05/2024	KM/RF/MD	Draft report for client
2	23/10/2024	KM/RF/MD	Final Report
3	20/11/2024	KM/RF/MD	Final Report
4	17/12/2024	KM/RF/MD	Final Report

BOAMS Status	
BOAMS	**Submitted to Consent Authority**
BAM-C	**Finalised**
Case Number	**00041658/BAAS17044/23/00041659**
Accredited Assessor	**Matt Doherty**

Approval for use:



Matt Doherty

Accredited BAM Assessor # BAAS17044

17 December 2024

SUMMARY

MJD Environmental has been engaged by Allams MHE Developments No. 2 Pty Ltd to prepare a Biodiversity Development Assessment Report (BDAR) over the land of Lot 11/-/DP615229, with an existing DA over Lot 100/-/DP1286524 for bulk earthworks. The proposal is for a 283-dwelling manufactured home estate with ancillary facilities

The Subject Land is not mapped on the Biodiversity Values Map (BVM); however, the proposal is expected to involve greater than 1 ha of native vegetation clearance, which will exceed the area clearing threshold of 0.25ha associated with the minimum lot size of the lot (450sqm). As such the proposal triggers entry into the Biodiversity Offset Scheme (BOS) as per section 7.1.1 (b) of the BC Regulations (2017) and assessment under the Biodiversity Assessment Method (BAM).

The Study Area is currently zoned as R2 Low Density Residential with portions within the South and East of the site zoned as C2 Environmental Conservation. The vegetation across the majority of the site consists of managed Coastal Swamp Forest along with scattered areas of Coastal Dune Dry Sclerophyll Forests.

A total of three (3) Plant Community Types (PCTs) were identified within the Study Area.

- PCT 4006 – *Northern Paperbark-Swamp Mahogany Saw-sedge Forest*
- PCT 3544 – *Coastal Sands Apple-Blackbutt Forest*
- PCT 4004 – *Northern Melaleuca quinquenervia Swamp Forest*

PCT 4006 – *Northern Paperbark-Swamp Mahogany Saw-sedge Forest* and PCT 4004 *Northern Melaleuca quinquenervia Swamp Forest* as they occur on the Subject Land were found to be commensurate with the BC Act listed (Endangered) Threatened Ecological Community *Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*.

One adult *Turnix maculosus* (Red-backed Button-quail) was detected via camera trapping within the Subject Land on the 17th and 19th February 2024.

Crinia tinnula (Wallum Froglet) were identified as present within the Subject Land, calls by two (2) individuals were heard within the Subject Land during targeted frog Call Playback survey undertaken on the 8th October 2024.No other threatened fauna or flora was detected during surveys.

The proposal will require the removal of 12.05 ha of native vegetation identified as consisting of two (2) separate PCT's - 4006 *Northern Paperbark-Swamp Mahogany Saw-sedge Forest*, 3544 *Coastal Sands Apple-Blackbutt Forest*. No fauna or flora listed as SAII were recorded within the site during surveys.

The proposal will retain: 1.56 ha of VZ1, 0.21 ha of VZ2, 0.13 ha of VZ4, 0.46 ha of VZ6, 0.21 ha of VZ9 and 0.02 ha of VZ10. And avoid 1.63 ha of identified PCT 4004

Table E1. Impacts that require an offset – ecosystem credits

Vegetation zone	PCT	TEC/EC	Impact area (ha)	Number of ecosystem credits required
VZ1: 4006 – Good	4006 - Northern Paperbark-Swamp Mahogany Saw-sedge Forest	**BC Act (E)** *Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	0.05	2
VZ2: 4006 – Intact			0.4	14
VZ3: 4006 - Moderate			0.17	3
VZ4: 4006 – Poor	4006 - Northern Paperbark-Swamp Mahogany Saw-sedge Forest	N/A	3.51	45
VZ5: 4006 – Poor-Grassland			1.52	21
VZ6: 4006 – Moderate-Grassland			1.93	27

Vegetation zone	PCT	TEC/EC	Impact area (ha)	Number of ecosystem credits required
VZ7: 4006 – Managed-Grassland			1.69	20
VZ9: 3544 - Poor	3544 - Coastal Sands Apple-Blackbutt Forest	N/A	0.83	9
VZ10: 3455 - Managed			1.97	14

Table E2. Impacts that require an offset – species credits

Common name	Scientific name	Loss of habitat (ha) or individuals	Number of species credits required
Wallum Froglet	*Crinia tinnula*	1.7	24
Red-backed Button-quail	*Turnix maculosus*	12.1	201

CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

SHORTENED FORMS

APZ	asset protection zone
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BC Act	Biodiversity Conservation Act 2016 (NSW)
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
BDAR	Biodiversity Development Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
BOS	Biodiversity Offsets Scheme
CEEC	critically endangered ecological community
DBH	diameter at breast height over bark
EC	ecological community listed under the EPBC Act
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EEC	endangered ecological community
HTW	high threat weed
IBRA	Interim Biogeographic Regionalisation for Australia
LLS Act	Local Land Services Act 2013 (NSW)
MNES	matters of national environmental significance
NPW Act	National Parks and Wildlife Act 1974 (NSW)
NSW	New South Wales
PCT	plant community type
SAII	serious and irreversible impact
SEARs	Secretary's Environmental Assessment Requirements
TBDC	Threatened Biodiversity Data Collection
TEC	threatened ecological community
VEC	vulnerable ecological community
Vegetation SEPP	State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 (NSW)

STAGE 1: BIODIVERSITY ASSESSMENT

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: 17 December 2024

BAM Assessor Accreditation no: 17044

This BDAR has been prepared to meet the requirements of BAM 2020. Appendix A provides an assessment of compliance with the minimum information requirements outlined in BAM Appendix K.

II. QUALIFICATIONS AND LICENCING

This BDAR has been prepared by Chris Spraggon (B.Sc.(Hons)) and Dr. Simone-Louise Yasui (B.Sc., MSc, PhD), under the guidance of Matt Doherty (BAAS# 17044).

Field work for the BDAR by various MJD Environmental (Aust) Pty Ltd. ecological staff. Refer to **Appendix I** for personnel qualifications.

Research was conducted under the following licences:

- NSW National Parks and Wildlife Service Scientific Investigation Licence SL101684 (Valid 31 March 2026).).
- Animal Research Authority Project Approval Period (Trim File No: 16/170) issued by NSW Government – Regional NSW on recommendation of Animal Care and Ethics Committee (Valid 8 February 2022 to 8 February 2027).
- Animal Care and Ethics Committee Certificate of Approval (Trim File No: 16/170) issued by NSW Department of Primary Industries (Valid 8 February 2024 to 8 February 2025).
- Animal Research Establishment Accreditation (No. 85120) issued by NSW Department of Primary Industries (Valid 28 February 2024 to 27 February 2025).

III. CONFLICT OF INTEREST

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

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: _____

Date: 17 December 2024

BAM Assessor Accreditation no: 17044

1. Introduction

MJD Environmental has been engaged by Allam MHE Developments No. 2 Pty Ltd to prepare a Biodiversity Development Report (BDAR) to accompany a Development Application for the development of Manufactured Homes across Lot 11/-/DP615229, 82 Chapmans Road, Tuncurry, NSW.

1.1 Proposed development

1.1.1 Development overview

An existing approved DA encompasses Lot 100/-/DP1286524 for bulk earthworks/ filling and development. Acknowledging that biodiversity has been addressed in the existing approval over Lot 100/-/DP1286523 and earthworks have commenced, this BDAR assesses the biodiversity values on Lot 11/-/DP615229 for the purposes of the DA that seeks a Manufactured Home Estate across both lots.

The proposed application seeks approval for the following works:

- Site clearing of vegetation within the area of the Subject Land
- Bulk earthworks to create level development pads for future construction
- Creation of construction access and lay down area
- Relocatable Homes
- Associated drainage works inclusive of stormwater basins, services and landscaping
- Fencing
- APZ establishment
- Two into two lot subdivision

Refer to **Appendix L** for a plan of the proposal along with a plan of proposed subdivision.

1.1.2 Proposed development and the Subject Land

The following nomenclature has been used in this report (Refer to **Figure 1**):

- Study Area – Refers to the affected lot/s
- Subject Land – Refers to the impact area.

Land Title	Lot 11/-/DP615229
LGA	Mid-Coast Council
Area	Lot (Study Area) – 16.43 ha Subject Land – 12.05 ha
Zoning	R2 Low Density Residential; and C2 Environmental Conservation
Minimum Lot Size/s	450 m^2 & 40ha
Boundaries	The Study Area is comprised primarily of R2 zoned land, with a small portion of the eastern boundary consisting of C2 zoned land. The C2 zoned land extends into a larger section within the Study Area along the South-Western boundary of the site. The Northern boundary of the Study Area is adjacent to previous DA for bulk earthworks across Lot 100/-/DP1286524, 40-80 Chapmans Road, Tuncurry. The Subject Land located within the R2 zoning is sparsely vegetated, with remnant dry forest and forested wetlands occurring through the managed rural property. The Study Area located within C2 zoning within the South-western

	portion of the site consists of forested wetlands in good condition with an intact canopy stratum. The land adjacent to the east of the site is zoned as R2 land and consist of urban development, The land to the south of the site is zoned as C2 with RU2 zoning occurring on the land to the West followed by the Wallamba River. The study land sits in an expansion of built, landscape of the greater Mid-Coast Council LGA
Current Land Use	The vegetation on the majority of the Subject Land has been historically used for the grazing of cattle as well as management through the use of slashing, resulting in large areas of native and exotic pasture interspersed with small patches of disturbed dry forest and forested wetlands.
Topography	Two (2) small Stock Dams occur within the site one occurs within the eastern portion of the Study Area the other occurring within the Western portion of the Subject Land. The Subject Land consists mostly of flat ground, with an elevation of 2m sloping slightly to the East beyond the site's periphery. To the west of the site lies RU2 zoned lad followed by Millers Mistake creek line (1st order watercourse) and the Wallamba River (7th order watercourse).

1.1.3 Other documentation

Listed below are other documentation or reports submitted with the proposed development that are relevant to the assessment of biodiversity:

- Bushfire Assessment Report – 82 Chapmans Road, Tuncurry – Bushfire Planning Australia 2024
- Concept Engineering Plans prepared by ADW Johnson (Ref: Project No. 190835-S2-CENG, Rev A, dated 09.12.2024)

1.2 Biodiversity Offsets Scheme Entry

The Subject Land is not mapped on the OEH Biodiversity Values Map (**Figure 4** Biodiversity Values Map or **Appendix B** Biodiversity Values Map and Threshold tool report), however the proposal exceeds the area clearing threshold for the relevant minimum lot size (MLS). This is one of the triggers for determining whether the Biodiversity Offsets Scheme applies to the proposed impact.

The threshold for clearing is dependent on the minimum lot size applicable to the land under the relevant Local Environmental Plan.

Minimum lot size associated with the property	Threshold for clearing, above which the BAM offsets scheme apply.
Less than 1 ha	**0.25 ha or more**
1 ha to less than 40 ha	0.5 ha or more
40 ha to less than 1000 ha	1 ha or more
1000 ha or more	2 ha or more

The threshold applies to all native vegetation clearing associated with a proposal, regardless of whether this clearing is across multiple lots. In the case of a subdivision, the proposed clearing must include all future clearing likely to be required for the intended use of the land after it is subdivided.

The affected Lot with the smallest MLS has a minimum lot size of 450 m^2 and clearing of up to 12.06 ha of native vegetation (>0.25 ha) is proposed, therefore exceeding the area clearing threshold triggering entry into the Biodiversity Offsets Scheme (BOS).

1.3 Excluded impacts

N/A

1.4 Matters of national environmental significance

Preliminary assessment was undertaken having regard to those threatened entities listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). Refer to **Appendix E** Matters of national environmental significance (MNES).

This preliminary assessment concluded that no actions associated with the proposal are likely to have a significant impact on a Matter of National Significance. The proposal therefore does not require referral under the EPBC Act. Flora, fauna and ecological communities nominated by the BAM-C at the time of assessment and listed under the EPBC Act are tabulated and assessed throughout this BDAR as appropriate and required.

1.5 Other legislative considerations

Koala SEPP (Biodiversity and Conservation) 2021 a Koala Assessment Report has been written in conjunction with this BDAR to assess potential impacts to Koala habitat within the Subject Land, See **Appendix J**

1.6 Information sources

Key information sources used in the BDAR, including but not limited to:

- *Threatened Biodiversity Data Collection (TBDC);*
- *Biodiversity Assessment Methodology (BAM): Department of Planning, Industry and Environment (DPIE), October 2020;*
- *Biodiversity Assessment Method Operational Manual- Stage 1 Department of Planning, Industry and Environment (DPIE), December 2020; and*
- *NSW survey guide for the Biodiversity Assessment Method; Surveying threatened plants and their habitats (DPIE), April 2020.*
- *NSW survey guide for the Biodiversity Assessment Method; Surveying threatened plants and their habitats (DPIE), April 2020;*
- *NSW Survey Guide for Threatened Frogs – A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method DPIE September 2020;*
- *NSW survey guideline for the Biodiversity Assessment Method; 'Species credit' threatened bats and their habitats (OEH), September 2018;*
- *NSW Department of Planning and Environment – Koala (Phascolarctos cinereus) Biodiversity Assessment Method Survey Guide, 2022;* and
- *NSW Department of Planning and Environment Threatened – Threatened reptiles Biodiversity Assessment Method survey guide, 2022.*

2. Methods

2.1 Site context methods

2.1.1 Landscape features

The landscape features of the Subject Land were assessed by API of high-quality digital aerial photography (NearMap – imagery capture April 16 2024), using GIS Software (QGIS) and *NSW Digital Topographic Database* (NSW DCCEEW 2024). Features were confirmed by ground survey.

2.1.2 Native vegetation cover

The native vegetation cover of the Subject Land and 1,500 m buffer was carried out by API of high-quality digital aerial photography (NearMap – imagery capture June 16 2024), using GIS Software (QGIS) and the *NSW State Vegetation Type Map* regional PCT data (DCCEEW 2022). Vegetation on the Subject Land and Study Area was confirmed by ground survey. The native vegetation cover has been assessed as 35%. Field reconnaissance was conducted on the 28th and 29th of June 2023 to assess extent of native vegetation. See **Section 3.3** for detailed description of native vegetation extent.

2.2 Native vegetation, threatened ecological communities and vegetation integrity methods

2.2.1 Existing information

Existing information sources used to assist identification of PCT, TEC and vegetation extent for this assessment include:

- NSW State Vegetation Type Map (DCCEEW 2022)
- NSW BioNet (VIS)
- NSW Landscape - Modified (DEM-S) Elevation layer

2.2.2 Mapping native vegetation extent

In accordance with Section 4.1 of the BAM (2020), native vegetation extent, including all native ground cover and tree canopy cover was mapped within the Subject Land and surrounding Study Area. Native vegetation extent was mapped using digital aerial photography (as described in **Section 2.1.2**), which was informed by the NSW STVM and by field surveys conducted across the Study Area. On 28th and 29th of June 2023 field surveys aimed at broad vegetation identification, delineation and stratification into vegetation zones carried out by detailed random meander methods (Cropper 1993). During this survey, the ecologist also collected information on landscape attributes, including landform, aspect, soil type, detailed descriptions of the vegetation condition, current land use and the current impacts.

- Identification of PCTs within the Subject Land were determined using:
- Occurrence within the Sydney IBRA bio-region;
- Vegetation formation and class;
- Landscape position; and
- Dominant species noted during field data collected from the full floristic plots/transects established in accordance.

Three PCTs were identified within the Study Area with two identified to be impacted within the Subject Land. All PCTs occur within the Karuah Manning subregion of the NSW North Coast Bioregion. The identified PCTs are as follows:

- PCT 3544 – *Coastal Sands Apple-Blackbutt Forest*.
- PCT 4004 – *Northen Melaleuca Quinquenervia Swamp Forest*
- PCT 4006 – *Northern Paperbark-Swamp Mahogany Saw-sedge Forest*.

PCTs are delineated into a total of ten vegetation zones (VZ) driven primarily by condition; be it from burn history, management of the land i.e. slashing, access roads or weed invasion. Complete VZ descriptions are included in **Section 4.4.**

2.2.3 Plot-based vegetation survey

Plot-based vegetation surveys were conducted within the Study Area during 28th and 29th of June 2023. During these surveys, 13 BAM plots were conducted and included the collection of the following:

- Identification of all flora species to genus or finer where identification attributes were present (in accordance with BAM Section 4.2.1);
- Composition, Structure attributes within 20x20 plot (in accordance with BAM Section 4.3.4); and
- Function attributes within the 20x50 m plot (in accordance with BAM Section 4.3.4)

Refer to **Figure 6** for BAM plot locations.

2.2.4 Vegetation integrity survey

To assess vegetation integrity (vegetation condition) for each of the delineated vegetation zones, the collected BAM plot data was input into the BAM-C to determine the current vegetation integrity scores. All plots were conformant dimensions. See **Section 4.5** for detailed results on the vegetation integrity of each vegetation zone found within the site.

2.3 Threatened flora survey methods

Targeted surveys for all flora candidate species recognised to have potential to occur within the Subject Land were carried out by ecologists from MJD Environmental (2023-2024) as part of the works informing this BDAR.

2.3.1 Review of existing information

Existing information sources used to assist identification of habitat constraints, presence of microhabitats and extant woody vegetation for this assessment include:

- NSW State Vegetation Type Map (DCCEEW 2022)
- NSW BioNet (VIS)
- NSW Landscape - Modified (DEM-S) Elevation layer

A review of threatened species information was undertaken to provide context and understanding of biodiversity and habitat values occurring within the Study Area. Information reviewed included:

- Species auto-populated by the BAM-C; and
- Online database searches involving a 10 x 10 km search around the Study Area to provide potentially occurring threatened flora and fauna and migratory species under both the BC Act and EPBC Act:
- NSW Bionet (accessed 12 April 2024 and continually during BDAR production)
- Commonwealth Protected Matters of National Significance search tool (accessed 22 January 2024).

Threatened flora surveys were undertaken in accordance with the NSW Survey guide for the Biodiversity Assessment Method; Surveying threatened plants and their habitats (DPIE, 2020), or as informed by the TBDC.

2.3.2 Habitat constraints assessment

Over the duration of the biodiversity impact assessment, habitat features which would exclude the presence of threatened flora species were assessed. Such features include:

- Cleared vegetation;
- Disturbed vegetation, including frequent management or high weed density; and
- Geographical limitations.

No habitat constraints were identified to exclude the presence of the listed flora candidate species. However geographic limitations were considered, as such the following species were identified to be excluded; *Angophora inopina* (Charmhaven apple), *Diuris arenaria* (Sand doubletail), *Diuris praecox* (Rough doubletail) and *Eucalyptus seeana*. Further justification of the exclusion of these species can be found within see **Section 5.1.2 Table 10**.

2.3.3 Field surveys

Threatened flora surveys were undertaken in accordance with the *NSW Survey guide for the Biodiversity Assessment Method; Surveying threatened plants and their habitats* (DPIE, 2020), or as informed by the TBDC. In accordance with Section 4.1 of the flora guidelines (DPIE, 2020), parallel field traverses are conducted to systematically cover all areas of suitable habitat on the Subject Land. This technique includes the following methodology:

- One ecologist walks along an array of parallel transects searching for the target flora species.
- The separation distance between the parallel transects is set at a distance between 5-40 m depending on the growth form of the species and the density of the vegetation at time of survey (per Table 1 of the guidelines).
- Transects conducted in suitable habitat for each of the targeted species; and
- Transects were recorded using a hand-held GPS unit.

Refer to **Figure 6** for all targeted flora surveys.

2.4 Threatened fauna survey methods

Threatened fauna surveys were carried for species that could not be conclusively ruled out from occurring within the Subject Land to suitable habitat, due to seasonality constraints. These surveys were carried out by ecologists from MJD Environmental (2023-2024) as part of the works informing this BDAR.

2.4.1 Review of existing information

Existing information sources used to assist identification of habitat constraints, presence of microhabitats and extant woody vegetation for this assessment include:

- NSW State Vegetation Type Map (DCCEEW 2022)
- NSW BioNet (VIS)
- NSW Landscape - Modified (DEM-S) Elevation layer

A desktop assessment of the potential use of the Study Area by threatened fauna species (as listed under the BC Act and EPBC Act) identified from the vicinity was undertaken prior to the commencement of field surveys (Refer to **Section 3.2**).

Threatened fauna surveys were undertaken in accordance with the requirements and guidelines listed in **Section 1.5**.

2.4.2 Habitat constraints assessment

Over the duration of the biodiversity impact assessment, habitat features within the Subject Land were identified in accordance with Section 6 of the BAM (2020) and detailed below. The results of the habitat assessments are detailed below.

Habitat Survey

An assessment of the relative habitat value present within the study area was undertaken. This assessment focused primarily on the identification of specific habitat types and resources in the Subject Land favoured by known threatened species from the locality. The assessment also considered the potential value of the Subject Land (and surrounds) for all major guilds of native flora and fauna. Habitat assessment included:

- presence, size and types of tree hollows within the Subject Land;
- survey for trees containing suitable hollows for Large Forest Owls;
- presence of Karst, caves, crevices, cliffs, rocks and other geological features of significance;
- vegetation complexity, structure and quality;
- human-made structures that can be utilised by microbats
- presence of freshwater or estuarine aquatic habitats, noting permanency;
- connectivity to adjacent areas of habitat;
- extent and types of disturbance;
- foraging opportunities, such as winter flowering gum utilised by *Lathamus discolor* (Swift Parrot), and mistletoe (*Amyema spp.*) utilised by *Anthochaera phrygia* (Regent Honeyeater);
- (flowering eucalypts, fruits, seeds or other nectar bearing native plants);
- presence and abundance of various potential prey species;
- fallen Timber and hollow logs utilised by ground nesting or foraging threatened fauna; and
- stick nests utilised by threatened raptors.

Habitat assessment was based on the specific habitat requirements of each threatened fauna species with regard to home range, feeding, roosting, breeding, movement patterns and corridor requirements. Consideration was given to contributing factors including topography, soil, light and hydrology for threatened flora and assemblages.

Hollow bearing tree survey

A hollow bearing tree survey was undertaken on the 13th June 2023 (**Figure 3**) across the Subject Land with the following information collected:

- Location (GPS);
- Tree species;
- Tree DBH;
- Presences of hollows (including potential hollows) and class;
- Habitat suitability for large Forest Owls; and
- Any observational information.

Secondary Indications and Incidental Observations

Opportunistic sightings of secondary indications (scratches, scats, diggings, tracks etc.) of resident fauna were noted. Such indicators included:

- Distinctive scats left by mammals;
- Scratch marks made by various types of arboreal animals;
- Nests made by various guilds of birds;

- Feeding scars on Eucalyptus trees made by Gliders;
- Whitewash, regurgitation pellets and prey remains from Owls;
- Aural recognition of bird and frog calls;
- Skeletal material of vertebrate fauna; and
- Searches for indirect evidence of fauna (such as scats, nests, burrows, hollows, tracks, and diggings).

2.4.3 Field surveys

Targeted surveys for fauna species recognised to have potential to occur within the Subject Land were carried out by MJD Environmental as part of the works informing this BDAR and are described below. All surveys were conducted in accordance with the relevant guidelines listed in Section 1.5, with modifications or adjustments made based on survey comments included in the TBDC.

Arboreal Mammals

Arboreal mammal surveys were undertaken using Scout Guard remote wildlife cameras deployed from 23/01/2024 – 20/02/2024. Cameras were mounted to trees via a bracket or strap and set to record images in bursts of three photos, with a three-minute delay before the next photo sequence would be triggered (Refer to **Figure 6**).

To attract fauna to the camera, a bait station was attached to a tree within 1- 1.5m of the camera. The bait station was filled with a bait containing a mixture of sardines, oats, honey, and peanut butter. The tree in which the bait station was attached also was sprayed with an attractant of honey / sugar water to increase the chance of arboreal fauna.

A total of 19 cameras accounting for 532 camera trap nights were undertaken to target arboreal mammals within the Study Area.

Arboreal mammal surveys targeting *Phascolarctos cinereus* (Koala) were undertaken in accordance with TBDC guidelines. Nocturnal spotlighting transects using headtorches and 6W LED reflector lens handheld searchlights (1 LUX @ 334 m) were conducted on the; 23/11/2023, 24/01/2024 and the 25/01/2024 (Refer to **Figure 6**). These surveys were then followed by five SAT surveys conducted on the 31/01/2024 (Refer to **Figure 6**).

Terrestrial Mammals

The presence of mammals was also assessed using opportunistic observations during other diurnal fieldwork and nocturnal surveys. The surveys undertaken are outlined in detail below.

Terrestrial mammal surveys were undertaken within the Study Area by deploying pitfall traps and drift fence arrays. Pitfall arrays were installed per the TBDC guidelines set for *Planigale maculata* (Common Planigale), using two 20 L buckets set 8 m apart with a 10 m drift fence standing 30 cm tall crossing both traps.

A total of 12 pitfall arrays were conducted (Refer to **Figure 6** for pitfall locations). During the survey, traps remained open four consecutive days and nights from a period of 22/01/2024 – 26/01/2024, the traps were reopened for an additional four consecutive days and nights from a period of 29/01/2024 – 02/02/2024, with checks occurring in both the morning and evening. were undertaken within the Study Area. To minimise the potential for accidental trap deaths, additional shelters made of PVC pipes cut in half were added to the traps to provide daytime refuge.

Terrestrial mammal surveys were undertaken using Scout Guard remote wildlife cameras deployed from 23/01/2024 – 20/02/2024. A total of 14 cameras accounting for 392 camera trap nights were undertaken to target terrestrial mammals within the Study Area.

Avifauna

The observation of avifauna within the Subject Land was undertaken via targeted diurnal census supplemented by opportunistic observations during other diurnal fieldwork (Refer to **Figure 6**). The diurnal census surveys were undertaken at dusk and dawn (early morning being a peak activity period for birds.

Nocturnal bird surveys were undertaken, and detail of methods employed is outlined in below under Spotlighting and call playback survey techniques.

Herpetofauna

Targeted habitat/ spotlight searches were undertaken over four separate nights, with a focus on suitable habitat areas (Refer to **Figure 6**). Known occurrences of threatened reptile species from the locality were taken into account during assessment of onsite habitat, to determine the potential for the Subject Land to support such species. Searches in likely habitat such as among thick leaf litter, hollow bearing trees, under rocks and fallen timber were undertaken. These searches were carried out during peak activity periods, after dusk.

Call playback and transect surveys have been conducted over four nights for threatened amphibian species through suitable potential habitat covering waterbodies and inundated areas. For potential breeding. (Refer to **Figure 6).**

Opportunistically observed herpetofauna within the pitfall/spotlighting effort have been listed in **Appendix C**.

Water samples to test PH levels were taken in accordance with 'NSW Survey Guide for Threatened Frogs' see **Figure 6** for water sample locations. Sample taken determined dam to be retained located within the eastern portion of the site had a suitable PH level of 4.9 for *Crinia tinnula* (Wallum Froglet) all other sample location did not contain a suitable PH (6.8-7) for the species as listed within 'NSW Survey Guide for Threatened Frogs'.

Microchiropteran Bats

Microbat surveys were undertaken by recording echolocation calls using two Titley Chorus Ultrasonic Detector units set to remotely record for 11 nights (civilian sunset to sunrise). These recordings and assessment of the Subject Land habitat and surrounds were undertaken in accordance with *Species Credit Threatened Bats and their habitats NSW Survey guide* for the Biodiversity Assessment Method (2018). A total of 22-night recording was made over the Subject Land. The chorus units were placed with an emphasis on those areas deemed likely to provide potential foraging and flyway sites for microbats.

Bat call analysis was undertaken by Amanda Lo Cascio who is experienced in the analysis of bat echolocation calls. Each call sequence ('pass') was assigned to one of five categories, according to the confidence with which an identification could be made, being:

- Definite - Pass identified to species level and could not be confused with another species.
- Probable - Pass identified to species level and there is a low chance of confusion with another species.
- Possible - Pass identified to species level but short duration or poor quality of the pass increases the chance of confusion with another species.
- Species group - Pass could not be identified to species level and could belong to one of two or more species. Occurs more frequently when passes are short or of poor quality.

Three Harp Traps were placed at likely flyways for nine nights each over two separate survey periods for a total of 27 trap nights to sample microbat species for identification in hand and assessment of reproductive status. Traps were checked prior to dawn each day and catch bags removed during daylight hours. With *Chalinolobus gouldii* being captured within survey effort.

The location of the Chorus Recorders and Harp Trap locations are shown in **Figure 6**.

Spotlighting

Spotlighting was undertaken with the use of a Lightforce Enforcer 140mm LED (1 LUX @ 334m) hand-held spotlight and head torch whilst traversing the Subject Land. Areas of mature remnant vegetation were targeted as well as on-site waterbodies, however, tracks around the site were also spotlighted whilst entering and exiting the vegetation.

A total of 30 person hours of spotlighting was conducted over five nights for mammals, herpetofauna and nocturnal birds.

2.5 Weather conditions

Field surveys were undertaken by MJD Environmental between the 31st of August 2022 and the 2nd September 2024. The prevailing weather conditions during the survey are presented in a **Table 1** below. Weather conditions have been taken from Taree Airport {station 060141}

Table 1. Environmental conditions during threatened species surveys

Survey undertaken (e.g. method / targeted species)	Date	Min Temp (℃)	Max Temp (℃)	Wind (light, mod…)	Rainfall (mm)	Other conditions relevant to the species
Flora Transect/ HBT Survey/ Large Forest Owls	31/08/2022	10.3	21.1		0	
Flora Transect/ *Corunastylis littoralis*	9/05/2023	16	18.4	17-26	0	
Veg delineation /BAM plots	28/06/2023	16	23.1	SSW-9 SE-24	1.6	
Veg delineation /BAM plots	29/06/2023	14.5	25.1	SW-15 SE-28	15	
Flora Transect	13/07/2023	8.8	20.7	6-15	0	
Flora Transect	14/07/2023	7.6	16.6	SW-9-11	0.2	
Flora Transect	22/11/2023	19	23.4	S-28 SSW-15	1	
Flora Transect	23/11/2023	19	23.4	S-28 SSW-15	1	
Koala/Curlew - Spotlight/ Frog Call Playback	23/11/2023	18.6	24.7	SE-26 WSW-9	0.2	
Pitfall trapping (installation) Harp Trapping (installation)	22/01/2024	23.3	27.4	SSW-48 SSE-28	0	
Chorous (installation) Arboreal/ Terrestrial Camera trapping (installation) Pitfall Trapping	22/01/2024	23.3	27.4	SSW-48 SSE-28	0	
Arboreal/ Terrestrial Camera trapping (installation)	23/01/2024	20.1	25.4	SSE-13 SE-15	0	
Pitfall trapping Harp trapping	23/01/2024	20.1	25.4	SSE-13 SE-15	0	

Survey undertaken (e.g. method / targeted species)	Date	Min Temp (℃)	Max Temp (℃)	Wind (light, mod…)	Rainfall (mm)	Other conditions relevant to the species
Pitfall trapping Harp trapping Spotlighting	24/01/2024	16.3	30.3	NE-19 E-28	0	
Pitfall trapping Harp trapping Spotlighting	25/01/2024	17.1	39.1	E-17	0	
Pitfall trapping Harp trapping	29/01/2024	22.3	28.1	NNW-6 NE-24	0	
Pitfall trapping Harp trapping	30/01/2024	23.8	30.4	NE-13 ENE-26	0	
Pitfall trapping Harp trapping Dragonfly survey	31/01/2024	19.9	29.5	ESE-20	0	
Pitfall trapping Harp trapping	1/02/2024	19.8	23.7	W-2-9	0	
Pitfall trapping Harp trapping	2/02/2024	19.4	31.7	WSW-7 SE-26	0	
Pitfall trapping (Decommission) Harp trapping (Decommission)	2/02/2024	19.4	31.7	WSW-7	0	
Camera Trapping (Decommission)	20/02/2024	18.5	26.4	W-9 ESE-22	21.8	
Spotlighting Call playback surveys	22/02/2024	19.8	30.4	W-9 ESE-17	0.4	
Flora Transect	26/02/2024	16.7	31.8	W-9 E-17	0.2	
Flora Transect	27/02/2024	20	27.9	W-9 E-17	0	
Flora Transect	9/04/2024	15.2	26.2	WSW-11 SSW-28	0.2	
Pre Frog CP	6/05/2024				1.2	
Pre Frog CP	7/05/2024				1.6	
Pre Frog CP	8/05/2024				3.2	
Meander, Call playback	9/05/2024	15.2	26.2	WSW-11	0	
Pre Frog CP	10/05/2024				0.2	
Pre Frog CP	11/05/2024				27.8	
Pre Frog CP	12/05/2024				12.6	
Meander, Call playback	13/05/2024	13.5	25.5	W-6 E-20	0.2	

Survey undertaken (e.g. method / targeted species)	Date	Min Temp (℃)	Max Temp (℃)	Wind (light, mod…)	Rainfall (mm)	Other conditions relevant to the species
Flora Transects	5/08/2024	7.7	20.9	NE-11	0	
Flora Transects	19/08/2024	11.2	20	W-9 ESE-13	0	
Flora Transects	2/09/2024	11.4	28.9	E-2 WNW-28	0	
Meander, Call playback	2/10/2024	10.9	20.7	W-9 SE-19	0.2	
Meander, Call playback	8/10/2024	15	22.8	WSW-11 SSE-28	0	
Flora Transects	13/11/2024	17.8	25.4	ENE-9 E-15	4.2	
Flora Transects	14/11/2024	15.5	26.7	W-13	1.8	

2.6 Limitations

Limitations associated with this assessment report are presented herewith. The limitations have been taken into account specifically in relation to threatened species assessments, results and conclusions.

In these instances, a precautionary approach has been adopted, whereby 'assumed presence' of known and expected threatened species, populations and ecological communities has been made where relevant and scientifically justified to ensure a holistic assessment.

Seasonality & Conditions

The flowering and fruiting plant species that attract some nomadic or migratory threatened species, often fruit or flower in cycles spanning a number of years. Furthermore, these resources might only be accessed in some areas during years when resources that are more accessible to threatened species fail. Consequently, threatened species may be absent from some areas where potential habitat exists for extended periods, and this might be the case for nomadic and opportunistic species.

Additionally, due to the increase in rainfall within the survey period for *Planigale maculata* (Common Planigale), only 12 of the proposed 13 pitfall arrays were able to be installed due to the wet weather and inundation of proposed locations, this was done as to avoid increasing the likely hood of death for trapped specimens.

Data Availability & Accuracy

The collated threatened flora and fauna species records provided by NSW BioNet are known to vary in accuracy and reliability. This is usually due to the reliability of information provided to the National Parks and Wildlife Service (NPWS) for collation and/or the need to protect specific threatened species locations. During the review of threatened species records sourced from BioNet Atlas of NSW, consideration has been given to the date and accuracy of each threatened species record in addition to an assessment of habitat suitability within the Subject Land.

Similarly, EPBC Protected Matters Searches provide a list of threatened species and communities that have been recorded within 10 km of the Subject Land, or which have suitable habitat within the wider area, and are subject to the same inherent inaccuracy issues as the State derived databases.

In order to address these limitations in respect to data accuracy, threatened species records have only been used to provide a guide to the types of species that occur within the locality of the Subject Land. Consequently, BAM assessment and the results of surveys conducted within the Subject Land and surrounds have been used to assess the likelihood of occurrence of threatened species, populations and ecological communities to occur therein.

3. Site context

3.1 Assessment area

The following section provides a description of the landscape features within the Subject Land and surrounding 1,500 m buffer as outlined in Section 3 of the BAM (2020). Refer to **Figure 2** for Location Map.

3.2 Landscape features

Landscape features identified within the Subject Land and assessment area are shown on **Figure 1 Site Map** and **Figure 2 2 Location Map**, respectively. A discussion of relevant landscape features is provided below.

3.2.1 IBRA bioregions and IBRA subregions

Bioregion

The Subject Land occurs wholly within the NSW North Coast region.

Subregion

The Subject Land occurs wholly within the Karuah Manning subregion.

3.2.2 Rivers, streams, estuaries and wetlands

The Subject Land is located within the Wallis Lake catchment in the New South Wales North Coast region, with Millers Mistake a 1st order watercourse and Wallamba river a 7th order watercourse occurring approximately 350m to the West of the site. These watercourses lead into Wallis Lake and eventually drain out into the South Pacific Ocean through Cape Hawke Harbour.

An MNES protected matters search identified no Wetlands of International Importance occur within a 10km buffer of the site.

3.2.3 Habitat connectivity

Habitat connectivity within the Subject Land is generally limited due to historic land use (agriculture) and proximity to residential developments which have been established around the Subject Land. Despite this, the south-western portion of the site zoned as C2 Environmental Conservation would facilitate the movement of mobile fauna throughout the broader area. The development layout will retain this area along with a portion of native tussock grasses along the Western boundary of the site to allow for continued facilitation by terrestrial fauna.

3.2.4 Karst, caves, crevices, cliffs, rocks or other geological features of significance

A desktop analysis was undertaken for areas within 1500m of the site using arial imagery from NSW Spatial Map Viewer. This imagery was utilised to show surrounding elevations through contour mapping of 2m. From this desktop-based search, it was determined there are no occurrences of karst, caves, crevices or cliffs within the Subject Land or within 1500m.

3.2.5 Areas of outstanding biodiversity value

There are no Areas of Outstanding Biodiversity Values within the 1,500 m buffer or in the general locality of the Subject Land.

3.2.6 NSW (Mitchell) landscape

The Subject Land occurs wholly within the Manning – Macleay Barriers and Beaches, NSW Mitchell Landscape.

3.2.7 Soil hazard features

A review of the Acid Sulphate Soils Risk mapping (Naylor et al 1998) records indicate the Subject Land has a high probability for Acid Sulphates <1m below ground surface.

3.3 Native vegetation cover

Native vegetation cover assessment was undertaken using arial imagery along with ground truthing of the site's vegetation see **Table 2** for values in relation to Native Vegetation Cover.

An area of 0.065 ha has been excluded from the Native vegetation cover assessment; this area was excluded because it consisted of a gravel substrate that does not containing woody/non-woody native vegetation.

Table 2 summarises the extent of native vegetation cover within the assessment area. **Figure 2** Location Map shows native vegetation cover within the assessment area.

Table 2. Native vegetation cover in the assessment area

Assessment area (ha)	949.3 ha
Total area of native vegetation cover (ha)	490.4 ha
Percentage of native vegetation cover (%)	52%
Class (0-10, >10-30, >30-70 or >70%)	>30-70%

4. Native Vegetation, Threatened Ecological Communities and Vegetation Integrity

4.1 Native vegetation extent

4.1.1 Changes to the mapped native vegetation extent

Native vegetation extent on the Subject Land was assessed by digital aerial photography (as described in **Section 2.1.2**) and confirmed by field surveys conducted across the entire extent of the Subject Land. No modifications from the mapped extent of vegetation indicated on the aerial imagery have been identified. Therefore, vegetation is mapped to the extent indicated on aerial imagery.

4.1.2 Areas that are not native vegetation

One area mapped within the site surrounding the shed located within the Northwestern corner of the site has been mapped as not containing native vegetation This is due to the shed and surrounding area containing a raised gravel bed. This gravelled area equates to 0.065 ha of non-native vegetation. As such this area has been excluded from assessment.

4.2 Plant community types

4.2.1 Overview

The Subject Land is 12.09. ha in size which was observed as native vegetation. The extent of native vegetation has been interpreted using API and ground truthing during field survey works. (Refer to **Figure 3**).

The vegetation within the Subject Land has been broadly cleared historically. The historic land use has resulted in a degraded landscape generally devoid of dense canopy cover, with multiple areas in a poor condition state. Areas that remain vegetated with native species include the South-east and South-west areas of the site. These areas are proposed to be retained within the site as to avoid impacting intact areas of native vegetation.

Vegetation within the Subject Land has been assessed as aligning with the BioNet Vegetation Classification PCTs identified within Table 3 and their extent is shown in **Figure 8** Plant community types.

- Identification of PCTs within the Subject Land were determined using:
- Occurrence within the Sydney IBRA bioregion & Hunter Sub-region;
- Vegetation formation and class;
- Landscape position; and
- Dominant species noted during field data collected from the full floristic plots/transects established in accordance.

Detailed descriptions of each PCT are provided in the following subsections.

Table 3. PCTs identified within the Subject Land

PCT ID	PCT name	Subject Land area (ha)
4006	Northern Paperbark-Swamp Mahogany Saw-Sedge Forest	9.26
3544	Coastal Sands Apple-Blackbutt Forest	2.80
	Total area	**12.06**

4.2.2 PCT 4006 Northern Paperbark Swamp Mahogany Saw Sedge Forest

4.2.2.1 PCT overview

Table 4. PCT 4006 Northern Paperbark Swamp Mahogany Saw Sedge Forest

PCT ID	4006
PCT name	Northern Paperbark-Swamp Mahogany Saw-sedge Forest
Vegetation formation	Forested Wetlands
Vegetation class	Coastal Swamp Forests
Per cent cleared value (%)	23%
Extent within Subject Land (ha)	9.26

A mid-high to very tall mixed eucalypt and Melaleuca open to closed forest with a sparse mid-stratum of mesophyll small trees and palms and a dense ground layer of sedges and ferns. This PCT occurs on low-lying coastal alluvial swamps and depressions and back barrier sand flats between Sydney and Yamba, Central Coast and north coast. The tree canopy very frequently includes both *Melaleuca quinquenervia* and *Eucalyptus robusta*, rarely with other eucalypts. The vine *Parsonsia straminea* is very frequently recorded in the canopy or mid-stratum.

The mid-stratum is otherwise sparse, however often layered with small trees that very frequently includes *Glochidion ferdinandi*, occasionally *Livistona australis* and *Casuarina glauca*, and rarely *Melaleuca linariifolia*. A patchy cover of smaller sclerophyll shrubs occasionally includes *Acacia longifolia* and *Breynia oblongifolia*. The ground layer is very often dense and almost always includes a high cover of the tall sedge *Gahnia clarkei* together with the ferns *Telmatoblechnum indicum*, *Pteridium esculentum*, *Hypolepis muelleri* and *Calochlaena dubia*. Other species include grasses such as *Entolasia marginata*, which is common and occasionally sedges *Machaerina rubiginosa*, *Machaerina articulata* or *Carex appressa*.

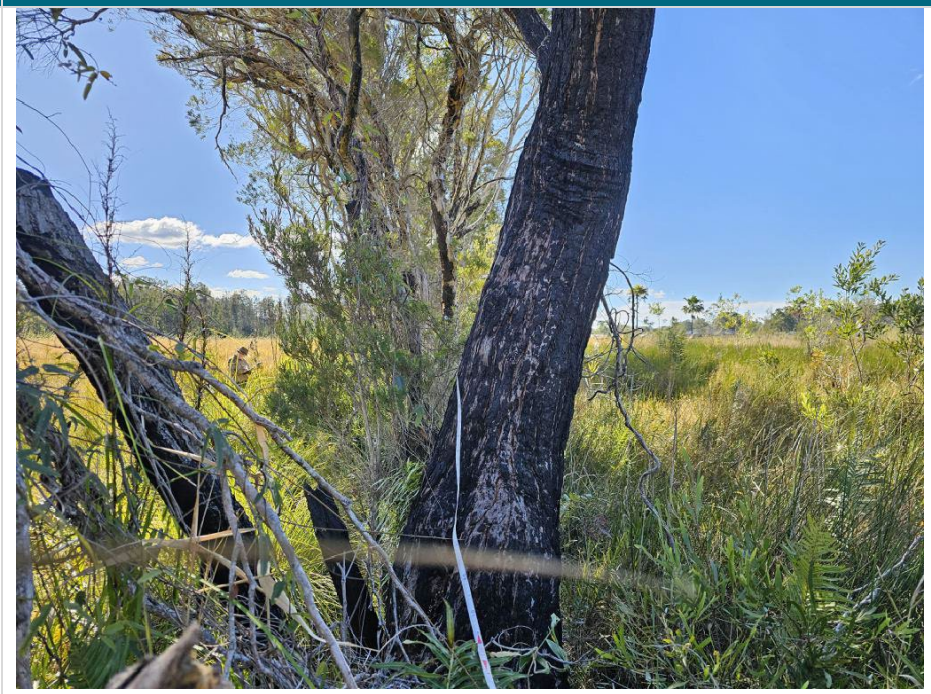
This PCT occurs on very low-lying alluvium, estuarine deposits, back barrier flats, back swamps and rarely sand swales, at elevations almost always below 20 metres asl. It is mainly constrained to within a few kilometres of the coastline, although spatial outliers occur on coastal floodplains that extend some way inland. This community partially overlaps with a range of coastal swamp forests of the central and north coasts, each varying in the frequency and duration of inundation, and substrate characteristics bearing trees occur in this PCT.

This PCT dominates the subject site as a result of the large swathe of waterlogged soil that is prone to inundation owing to the low elevation the site (< 20 m asl). This PCT consists of a dense canopy, however, due to the land use history and ongoing management practices across the site, This PCT is present in varying degrees of regeneration and/or alteration. The water table is highest in the South and Southwest of the site and gradually recedes to the north and east of the site.

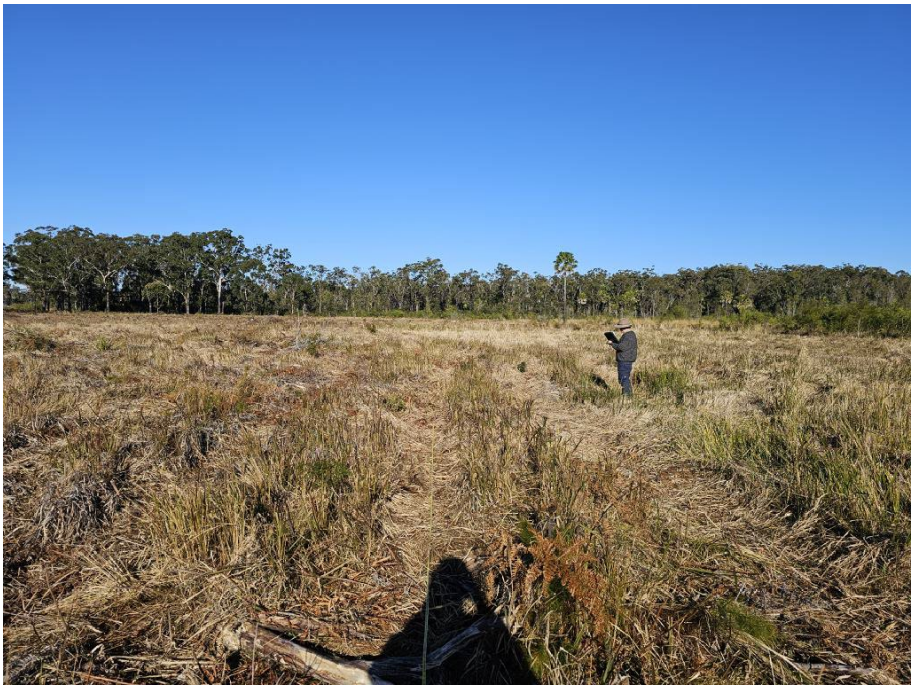
4.2.2.2 Condition states

PCT 4006 _ Northern Paperbark Wamp Mahogany Saw Sedge Forest	
Vegetation Zones	**Vegetation Condition Description**
VZ1: 4006 - Good	This vegetation zone (VZ1) is present in the South of the Subject Land and is connected to a larger region of vegetated land. As such, it is relatively undisturbed though is edge effected where it abuts cleared land in the North and Northeast. All stratum layers are present and intact, with no impacts from vehicle tracks and/or erosion. The upper and ground stratum are dense whereas the mid stratum is sparse. This coastal swamp forest contains an upper stratum dominated by amphiphytic species such as *Melaleuca quinquenervia* (Broad Leaved Paperbark), *Eucalyptus robusta* (Swamp Mahogany) and *Livistona australis* (Cabbage Palm). The highest concentrations of *Eucalyptus robusta occurs* in the Northeast of the vegetation zone. *Casuarina glauca*, *Callistemon saligna* are present consistently throughout though in lower frequencies.

PCT 4006 _ Northern Paperbark Wamp Mahogany Saw Sedge Forest	
Vegetation Zones	**Vegetation Condition Description**
	The midstratum is sparse and consists of *Glochidion ferdinandi* (Cheese Tree), *Acacia longifolia* (Golden Wattle) and *Melaleuca linearis* (Narrow-Leaved Bottlebrush) in low frequencies. The groundcover is a diverse bouquet of sedges, grasses, graminoids and forbs. This stratum is dominated by *Gahnia clarkei* (Tall Sawsedge), *Gahnia sieberiana* (Red-Fruit Sawsedge), *Carex appressa* (Tall Sedge) and *Cyclosorus interruptus* (Hottentot fern). *Pteridium esculentum* (Bracken Fern), *Phragmites australis* (Common Reed) and *Telmatoblechnum indicum* (Swamp Water Fern) are also consistent throughout in lower abundances. Forb and climber species commonly include but are not limited to *Parsonsia straminea* (Monkey Vine), *Viola hederacea* (Native Violet), *Gonocarpus chinensis subsp. Verrucosus* (raspwort) and *Oplismenus aemulus* (Basket Grass). Of note is the higher density of *Isachne globosa* (Swamp Millet) present along the Southern edge of the vegetation zone where the canopy is sparser. Weed invasion is low in this area however, the High Threat Exotic grass, *Cortaderia selloana* (Pampas Grass), was recorded in low numbers in this vegetation zone. The Northern section of this Vegetation Zone abuts a cleared paddock and is somewhat edge effected. Species associated with this PCT such as *Isachne globosa* (Swamp Millet) and *Pteridium esculentum* (Bracken Fern) were present in higher densities here than in the south of the Vegetation Zone. 
VZ2: 4006 - Intact	Within this vegetation zone all structural layers are present; however, it is edge effected due to the small size of these remnant stands. The ground layer is dense due to the increase of invasive species from the surrounding paddocks that are more sun-tolerant. Vegetation Zone 2 exists as remnant stands of vegetation within a mosaic of clearing. This has and subsequently influenced all strata of this area. The upper stratum is dominated by *Melaleuca quinquenervia* (Broad Leaved Paperbark), *Melaleuca stypheloides* (Prickly-Leaved Paperbark), *Casuarina glauca* (Swamp She-Oak) and *Eucalyptus robusta* (Swamp Mahogany). The shrub layer is relatively dense and consists of *Acacia longifolia* (Golden Wattle), *Pultenaea blakelyi* (Blakelyi's Bush Pea) and *Melaleuca linariifolia* (Narrow-Leaved Paperbark). The groundcover is a dense layer consisting of *Gahnia sieberiana* (Red-Fruit Sawsedge), *Baumea rubiginosa* (Soft Twig-Rush), *Telmatoblechnum indicum* (Swamp Water Fern) and *Pteridium esculentum* (Backen Fern). Nestled amongst the dense ground layer are forbs including *Centella asiatica* (Indian Pennywort), *Ranunculus inundates* (River Buttercup) and *Persicaria decipiens* (Slender Knotweed). Furthermore, this vegetation zone has been invaded by High Threat Exotic grasses *Setaria sphacelata* (Tall African Grass) and *Paspalum urvillei* (Vasey Grass).

PCT 4006 _ Northern Paperbark Wamp Mahogany Saw Sedge Forest	
Vegetation Zones	**Vegetation Condition Description**
	
VZ3: 4006 - Moderate	This remnant VZ occurs in a floristically altered state following disturbance in the due to historical clearing. However, regeneration of canopy species is present, and includes key canopy species such as *Eucalyptus robusta* (Swamp Mahogany), *Melaleuca quinquenervia* (Broad-leaved Paperbark) and *Casuarina glauca* (Swamp She-oak). It is evident that This area has been historically cleared and as such no upper stratum is present. However, there is a cohort of regenerating *Eucalyptus robusta* (Swamp Mahogany) and *Melaleuca quinquenervia* (Broad Leaved Paperbark). The midstrata consists of species such as *Pultenaea blakelyi* (Blakelyi's Bush Pea) and *Acacia longifolia* (Golden Wattle). The dense ground strata is dominated by *Pteridium esculentum* (Bracken Fern), *Baumea rubiginosa* (Soft Twig-rush), *Ischaemum australe* (Large Bluegrass) and *Baloskion tetraphyllum*.
VZ4: 4006 - Poor	The upper and mid strata have been historically cleared, as such the groundcover is more dense and less diverse than expected for PCT 4006. Furthermore, several High Threat Exotics including *Senecio madagascariensis* (Fireweed), *Paspalum urvillei* (Vasey Grass) and *Juncus articulatus* (Jointed Rush) are present throughout. 

PCT 4006 _ Northern Paperbark Wamp Mahogany Saw Sedge Forest	
Vegetation Zones	**Vegetation Condition Description**
VZ5: 4006 – Poor-Grassland	The upper and mid strata have been historically cleared, as such the groundcover is more dense and less diverse than expected for PCT 4006. This remnant VZ occurs in a floristically altered state resulting from historical clearing. However, it was determined to be PCT 4006 due to ground cover species commensurate with the PCT description, including *Isachne globose* (Swamp Millet), *Baumea juncea* (Bare Twig-rush) and *Phragmites australis* (Common Reed). 
VZ6: 4006 – Moderate-Grassland	This remnant VZ occurs in a floristically altered state resulting from historical clearing. As such, no upper or mid strata species are present. It is considered to be PCT 4006 due to the remnant ground cover species associated with that plant community. 

PCT 4006 _ Northern Paperbark Wamp Mahogany Saw Sedge Forest	
Vegetation Zones	**Vegetation Condition Description**
VZ7: 4006 – Managed-Grassland	This remnant VZ occurs in a floristically altered state resulting from historical clearing. As such, no upper or mid strata species are present. This vegetation zone exists in a transition zone between 4006 and 3544. Due to diagnostic species, *Ischaemum australe* (Large Bluegrass) and *Baloskion tetraphyllum*. 

4.2.2.3 Justification of PCT selection

This PCT presents as a Forested Wetlands formation and Coastal Swamp Forests Class. All PCTs within the NSW Mid-Coast and Sydney Basin IBRA bioregions were assessed, with consideration for Forested Wetlands that occur in low-lying coastal alluvial plains and depressions. PCTs considered were PCT 4004 and 4028 in addition to PCT 4006.

Further assessment of PCTs within the IBRA subregion was based on landform, geology and lastly floristics. PCT 4028 was not considered due to hydrological inconsistencies in that this plant community occurs on the edges of tidal estuarine flats. Furthermore, there were incongruencies between the floristic composition in all strata. The description for PCT 4004, was incongruent with the vegetation zone due to the higher frequency of *Eucalyptus robusta* (Swamp Mahogany) and the lower frequency of *Casuarina glauca* (Swamp Sheoak), both being diagnostic canopy species for PCT 4006 and PCT 4004 respectively. Furthermore, groundcover species indicative of PCT 4004, *Baumea articulata* (Jointed Twig Rush) and *Baumea rubiginosa* (Soft Twig-sedge), were infrequent throughout. Determination beyond this was aided by the floristic composition of each stratum commensurate with that of PCT 4006. This included the key diagnostic canopy species *Melaleuca quinquenervia* (Broad-leaved Paperbark), *Livistona australis* (Cabbage Palm) and *Eucalyptus Robusta* (Swamp Mahogany). The sparse midstory, and the infrequent inclusion of diagnostic species such as *Glochidion ferdinandi* (Cheese Tree) and *Melaleuca linariifolia* was also consistent with PCT 4006.

4.2.2.4 Alignment with TECs

The on-site PCT 4006 that encompasses VZ1, VZ2 and VZ3 were determined to be commensurate with the TEC - *Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and Southeast Corner Bioregions*. This was determined through ground truthing on-site PCT/ Vegetation zones. The TEC has been delineated as the sites soil composition is made up loamy sands found within an elevation range of 0-20m. the on-site PCT 4006- Northern Paperbark-Swamp Mahogany Saw-sedge Forest overlaps species that are commensurate with the TEC -

Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions these species include; *Acacia longifolia*, *Blechnum indicum*, *Callistemon salignus*, *Carex appressa*, *Casuarina glauca*, *Eucalyptus robusta*, *Gahnia clarkei*, *Gahnia sieberiana*, *Glochidion ferdinandi*, *Melaleuca linariifolia*, *Melaleuca quinquenervia*, *Melaleuca stypheloides*, *Oplismenus aemulus*, *Phragmites australis*, *Pteridium esculentum*, *Stephania japonica*, *Viola hederacea*.

It was determined that vegetation zones VZ4, VS5, VZ6 and VZ7 where not commensurate with TEC - *Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and Southeast Corner Bioregions*. This is due to the highly altered nature of these vegetation zones, consisting of mostly derived native grasslands.

4.2.2.5 Alignment with EPBC Act listed ECs

A review of BioNet Vegetation Classification has shown that PCT – *4006 Northern Paperbark-Swamp Mahogany Saw-sedge Forest is aligned to Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland*.

4.2.3 PCT 3544 Coastal Sands Apple Blackbutt Forest

4.2.3.1 PCT overview

Table 5. PCT 3544 – Coastal Sands Apple Blackbutt Forest

PCT ID	3544
PCT name	Coastal Sands Apple Blackbutt Forest
Vegetation formation	Dry Sclerophyll Forests (Shrubby sub-formation)
Vegetation class	Coastal Swamp Forests
Per cent cleared value (%)	22%
Extent within Subject Land (ha)	2.80

A tall to very tall sclerophyll open forest with a dry shrubby understorey and ferny ground cover found on coastal sand plains from Jervis Bay to Port Macquarie. The tree canopy very frequently includes a high cover of *Eucalyptus pilularis* and *Angophora costata*, occasionally with *Corymbia gummifera*. The mid-stratum is characterised by a sparse to mid-dense shrub and small tree cover with *Banksia serrata* very frequently forming a sparse cover beneath the eucalypts. The lower shrub layer very frequently includes a sparse cover of *Monotoca elliptica*, *Acacia ulicifolia*, *Acacia suaveolens*, *Leucopogon lanceolatus* and *Persoonia levis*, with *Acacia longifolia* and *Ricinocarpos pinifolius* also common. The ground layer almost always includes a sparse to mid-dense cover of *Pteridium esculentum* and very frequently *Lomandra longifolia* and *Imperata cylindrica*. This PCT occurs mainly on low elevation coastal dune systems, which are commonly below 40 metres asl but in some cases up to 150 metres asl. The highest densities of plots are on the sand plains of the Tomago peninsula near Port Stephens and in Myall Lakes National Park. This community grades into northern sand plain forest PCT 3552 around Port Macquarie and into PCT 3545 or PCT 3549 on older podsolised dunes. It is patchy and restricted to larger coastal dune systems on the south coast where it intergrades with PCT 3638 near Jervis Bay.

4.2.3.2 Condition states

PCT 3544 _ Coastal Sands Apple Blackbutt Forest	
Vegetation Zones	**Vegetation Condition Description**
VZ9: 3544 - Poor	The upper strata is intact in the form of remnant paddock trees. They are exposed due to the limited patch size and would be impact by the management of the surrounding area. The midstratum and ground stratum are heavily managed and no mature individuals in the mid strata are present.

PCT 3544 _ Coastal Sands Apple Blackbutt Forest	
Vegetation Zones	**Vegetation Condition Description**
	The eastern region of the site is situated on sandy soils. There are remnant *Eucalyptus pilularis* however, this region has been historically clear and much of the tall open forest with a dry shrubby understorey congruent with PCT 3544 has been historically cleared. This area still has remnant canopy in the form of *Eucalyptus pilularis* individuals. Despite the midstratum being largely cleared, it contains a diverse cohort of juvenile native shrubs such as *Acacia longifolia*, *Pultenaea blackelyi*, *Hibbertia linearis*, *Persoonia linearis* and *Monotoca elliptica*. The ground stratum is relatively sparse in terms of cover, though had many native species. *Pteridium esculentum, Lomandra longifolia, Carex appressa, Dianella revoluta* and *Gahnia sieberiana*. 
VZ10: 3544 - Managed	The upper and mid strata have been historically cleared, however, the ground strata is still intact. There are many regenerating shrubby species within the ground strata. This vegetation zone is currently managed, and the canopy and midstory have been slashed. There is a diverse regenerating midstratum including the species *Acacia longifolia*, *Leptospermum trinervium*, *Leucopogon leptospermoides* and *Monotoca elliptica*. The ground stratum is dominated by *Imperata cylindrica*, *Pteridium esculentum* and the High Threat Exotic *Andropogon virginicus*. The groundcover also consists other forbs and graminoids such as *Pomax umbellate*, *Eragrostis brownii* and *Lomandra longifolia*. 

4.2.3.3 Justification of PCT selection

PCTs within the IBRA subregion remaining for consideration based on landform, geology and lastly floristics. PCTs considered were PCT 3549, PCT 3546 in addition to PCT 3544. Determination beyond this was based on floristics. PCT 3546 was discounted as diagnostic species in the upper strata *Banksia integrifolia*, *Leptospermum laevigatum* and *Cupaniopsis anacardioides* were not detected. PCT 3549 was discounted as key diagnostic species in the upper strata include *Corymbia gummifera* and *Eucalyptus signata* were not detected. The presence of *Eucalyptus pilularis* as well as similar assemblages of both the mid and ground strata was used as the final determinant.

4.2.3.4 Alignment with TECs

No associated TEC's in NSW. The condition of the single vegetation zone associated with the PCT on site, representing extant woody native vegetation, is too fragmented and disturbed to effectively assess the species assemblage with reference to characteristic species listed in the Threatened Species Scientific Committee final determination for *Lower Hunter Spotted Gum Ironbark Forest* etc. A single characteristic species (*Corymbia maculata*) occurs; however this is a widespread species, characteristic of 59 East Coast PCTs and four (4) TECs in the Hunter. While the landscape position and geology is within the bounds described in the final determination, the VZ has been assessed as not representative of the TEC.

4.2.3.5 Alignment with EPBC Act listed ECs

No associated EPBC Act listed Ecological Communities (NSW BioNet Vegetation Classification, on 15 January 2024).

4.3 Threatened ecological communities

A review of BioNet Vegetation Classification has shown that PCT – 4006 Northern Paperbark-Swamp Mahogany Saw-sedge Forest is aligned to the BC listed TEC Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions.

Table 6. TECs within the Subject Land

TEC name	Profile ID (from TBDC)	BC Act status	EPBC Act status	Associated vegetation zones within the Subject Land	Area within Subject Land (ha)
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	10786	Endangered Ecological Community	Not Listed	VZ1: 4006 - Good VZ2: 4006 - Intact VZ3: 4006 - Moderate	0.05 0.4 0.17

4.4 Vegetation zones

The Subject Land was investigated for further assessment as described in **Section 2.2** and further in **Section 4.5**. Vegetation zones were initially identified through desktop survey with the use of available resources:

- NSW State Vegetation Type Map (DCCEEW 2022)
- NSW BioNet (VIS)
- NSW Landscape - Modified (DEM-S) Elevation layer

The site was then surveyed to determine vegetation zone definitions these delineations occurred in area of each PCT where different broad condition states occurred.

Table 7. Vegetation zones and patch sizes

Vegetation zone ID	Condition / other defining feature	Area (ha)	Patch size class (select multiple if areas of native vegetation are discontinuous)	No. vegetation integrity plots completed	No. & Plot IDs of vegetation integrity plots used in assessment
VZ1: 4006 – Good	Good	0.05	>100 ha	1	B01
VZ2: 4006 – Intact	Intact	0.4	>100 ha	1	B09
VZ3: 4006 - Moderate	Moderate	0.17	>100 ha	1	B02
VZ4: 4006 – Poor	Poor	3.51	>100 ha	2	B07 B08
VZ5: 4006 – Poor-Grassland	Poor-Grassland	1.52	>100 ha	2	B04 B12
VZ6: 4006 – Moderate-Grassland	Moderate-Grassland	1.93	>100 ha	2	B10 B13
VZ7: 4006 – Managed-Grassland	Managed-Grassland	1.69	>100 ha	1	B06
VZ9: 3544 – Poor	Poor	0.83	>100 ha	1	B03
VZ10: 3544 - Managed	Managed	1.97	>100 ha	1	B05

4.5 Vegetation integrity (vegetation condition)

4.5.1 Vegetation integrity survey plots

Required minimum vegetation integrity survey plots have been sampled in accordance with BAM section 4.3.4 (Table 3 – extracted below BAM 2020) for each assessable Vegetation Zone. The minimum number of plots has been assigned to each Vegetation Zone based upon these guidelines. See **Table 8** below.

Table 3 Minimum number of plots required per zone area

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

Plate 1 'Table 3 Minimum Number of plots required per zone area' Biodiversity Assessment Method 2020 DPIE.

Table 8. Number of Vegetation Integrity Survey Plots

Vegetation Zone ID:	No. vegetation integrity plots required	No. vegetation integrity plots completed	No. vegetation integrity plots used in assessment
VZ1: 4006 - Good	1	1	1
VZ2: 4006 – Intact	1	1	1
VZ3: 4006 - Moderate	1	1	1
VZ4: 4006 – Poor	2	2	2
VZ5: 4006 – Poor-Grassland	2	2	2
VZ6: 4006 – Moderate-Grassland	2	2	2
VZ7: 4006 – Managed-Grassland	1	1	1
VZ9: 3544 – Poor	1	1	1
VZ10: 3544 - Managed	1	1	1

Biodiversity Assessment Method section 4.3.4 was utilised in determining the minimum number of plots required in accordance with BAM (2020) Table 3, as such the above table reflects these guidelines as all vegetation zones within the site have been assessed in accordance.

4.5.2 Scores

Table 9. Vegetation integrity scores

Vegetation zone ID	Composition condition score	Structure condition score	Function condition score (where relevant)	Vegetation integrity score	Hollow bearing trees present?
VZ1: 4006 - Good	85	91.4	100	91.9	Yes
VZ2: 4006 – Intact	75.7	82	51.1	68.2	No
VZ3: 4006 - Moderate	45.2	32.6	43.9	40.1	No
VZ4: 4006 – Poor	40	65.2	15.1	34.1	No
VZ5: 4006 – Poor-Grassland	36.6	56.8	22.9	36.2	No
VZ6: 4006 – Moderate-Grassland	35.3	50.1	30.4	37.7	No
VZ7: 4006 – Managed-Grassland	35.1	57.3	15.5	31.4	No
VZ9: 3544 – Poor	59.4	5.8	63.9	28.1	No
VZ10: 3544 - Managed	45.8	24	6.1	18.8	No

Italic VI scores indicate assessment thresholds not met.

4.5.3 Use of benchmark data

Reference data used for the BAM-Calculator was the Current Classification (Live – Default). No modifications were made to benchmarks and legacy benchmarks were not used to assess vegetation integrity.

5. Habitat suitability for threatened species

5.1 Identification of threatened species for assessment

A review of threatened species information was undertaken to provide context and understanding of biodiversity values occurring within the Subject Land. Information reviewed included:

- Species auto-populated by the BAM-C;
- Online database searches involving a 10 x 10 km search around the Subject Land to provide potentially occurring threatened flora and fauna and migratory species under both the BC Act and EPBC Act:
    - NSW Bionet (accessed 22 January 2024 and continually during BDAR production)
    - Commonwealth Protected Matters of National Significance search tool (accessed 22 January 2024); and
- BioNet Vegetation Classification – Threatened species associated with known PCTs to occur within the Subject Land.

5.1.1 Ecosystem credit species

Ecosystem Credit Species (in accordance with the BAM) are reliably predicted to occur by vegetation surrogates and landscape features. An assessment of the habitat suitability for each predicted species was undertaken to determine the presences or potential utilisation of the Subject Land as part of their home range. These species are presented in **Table 10**.

Table 10. Predicted ecosystem credit species

Common name	Scientific name	Listing status		Dual credit species	Sources	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						
Regent Honeyeater (Foraging)	*Anthochaera phrygia*	CE	CE	Yes	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	High
Dusky Wood swallow	*Artamus cyanopterus cyanopterus*	V	-	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	Moderate
Australasian Bittern	*Botaurus poiciloptilus*	E	E	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7	Moderate
Sanderling (Foraging)	*Calidris alba*	V	-	Yes	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7	High

Common name	Scientific name	Listing status		Dual credit species	Sources	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						
Red Knot (Foraging)	*Calidris canutus*	-	E	Yes	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7	High
Curlew Sandpiper (Foraging)	*Calidris ferruginea*	E	CE	Yes	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7	High
Great Knot (Foraging)	*Calidris tenuirostris*	V	V	Yes	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7	High
Gang-gang Cockatoo (Foraging)	*Callocephalon fimbriatum*	V	E	Yes	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	Moderate
South-eastern Glossy Black-Cockatoo (Foraging)	*Calyptorhynchus lathami lathami*	V	V	Yes	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	High
Greater Sand-plover (Foraging)	*Charadrius leschenaultii*	V	V	Yes	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7	High
Lesser Sand-plover (Foraging)	*Charadrius mongolus*	V	E	Yes	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7	High
Speckled Warbler	*Chthonicola sagittata*	V	-	No	BAM-C	Yes	N/A	VZ9, VZ10	High
Spotted Harrier	*Circus assimilis*	V	-	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	Moderate
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	V	V	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	High
Barred Cuckoo-shrike	*Coracina lineata*	V	-	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7	Moderate
Varied Sittella	*Daphoenositta chrysoptera*	V	-	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7	Moderate
Spotted-tailed Quoll	*Dasyurus maculatus*	V	E	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	High

Common name	Scientific name	Listing status		Dual credit species	Sources	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						
Black-necked Stork	*Ephippiorhynchus asiaticus*	E	-	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	Moderate
Beach Stone-curlew (Foraging)	*Esacus magnirostris*	CE	-	Yes	BAM-C	Yes	N/A	VZ9, VZ10	High
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*	V	-	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	High
Little Lorikeet	*Glossopsitta pusilla*	V	-	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	High
White-bellied Sea-Eagle (Foraging)	*Haliaeetus leucogaster*	V	-	Yes	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	High
Little Eagle (Foraging)	*Hieraaetus morphnoides*	V	-	Yes	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	Moderate
White-throated Needletail	*Hirundapus caudacutus*	-	V	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	High
Black Bittern	*Ixobrychus flavicollis*	V	-	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7	Moderate
Swift Parrot (Foraging)	*Lathamus discolor*	E	CE	Yes	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	Moderate
Bar-tailed Godwit (baueri) (Foraging)	*Limosa lapponica baueri*	-	V	Yes	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7	High
Square-tailed Kite (Foraging)	*Lophoictinia isura*	V	-	Yes	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	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						
South-eastern Hooded Robin	*Melanodryas cucullata cucullata*	E	E	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7	Moderate
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	V	-	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7	Moderate
Eastern Coastal Free-tailed Bat	*Micronomus norfolkensis*	V	-	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	High
Little Bent-winged Bat (Foraging)	*Miniopterus australis*	V	-	Yes	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	High
Large Bent-winged Bat (Foraging)	*Miniopterus orianae oceanensis*	V	-	Yes	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	High
Turquoise Parrot	*Neophema pulchella*	V	-	No	BAM-C	Yes	N/A	VZ9, VZ10	High
Eastern Curlew (Foraging)	*Numenius madagascariensis*	-	CE	Yes	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7	High
Eastern Osprey (Foraging)	*Pandion cristatus*	V	-	Yes	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	Moderate
Yellow-bellied Glider	*Petaurus australis*	V	-	No	BAM-C	Yes	N/A	VZ9, VZ10	High
Scarlet Robin	*Petroica boodang*	V	-	No	BAM-C	Yes	N/A	VZ9, VZ10	Moderate
Golden-tipped Bat	*Phoniscus papuensis*	V	-	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	High
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	V	-	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	Moderate
Eastern Chestnut Mouse	*Pseudomys gracilicaudatus*	V	-	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7	High

Common name	Scientific name	Listing status		Dual credit species	Sources	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						
New Holland Mouse	*Pseudomys novaehollandiae*	-	V	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	High
Grey-headed Flying-fox (Foraging)	*Pteropus poliocephalus*	V	V	Yes	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	High
Wompoo Fruit-Dove	*Ptilinopus magnificus*	V	-	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7,	Moderate
Rose-crowned Fruit-Dove	*Ptilinopus regina*	V	-	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7	Moderate
Superb Fruit-Dove	*Ptilinopus superbus*	V	-	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7	Moderate
Australian Painted Snipe	*Rostratula australis*	E	E	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7	Moderate
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V	-	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	High
Greater Broad-nosed Bat	*Scoteanax rueppellii*	V	-	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	High
Diamond Firetail	*Stagonopleura guttata*	V	V	No	BAM-C	Yes	N/A	VZ9, VZ10	Moderate
Common Blossom-bat	*Syconycteris australis*	V	-	No	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7, VZ9, VZ10	High
Terek Sandpiper (Foraging)	*Xenus cinereus*	V	-	Yes	BAM-C	Yes	N/A	VZ1, VZ2, VZ3, VZ4, VZ5, VZ6, VZ7	High

5.1.2 Species credit species

Species Credit Species (in accordance with **BAM Section 5**) are threatened species for which vegetation surrogates and/or landscape features cannot reliably predict the likelihood of their occurrence or components of their habitats. Based on this information **Table 11** and **Table 12** identify threatened species that have been automatically populated within the BAM-C. Along with if the species is to be further assessed or excluded from assessment and their associated vegetation zones.

Table 11. Predicted flora species credit species

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act				
Nabiac Casuarina	*Allocasuarina simulans*	V	V	BAM-C	Yes	N/A	3544_All VZ
Charmhaven Apple	*Angophora inopina*	V	V	BAM-C	No	**Geographic Limitation:** The site is not located South of Wootton	N/A
Netted Bottle Brush	*Callistemon linearifolius*	V	-	BAM-C	Yes	N/A	3544_All VZ
Dwarf Kerrawang	*Commersonia prostrata*	E	E	BAM-C	Yes	N/A	3544_All VZ
Red Helmet Orchid	*Corybas dowlingii*	E	-	BAM-C	Yes	N/A	3544_All VZ
Leafless Tongue Orchid	*Cryptostylis hunteriana*	V	V	BAM-C	Yes	N/A	3544_All VZ
White-flowered Wax Plant	*Cynanchum elegans*	E	E	BAM-C	Yes	N/A	3544_All VZ
Spider orchid	*Dendrobium melaleucaphilum*	E	-	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act				
Sand Doubletail	*Diuris arenaria*	E	-	BAM-C	No	**Geographic Limitations:** The site is not located within the Port Stephens LGA	N/A
Rough Doubletail	*Diuris praecox*	V	V	BAM-C	No	**Geographic Limitations:** The site is not located within the Parish boundaries of Forster, Eurunderee, Fens, Tomaree, Stowell and Stockton	N/A
Eucalyptus parramattensis subsp. *decadens*	*Eucalyptus parramattensis subsp. decadens*	V	V	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Eucalyptus seeana population in the Greater Taree LGA	*Eucalyptus seeana - endangered population*	EP	-	BAM-C	No	**Geographic Limitations:** Site is not located within the Greater Taree LGA	N/A
Tuncurry Midge Orchid	*Genoplesium littorale*	CE	CE	BAM-C	Yes	N/A	4006_All VZ
Small-flower Grevillea	*Grevillea parviflora subsp. parviflora*	V	V	BAM-C	Yes	N/A	3544_All VZ
Noah's False Chickweed	*Lindernia alsinoides*	E	-	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Tall Knotweed	*Persicaria elatior*	V	V	BAM-C	Yes	N/A	4006_All VZ

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act				
Villous Mint-bush	*Prostanthera densa*	V	V	BAM-C	Yes	N/A	3544_All VZ
Eastern Australian Underground Orchid	*Rhizanthella slateri*	V	E	BAM-C	Yes	N/A	3544_All VZ
Scrub Turpentine	*Rhodamnia rubescens*	CE	CE	BAM-C	Yes	N/A	4006_All VZ
Native Guava	*Rhodomyrtus psidioides*	CE	CE	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Coast Groundsel	*Senecio spathulatus*	E	-	BAM-C	No	**Habitat Constraint:** The site is not located within 500m of the Coast.	N/A
Magenta Lilly Pilly	*Syzygium paniculatum*	E	V	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Black-eyed Susan	*Tetratheca juncea*	V	V	BAM-C	No	**Microhabitat:** *Tetratheca juncea* has been excluded from further assessment due micro habitat constraints, the Subject Land does not provide suitable habitat for the species as the species prefers low nutrient well-draining soils on hills, ridges, and creeks. Due to the topographical/geophysical nature of the site, the Subject Land is prone to flooding/inundation for extended periods due to poor draining soils. The site is also frequently slashed and managed which would further decrease the likelihood that this species would be found within this habitat. Furthermore, a 10km Bionet atlas search was conducted around the site and no known records of this species occurs within said 10km buffer of the Subject Land	N/A

Table 12. Predicted fauna species credit species

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Rufous Bettong	*Aepyprymnus rufescens*	V	-	No	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Regent Honeyeater	*Anthochaera phrygia*	CE	CE	Yes	BAM-C	No	**Habitat Constraints:** Site is not mapped on important habitat mapping.	N/A
Bush Stone Curlew	*Burhinus grallarius*	E	-	No	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Sanderling (Breeding)	*Calidris alba*	V	-	Yes	BAM-C	No	**Habitat Constraints:** Site is not mapped on important habitat mapping.	N/A
Red Knot (Breeding)	*Calidris canutus*	-	E	Yes	BAM-C	No	**Habitat Constraints:** Site is not mapped on important habitat mapping.	N/A
Curlew Sandpiper (Breeding)	*Calidris ferruginea*	E	CE	Yes	BAM-C	No	**Habitat Constraints:** Site is not mapped on important habitat mapping.	N/A
Great Knot (Breeding)	*Calidris tenuirostris*	V	V	Yes	BAM-C	No	**Habitat Constraints:** Site is not mapped on important habitat mapping.	N/A

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Gang-gang cockatoo	*Callocephalon fimbriatum*	V	E	Yes	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Glossy Black-cockatoo	*Calyptorhynchus lathami*	V	V	Yes	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Eastern Pygmy-possum	*Cercartetus nanus*	V	-	No	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Large-eared Pied Bat	*Chalinolobus dwyeri*	V	E	Yes	BAM-C	No	**Habitat Constraints:** The site is not located within two kilometres of rocky areas containing caves, overhangs, escarpment, outcrops, or crevices, or within two kilometres of old mines or tunnels.	N/A
Greater Sand-plover (Breeding)	*Charadrius leschenaultii*	V	V	Yes	BAM-C	No	**Habitat Constraints:** Site is not mapped on important habitat mapping.	N/A
Lesser Sand-plover (Breeding)	*Charadrius mongolus*	V	E	Yes	BAM-C	No	**Habitat Constraints:** Site is not mapped on important habitat mapping.	N/A
Wallum froglet	*Crinia tinnula*	V	-	No	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Dromaius novaehollandiae - endangered population Emu population in the New South Wales North Coast Bioregion and Port Stephens local	*Dromaius novaehollandiae - endangered population*	EP	-	No	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Beach Stone-curlew	*Esacus magnirostris*	CE	-	Yes	BAM-C	Yes	N/A	3544_All VZ
White-bellied Sea-eagle	*Haliaeetus leucogaster*	V	-	Yes	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Little Eagle	*Hieraaetus morphnoides*	V	-	Yes	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Stephens' Babded Snake	*Hoplocephalus stephensii*	V	-	No	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Swift Parrot	*Lathamus discolor*	E	CE	Yes	BAM-C	No	**Habitat Constraints:** Site is not mapped on important habitat mapping.	N/A
Bar-tailed Godwit (baueri) (Breeding)	*Limosa lapponica baueri*	-	V	Yes	BAM-C	No	**Habitat Constraints:** Site is not mapped on important habitat mapping.	N/A
Green and Golden Bell Frog	*Litoria aurea*	E	V	No	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Square-tailed Kite	*Lophoictinia isura*	V	-	Yes	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Little Bent-winged Bat	*Miniopterus australis*	V	-	Yes	BAM-C	No	**Habitat Constraints:** The site does not contain suitable breeding habitat in the forms of caves, tunnels, mines.	N/A
Large Bent-winged Bat	*Miniopterus orianae oceanensis*	V	-	Yes	BAM-C	No	**Habitat Constraints:** The site does not contain suitable breeding habitat in the forms of caves, tunnels, mines.	N/A
Giant Barred Frog	*Mixophyes iteratus*	E	V	No	BAM-C	Yes	N/A	4006_All VZ
Southern myotis	*Myotis macropus*	V	-	No	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Barking Owl	*Ninox connivens*	V	-	No	BAM-C	No	**Habitat Constraints:** The site does not contain trees with hollows >20cm diameter that occur >4m above the ground.	N/A

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Powerful owl	*Ninox strenua*	V	-	No	BAM-C	No	**Habitat Constraints:** The site does not contain trees with hollows >20cm diameter that occur >4m above the ground.	N/A
Eastern Curlew (Breeding)	*Numenius madagascariensis*	-	CE	Yes	BAM-C	No	**Habitat Constraints:** Site is not mapped on important habitat mapping.	N/A
Eastern Osprey	*Pandion cristatus*	V	-	Yes	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Giant Dragonfly	*Petalura gigantea*	E	-	No	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Greater Glider	*Petauroides volans*	E	E	No	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Squirrel Glider	*Petaurus norfolcensis*	V	-	No	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Brush-tailed Rock-wallaby	*Petrogale penicillata*	E	V	No	BAM-C	No	**Habitat Constraints:** Rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or cliff-lines do not occur within 1km of the site.	N/A

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Brush-tailed Phascogale	*Phascogale tapoatafa*	V	-	No	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Koala	*Phascolarctos cinereus*	E	E	No	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Common Planigale	*Planigale maculata*	V	-	No	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Long-nosed Potoroo	*Potorous tridactylus*	V	V	No	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Grey-headed flying fox	*Pteropus poliocephalus*	V	V	No	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Red-backed Button-quail	*Turnix maculosus*	V	-	No	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ
Masked owl	*Tyto novaehollandiae*	V	-	No	BAM-C	No	**Habitat Constraints:** The site does not contain trees with hollows >20cm diameter that occur >4m above the ground.	N/A
Mahoney's Toadlet	*Uperoleia mahonyi*	E	E	No	BAM-C	Yes	N/A	4006_All VZ 3544_All VZ

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Eastern Cave Bat	*Vespadelus troughtoni*	V	-	No	BAM-C	No	**Habitat Constraints:** The site is not located within two kilometres of rocky areas containing caves, overhangs, escarpment, outcrops, or crevices, or within two kilometres of old mines or tunnels.	N/A
Terek Sandpiper (Breeding)	*Xenus cinereus*	V	V	Yes	BAM-C	No	**Habitat Constraints:** site is not mapped on important habitat mapping.	N/A

5.1.3 Justifications For Exclusions of Further Assessment

Flora Species

***Angophora inopina* (Charmhaven apple)**

The reason for exclusion from further assessment is due to geographic limitations within the site, the site is not located South of Wootton. The species is known to occur from the Central Coast with its most Northern extent being Karuah (Bell, 2004).

***Diuris arenaria* (Sand doubletail)**

The reason for exclusion is due to the site not occurring within the Port Stephens LGA (TBDC, 2021) as such this species has been excluded from assessment (BAM-C).

***Diuris praecox* (Rough doubletail)**

The reason for exclusion is due to geographic exclusions this being the site does not occur within the Parish boundaries of Forster, Eurunderee, Fens, Tomaree, Stowell and Stockton as such this species has been excluded from further assessment (BAM-C).

***Eucalyptus seeana* (endangered population)**

This species has been excluded from further assessment due to geographic limitations of the site not occurring within the Greater Taree LGA (BAM-C).

***Senecio spathulatus* (Coast groundsel)**

This species has been excluded from further assessment due to the habitat constraints of the site not containing headlands within 500m of the coast (BAM-C).

***Tetratheca juncea* (Black-eyed Susan)**

Tetratheca juncea has been excluded from further assessment due micro habitat constraints, the study area does not provide suitable habitat for the species as the species known populations are confined to specific local government areas including Wyong, Lake Macquarie, Newcastle, Port Stephens, Great Lakes and Cessnock. *Tetratheca juncea* prefers low nutrient well-draining soils on hills, ridges, and creeks. Due to the topographical/geophysical nature of the site, the Subject Land is prone to flooding/inundation for extended periods due to poor draining soils. The site is also frequently slashed and managed which would further decrease the likelihood that this species would be found within this habitat. Furthermore, a 10km Bionet atlas search was conducted around the site and no known sighted records of this species occurs within said 10km buffer of the Subject Land.

Fauna Species

The following fauna species have been excluded from further surveys due to the Subject Land not containing important habitat mapping, these species include *Anthochaera Phrygia* (Regent honeyeater), *Calidris alba* (Bush Stone-curlew), *Calidris canutus* (Sanderling), *Calidris ferruginea* (Curlew sandpiper), *Calidris tenuirostris* (Great knot), *Charadrius leschenaultia* (Greater sand-plover), *Charadrius mongolus* (Lesser sand-plover), *Lathamus discolor* (Swift parrot), *Limosa lapponica baueri* (Bar-tailed godwit (baueri)), *Limosa limosa* (Black-tailed godwit), *Numenius madagascariensis* (Eastern curlew) and *Xenus cinereus* (Terek Sandpiper).

***Chalinolobus dwyeri* (Large-eared pied bat) & *Vespadelus troughtoni* (Eastern cave bat)**

These species have been precluded from further assessment as no habitat features such as cliffs, overhangs, escarpments, outcrops, or crevices occur within 2km of the site. This was determined by reviewing aerial imaging of the surrounding landscape focusing on elevations and topography of the surrounding geographical region this data was taken from *Mecone Mosaic* with layers to show elevation contours provided by Australian Height Datum. This review of the surrounding area shows that surrounding elevation of the region does not extend past 6m in height due to this and the developed nature of the surrounding 2.5km these areas would not provide such habitat for the species (BAM-C).

***Miniopterus australis* (Little bent-winged bat)**

Miniopterus australis has been excluded from further assessment due to the Subject Land not containing caves, tunnels, mines, culvert or other structure known or suspected to be used for breeding (BAM-C).

***Miniopterus orianae oceanensis* (Large bent-winged bat)**

Miniopterus orianae oceanensis has been excluded from further assessment due to the Subject Land not containing caves, tunnels, mines, culvert or other structure known or suspected to be used for breeding (BAM-C).

***Ninox connivens* (Barking owl), *Ninox strenua* (Powerful owl) & *Tyto novaehollandiae* (Masked owl)**

Large forest owls have been excluded from further surveys TBDC guidelines state large forest owls require living or dead hollow bearing trees with a hollow diameter that is greater than 20cm and that occurs greater than 4m above ground. Habitat assessments conducted on the 13/07/2023 determined no such hollows occur within the site's boundaries due to this these species will not require further assessment as no potential breeding habitat occurs on-site (BAM-C).

***Petrogale penicillata* (Brush-tailed rock wallaby)**

The site is not located within 1km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or cliff lines this was determined using contour mapping provided from Mecone Mosaic Australian Height Datum which showed no such geological features within a 1km buffer of the site's boundaries. Due to this the species has been excluded from further assessment following constraints listed within the BAM-C (BAM-C).

***Pteropus poliocephalus* (Grey-headed Flying-fox)**

This species has not been excluded from assessment for impact due to the site not containing breeding camps (BAM-C). Further, a review of DCCEEW National Flying-fox monitoring viewer shows that the closest known breeding camp occurs ~ 7.5km to the Southeast within Forster.

5.2 Presence of candidate species credit species

In accordance with BAM Subsection 5.2.4, from the remaining list of Candidate Species from Section 5.1.2, **Table 11** (flora) and **Table 12** (fauna) identify the species determined to be present within the Subject Land based on:

- assumed presence within the Subject Land;
- an important habitat map (for dual credit species);
- targeted threatened species surveys; or
- an expert report.

Assessment of presence of candidate flora and fauna credit species on the Subject Land is summarised in **Table 13** and **Table 14** respectively below.

Table 13. Determining the presence of candidate flora species credit species on the Subject Land

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
Nabiac Casuarina	*Allocasuarina simulans*	V	V	Targeted survey	No	No
Netted Bottle Brush	*Callistemon linearifolius*	V	-	Targeted survey	No	No
Dwarf Kerrawang	*Commersonia prostrata*	E	E	Targeted survey	No	No
Red Helmet Orchid	*Corybas dowlingii*	E	-	Targeted survey	No	No
Leafless Tongue Orchid	*Cryptostylis hunteriana*	V	V	Targeted survey	No	No
White-flowered Wax Plant	*Cynanchum elegans*	E	E	Targeted survey	No	No
Spider orchid	*Dendrobium melaleucaphilum*	E	-	Targeted survey	No	No
Eucalyptus parramattensis subsp. decadens	*Eucalyptus parramattensis subsp. decadens*	V	V	Targeted survey	No	No
Tuncurry Midge Orchid	*Genoplesium littorale*	CE	CE	Targeted survey	No	No
Small-flower Grevillea	*Grevillea parviflora subsp. parviflora*	V	V	Targeted survey	No	No
Noah's False Chickweed	*Lindernia alsinoides*	E	-	Targeted survey	No	No
Maundia triglochinoides	*Maundia triglochinoides*	V	-	Targeted survey	No	No
Biconvex Paperbark	*Melaleuca biconvexa*	V	V	Targeted survey	No	No
Tall Knotweed	*Persicaria elatior*	V	V	Targeted survey	No	No

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
Villous Mint-bush	*Prostanthera densa*	V	V	Targeted survey	No	No
Eastern Australian Underground Orchid	*Rhizanthella slateri*	V	E	Targeted survey	No	No
Scrub Turpentine	*Rhodamnia rubescens*	CE	CE	Targeted survey	No	No
Native Guava	*Rhodomyrtus psidioides*	CE	CE	Targeted survey	No	No
Magenta Lilly Pilly	*Syzygium paniculatum*	E	V	Targeted survey	No	No

Table 14. Determining the presence of candidate fauna species credit species on the Subject Land

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
Rufous Bettong	*Aepyprymnus rufescens*	V	-	Targeted survey	No	No
Bush Stone Curlew	*Burhinus grallarius*	E	-	Targeted survey	No	No
Gang-gang cockatoo	*Callocephalon fimbriatum*	V	E	Targeted survey	No	No
Glossy Black-cockatoo	*Calyptorhynchus lathami*	V	V	Targeted survey	No	No
Eastern Pygmy-possum	*Cercartetus nanus*	V	-	Targeted survey	No	No
Large-eared Pied Bat	*Chalinolobus dwyeri*	V	E	Targeted survey	No	No
Wallum froglet	*Crinia tinnula*	V	-	Targeted survey	Yes	Yes
novaehollandiae - endangered population	*novaehollandiae - endangered population*	EP	-	Targeted survey	No	No
Beach Stone-curlew	*Esacus magnirostris*	CE	-	Targeted survey	No	No
White-bellied Sea-eagle	*Haliaeetus leucogaster*	V	-	Targeted survey	No	No
Little Eagle	*Hieraaetus morphnoides*	V	-	Targeted survey	No	No
Stephens' Banded Snake	*Hoplocephalus stephensii*	V	-	Targeted survey	No	No

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
Green and Golden Bell Frog	*Litoria aurea*	E	V	Targeted survey	No	**No**
Square-tailed Kite	*Lophoictinia isura*	V	-	Targeted survey	No	No
Giant Barred Frog	*Mixophyes iteratus*	E	V	Targeted survey	No	**No**
Southern myotis	*Myotis macropus*	V	-	Targeted survey	No	No
Eastern Osprey	*Pandion cristatus*	V	-	Targeted survey	No	No
Giant Dragonfly	*Petalura gigantea*	E	-	Targeted survey	No	No
Greater Glider	*Petauroides volans*	E	E	Targeted survey	No	No
Squirrel Glider	*Petaurus norfolcensis*	V	-	Targeted survey	No	No
Brush-tailed Phascogale	*Phascogale tapoatafa*	V	-	Targeted survey	No	No
Koala	*Phascolarctos cinereus*	E	E	Targeted survey	No	No
Common Planigale	*Planigale maculata*	V	-	Targeted survey	No	No
Long-nosed Potoroo	*Potorous tridactylus*	V	V	Targeted survey	No	No
Grey-headed flying fox	*Pteropus poliocephalus*	V	V	Targeted survey	No	No
Red-backed Button-quail	*Turnix maculosus*	V	-	Targeted survey	Yes	Yes
Mahoney's Toadlet	*Uperoleia mahonyi*	E	E	Targeted survey	No	**No**
Eastern Cave Bat	*Vespadelus troughtoni*	V	-	Targeted survey	No	No

5.3 Threatened species surveys

In accordance with the guidelines listed in **Section 2.3** and **Section 2.4**, **Table 15** and **Table 16** lists the flora and fauna surveys conducted, respectively.

Table 15. Surveys for candidate flora species credit species on the Subject Land

Common name	Scientific name	Threatened flora species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (transects or grids)	Timing of survey – (BAM-C / TBDC)		Effort (hours & no. people)		
			Dates Comply	Non-comply			
Nabiac Casuarina	*Allocasuarina simulans*	Parallel Traverse (5 m)	18/11/2023; 20/11/2023; 21/11/2023		35.25 hr; 3 ppl	No	No
Trailing Woodruff	*Asperula asthenes*	Parallel Traverse (5m)	13/11/2024 14/11/2024		28 hr: 2 ppl	No	No
Netted Bottle Brush	*Callistemon linearifolius*	Parallel Traverse (5 m)	18/11/2023; 20/11/2023; 21/11/2023		35.25 hr; 3 ppl	No	No
Dwarf Kerrawang	*Commersonia prostrata*	Parallel Traverse (5 m)	13/11/2024 14/11/2024		28 hr: 2 ppl	No	No
Red Helmet Orchid	*Corybas dowlingii*	Parallel Traverse (5 m 10 m in open areas)	13/07/2023; 14/07/2023		23 hr; 2 ppl	No	No
Leafless Tongue Orchid	*Cryptostylis hunteriana*	Parallel Traverse (5 m)	13/11/2024 14/11/2024		28 hr: 2 ppl	No	No
White-flowered Wax Plant	*Cynanchum elegans*	Parallel Traverse (5 m 10 m in open areas)	13/07/2023; 14/07/2023		23 hr; 2 ppl	No	No
Spider orchid	*Dendrobium melaleucaphilum*	Parallel Traverse of treed areas	05/08/2024; 19/08/2024; 02/09/2024		3 hr; 1p 2 hr: 1p; 2.5 hr: 1p:	No	No
Eucalyptus parramattensis subsp. decadens	*Eucalyptus parramattensis subsp. decadens*	Parallel Traverse (5 m)	18/11/2023; 20/11/2023; 21/11/2023		35.25 hr; 3 ppl	No	No
Tuncurry Midge Orchid	*Genoplesium littorale*	Parallel Traverse (5 m)	9/04/2024		5.5 hr; 1 ppl	No	No
Small-flower Grevillea	*Grevillea parviflora subsp. parviflora*	Parallel Traverse (5 m)	18/11/2023; 20/11/2023; 21/11/2023		35.25 hr; 3 ppl	No	No
Noah's False Chickweed	*Lindernia alsinoides*	Parallel Traverse (5 m)	22/02/2024; 26/02/2024; 13/11/2024 14/11/2024		28 hr: 2 ppl	No	No
Maundia triglochinoides	*Maundia triglochinoides*	Parallel Traverse (5 m)	18/11/2023; 20/11/2023; 21/11/2023		35.25 hr; 3 ppl	No	No

Common name	Scientific name	Threatened flora species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (transects or grids)	Timing of survey – (BAM-C / TBDC)		Effort (hours & no. people)		
			Dates Comply	Non-comply			
Tall Knotweed	*Persicaria elatior*	Parallel Traverse (5 m)	22/02/2024; 26/02/2024; 9/04/2024		15 hr; 3 ppl 11 hr; 2 ppl 5.5 hr; 1 ppl	No	No
Villous Mint-bush	*Prostanthera densa*	Parallel Traverse (5 m)	18/11/2023; 20/11/2023; 21/11/2023		35.25 hr; 3 ppl	No	No
Eastern Australian Underground Orchid	*Rhizanthella slateri*	Parallel Traverse (5 m)	13/11/2024 14/11/2024		28 hr: 2 ppl	No	No
Scrub Turpentine	*Rhodamnia rubescens*	Parallel Traverse (5 m) Targeted Tree Surveys	18/11/2023; 20/11/2023; 21/11/2023; 05/08/2024; 19/08/2024: 02/09/2024		35.25 hr; 3 ppl 3 hr; 1p 2 hr: 1p. 2.5 hr: 1p:	No	No
Native Guava	*Rhodomyrtus psidioides*	Parallel Traverse (5 m) Targeted Tree Surveys	18/11/2023; 20/11/2023; 21/11/2023 05/08/2024; 19/08/2024: 02/09/2024		35.25 hr; 3 ppl 3 hr; 1p 2 hr: 1p; 2.5 hr: 1p:	No	No
Magenta Lilly Pilly	*Syzygium paniculatum*	Parallel Traverse (5 m)	09/04/2024		5.5 hr; 1 ppl	No	No

Surveys were undertaken using appropriate field survey methods in accordance with TBDC guidelines as-well as guidelines following DPIE 'Surveying threatened plants and their habitats' (DPIE, 2020) recommended survey techniques. A 5m Parallel Field Transverse technique was used when conducting targeted species surveys for threatened flora in accordance with section 4.2.'Surveying threatened plants and their habitats'.

Additional survey effort was applied to *Rhodamnia rubescens* & *Rhodomyrtus psidioides* during August / September surveys. This additional effort was conducted on the basis that the recommended 5 species limit per survey was exceeded during the original survey effort. The additional effort focused on identifying shrub/treed areas above waist height to identify potential individuals along with conducting targeted surveys for *Dendrobium melaleucaphilum*. Reference populations of *Corybas dowlingii* (Red Helmet Orchid) were visited on the; 10/06/2023, 25/06/2023, 02/07/2023 and 09/072023. This reference population was flowering during each visit. Established reference populations for *Cryptostylis hunteriana* located within the Munmorah Conservation Area were recorded as flowering during the survey period these dates include 20/11/2023 and 28/11/2023

Table 16. Surveys for candidate fauna species credit species on the Subject Land

Common name	Scientific name	Threatened flora species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (transects or grids)	Timing of survey – (BAM-C / TBDC)		Effort (hours & no. people)		
			Dates Comply	Non-comply			
Rufous Bettong	*Aepyprymnus rufescens*	Terrestrial Camera Trapping	22/01/24 – 20/02/24		14 Cameras 392 Camera Nights	No	No
Bush Stone Curlew	*Burhinus grallarius*	Transects/ Meander	23/11/23 24/01/24 25/01/24 22/02/24		9 hr; 3 ppl 2 hr; 1ppl 3 hr; 1 ppl 4 hr; 2 ppl	No	No
Gang-gang cockatoo	*Callocephalon fimbriatum*	Diurnal Bird Searches	22/11/23 23/11/23		6.25hr; 3 ppl 5hr; 3ppl	No	No
Glossy Black-cockatoo	*Calyptorhynchus lathami*	Diurnal Bird Searches	05/08/24 19/08/24 02/09/24	24/01/24	2 hr; 1 ppl	No	No
Eastern Pygmy-possum	*Cercartetus nanus*	Arboreal Camera Trapping	22/01/24 – 20/02/24		19 Cameras 532 Camera Nights	No	No
Large-eared Pied Bat	*Chalinolobus dwyeri*	Harp Trapping/ Chorus Bat Recorders	22/01/24 - 02/02/24		50 hrs 11 nights	No	No
Wallum froglet	*Crinia tinnula*	Call Playback/ Spotlighting	23/11/22 22/02/24 09/05/24 13/05/24 02/10/24.0 8/10/24		9 hrs; 3 ppl 8 hrs; 2 ppl 6 hrs; 3 ppl 5 hrs; 2ppl	Yes	No
Dromaius novaehollandiae - endangered population	*Dromaius novaehollandiae - endangered population*	Terrestrial Camera Trapping	22/01/24 – 20/02/24		14 Cameras 392 Camera Nights	No	No
Beach Stone-curlew	*Esacus magnirostris*	Transects/ Meander	23/11/23 24/01/24 25/01/24 22/02/24		9 hr; 3 ppl 2 hr; 1ppl 3 hr; 1 ppl 4 hr; 2 ppl	No	No
White-bellied Sea-eagle	*Haliaeetus leucogaster*	Transects/ Meander	22/11/232 3/11/23		35.25 hr; 3 ppl	No	No
Little Eagle	*Hieraaetus morphnoides*	Transects/ Meander	05/08/241 9/08/2402/ 09/24		3 hr; 1p 2 hr: 1p; 2.5 hr: 1p:	No	No
Stephens' Banded Snake	*Hoplocephalus stephensii*	Nocturnal Spotlighting	23/11/23 24/01/24 25/01/24 22/02/24		9 hr; 3 ppl 2 hr; 1 ppl 3 hr; 1 ppl 8 hr; 2 ppl	No	No
Green and Golden Bell Frog	*Litoria aurea*	Call Playback/ Spotlighting	23/11/22 22/02/24	02/10/24 08/10/24	9 hrs; 3 ppl 8 hrs; 2 ppl	No	No
Square-tailed Kite	*Lophoictinia isura*	Transects/ Meander	22/11/23 23/11/23		35.25 hr; 3 ppl	No	No

Common name	Scientific name	Threatened flora species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (transects or grids)	Timing of survey – (BAM-C / TBDC)		Effort (hours & no. people)		
			Dates Comply	Non-comply			
Little Bent-winged Bat	*Miniopterus australis*	Harp Trapping/ Chorus Bat Recorders	22/01/24 - 02/02/24		50 hrs 11 nights	No	No
Large Bent-winged Bat	*Miniopterus orianae oceanensis*	Harp Trapping/ Chorus Bat Recorders	22/01/24 - 02/02/24		50 hrs 11 nights	No	No
Giant Barred Frog	*Mixophyes iteratus*	Call Playback/ Spotlighting	23/11/22 22/02/24 02/10/24.0 8/10/24		9 hrs; 3 ppl 8 hrs; 2 ppl	No	No
Southern myotis	*Myotis macropus*	Harp Trapping/ Chorus Bat Recorders	22/01/24 - 02/02/24		50 hrs 11 nights	No	No
Eastern Osprey	*Pandion cristatus*	Transects/ Meander	22/11/23 23/11/23		35.25 hr; 3 ppl	No	No
Giant Dragonfly	*Petalura gigantea*	Meander around suitable habitat	31/01/24		14 hr; 2 ppl	No	No
Greater Glider	*Petauroides volans*	Arboreal Camera Trapping	22/01/24 - 20/02/24		19 Cameras 532 Camera Nights	No	No
Squirrel Glider	*Petaurus norfolcensis*	Arboreal Camera Trapping	22/01/24 – 20/02/24		19 Cameras 532 Camera Nights	No	No
Brush-tailed Phascogale	*Phascogale tapoatafa*	Arboreal Camera Trapping	22/01/24 - 20/02/24		28 camera trapping nights	No	No
Koala	*Phascolarctos cinereus*	Koala SAT Spotlight Transects	23/11/23 24/01/24 25/01/24 31/01/24		9 hr; 3 ppl 2 hr; 1 ppl 3 hr; 1 ppl 14 hr; 2 ppl	No	No
Common Planigale	*Planigale maculata*	Pitfall Trapping	22/01/24 - 02/02/24		50 hrs 11 nights	No	No
Long-nosed Potoroo	*Potorous tridactylus*	Terrestrial Camera Trapping	22/01/24 - 02/02/24		14 Cameras 392 Camera Nights	No	No
Red-backed Button-quail	*Turnix maculosus*	Terrestrial Camera Trapping	22/01/24 - 02/02/24		14 Cameras 392 Camera Nights	Yes	No
Mahoney's Toadlet	*Uperoleia mahonyi*	Call Playback/ Spotlighting	23/11/23 22/02/24 02/10/24.0 8/10/24		9 hrs; 3 ppl 8 hrs; 2 ppl	No	No
Eastern Cave Bat	*Vespadelus troughtoni*	Harp Trapping/ Chorus Bat Recorders	22/01/24 - 02/02/24		50 hrs 11 nights	No	No

Non-Compliant Survey

Surveys for *Litoria aurea* were undertaken outside of identified TBDC survey timing being undertaken in October 2024. Lemckert, F. (2008) identifies within ***Table 2*** *Calling records for the Hylid frogs of New South Wales, Australia.* Recorded core calling periods were observed from August – February.

Acknowledging revision to the TBDC and BAM-C that occurred following initial surveys, additional survey effort for *Calyptorhynchus lathami lathami* (South-eastern Glossy Black-Cockatoo), has been added to coincide with targeted Flora surveys for *Dendrobium melaleucaphilum*, *Rhodamnia rubescens* and *Rhodomyrtus psidioides* as all trees within Subject Land were inspected for the presence of *Dendrobium melaleucaphilum*, during this survey period no additional hollow bearing trees were identified within the Subject Land as such no additional identifiable habitat features suitable for the species occur within the Subject Land. Furthermore, suitable hollows identified within Study Area will not be removed as part of the proposal but retained in the treed land situated in the south-west of the Study Area.

5.4 Expert reports

No species expert reports were utilised for this proposal.

5.5 More appropriate local data (where relevant)

No other local data was utilised to assess habitat suitability for the threatened species surveys.

5.6 Area or count, and location of suitable habitat for a species credit species (a species polygon)

Habitat condition for species determined or assumed to be present on the Subject Land is described in detail below. **Table 17** includes details related to present species from the TBDC. Refer to **Table 19** for results for EPBC Act listed species present within the Subject Land.

- *Crinia tinnula* (Wallum Froglet)
    - This species was detected on the Subject Land during surveys carried out in accordance with the TBDC. The species was detected during threatened species survey within the Subject Land on the 08/10/2024.
- *Turnix maculosus* (Red-backed button quail)
    - This species was detected on the Subject Land during surveys carried out in accordance with the TBDC. The species was detected on a remote camera station within the Subject Land. The vegetation zones found through the site were determined to be suitable for the species due to the high abundance of tussock grasses within proximity to water in the wider landscape. As such all-vegetation zones impacted upon by the proposal would constitute suitable habitat for the species in accordance with TBDC guidelines for the species.

Table 17. Results for present species (recorded within the Subject Land)

Common name	**Scientific name**	**Biodiversity risk weighting** (BAM-C & TBDC*)	**SAII entity**** (BAM-C & TBDC)	**Habitat constraints / microhabitats present on the Subject Land / vegetation zone**	**Abundance – No. individual plants present on Subject Land** (flora with unit of measure of count)	**Extent (ha) of suitable habitat present on site** (flora or fauna with unit of measure of area)	**TBDC species specific recommendations e.g. buffers, general comments** (where relevant)	**Habitat condition** (vegetation integrity score for each vegetation zone in the polygon – area species only)
Wallum Froglet	*Crinia tinnula*	Moderate (1.5)	No	N/A	-	1.7	Buffer extending 50m from top of bank (TBDC).	VZ1: 4006 – Good: 91.9 VZ2: 4006 – Intact: 68.2 VZ3: 4006 – Moderate: 40.1

Common name	**Scientific name**	**Biodiversity risk weighting** (BAM-C & TBDC*)	**SAII entity**** (BAM-C & TBDC)	**Habitat constraints / microhabitats present on the Subject Land / vegetation zone**	**Abundance – No. individual plants present on Subject Land** (flora with unit of measure of count)	**Extent (ha) of suitable habitat present on site** (flora or fauna with unit of measure of area)	**TBDC species specific recommendations e.g. buffers, general comments** (where relevant)	**Habitat condition** (vegetation integrity score for each vegetation zone in the polygon – area species only)
								VZ4: 4006 – Poor: 34.1
								VZ5: 4006 – Poor-Grassland: 36.2
								VZ6: 4006 – Moderate-Grassland: 37.7
Red-backed Button-quail	*Turnix maculosus*	High (2)	No	N/A	-	12.1	N/A	VZ1: 4006 – Good: 91.9
								VZ2: 4006 – Intact: 68.2
								VZ3: 4006 – Moderate: 40.1
								VZ4: 4006 – Poor: 34.1
								VZ5: 4006 – Poor-Grassland: 36.2

Common name	**Scientific name**	**Biodiversity risk weighting** (BAM-C & TBDC*)	**SAII entity**** (BAM-C & TBDC)	**Habitat constraints / microhabitats present on the Subject Land / vegetation zone**	**Abundance – No. individual plants present on Subject Land** (flora with unit of measure of count)	**Extent (ha) of suitable habitat present on site** (flora or fauna with unit of measure of area)	**TBDC species specific recommendations e.g. buffers, general comments** (where relevant)	**Habitat condition** (vegetation integrity score for each vegetation zone in the polygon – area species only)
								VZ6: 4006 – Moderate-Grassland: 37.7
								VZ7: 4006 – Managed-Grassland: 31.4
								VZ9: 3544 – Poor: 18.8

Table 18. Results for EPBC Act listed species present (recorded within the Subject Land)

Common name	**Scientific name**	**Abundance – No. individual plants present on Subject Land** (flora with unit of measure as count)	**Extent (ha) of suitable habitat present on site** (flora or fauna with unit of measure as area)
No listed species present within site	No listed species present within site	No listed species present within site	No listed species present within site

6. Identifying prescribed impacts

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. Where relevant, threatened species or fauna that are part of a TEC or EC, that are at risk of vehicle strike
Karst, caves, crevices, cliffs, rocks or other geological features of significance	No	There are no occurrences of karst, caves, crevices, or cliffs within the Subject Land	N/A. Not further assessed.
Human-made structures	Yes	A shed is located within the North-Western corner of the site. This building is in good condition with no visible access points that potential fauna may be able to utilise.	Potential threatened fauna are unlikely to utilise this shed as habitat due to its condition state and frequent use. Not further assessed.
Non-native vegetation	Yes	The Subject Land contains non-native vegetation in the form of exotic shrub and groundcover species. Exotic tussock grasses could provide suitable shelter for some threatened species.	Species that may use non-native shrub and grass vegetation include; *Aepyprymnus rufescens* (Rufous Bettong), *Potorous tridactylus* (Long-nosed Potoroo), *Turnix maculosus* (Red-backed Button-quail)
Habitat connectivity	No	Habitat connectivity within the site through the broader landscape is generally limited, this is due to the historic management of the land resulting in limited canopy cover. Within the broader landscape the land adjacent to the West of the site would offer a more suitable intact corridor for fauna and for a species, this then extends to the site along the South-Western portion which will be retained as part of the proposed development. As a result, this proposal would not pose an impact upon habitat connectivity within the Tuncurry region.	N/A. Not further assessed.
Waterbodies, water quality and hydrological processes	Yes	The hydrology of the Subject Land is typified by the low-lying elevation and frequent inundation of the site, the subject sites hydrology primarily consists of ephemeral water bodies and two onsite dams. These habitat features offer potential foraging and breeding habitat for multiple amphibian species	Fauna species with the potential to be affected by this prescribed impact include *Crinia tinnula* (Wallum Froglet), *Litoria aurea* (Green and Golden Bell Frog), *Mixophyes iteratus* (Giant Barred Frog), *Uperoleia mahonyi* (Mahonys' Toadlet); Flora species with the potential to be affected by this prescribed impact include Maundia triglochinoides
Wind turbine strikes (wind farm development only)	No	Not applicable to this proposal	N/A. Not further assessed.
Vehicle strikes	Yes	There is currently limited vehicle thoroughfare within the Subject Land, however, the proposed development would introduce an	*Aepyprymnus rufescens* (Rufous Bettong), *Burhinus grallarius* (Bush Stone-curlew), *Crinia tinnula* (Wallum Froglet), *Litoria aurea*

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature. Where relevant, threatened species or fauna that are part of a TEC or EC, that are at risk of vehicle strike
		increase in traffic flow within the Subject Land due to the built form nature of the development, this in turn would increase the risk of vehicle strike within the site during construction, and post development of the subdivision.	(Green and Golden Bell Frog), *Mixophyes iteratus* (Giant Barred Frog), *Uperoleia mahonyi* (Mahonys' Toadlet), *Petrogale penicillate* (Brush-tailed Rock-wallaby), *Phascolarctos cinereus* (Koala), *Planigale maculate* (Common planigale).

Identified Prescribed Impacts

Potentially impacted threatened species were generated by the BAM-C and retained for assessment under the proposal (and present, in the case of Species Credit species). Potential impacts were assessed based on habitat and ecology descriptions for relevant species in the TBDC.

- Non-native vegetation
  - *Aepyprymnus rufescens* (Rufous Bettong)
  - *Potorous tridactylus* (Long-nosed Potoroo)
  - *Turnix maculosus* (Red-backed Button-quail)

  The subject site contains non-native vegetation in the form of introduced grass and shrub species. This non-native vegetation has the potential to provide foraging and potential nesting habitat for the identified species. Surveys undertaken within the subject area determined the presence of Red-backed Button-quail. As such this species will be impacted by the proposal as non-native vegetation is proposed to be removed. However, the identified prescribed impact will be reduced as the proposal will retain higher quality native vegetation in the form of 0.4 ha of VZ6: 4006 – Moderate-Grassland.
- Waterbodies, water quality and hydrological processes
  - *Crinia tinnula* – Wallum Froglet
  - *Litoria aurea* - Green and Golden Bell Frog
  - *Mixophyes iteratus* - Giant Barred Frog
  - *Uperoleia mahonyi* - Mahonys' Toadlet
  - *Maundia triglochinoides*

  The dams within the Subject Land that would be directly impacted by the proposal represents marginal habitat for the species assessed. These dams are proximal to mapped forested wetlands and approximately 400m from Wallamba River. Whilst there is potential for the species to utilise the onsite dams and inundated paddocks as *Crinia tinnula* was identified within the site during survey periods. Furthermore, higher functioning habitat located within the southwest corner of the subject site will be retained. As such the identified prescribed impact is minimal.
- Vehicle strikes
  - *Aepyprymnus rufescens* - Rufous Bettong
  - *Burhinus grallarius* - Bush Stone-curlew
  - *Crinia tinnula* - Wallum Froglet
  - *Litoria aurea* - Green and Golden Bell Frog
  - *Mixophyes iteratus* - Giant Barred Frog
  - *Uperoleia mahonyi* - Mahonys' Toadlet
  - *Petrogale penicillate* - Brush-tailed Rock-wallaby
  - *Phascolarctos cinereus* - Koala
  - *Planigale maculate* - Common planigale

The proposal would substantially increase vehicle movements. However, the proposal will likely result in reduced vehicle speed due to the inclusion of speed limits. Further, there is very limited vegetation that would be retained on the Northern Road corridor to which fauna might transit. Connectivity across the landscape is generally limited in an east-west plane, which would further limit likely fauna movement across the site.

Internal roads would be constructed as part of future proposals under the concept; however, these would be in a dense residential setting and fauna movement within the future development would likely be highly limited.

Vehicle strikes remain a potential risk for all protected fauna under the proposed Concept. Future applications should consider traffic calming measures, signage and fauna-friendly fencing to mitigate the potential for vehicle strikes.

STAGE 2: IMPACT ASSESSMENT (BIODIVERSITY VALUES AND PRESCRIBED IMPACTS)

7. Avoid and minimise impacts

7.1 Avoid and minimise direct and indirect impacts

7.1.1 Project location

Impacts to native vegetation and threatened species habitat have been avoided and minimised by locating the proposal in areas:

a. *Lacking biodiversity values.*

The proposed development has been located wholly within areas not containing biodiversity values identified within the biodiversity values map see **Figure 3**

Biodiversity values map.

b. *Where native vegetation or threatened species habitat is in the poorest condition (i.e. areas that have low vegetation integrity score).*

The proposed development has been located within areas that contain the lowest biodiversity values found within the Subject Land's vegetation zones See **Table 8** Vegetation Integrity Scores; the proposal will minimise direct impacts upon vegetation zone 1: VZ1 – PCT: 4006_Good having a VI of 91.9 by locating the proposal in such a way that the proposal will remove 0.05 ha of vegetation. Whilst retaining a further 1.5 ha of this vegetation occurring to the south of the Subject Land. Further the proposal will avoid the identified PCT 4004 in its entirety.

c. *That avoid habitat for species with a high biodiversity risk weighting or land mapped on the important habitat map, or native vegetation that is a TEC or a highly cleared PCT.*

Proposed development in not located in areas mapped as important habitat by DPIE Important Habitat Mapping.

The proposal is located within areas containing TEC however these areas are of a lower VI score and function than the larger portion of TEC to be retained within the proposal, furthermore the removal of 0.61ha of low quality/function of said TEC will not constitute a significant impact.

d. *Locating the proposal outside of buffer areas around breeding habitat features such as nest trees or caves.*

The proposals' location has been implemented to avoid impacting breeding habitat features such as hollow bearing trees and caves. Two hollow bearing trees are located within the sites retained/ avoided areas of vegetation, as such these hollows will not be removed as to retain a net total of hollows within the site. No caves crevices or karsts occur within the site as such the proposal will not impact upon these features.

However, the site will require the removal of 12.1 ha of suitable breeding habitat in the form of PCT- 4006 – Northern Paperbark-Swamp Mahogany Saw-sedge Forest and PCT 3544 for the recorded threatened species *Turnix maculosus* (Red-backed Button-quail). Along with 1.66 ha of suitable habitat of the identified *Crinia tinnula* (Wallum Froglet).

The determination of the final location of the development has been based on the consideration of alternative modes or technologies, routes, locations, sites. Due to the managed nature of the site and its proximity to existing urban development it was determined that the proposals' location within the site as well as within the broader surrounding landscape, would be the most appropriate location when aiming to avoid and minimise impacts on biodiversity values. This is due to the managed nature of the site along with the proposed sites development boundaries not impeding upon areas of

biodiversity values or important habitat mapping and that the site is zoned as R2 Low Density Residential.

7.1.2 Project design

Impacts to native vegetation and threatened species habitat have been avoided and minimised during project design by:

a. Reducing the proposal's clearing footprint by minimising the number and type of facilities.

The proposal has been designed to achieve desired lot yield whilst also minimising impacts to native vegetation and threatened species habitat by designing the project to avoid areas of high biodiversity values, along with minimising impacts to threatened ecological communities identified within the development boundary through locating the proposal in areas of low vegetation integrity scores. This has occurred in an iterative fashion to consider biodiversity avoidance and further candidate species survey results at the conclusion of seasonal survey tranches – for example the retention of grasslands for the Red-backed Button-quail and installation of retaining walls to avoid areas of inundation in the south-western site area for the Wallum Froglet. In addition, the eastern footprint extent was adjusted to maintain the small existing dam in-situ.

b. Locating ancillary facilities in areas that have no biodiversity values.

The project has been designed to avoid areas containing mapped biodiversity values in their entirety as such the location of ancillary facilities within the site will not impede or impact upon any areas containing mapped biodiversity values.

c. Locating ancillary facilities in areas where the native vegetation or threatened species habitat is in the poorest condition. (i.e. areas with the lowest vegetation integrity scores).

Ancillary facilities will be located within areas of native vegetation containing the lowest recorded vegetation integrity scores, such as locating ancillary facilities within vegetation zones: VZ4 – Poor, VZ5 – Poor-Grassland and VZ7 – Managed Grassland. By doing so vegetation zones containing higher vegetation integrity scores will not be impacted. Furthermore, areas to be retained will be demarcated by highly visible flagging tape and considered as 'no go zones.' The retention of suitable foraging and breeding habitat as identified within vegetation zone 6 for *Turnix maculosus* will aim to reduced impacts to the species.

d. Locating ancillary facilities in areas that avoid habitat for species and vegetation that has a high threat status.

Ancillary facilities have been located as to avoid areas of TEC containing high vegetation integrity scores as such vegetation zones VZ1 and VZ8 Aswell as TEC surrounding the dam located within VZ3 will be retained and avoided as part of the proposal.

e. Actions and activities that provide for rehabilitation, ecological restoration and/ or ongoing maintenance of retained areas of native vegetation, threatened species, threatened ecological communities and their habitat on the Subject Land.

Ancillary facilities will avoid areas containing retained native vegetation along with C2 zoned areas.

7.2 Avoid and minimise prescribed impacts

7.2.1 Project location

The determination of the proposed location for the development has been a reiterative process in efforts to avoid prescribed habitat features located within the site were possible.

Surface works and subsurface works have been located within areas lacking in prescribed biodiversity. The Subject Land's location avoids impact to geophysical features such as caves and karst along with avoiding mapped watercourses. One waterbody identified within the site will be removed as part pf the proposal however the creation of two (2) quality basins will offset potential impacts to occur to threatened species habitat.

The proposals' location has been selected within the Subject due to its limited canopy cover due to historic land use and management practices. Furthermore, The proposals' location has been identified as to avoid severing or interfering with habitat corridors. Additionally adjoining landholding to the West of the Subject Land provides a more suitable intact corridor and is not zoned for development.

7.2.2 Project design

The project design aims to retain aquatic habitat integrity by replacing one identified farm dam with two (2) quality basins, in doing so minimising impacts to native vegetation and fauna that relies on the onsite waterbody and riparian habitat, the introduction of these basins also aims to improve standing water quality within the retained TEC vegetation located within the southern portion of the site. Road networks within the site will be designed with traffic calming devices to reduce vehicle speed and therefore reducing the likelihood of potential vehicle strikes to native fauna. Fencing along the western boundary will be established with *Turnix maculosus* in mind as to allow it's continued access into the retained suitable habitat found within vegetation zone 6, this will be achieved through utilised fencing having a 100ml gap as to not disrupt movement across the site.

7.3 Summary of measures to avoid and minimise impacts

Table 20. Avoidance and minimisation measures for direct, indirect and prescribed impacts

Action	Outcome (Describe the outcome of implementing the measure, with reference to specific entities identified in Sections 4 and 5)	Timing	Responsibility
Direct Impacts			
Vegetation Clearing			
Vegetation removal works are to occur outside core breeding periods for species known to use habitat on site wherever possible.	The implementation of this management action would allow for a reduction in potential juvenile mortality within the site, in particular having cleared staged outside of the breeding period for *Turnix maculosus* (Red-backed Button-quail) from October-June. Would allow breeding individuals on-site to re-located to more suitable habitat prior to breeding/nesting species.	Prior to clearing works, with Winter months being the most suitable timeframe.	Project ecologist in consultation with project manager
Pre-clearance survey of trees to be removed	Pre-clearance surveys indicate if breeding fauna occupy habitat features such as hollow bearing trees/stick nests prior to clearing.	Prior to commencement of works for each stage	Project Ecologist
Under scrubbing of vegetation and removal of non-habitat trees to occur in a sequence to allow for resident fauna to move to adjacent areas of habitat	this action allows for disturbance to be present prior to the removal of habitat trees in order for resident fauna to move to adjacent suitable habitat.	Prior to commencement of works for each stage	Project ecologist in consultation with project manager
Indirect Impacts			
Retained / Adjacent Vegetation			
Establish Tree Protection Zones (TPZ) around retained vegetation within the site	The outcome of this action is to avoid indirect impact to remaining vegetation to be retained within the site, this will particularly affect Vegetations zones 1	Prior to construction	Contractor in consultation with project ecologist

Action	Outcome (Describe the outcome of implementing the measure, with reference to specific entities identified in Sections 4 and 5)	Timing	Responsibility
	& 8 as both zones are commensurate with TEC – Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast and South East Corner Bioregions.		
Noise, Light and Dust Impacts			
Limit construction works to daylight hours to reduce impacts from light and noise	Limiting construction times to daylight hours will reduce any potential impacts to nocturnal species within or around the site.	During construction works	Construction contractor
All machinery is maintained and operated as per operation manual.	No excessive noise of machinery due to poor maintenance or faulty parts	During construction works and during operation	Construction contractor
Vehicles/machinery to observe 5-10km/h speed limit on Site.	To reduce the potential of excessive dust which may impact upon fauna and flora species as well as increased risk of runoff/sedimentation.	For the duration of site works	Contractors
Weeds, diseases and edge effects			
weed management protocol is to be established on-site i.e. Equipment and vehicles entering site are cleaned of foreign soil and seed prior to entering site.	Weed management protocol is to be established on-site i.e. Equipment and vehicles entering site are cleaned of foreign soil and seed prior to entering site.	weed management protocol is to be established on-site i.e. Equipment and vehicles entering site are cleaned of foreign soil and seed prior to entering site.	Contractors
Rubbish dumping			
Rubbish to be disposed of offsite appropriately.	Reduced risk of invasive species occurring within site attracted by rubbish. Reduced loss of vegetative habitat within retained areas.	For the duration of site works	Contractors
Non-native vegetation			
Removal of non-native vegetation from site.	Increased vegetation integrity of retained vegetation within the site, reduction of competition for native species. Increase in native tussocks resulting in increase habitat capabilities for threatened *Turnix maculosus* (Red-backed Button-quail).	During construction works and during operation.	Contractors
Waterbodies, water quality and hydrological processes			
Ecologist is to be present during de-watering of on-site dams, to collect and relocate native fauna species into suitable nearby habitat.	minimise impacts to native aquatic species on-site	During construction works.	Ecologist
Yearly planned discharging of Stormwater basins into retained vegetation within the east and south portions of the site.	Minimise impacts to aquatic fauna and flora present within retained TEC's located within the subject area.	During operation	Contractors

Action	Outcome (Describe the outcome of implementing the measure, with reference to specific entities identified in Sections 4 and 5)	Timing	Responsibility
Vehicle strikes			
imposing speed limits within the site during construction and post construction periods.	imposed speed limits will reduce the likelihood of vehicle strikes occurring within the site during construction and post development.	During construction works and during operation.	Contractors

8. Impact assessment

8.1 Direct impacts

8.1.1 Residual direct impacts

Table 21. Summary of residual direct impacts

Direct impact (Describe the impact on PCT/TEC/EC or threatened species and their habitat)	**BC Act status**	**EPBC Act status**	**SAII entity**	**Project phase/timing of impact** (e.g. construction, operation, rehabilitation)	**Extent** (ha, number of individuals)
Clearing of native vegetation to occur within PCT 4006 – Northern Paperbark-Swamp Mahogany Saw-sedge Forest, This PCT has an associated TEC Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and Southeast Corner Bioregions.	Endangered Ecological Community	Not Listed	No	Construction	9.26
Clearing of native vegetation to occur within PCT 3544 – Coastal Sands Apple-Blackbutt Forest.	Not Listed	Not Listed	No	Construction	2.8
Clearing of habitat in which *Crinia tinnula* (Wallum Froglet)	Vulnerable	Not Listed	No	Construction	1.7
Clearing of habitat in which *Turnix maculosus* (Red-backed Button-quail) uses within the site's boundaries.	Vulnerable	Not Listed	No	Construction	12.1

8.1.2 Change in vegetation integrity score

Table 22. Impacts to vegetation integrity

Vegetation zone	PCT ID	Management zone	Area (ha)	Before development				After development				Change
				Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	Change in VI score
VZ1: 4006 - Good	4006	N/A	0.05	85	91.4	100	91.9	0	0	0	91.9	-91.9
VZ2: 4006 – Intact	4006	N/A	0.4	75.7	82	51.1	68.2	0	0	0	68.2	-68.2
VZ3: 4006 - Moderate	4006	N/A	0.17	45.2	32.6	43.9	40.1	0	0	0	40.1	-40.1
VZ4: 4006 – Poor	4006	N/A	3.51	40	65.2	15.1	34.1	0	0	0	34.1	-34.-1
VZ5: 4006 – Poor-Grassland	4006	N/A	1.52	36.6	56.8	22.9	36.2	0	0	0	36.2	-36.2
VZ6: 4006 – Moderate-Grassland	4006	N/A	1.93	35.3	50.1	30.4	37.7	0	0	0	37.7	-37.7
VZ7: 4006 – Managed-Grassland	4006	N/A	1.69	35.1	57.3	15.5	31.4	0	0	0	31.4	-31.4
VZ9: 3544 – Poor	3544	N/A	0.83	59.4	5.8	63.9	28.1	0	0	0	28.1	-28.1
VZ10: 3544 - Managed	3544	N/A	1.97	45.8	24	6.1	18.8	0	0	0	18.8	-18.8

8.2 Indirect impacts

Table 23. Summary of residual indirect impacts

Indirect impact (Describe impact, e.g. transport of weeds and pathogens form the site to adjacent vegetation)	**Impacted entities** (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	**Extent** (ha or zone reference)	**Frequency**	**Duration** (long-term/ short-term/ medium-term)	**Project phase/ timing of impact** (e.g. construction, operation, rehabilitation)	**Likelihood and consequences**
Inadvertent impacts on adjacent habitat or vegetation	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. *Crinia tinnula* (Wallum Froglet). Turnix maculosus (Red-backed Button-quail)	Adjacent vegetation	Daily – during construction stage	Potentially long-term impact	Construction	Unlikely; Risk of disturbance of genetic exchange between flora species; Risk of disturbance to retained vegetation; Risk of loss/disturbance to fauna habitat (nests, foraging habitat); Minor risk of injury or mortality of fauna during clearing within Subject Land. However, managed through a CEM, implementation of sediment and erosion control and appropriate fencing to protect retained vegetation this risk will be reduced.
Reduced viability of adjacent habitat due to edge effects	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. *Crinia tinnula* (Wallum Froglet). Turnix maculosus (Red-backed Button-quail)	Adjacent vegetation	Ongoing – all stages	Potentially long-term impacts	All stages of development	Unlikely; Risk of disturbance to retained vegetation; Potential disturbance via erosion and sediment flows tor retained adjacent vegetation; Increased edge effect may have an impact on accessibility to native vegetation for threatened species. However, managed through a CEM, implementation of sediment and erosion control and appropriate fencing to protect retained vegetation this risk will be reduced.
Reduced viability of adjacent habitat due to noise, dust or light spill	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. *Crinia tinnula* (Wallum Froglet). Turnix maculosus (Red-backed Button-quail)	Adjacent vegetation/ habitat	Daily – during construction phase	Medium term impact	Construction	Moderate; Alter fauna behaviour (breeding, roosting and movement) in the immediate locality; Dust cover may impact function of flora species in immediately adjacent vegetation; increased light in the locality impacting on nocturnal fauna movements.
Transport of weeds and pathogens from the site to adjacent vegetation	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. *Crinia tinnula* (Wallum Froglet). Turnix maculosus (Red-backed Button-quail)	Adjacent and downstream vegetation	Ongoing during construction and operation	Potentially long-term impact	All stages	Moderate; Mortality and degradation of adjacent vegetation from disease; increase risk in weed presences; loss of fauna habitat. The implementation of a VMP will reduce weed infestation and ensure weed control during the construction phase.

Indirect impact (Describe impact, e.g. transport of weeds and pathogens form the site to adjacent vegetation)	**Impacted entities** (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	**Extent** (ha or zone reference)	**Frequency**	**Duration** (long-term/ short-term/ medium-term)	**Project phase/ timing of impact** (e.g. construction, operation, rehabilitation)	**Likelihood and consequences**
Increased risk of starvation or exposure, and loss of shade or shelter	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. *Crinia tinnula* (Wallum Froglet). Turnix maculosus (Red-backed Button-quail)	Adjacent habitat	Ongoing During construction and Operation	Long term	Ongoing	Unlikely; increased density of fauna biota within given areas due to habitat clearing; starvation based on an increase of competition coupled with habitat lacking resources; dispersal of local fauna due to increase in competition.
Loss of breeding habitat	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. *Crinia tinnula* (Wallum Froglet). Turnix maculosus (Red-backed Button-quail)	Adjacent breeding habitat	Ongoing	Long term	Construction	Unlikely; inadvertent impact to breeding habitat through the loss of vegetation within development, increased pressure on existing adjacent breeding habitat.
Trampling of threatened flora species	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. *Crinia tinnula* (Wallum Froglet). Turnix maculosus (Red-backed Button-quail)	Adjacent vegetation	Ongoing during construction and operation	Potentially long-term impacts	All stages	Unlikely; minor risk of workers trampling adjacent vegetation during construction; minor risk of residents entering retained area and trampling vegetation. Fencing will be installed as part of CENG plan, and ecologist will be onsite during its establishment therefore reducing the risk.
Inhibition of nitrogen fixation and increased soil salinity	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. *Crinia tinnula* (Wallum Froglet). Turnix maculosus (Red-backed Button-quail)	Adjacent vegetation	During construction	Long Term	All stages	Unlikely; minor risk of inhibition of nitrogen fixation due to increased weed pressure; minor risk due to increase in sediment runoff. Implementation of SWMP ensures that water entering retained areas will be of similar waster quality to preexisting cycles post development.
Fertiliser drift	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. *Crinia tinnula* (Wallum Froglet). Turnix maculosus (Red-backed Button-quail)	Adjacent vegetation and downstream vegetation/ waterbodies	Ongoing construction and operation	Long Term	Operational	Unlikely; increase risk of eutrophication within downstream waterbodies, reduction in overall soil health of the area.
Rubbish dumping	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney	Adjacent vegetation	Ongoing construction	Long term	Operational	Possible; moderate risk of residents dumping rubbish within retained vegetation. Being a Land Lease Community development the

Indirect impact (Describe impact, e.g. transport of weeds and pathogens form the site to adjacent vegetation)	**Impacted entities** (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	**Extent** (ha or zone reference)	**Frequency**	**Duration** (long-term/ short-term/ medium-term)	**Project phase/ timing of impact** (e.g. construction, operation, rehabilitation)	**Likelihood and consequences**
	Basin and South East Corner Bioregions. *Crinia tinnula* (Wallum Froglet). Turnix maculosus (Red-backed Button-quail)		and operation			MHE Plans of Management and Operation, and resident contracts include provisions for protecting the environment and appropriate resident behaviour. Managers of the site will carry out inspections. The VMP works will also ensure reduced impacts and risks.
Wood collection	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. *Crinia tinnula* (Wallum Froglet). Turnix maculosus (Red-backed Button-quail)	Adjacent vegetation	Ongoing construction and operation	Long Term	Operational	Possible; moderate risk of residents collecting wood within retained vegetation. Being a Land Lease Community development the MHE Plans of Management and Operation, and resident contracts include provisions for protecting the environment and appropriate resident behaviour. Managers of the site will carry out inspections. The VMP works will also ensure reduced impacts and risks.
Removal and disturbance of rocks, including bush rock	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. *Crinia tinnula* (Wallum Froglet). Turnix maculosus (Red-backed Button-quail)	Adjacent vegetation	Ongoing construction and operation	Long Term	Construction operation	Unlikely; minor risk displacement of bush rock, loss of habitat features.
Increase in predators	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. *Crinia tinnula* (Wallum Froglet). Turnix maculosus (Red-backed Button-quail)	Adjacent vegetation	Ongoing Operation	Long Term	Operational	Possible; Moderate risk introduction of domesticated predators e.g. cats, within the local area, increased risk of potential native fauna mortality.
Increase in pest animal populations	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. *Crinia tinnula* (Wallum Froglet). Turnix maculosus (Red-backed Button-quail)	Adjacent vegetation	Ongoing Construction and operation	Long Term	Construction and Operational	Probable; Moderate risk to increase populations of urban adapted species, resulting on increased competition/ risk of disease within local fauna population.
Changed fire regimes	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney	Adjacent vegetation	Ongoing Construction	Long Term	Construction and Operational	Unlikely; Moderate risk to changes in successional flora post fire events, leading to an increased risk of weeds; Minor risk to

Indirect impact (Describe impact, e.g. transport of weeds and pathogens form the site to adjacent vegetation)	**Impacted entities** (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	**Extent** (ha or zone reference)	**Frequency**	**Duration** (long-term/ short-term/ medium-term)	**Project phase/ timing of impact** (e.g. construction, operation, rehabilitation)	**Likelihood and consequences**
	Basin and South East Corner Bioregions. *Crinia tinnula* (Wallum Froglet). Turnix maculosus (Red-backed Button-quail)		and Operation			increase of intensity of fire events due to improper fire regimes.
Disturbance to specialist breeding and foraging habitat (eg beach nesting for shorebirds)	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. *Crinia tinnula* (Wallum Froglet). Turnix maculosus (Red-backed Button-quail)	Adjacent vegetation and waterbodies	Daily Construction	Short Term	Construction	Unlikely; Minor risk; specialist breeding species not detected within the site's boundaries, as such it is considered unlikely that the proposal would impact upon these specialist species.

8.3 Prescribed impacts

8.3.1 Non-native vegetation

8.3.1.1 Nature

Non-native vegetation occurs through the sites varying vegetation zones. Exotic flora species will be removed from areas of native vegetation that are to be retained as part of the proposal.

8.3.1.2 Extent

Exotic vegetation makes up 0.06 ha of vegetation found within the site.

8.3.1.3 Duration

Non-native vegetation occurring within the site will be removed through the clearing process undertaken for the development of the proposed subdivision. However defined area of 0.06 ha of non-native vegetation is to be re-seeded post construction works with native species to improve functionality for threatened species utilisation particularly *Turnix maculosus* (Red-backed buttonquail).

8.3.1.4 Consequences

The removal of non-native vegetation within the site is not expected to incur impacts to threatened species utilising the areas as nonnative vegetation identified within the site does not provide functional habitat for threatened species. Furthermore, remediation to identified areas of exotic vegetation should function to increase utilisation of identified areas by threatened species.

8.3.2 Waterbodies, water quality and hydrological processes

8.3.2.1 Nature

The proposal includes the removal of one (1) dam located within the proposal footprint, the site does not contain any mapped watercourses. Impacts to species that utilise the waterbodies on the site will be mitigated by the retention of one dam located along the Eastern boundary of the Subject Land along with the creation of two (2) quality basins (a total of four basins will be established through-out the entirety of the subdivision). These basins will mimic to a degree the foraging function of the existing dam, furthermore the degraded nature of the dam would limit the reach of potential consequences for threatened species.

8.3.2.2 Extent

The extent of these impacts includes onsite features as discussed, the removal of one dam located within the development footprint, along with potential impacts to downstream waterbodies and watercourses along with hydrological processes within the site. The quality basins to be established within the site will function to mitigate potential impacts to downstream and improve overall water quality on gaining streams to the south of the site, furthermore, planned yearly discharging of stormwater basins to the south and east of the site will aim to provide consistent inundation and flooding levels to areas of retained TEC within the southern and eastern portion of the site. These processes will further mitigate potential impacts to threatened species and mimic the existing water cycle.

8.3.2.3 Duration

The durations of these impacts area both immediate (during construction) and long term (during operation). It is expected that long term alteration to hydrology will be mitigated though the use of discharging practices, along with an increase of water quality due to standing quality basins. Short term impacts during construction period have the potential to negatively impact riparian habitat, and controls will be required to avoid indirect impacts. Such controls will be managed through the CEMP and consultation with ecologist.

8.3.2.4 Consequences

Unmanaged impacts to water quality within retained dam along with riparian habitats located within the south and east portions of the site could preclude threatened species form utilising on-site riparian habitat. However, it is not anticipated that the temporary reduction of available waterbodies within the site will negatively impact upon threatened species and their ability to forage/breed as higher quality riparian vegetation exists within the southern portion of the Study Area and will be retained as part of the proposal. Suitable controls for erosion and sedimentation will be required during construction to minimize potential impacts to surrounding waterbodies/ watercourses.

8.3.3 Vehicle strikes

Threatened fauna or protected fauna that are part of a TEC that are at risk of vehicle strike (identified in Section 6)

Table 24. Residual prescribed impacts – vehicle strikes

Species Name (Common Name)	SAII entity	Likelihood	Consequences
Aepyprymnus rufescens (Rufous Bettong)	No	Unlikely as species was not detected on site despite sufficient survey effort	Increase in mortality rate of individuals, with potential impacts to total population size within the local area.
Burhinus grallarius (Bush Stone-curlew)	No	Unlikely as species was not detected on site despite sufficient survey effort	Increase in mortality rate of individuals, with potential impacts to total population size within the local area.
Crinia tinnula (Wallum Froglet)	No	Unlikely as species was not detected on site despite sufficient survey effort	Increase in mortality rate of individuals, with potential impacts to total population size within the local area.
Litoria aurea (Green and Golden Bell Frog)	No	Unlikely as species was not detected on site despite sufficient survey effort	Increase in mortality rate of individuals, with potential impacts to total population size within the local area.
Mixophyes iteratus (Giant Barred Frog)	No	Unlikely as species was not detected on site despite sufficient survey effort	Increase in mortality rate of individuals, with potential impacts to total population size within the local area.
Phascolarctos cinereus (Koala)	No	Unlikely as species was not detected on site despite sufficient survey effort	Increase in mortality rate of individuals, with potential impacts to total population size within the local area.
Planigale maculate (Common planigale)	No	Unlikely as species was not detected on site despite sufficient survey effort	Increase in mortality rate of individuals, with potential impacts to total population size within the local area.
Uperoleia mahonyi (Mahonys' Toadlet)	No	Unlikely as species was not detected on site despite sufficient survey effort	Increase in mortality rate of individuals, with potential impacts to total population size within the local area.

8.4 Mitigating residual impacts – management measures and implementation

Table 25. Summary of proposed mitigation and management measures for residual impacts (direct, indirect and prescribed)

Mitigation measure	Method/technique	Timing	Freq.	Responsibility	Performance criteria	Corrective Action	Likely efficacy (including risk of failure)	MNES (when relevant)
Mitigate direct loss of individuals of threatened species associated with removal of habitat.	Vegetation removal works are to occur outside core breeding periods for species known to use habitat on site wherever possible. Where not possible supervision by an ecologist is required to ensure harm to individual entities is minimised.	Summer	N/A	Proponent/ Ecologist	Works plan indicates tree clearing areas during optimal months	Cease site works and refer to technique & performance criteria and timing of activities	Moderate. Risk of failure remains, as no timing can mitigate risks to all species.	N/A
	Pre-clearance survey of trees to be removed.	Prior to commencement of works for each stage	N/A	Proponent/ Ecologist	Tree pre-clearance survey completed maximum one week prior to removal.	Cease site works, revert to technique & performance criteria	Good. Risk of losses significantly reduced	N/A
	Mark habitat trees.	Prior to commencement of works for each stage	N/A	Proponent	No breeding fauna observed at time of clearing	Cease site works, revert to technique & performance criteria	Good. Risk of losses significantly reduced	N/A
	Under scrubbing of vegetation and removal of non-habitat trees to occur in a sequence to allow for resident fauna to move to adjacent areas of habitat.	Prior to commencement of works for each stage	N/A	Proponent	All habitat trees flagged and determine fauna presences (utilisation)	Cease site works, revert to technique & performance criteria	Good. Risk of losses significantly reduced	N/A
	Hollow-bearing and habitat trees sectionally dismantled by arborist, or if not practical trees soft felled.	During clearing works for each stage	N/A	Proponent/ Civil contractor/s	No injury or mortality of native fauna during clearing works	Cease site works, revert to technique & performance criteria	Good. Risk of losses significantly reduced	
	Felling supervised by Ecologist.	During clearing works for each stage	N/A	Proponent/ Ecologist	Hollows checked for fauna. Welfare managed	Cease site works, revert to technique	Moderate. Risk of failure remains. Though this is a late	N/A

Mitigation measure	Method/technique	Timing	Freq.	Responsibility	Performance criteria	Corrective Action	Likely efficacy (including risk of failure)	MNES (when relevant)
					in accordance with ethics approval	& performance criteria	step in an otherwise effective process	
	Felled trees left in situ before stockpiling to allow for any fauna to relocate.	After felling of hollow-bearing and habitat trees, prior to stockpiling	N/A	Proponent	Trees left overnight after felling, stockpiled within clearing boundary	Cease site works and refer to technique & performance criteria and timing of activities	Low. Risk of failure remains, though this method is the last step in an effective process, so risk is low.	N/A
	Develop a Biodiversity Management Plan (BMP) addressing management actions of habitat removal.	Prior to commencement of works for each stage	N/A	Proponent	Approved BMP prior to construction of each stage	Cease site works, revert to technique & performance criteria	Good. Risk of losses significantly reduced by documenting an effective process	N/A
Mitigate indirect impacts to retained vegetation adjacent to the Subject Land	Establish Tree Protection Zones (TPZ) around retained habitat trees on the boundary of the development/ within APZ area.	Prior to commencement of works for each stage	N/A	Proponent/ Civil contractor/s	TPZ is in accordance with Australian Standards AS4970-2009. No-Go signs & fencing of boundary	Cease site works, revert to technique & performance criteria	Good. Risk of losses significantly reduced	N/A
	Develop a weed management protocol to be included in Construction Environment Management Plan (CEMP) for constructions period to limit degradation of interface of development and retained vegetation.	Prior to commencement of works for each stage	N/A	Proponent	Approved CEMP (Inc. weed management protocols) prior to construction of each stage	Cease site works, revert to technique & performance criteria	Moderate. Risk of failure remains as mobile weed propagules difficult to control and construction spoil creates ideal habitat for the establishment of weeds of disturbance and High Threat Weeds	N/A
	Develop a Vegetation Management Plan (VMP) addressing ongoing impacts to retained and surrounding native vegetation.	Prior to commencement of works.	N/A	Proponent	Approved VMP prior to construction of each stage	Cease site works, revert to technique & performance criteria	Good. Risk of degradation significantly reduced and substantial improvement is practically achievable	N/A

Mitigation measure	Method/technique	Timing	Freq.	Responsibility	Performance criteria	Corrective Action	Likely efficacy (including risk of failure)	MNES (when relevant)
	Equipment and vehicles entering Site are cleaned of foreign soil and seed prior to entering the site.	Prior to machinery arriving on Site	Per Float	Proponent/ Civil contractor/s	Best practice hygiene protocols followed, No visible foreign material, certification available upon request	Cease site works, revert to technique & performance criteria	Moderate. Risk of failure remains as pathogens can persist in very low volumes of material	N/A
Mitigate indirect impacts to threatened species habitat retained adjacent to the Subject Land	Limit construction works to daylight hours to reduce impacts from light and noise.	For the duration of Site works	N/A	Proponent/ Civil contractor/s	No construction works to occur from dusk till dawn. Site not lit between dusk and dawn	Cease site works, revert to technique & performance criteria	Good. No risk.	N/A
	All machinery is correctly maintained and operated as per operation manual to reduce excessive noise.	For the duration of Site works	N/A	Proponent/ Civil contractor/s	No excessive noise of machinery due to poor maintenance or faulty parts	Cease site works, revert to technique & performance criteria	Moderate.	N/A
	Vehicles/machinery to observe 5-10km/h speed limit on Site to reduce dust.	For the duration of Site works	N/A	Proponent/ Civil contractor/s	No excessive dust	Cease site works, revert to technique & performance criteria	Good. Risk remains however consequence is relatively low.	N/A
Mitigating Prescribed Impacts to threatened species and their habitat	Erosion and sediment controls enacted in accordance with construction environment management plan (CEMP) to limit impacts on retained vegetation and creek lines.	Prior to commencement of works, for duration of Site works	N/A	Proponent/ Civil contractor/s	CEMP followed & modified as needed	Cease site works, revert to technique & performance criteria	Good. Significant control is achievable if implemented effectively. High consequence of failure.	N/A
	Establish Speed limits during construction and operation of the proposed development.	Prior to construction and during operation	N/A	Proponent/ Civil contractor/s	Low speed limits set to minimise vehicle strikes	Cease site works, revert to technique & performance criteria	Moderate. Risk of strikes remains and high consequence of failure.	N/A

9. Serious and irreversible impacts

9.1 Assessment for serious and irreversible impacts on biodiversity values

No impacts associated with the proposal are likely to be serious and irreversible. See **Section 5** for details of entities assessed and justification of exclusion of SAII.

Table 26. Entities at risk of an SAII

Common name	Scientific name	Reason for inclusion in assessment
N/A	*N/A*	N/A

10. Impact summary

10.1 Determine an offset requirement for impacts

10.1.1 Impacts on native vegetation and TECs or ECs (ecosystem credits)

Table 27. Impacts that do not require offset – ecosystem credits

Vegetation zone	PCT name	TEC	Impact area (ha)	TEC association	Entity at risk of an SAII?	Current VI score
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 28. Impacts that require an offset – ecosystem credits

Vegetation zone	PCT name	TEC	Impact area (ha)	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	Number of ecosystem credits required
VZ1: 4006 - Good	4006 – Northern Paperbark-Swamp Mahogany Saw-sedge Forest	Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions.	0.05	91.9	0	-91.9	2	2
VZ2: 4006 – Intact			0.4	68.2	0	-68.2	2	14
VZ3: 4006 - Moderate			0.17	40.1	0	-40.1	2	3
VZ4: 4006 – Poor		Not representative of a TEC	3.51	34.1	0	-34.1	1.5	45
VZ5: 4006 – Poor-Grassland			1.52	36.2	0	-36.2	1.5	21
VZ6: 4006 – Moderate-Grassland			1.93	37.7	0	-37.7	1.5	27
VZ7: 4006 – Managed-Grassland			1.69	31.4	0	-31.4	1.5	20
VZ9: 3544 – Poor	3544 – Coastal Sands Apple-Blackbutt Forest		0.83	28.1	0	-28.1	1.5	9
VZ10: 3544 - Managed			1.97	18.8	0	-18.8	1.5	14
							Total credits	155

10.1.2 Impacts on threatened species and their habitat (species credits)

Table 29. Impacts that require an offset – species credits

Common name	Scientific name	BC Act status	EPBC Act status	Loss of habitat (ha) or individuals	Biodiversity risk weighting	Number of species credits required
(Wallum Froglet)	*Crinia tinnula*	Vulnerable	Not Listed	1.7	Moderate (1.5)	24
(Red-backed Button-quail)	*Turnix maculosus*	Vulnerable	Not Listed	12.1	High (2.00)	201
					Total credits	225

10.2 Impacts that do not need further assessment

Table 30. Impacts that do not need further assessment for ecosystem credits

Impact	Location within Subject Land	Justification why no further assessment is required
N/A	N/A	N/A

11. Biodiversity credit report

The BAM-C credit report must identify the numbers and classes of biodiversity credits required to be retired in accordance with the like-for-like requirements of the offset rules and those that could be retired in accordance with the variation rules. The BDAR must be submitted to the decision-maker within 14 days of the date the BAM-C credit report was finalised.

11.1 Ecosystem credits

Table 31. Ecosystem credit class and matching credit profile

Ecosystem credit	Attributes shared with matching credits						
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC or EC	Offset trading group (BAM Section 10.2, Tables 4 & 5)	Hollow bearing trees present?	IBRA subregion (in which proposal is located)
19	4006 - Northern Paperbark-Swamp Mahogany Saw-sedge Forest	Coastal Swamp Forests	Forested Wetlands	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Yes	Karuah Manning
113		Coastal Swamp Forests	Forested Wetlands	Not a TEC	Coastal Swamp Forests - < 50% cleared group (including Tier 4 or higher threat status).	No	Karuah Manning
23	3544 - Coastal Sands Apple-Blackbutt Forest	Coastal Dune Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrubby sub-formation)	Not a TEC	Coastal Dune Dry Sclerophyll Forests - <50% cleared group (including tier 4 or higher threat status)	No	Karuah Manning

11.2 Species credits

Table 32. Species credit class and matching credit profile

Species credit	Attributes shared with matching credits				
	Name of threatened species	Kingdom	BC Act status	EPBC Act status	IBRA region
24	*Crinia tinnula*	Animal	Vulnerable	Not Listed	Karuah Manning

Species credit	Attributes shared with matching credits				
	Name of threatened species	Kingdom	BC Act status	EPBC Act status	IBRA region
201	*Turnix maculosus*	Animal	Vulnerable	Not Listed	Karuah Manning

12. References

Royal Botanic Gardens and Domain Trust, 2024 – *PlantNET (The Plant Information Network System)*, Sydney, https://plantnet.rbgsyd.nsw.gov.au (accessed ongoing).

DCCEEW (2024), *Commonwealth Protected Matters of National Significance search tool,* Department of Climate Change, Energy, Environment and Water, Canberra, Accessed January 2024, https://pmst.awe.gov.au/

Lemckert, F., & Mahony, M. (2008). *Core calling periods of the frogs of temperate New South Wales, Australia*. Herpetological Conservation and Biology, 3(1), 71-76.

NSW DPE (2022a)*, Koala (Phascolarctos cinereus) Biodiversity Assessment Method Survey Guide,* Department of Planning and Environment, Parramatta

NSW DPE (2022b)*, NSW Department of Planning and Environment Threatened – Threatened reptiles Biodiversity Assessment Method survey guide,* Department of Planning and Environment, Parramatta

NSW DPIE (2020a)*, Biodiversity Assessment Methodology (BAM):* Department of Planning, Industry and Environment, Parramatta

NSW DPIE (2020b)*, Biodiversity Assessment Method Operational Manual- Stage 1,* Department of Planning, Industry and Environment

NSW DPIE (2020c)*, NSW Survey Guide for Threatened Frogs – A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method,* Department of Planning, Industry and Environment, Parramatta

NSW DPIE (2020d) *Surveying threatened plants and their habitats, NSW survey guide for the Biodiversity Assessment Method*, Department of Planning, Industry and Environment, Parramatta.

NSW DCCEEW (2018) *Biodiversity Values Map,* NSW Department of Climate Change, Energy, the Environment and Water, Parramatta,

NSW DCCEEW (2020), *NSW Landscape - Modified (DEM-S) Elevation layer,* NSW Department of Climate Change, Energy, Environment and Water, Parramatta

NSW DCCEEW (2022), *NSW State Vegetation Type Map,* NSW Department of Climate Change, Energy, Environment and Water, Parramatta

NSW DCCEEW (2024a)*, Biodiversity Values Map and Threshold tool,* NSW Department of Climate Change, Energy, the Environment and Water, Parramatta*,* Accessed online June 2024 – *https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap*

NSW DCCEEW (2024b)*, NSW Digital Topographic Database,* Department of Planning and Environment, Parramatta

NSW DCCEEW (2024c) *NSW BioNet. Threatened Biodiversity Data Collection*, NSW Department of Climate Change, Energy, Environment and Water, Parramatta, Accessed online June 2024 – http://www.bionet.nsw.gov.au/

NSW DCCEEW (2024d), *NSW BioNet (VIS),* NSW Department of Climate Change, Energy, Environment and Water, Parramatta, Accessed online June 2024, https://vegetation.bionet.nsw.gov.au/

NSW DCCEEW (2024e), *NSW Native Vegetation Area Clearing Estimate (NVACE),* NSW Department of Climate Change, Energy, Environment and Water, Parramatta

NSW OEH 2018*, NSW survey guideline for the Biodiversity Assessment Method; 'Species credit' threatened bats and their habitats,* Office of Environment and Heritage, Parramatta

13. Figures

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 1:
SITE LOCATION

Legend

- Subject Land
- Study Area
- Cadastral Boundary
- Proposed Layout

N
W E
S

0 60 120 180 240

Metres
1:3000

MJD Environmental

Aerial: Nearmap (2024) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services (2024) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-15 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 2:
NATIVE VEGETATION EXTENT

Legend

- Subject Land
- Study Area
- 1500 m Buffer from Subject Land
- Coastal Wetland (SEPP)
- Coastal Wetland Proximity Area (SEPP)
- Native Vegetation
- NPWS Nature Reserve

Mitchell Landscape

- Manning - Macleay Barriers and Beaches
- Manning - Macleay Coastal Alluvial Plains

Riparian Buffer

- 10 m
- 50 m

Watercourse

- 1st Order Stream
- 7th Order Stream

N
W E
S

0 200 400 600 800

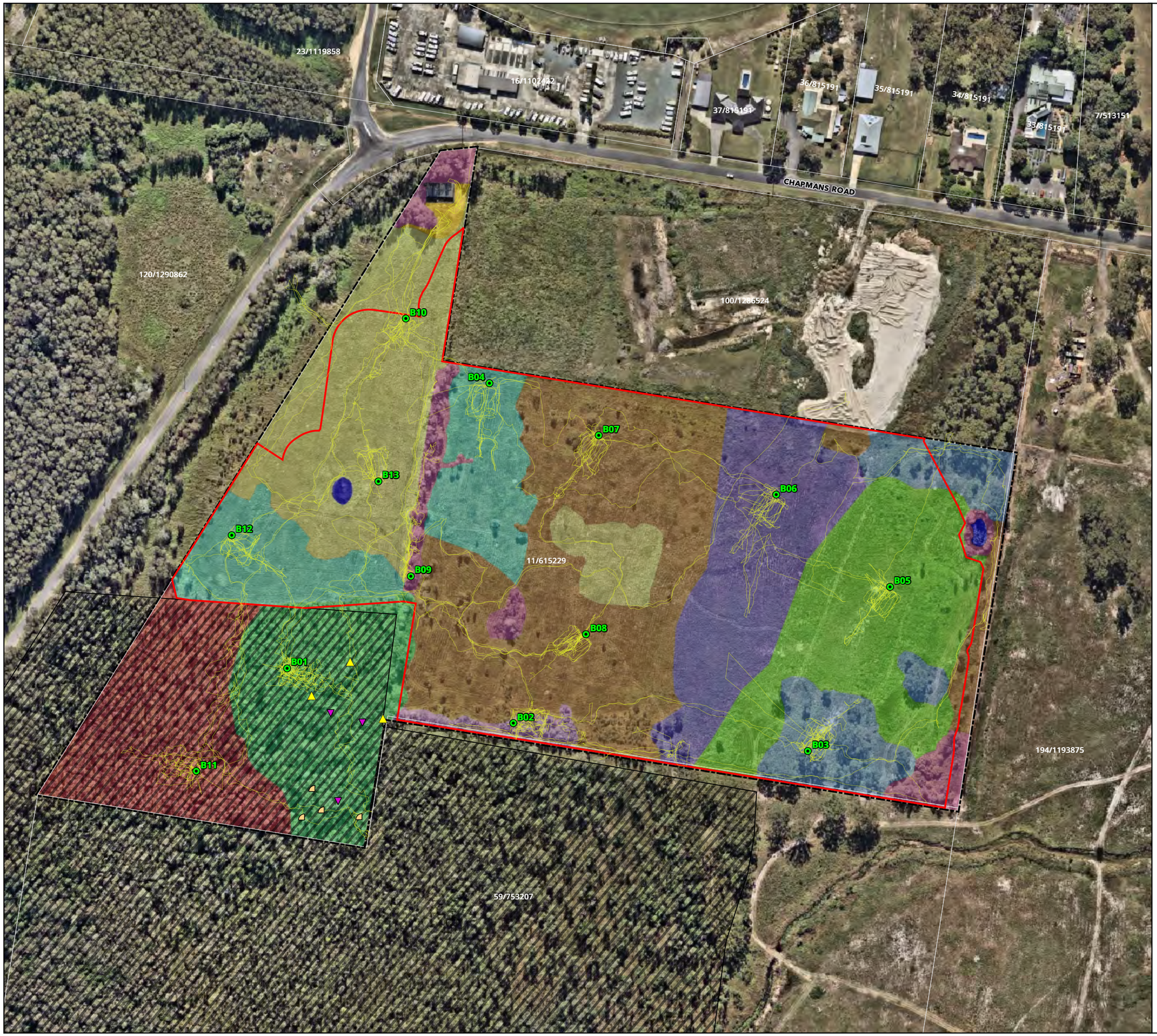
Metres
1:12000

MJD Environmental

Aerial: Nearmap (2024) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services (2024), © State Government of NSW and NSW Department of Climate Change, Energy, the Environment and Water (2022, 2016) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-21 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 3:
PLANT COMMUNITY TYPES & VEGETATION ZONES



Legend

- Subject Land
- Study Area
- Cadastral Boundary
- Biodiversity Values Map
- Survey Transects
- BAM Plot
- Hollow Bearing Tree
- Stick Nest
- Termitarium

Vegetation

- VZ1 - PCT: 4006 - Good
- VZ2 - PCT: 4006 - Intact
- VZ3 - PCT: 4006 - Moderate
- VZ4 - PCT: 4006 - Poor
- VZ5 - PCT: 4006 - Poor-Grassland
- VZ6 - PCT: 4006 - Moderate-Grassland
- VZ7 - PCT: 4006 - Managed-Grassland
- VZ8 - PCT: 4004 - Good
- VZ9 - PCT: 3544 - Poor
- VZ10 - PCT: 3544 - Managed
- Exotic
- Structure
- Waterbody

N
W E
S

0 50 100 150 200

Metres
1:2500

MJD Environmental

Aerial: Nearmap (2024) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services (2024) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-15 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 4:
TARGETED FLORA SURVEY
MAY 2023

Legend

- Subject Land
- Study Area
- Cadastral Boundary
- Survey Transects

Vegetation

- VZ1 - PCT: 4006 - Good
- VZ2 - PCT: 4006 - Intact
- VZ3 - PCT: 4006 - Moderate
- VZ4 - PCT: 4006 - Poor
- VZ5 - PCT: 4006 - Poor-Grassland
- VZ6 - PCT: 4006 - Moderate-Grassland
- VZ7 - PCT: 4006 - Managed-Grassland
- VZ8 - PCT: 4004 - Good
- VZ9 - PCT: 3544 - Poor
- VZ10 - PCT: 3544 - Managed
- Exotic
- Structure
- Waterbody

N
W E
S

0 50 100 150 200

Metres
1:2500

MJD Environmental

Aerial: Nearmap (2024) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services (2024) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-15 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 5:
TARGETED FLORA SURVEY
JULY 2023

Legend

- Subject Land
- Study Area
- Cadastral Boundary
- Survey Transects

Vegetation

- VZ1 - PCT: 4006 - Good
- VZ2 - PCT: 4006 - Intact
- VZ3 - PCT: 4006 - Moderate
- VZ4 - PCT: 4006 - Poor
- VZ5 - PCT: 4006 - Poor-Grassland
- VZ6 - PCT: 4006 - Moderate-Grassland
- VZ7 - PCT: 4006 - Managed-Grassland
- VZ8 - PCT: 4004 - Good
- VZ9 - PCT: 3544 - Poor
- VZ10 - PCT: 3544 - Managed
- Exotic
- Structure
- Waterbody

N
W E
S

0 50 100 150 200

Metres
1:2500

MJD Environmental

Aerial: Nearmap (2024) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services (2024) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-15 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 6: TARGETED FLORA SURVEY NOVEMBER 2023

Legend

- Subject Land
- Study Area
- Cadastral Boundary
- Survey Transects

Vegetation

- VZ1 - PCT: 4006 - Good
- VZ2 - PCT: 4006 - Intact
- VZ3 - PCT: 4006 - Moderate
- VZ4 - PCT: 4006 - Poor
- VZ5 - PCT: 4006 - Poor-Grassland
- VZ6 - PCT: 4006 - Moderate-Grassland
- VZ7 - PCT: 4006 - Managed-Grassland
- VZ8 - PCT: 4004 - Good
- VZ9 - PCT: 3544 - Poor
- VZ10 - PCT: 3544 - Managed
- Exotic
- Structure
- Waterbody

N W E S

0 50 100 150 200

Metres
1:2500

MJD Environmental

Aerial: Nearmap (2024) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services (2024) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-15 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 7:
TARGETED FLORA SURVEY
FEBRUARY 2024

Legend

- Subject Land
- Study Area
- Cadastral Boundary
- Survey Transects

Vegetation

- VZ1 - PCT: 4006 - Good
- VZ2 - PCT: 4006 - Intact
- VZ3 - PCT: 4006 - Moderate
- VZ4 - PCT: 4006 - Poor
- VZ5 - PCT: 4006 - Poor-Grassland
- VZ6 - PCT: 4006 - Moderate-Grassland
- VZ7 - PCT: 4006 - Managed-Grassland
- VZ8 - PCT: 4004 - Good
- VZ9 - PCT: 3544 - Poor
- VZ10 - PCT: 3544 - Managed
- Exotic
- Structure
- Waterbody

N
W E
S

0 50 100 150 200

Metres
1:2500

MJD Environmental

Aerial: Nearmap (2024) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services (2024) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-15 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 8:
TARGETED FLORA SURVEY
APRIL 2024

Legend

- Subject Land
- Study Area
- Cadastral Boundary
- Survey Transects

Vegetation

- VZ1 - PCT: 4006 - Good
- VZ2 - PCT: 4006 - Intact
- VZ3 - PCT: 4006 - Moderate
- VZ4 - PCT: 4006 - Poor
- VZ5 - PCT: 4006 - Poor-Grassland
- VZ6 - PCT: 4006 - Moderate-Grassland
- VZ7 - PCT: 4006 - Managed-Grassland
- VZ8 - PCT: 4004 - Good
- VZ9 - PCT: 3544 - Poor
- VZ10 - PCT: 3544 - Managed
- Exotic
- Structure
- Waterbody

N
W E
S

0 50 100 150 200

Metres
1:2500

MJD Environmental

Aerial: Nearmap (2024) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services (2024) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-15 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 9:
TARGETED FLORA SURVEY
AUGUST-SEPTEMBER 2024

Legend

- Subject Land
- Study Area
- Cadastral Boundary
- Survey Transects

Vegetation

- VZ1 - PCT: 4006 - Good
- VZ2 - PCT: 4006 - Intact
- VZ3 - PCT: 4006 - Moderate
- VZ4 - PCT: 4006 - Poor
- VZ5 - PCT: 4006 - Poor-Grassland
- VZ6 - PCT: 4006 - Moderate-Grassland
- VZ7 - PCT: 4006 - Managed-Grassland
- VZ8 - PCT: 4004 - Good
- VZ9 - PCT: 3544 - Poor
- VZ10 - PCT: 3544 - Managed
- Exotic
- Structure
- Waterbody

N
W E
S

0 50 100 150 200

Metres
1:2500

MJD Environmental

Aerial: Nearmap (2024) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services (2024) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-15 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 10:
TARGETED FLORA SURVEY
NOVEMBER 2024

Legend

- Subject Land
- Study Area
- Cadastral Boundary
- Survey Transects

Vegetation

- VZ1 - PCT: 4006 - Good
- VZ2 - PCT: 4006 - Intact
- VZ3 - PCT: 4006 - Moderate
- VZ4 - PCT: 4006 - Poor
- VZ5 - PCT: 4006 - Poor-Grassland
- VZ6 - PCT: 4006 - Moderate-Grassland
- VZ7 - PCT: 4006 - Managed-Grassland
- VZ8 - PCT: 4004 - Good
- VZ9 - PCT: 3544 - Poor
- VZ10 - PCT: 3544 - Managed
- Exotic
- Structure
- Waterbody

N
W E
S

0 50 100 150 200

Metres
1:2500

MJD Environmental

Aerial: Nearmap (2024) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services (2024) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-15 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 11: FAUNA SURVEY AVES

Legend

- Subject Land
- Study Area
- Cadastral Boundary
- Glossy Black Cockatoo Survey
- Nocturnal Survey Transects
- Beach stone-curlew (*Esacus neglectus*)
  Bush stone-curlew (*Burhinus grallarius*)
  Call Playback
- Hollow Bearing Tree
- Stick Nest
- Terrarium

Vegetation

- VZ1 - PCT: 4006 - Good
- VZ2 - PCT: 4006 - Intact
- VZ3 - PCT: 4006 - Moderate
- VZ4 - PCT: 4006 - Poor
- VZ5 - PCT: 4006 - Poor-Grassland
- VZ6 - PCT: 4006 - Moderate-Grassland
- VZ7 - PCT: 4006 - Managed-Grassland
- VZ8 - PCT: 4004 - Good
- VZ9 - PCT: 3544 - Poor
- VZ10 - PCT: 3544 - Managed
- Exotic
- Structure
- Waterbody

N W E S

0 50 100 150 200

Metres
1:2500

MJD Environmental

Aerial: Nearmap (2024) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services (2024) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-15 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 12:
FAUNA SURVEY
HERPETOFAUNA

Legend

- Subject Land
- Study Area
- Cadastral Boundary
- Frog Survey Transects
- Giant Dragonfly Survey Transects
- Nocturnal Survey Transects
- Frog Call Playback
- Water Sample

Vegetation

- VZ1 - PCT: 4006 - Good
- VZ2 - PCT: 4006 - Intact
- VZ3 - PCT: 4006 - Moderate
- VZ4 - PCT: 4006 - Poor
- VZ5 - PCT: 4006 - Poor-Grassland
- VZ6 - PCT: 4006 - Moderate-Grassland
- VZ7 - PCT: 4006 - Managed-Grassland
- VZ8 - PCT: 4004 - Good
- VZ9 - PCT: 3544 - Poor
- VZ10 - PCT: 3544 - Managed
- Exotic
- Structure
- Waterbody

N
W E
S

0 50 100 150 200

Metres
1:2500

MJD Environmental

Aerial: Nearmap (2024) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services (2024) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-21 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 13:
FAUNA SURVEY
MAMMALS TRAP EFFORT

Legend

- Subject Land
- Study Area
- Cadastral Boundary
- Camera Trap - Arboreal
- Camera Trap - Terrestrial
- Pitfall Trap Array

Vegetation

- VZ1 - PCT: 4006 - Good
- VZ2 - PCT: 4006 - Intact
- VZ3 - PCT: 4006 - Moderate
- VZ4 - PCT: 4006 - Poor
- VZ5 - PCT: 4006 - Poor-Grassland
- VZ6 - PCT: 4006 - Moderate-Grassland
- VZ7 - PCT: 4006 - Managed-Grassland
- VZ8 - PCT: 4004 - Good
- VZ9 - PCT: 3544 - Poor
- VZ10 - PCT: 3544 - Managed
- Exotic
- Structure
- Waterbody

N
W E
S

0 50 100 150 200

Metres
1:2500

MJD Environmental

Aerial: Nearmap (2024) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services (2024) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-15 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 14:
FAUNA SURVEY
MAMMALS SEARCH EFFORT

Legend

- Subject Land
- Study Area
- Cadastral Boundary
- Nocturnal Survey Transects
- Diurnal Survey Transects
- Koala SAT

Vegetation

- VZ1 - PCT: 4006 - Good
- VZ2 - PCT: 4006 - Intact
- VZ3 - PCT: 4006 - Moderate
- VZ4 - PCT: 4006 - Poor
- VZ5 - PCT: 4006 - Poor-Grassland
- VZ6 - PCT: 4006 - Moderate-Grassland
- VZ7 - PCT: 4006 - Managed-Grassland
- VZ8 - PCT: 4004 - Good
- VZ9 - PCT: 3544 - Poor
- VZ10 - PCT: 3544 - Managed
- Exotic
- Structure
- Waterbody

N
W E
S

0 50 100 150 200

Metres
1:2500

MJD Environmental

Aerial: Nearmap (2024) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services (2024) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-15 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 15:
FAUNA SURVEY
MICROCHIROPTERA

Legend

- Subject Land
- Study Area
- Cadastral Boundary
- Harp Trap
- Ultrasonic Recorder

Vegetation

- VZ1 - PCT: 4006 - Good
- VZ2 - PCT: 4006 - Intact
- VZ3 - PCT: 4006 - Moderate
- VZ4 - PCT: 4006 - Poor
- VZ5 - PCT: 4006 - Poor-Grassland
- VZ6 - PCT: 4006 - Moderate-Grassland
- VZ7 - PCT: 4006 - Managed-Grassland
- VZ8 - PCT: 4004 - Good
- VZ9 - PCT: 3544 - Poor
- VZ10 - PCT: 3544 - Managed
- Exotic
- Structure
- Waterbody

N
W E
S

0 50 100 150 200

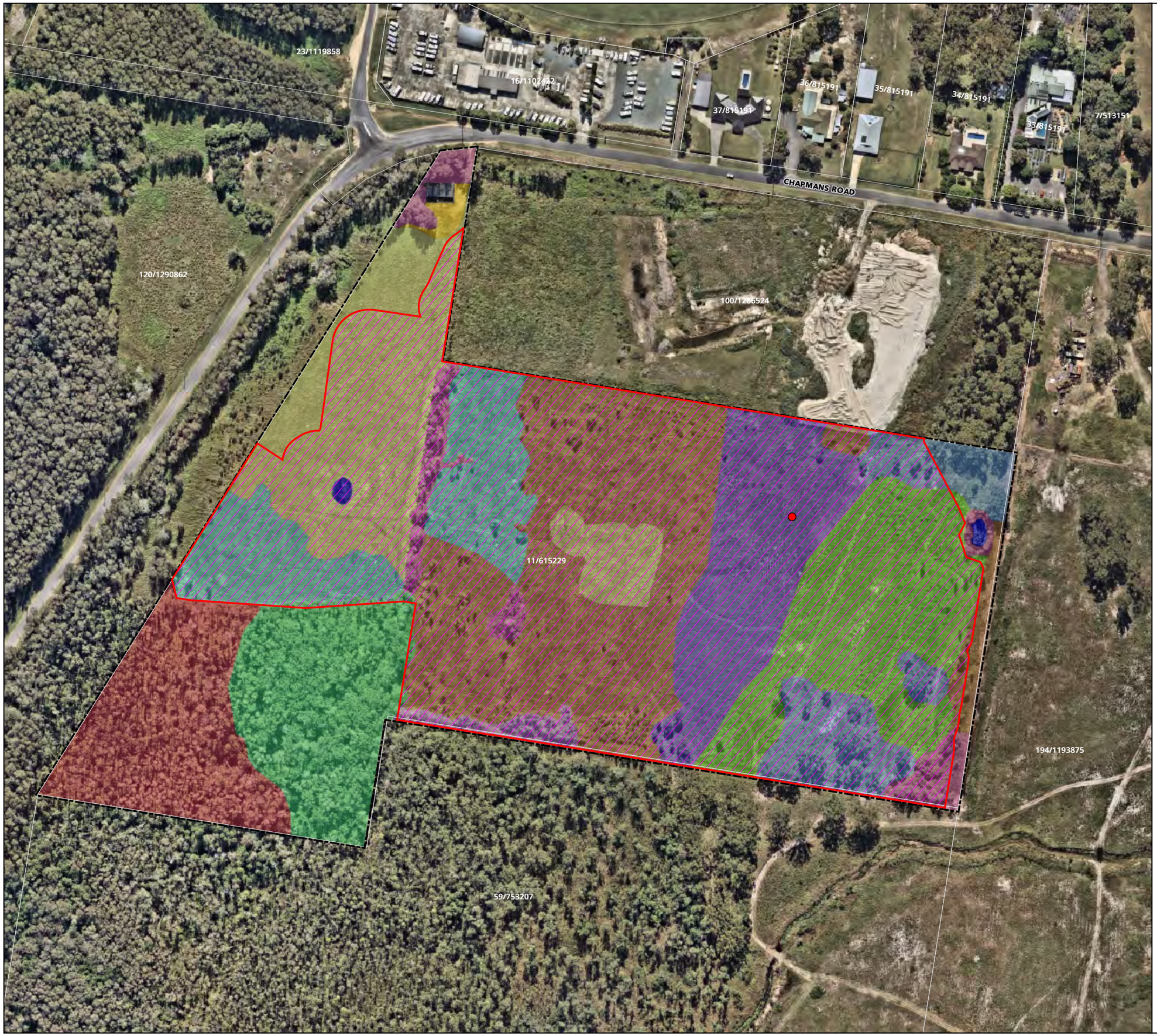
Metres
1:2500

MJD Environmental

Aerial: Nearmap (2024) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services (2024) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-21 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 16:
SPECIES POLYGON
TURNIX MACULOSUS



Legend

- Subject Land
- Study Area
- Cadastral Boundary
- Species Polygon
  Red-backed buttonquail
  (*Turnix maculosus*)
- Species Record
  Red-backed buttonquail
  (*Turnix maculosus*)

Vegetation

- VZ1 - PCT: 4006 - Good
- VZ2 - PCT: 4006 - Intact
- VZ3 - PCT: 4006 - Moderate
- VZ4 - PCT: 4006 - Poor
- VZ5 - PCT: 4006 - Poor-Grassland
- VZ6 - PCT: 4006 - Moderate-Grassland
- VZ7 - PCT: 4006 - Managed-Grassland
- VZ8 - PCT: 4004 - Good
- VZ9 - PCT: 3544 - Poor
- VZ10 - PCT: 3544 - Managed
- Exotic
- Structure
- Waterbody

N
W E
S

0 50 100 150 200

Metres
1:2500

MJD Environmental

Aerial: Nearmap (2024) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services (2024) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-21 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 17:
SPECIES POLYGON
CRINIA TINNULA

Legend

- Subject Land
- Study Area
- Cadastral Boundary
- *Crinia tinnula* Associated Aquatic Habitat
- 50 m Buffer from Associated Aquatic Habitat
- *Crinia tinnula*

Vegetation

- VZ1 - PCT: 4006 - Good
- VZ2 - PCT: 4006 - Intact
- VZ3 - PCT: 4006 - Moderate
- VZ4 - PCT: 4006 - Poor
- VZ5 - PCT: 4006 - Poor-Grassland
- VZ6 - PCT: 4006 - Moderate-Grassland
- VZ7 - PCT: 4006 - Managed-Grassland
- VZ8 - PCT: 4004 - Good
- VZ9 - PCT: 3544 - Poor
- VZ10 - PCT: 3544 - Managed
- Exotic
- Structure
- Waterbody

N
W E
S

0 50 100 150 200

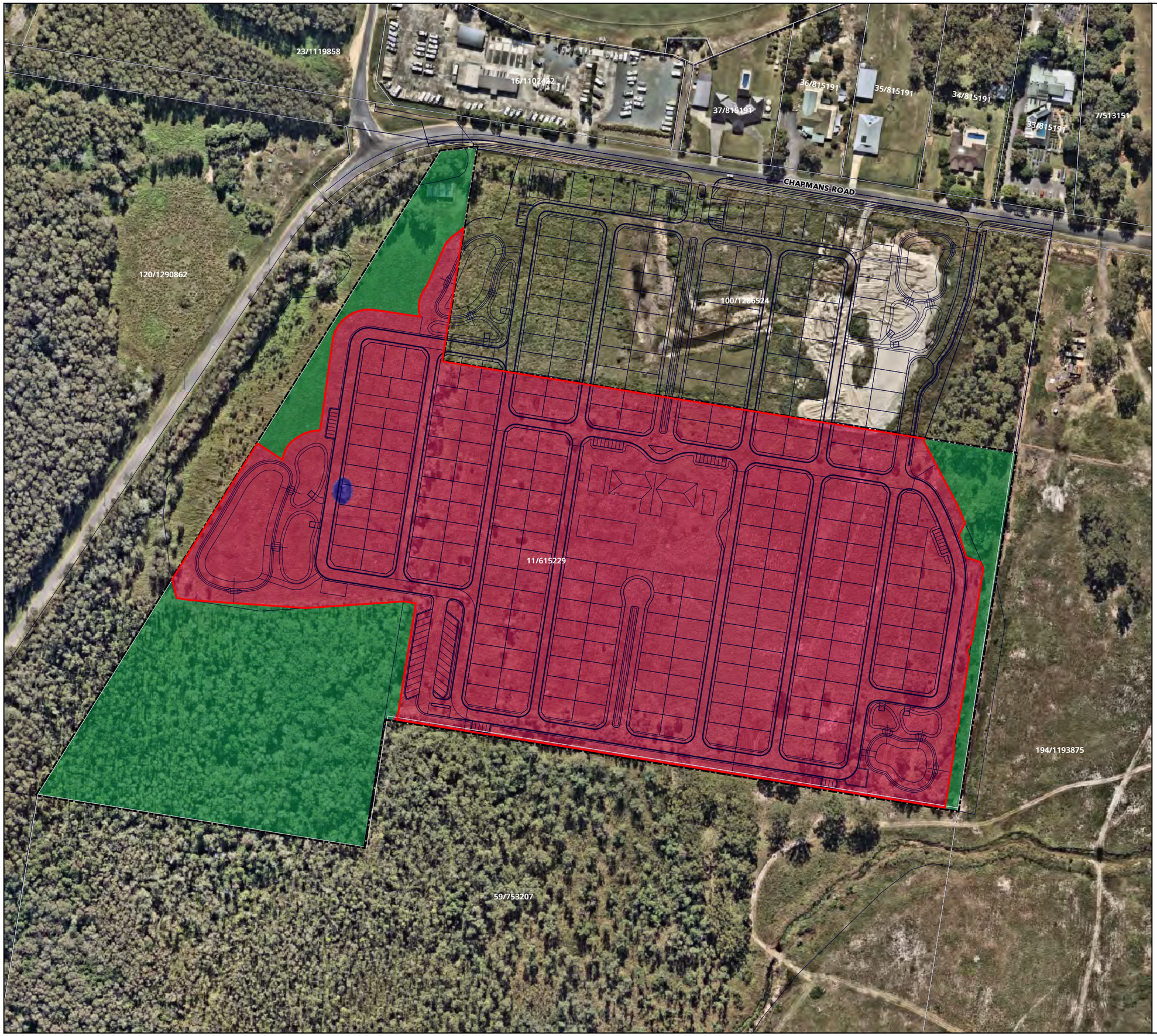
Metres
1:2500

MJD Environmental

Aerial: Nearmap (2024) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services (2024) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-15 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 18:
OFFSET REQUIREMENTS



Legend

- Subject Land
- Study Area
- Cadastral Boundary
- Proposed Layout

Vegetation

- Areas not requiring assessment
- Impacts not requiring offset
- Impacts requiring offset

N
W E
S

0 50 100 150 200

Metres
1:2500

MJD Environmental

Aerial: Nearmap (2024) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services (2024) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-15 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

Appendix A. BDAR requirements compliance

Table 33. Assessment of compliance with BDAR minimum information requirements

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
Introduction	Chapters 2 and 3	Information	
		Introduction to the biodiversity assessment including:	–
		☒ brief description of the proposal	<1.1.1>
		☒ identification of Subject Land boundary, including: ☒ operational footprint ☒ construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure	<1.1.2>
		☒ general description of the Subject Land	<1.1.2>
		☒ sources of information used in the assessment, including reports and spatial data	<1.5>
		☒ identification and justification for entering the BOS	<1.2>
		Maps and tables	
		☒ 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	Sections 3.1 and 3.2, Appendix E	Information	
		Identification of site context components and landscape features, including:	–
		☒ general description of Subject Land topographic and hydrological setting, geology and soils	<1.1.2>
		☒ per cent native vegetation cover in the assessment area (as described in BAM Section 3.2)	3.3
		☒ IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.))	<3.2.1>

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3.) and Appendix E)	<3.2.2>
		☒ wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(3.))	<3.2.2>
		☒ connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.))	<3.2.3>
		☒ karst, caves, crevices, cliffs, rocks and other geological features of significance and for vegetation clearing proposals, soil hazard features (as described in BAM Subsections 3.1.3(7.) and 3.1.3(12.))	<3.2.4>
		☒ areas of outstanding biodiversity value occurring on the Subject Land and assessment area (as described in BAM Subsection 3.1.3(8–9.))	<3.2.5>
		☐ any additional landscape features identified in any SEARs for the proposal	N/A
		☒ NSW (Mitchell) landscape on which the Subject Land occurs	<3.2.6>
		☒ details of field reconnaissance undertaken to confirm the extent and condition of landscape features and native vegetation cover (as described in Operational Manual Stage 1 Section 2.4)	<2.1>
		Maps and tables	
		☒ Site Map ☒ Property boundary ☒ Boundary of Subject Land ☒ Cadastre of Subject Land (including labelling of Lot and DP or section plan if relevant) ☒ Landscape features identified in BAM Subsection 3.1.3	<Figure 1>
		☒ Location Map ☐ Digital aerial photography at 1:1,000 scale or finer ☐ Boundary of Subject Land ☐ Assessment area (i.e. the Subject Land and either 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	<Figure 2>
		Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location Map include:	–
		☒ IBRA bioregions and subregions	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ rivers, streams and estuaries ☒ wetlands and important wetlands ☒ connectivity of different areas of habitat ☐ karst, caves, crevices, cliffs, rocks and other geological features of significance and if required, soil hazard features ☐ areas of outstanding biodiversity value occurring on the Subject Land and assessment area ☐ any additional landscape features identified in any SEARs for the proposal ☒ NSW (Mitchell) landscape on which the Subject Land occurs	<Figure 1 & Figure 2>
		Data	
		☒ All report maps as separate jpeg files	–
		Individual digital shape files of:	–
		☒ Subject Land boundary	–
		☒ assessment area (i.e. Subject Land and 1500 m buffer area) boundary	–
		☒ cadastral boundary of Subject Land	–
		☒ areas of native vegetation cover	–
		☒ landscape features	–
Native vegetation	Chapter 4, Appendix A and Appendix H	Information	
		☒ Identify native vegetation extent within the Subject Land, including cleared areas and evidence to support differences between mapped vegetation extent and aerial imagery (as described in BAM Section 4.1(1–3.) and Subsection 4.1.1)	<4.1 & Figure 7>
		☒ Provide justification for all parts of the Subject Land that do not contain native vegetation (as described in BAM Subsection 4.1.2)	<4.1.2>
		☒ Review of existing information on native vegetation including references to previous vegetation maps of the Subject Land and assessment area (described in BAM Section 4.1(3.) and Subsection 4.1.1)	<2.2.2>
		☒ Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2	<2.2.3>

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☐ Where relevant, describe the use of more appropriate local data, provide reasons that support the use of more appropriate local data and include the written confirmation from the decision-maker that they support the use of more appropriate local data (as described in BAM Subsection 1.4.2 and Appendix A)	N/A
		For each PCT within the Subject Land, describe:	–
		☒ PCT name and ID	4.2
		☒ vegetation class	4.2
		☒ extent (ha) within Subject Land	4.2
		☒ evidence used to identify a PCT including any analyses undertaken, references/sources, existing vegetation maps (BAM Section 4.2(1–3.))	4.2
		☒ plant species relied upon for identification of the PCT and relative abundance of each species	4.2
		☒ if relevant, TEC status including evidence used to determine vegetation is the TEC (BAM Subsection 4.2.2(1–2.))	4.2
		☒ estimate of per cent cleared value of PCT (BAM Subsection 4.2.1(5.))	4.2
		Describe the vegetation integrity assessment of the Subject Land, including:	–
		☒ identification and mapping of vegetation zones (as described in BAM Subsection 4.3.1)	<4.4 & Figure 10>
		☒ description of vegetation zones within the Subject Land (as described in Operational Manual Stage 1 Table 2 and Subsection 3.3.2)	<4.4 & Figure 10>
		☒ area (ha) of each vegetation zone	<4.4>
		☒ assessment of patch size (as described in BAM Subsection 4.3.2)	<4.4>
		☒ survey effort (i.e. number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4(1–2.)	<4.5.1>
		☒ use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsection 4.3.3(5.))	<4.5.3>
		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)	-

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☐ provide justification for use of local data rather than BioNet Vegetation Classification benchmark values	-
		☐ provide written confirmation from the decision-maker that they support the use of local benchmark data	-
		Maps and tables	
		☒ Map of native vegetation extent within the Subject Land at scale not greater than 1:10,000 including identification of all areas of native vegetation including areas that are ground cover only, cleared areas (as described in BAM Section 4.1(1–3.)) and all parts of the Subject Land that do not contain native vegetation (BAM Subsection 4.1.2)	<Figure 2 >
		☒ Map of PCTs within the Subject Land (as described in BAM Section 4.2(1.))	<Figure 3>
		☒ Map of vegetation zones within the Subject Land (as described in BAM Subsection 4.3.1)	<Figure 3>
		☒ Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCT boundaries	<Figure 3>
		☐ Map of TEC distribution on the Subject Land and table of TEC listing, status and area (ha)	<Figure 9>
		☒ Map of patch size locations for each native vegetation zone and table of patch size areas (as described in BAM Subsection 4.3.2)	<Figure 3>
		Table of current vegetation integrity scores for each vegetation zone within the site and including:	–
		☒ composition condition score	<4.5.2 >
		☒ structure condition score	
		☒ function condition score	
		☒ presence of hollow bearing trees	
		Data	
		☒ All report maps as separate jpeg files	–
		☒ Plot field data (MS Excel format)	
		☒ Plot field datasheets	<Appendix F>
		Digital shape files of:	–
		☒ PCT boundaries within Subject Land	–
		☒ TEC boundaries within Subject Land	–
		☒ vegetation zone boundaries within Subject Land	–
		☒ floristic vegetation survey and vegetation integrity plot locations	–

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
Threatened species	Chapter 5	Information	
		Identify ecosystem credit species likely to occur on the Subject Land, including:	–
		☒ list of ecosystem credit species derived from the BAM-C (as described in BAM Subsection 5.1.1 and Section 5.2(1.))	<5.1.1>
		☒ justification and supporting evidence for exclusion of any ecosystem credit species based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	<5.1.3>
		☒ justification for addition of any ecosystem credit species to the list	<5.1.1>
		Identify species credit species likely to occur on the Subject Land, including:	–
		☒ list of species credit species derived from the BAM-C (as described in BAM Subsection 5.1.1)	<Table12 & Table13>
		☒ justification and supporting evidence for exclusions based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	<5.1.3>
		☒ justification and supporting evidence for exclusions based on degraded habitat constraints and/or microhabitats on which the species depends (as described in BAM Subsection 5.2.2)	<5.1.3>
		☒ justification for addition of any species credit species to the list	<5.1.2>
		From the list of candidate species credit species, identify:	–
		☐ species assumed present within the Subject Land (if relevant) (as described in BAM Subsection 5.2.4(2.a.)) ☐ species present within the Subject Land on the basis of being identified on an important habitat map for a species (as described in BAM Subsection 5.2.4(2.d.)) ☐ species for which targeted surveys are to be completed to determine species presence (BAM Subsection 5.2.4(2.b.)) ☐ species for which an expert report is to be used to determine species presence (BAM Subsection 5.2.4(2.c.))	<Table 14 & Table 15>
		Present the outcomes of species credit species assessments from:	–
		☒ threatened species survey (as described in BAM Section 5.2.4)	<Table 14 & Table 15>
		☒ expert reports (if relevant) including justification for presence of the species and information used to make this determination (as described in BAM Subsection 5.2.4, Section 5.3, Box 3)	<5.4>
		Where survey has been undertaken include detailed information on:	–

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ survey method and effort (as described in BAM Section 5.3)	<Table 16 and 17>
		☒ justification of survey method and effort (e.g. citation of peer-reviewed literature) if approach differs from the department's taxa-specific survey guides or where no relevant guideline has been published	<0>
		☒ timing of survey in relation to requirements in the TBDC or the department's taxa-specific survey guides. Where survey was undertaken outside these guides include justification for the timing of surveys	<5.3>
		☒ survey personnel and relevant experience	<Declarations ii>
		☒ describe any limitations to surveys and how these were addressed/overcome	<0>
		Where an expert report has been used in place of survey (as described in BAM Section 5.3, Box 3), include:	–
		☐ justification of the use of an expert report ☐ identify the expert, provide evidence of their expert credentials and departmental approval of expert status ☐ all requirements of Box 3 have been addressed in the expert report	- (N/A
		Where use of local data is proposed (BAM Subsection 1.4.2):	–
		☐ identify relevant species ☐ identify data to be amended ☐ identify source of information for local data, e.g. published literature, additional survey data, etc. ☐ justify use of local data in preference to VIS Classification or TBDC data	N/A
		☐ provide written confirmation from the decision-maker that they support the use of local data	<Appendix G N/A>
		Species polygon completed for species credit species present within the Subject Land (assumed present or determined on the basis of survey, expert report or important habitat map) ensuring that:	–
		☒ the unit of measure for each species is documented	<Table 18 >
		for species assessed by area:	–
		☒ the polygon includes the extent of suitable habitat for the target species within the Subject Land (as described in BAM Subsection 5.2.5)	<Figure 11>
		☒ a description of, and evidence-based justification for, the habitat constraints, features or microhabitats used to map the species polygon including reference to information in the TBDC for that species and any buffers applied	<0>
		for species assessed by counts of individuals:	–

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☐ the number of individual plants present on the Subject Land (as described in BAM Subsection 5.2.5(3.))	<0>
		☐ the method used to derive this number (i.e. threatened species survey or expert report) and evidence-based justification for the approach taken	<0>
		☐ the polygon includes all individuals located on the Subject Land with a buffer of 30 m around the individuals or groups of individuals on the Subject Land	<Figure 11>
		☒ Identify the biodiversity risk weighting for each species credit species identified as present within the Subject Land (as described in BAM Section 5.4)	<Table 18 >
		Maps and tables	
		☒ Table showing ecosystem credit species in accordance with BAM Subsection 5.1.1, and identifying:	
		☒ the ecosystem credit species removed from the list	<Table 11 >
		☒ the sensitivity to gain class of each species	<Table 11>
		☒ Table detailing species credit species in accordance with BAM Section 5.2 and identifying:	<Table 12 & Table 13>
		☒ the species credit species removed from the list of species because the species is considered vagrant, out of geographic range or the habitat or microhabitat features are not present	<Table 12 & Table 13>
		☒ the candidate species credit species not recorded on the Subject Land as determined by targeted survey, expert report or important habitat map	N/A
		☒ Table detailing species credit species recorded or assumed as present within the Subject Land, habitat constraints or microhabitats associated with the species, counts of individuals (flora)/extent of suitable habitat (flora and fauna) (as described in BAM Subsection 5.2.6) and biodiversity risk weighting (BAM Section 5.4)	<5.1.2>
		☒ Map indicating the GPS coordinates of all individuals of each species recorded within the Subject Land and the species polygon for each species (as described in BAM Subsection 5.2.5)	<Figure 11>
		Data	
		☒ Digital shape files of suitable habitat identified for survey for each candidate species credit species	–
		☒ Survey locations including GPS coordinates of any plots, transects, grids	
		☒ Digital shape files of each species polygon including GPS coordinates of located individuals	–
		☒ Species polygon map in jpeg format	–
		☒ Expert reports and any supporting data used to support conclusions of the expert report	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ Field datasheets detailing survey information including prevailing conditions, date, time, equipment used, etc.	
Prescribed impacts	Chapter 6	Information	
		Identify potential prescribed biodiversity impacts on threatened entities, including:	–
		☒ karst, caves, crevices, cliffs, rocks and other geological features of significance (as described in BAM Subsection 6.1.1) ☒ occurrences of human-made structures and non-native vegetation (as described in BAM Subsection 6.1.2) ☒ corridors or other areas of connectivity linking habitat for threatened entities (as described in BAM Subsection 6.1.3) ☒ waterbodies or any hydrological processes that sustain threatened entities (as described in BAM Subsection 6.1.4)	<Table 20 >
		☐ protected animals that may use the proposed wind farm development site as a flyway or migration route (as described in BAM Subsection 6.1.5)	N/A
		☒ where the proposed development may result in vehicle strike on threatened fauna or on animals that are part of a threatened ecological community (as described in BAM Subsection 6.1.6)	<Table 25 >
		☒ Identify a list of threatened entities that may be dependent upon or may use habitat features associated with any of the prescribed impacts	
		☒ Describe the importance of habitat features to the species including, where relevant, impacts on life cycle or movement patterns (e.g. Subsection 6.1.3)	<6>
		Where the proposed development is for a wind farm:	–
		☐ identify a candidate list of protected animals that may use the development site as a flyway or migration route, including: resident threatened aerial species, resident raptor species and nomadic and migratory species that are likely to fly over the proposal area (as described in BAM Subsection 6.1.5)	N/A
		☐ provide details of targeted survey for candidate species of wind farm developments undertaken in accordance with BAM Subsection 6.1.5(2–3.)	N/A
		☐ predict the habitual flight paths for nomadic and migratory species likely to fly over the Subject Land and map the likely habitat for resident threatened aerial and raptor species (BAM Subsection 6.1.5(4.))	N/A

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Where the proposal may result in vehicle strike:	–
		☒ identify a list of threatened fauna or protected fauna species that are part of a TEC and at risk of vehicle strike due to the proposal	Section 6 <Table 25>
		Maps and tables	
		☒ Map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.)	<Figure 1 & Figure 2>
		☒ Map showing location of potential vehicle strike locations	<Figure 1>
		☐ Maps of habitual flight paths for nomadic and migratory species likely to fly over the site and maps of likely habitat for threatened aerial species resident on the site (for wind farm developments only)	<Figure 1 & Figure 2>
		Data	
		☒ Digital shape files of prescribed impact feature locations	–
		☒ Prescribed impact features map in jpeg format	–
Avoid and minimise impacts	Chapter 7	Information	
		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	<7.1.2 & 7.2.2>
		☒ routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route	<7.1.1 & 7.2.1>
		☒ alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location	<7.1.1 & 7.2.1>
		☒ 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	<7.1.1 & 7.2.1>
		☒ Describe efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design (as described in BAM Sections 7.1 and 7.2)	<7.1.2 & 7.2.2>

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ 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>
		☐ Detail measures or options considered but not implemented because they are not feasible and/or practical (e.g. due to site constraints)	
		Maps and tables	
		☒ Table of measures to be implemented to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility	<Table 21>
		☒ Map of alternative footprints considered to avoid or minimise impacts on biodiversity values; and of the final proposal footprint, including construction and operation	
		☒ Maps demonstrating indirect impact zones where applicable	<Figure 12>
		Data	
		Digital shape files of:	–
		☒ alternative and final proposal footprint	–
		☒ direct and indirect impact zones	–
		☒ Maps in jpeg format	–
Assessment of impacts	Chapter 8, Sections 8.1 and 8.2	Information	
		☒ Determine the impacts on native vegetation and threatened species habitat, including a description of direct impacts of clearing of native vegetation, threatened ecological communities and threatened species habitat (as described in BAM Section 8.1)	<Table 22 -23>
		Assessment of indirect impacts on vegetation and threatened species and their habitat including (as described in BAM Section 8.2):	–
		☒ description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal	<8.2>
		☒ documenting the consequences to vegetation and threatened species and their habitat including evidence-based justifications	<8.2>
		☒ reporting any limitations or assumptions, etc. made during the assessment	<8.2>
		☒ identification of the threatened entities and their habitat likely to be affected	<8.2>

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Assessment of prescribed biodiversity impacts (as described in BAM Section 8.3) including:	–
		assessment of the nature, extent frequency, duration and timing of impacts on the habitat of threatened species or ecological communities associated with:	–
		☒ karst, caves, crevices, cliffs, rocks and other features of geological significance	<N/A>
		☒ human-made structures	<N/A>
		☒ non-native vegetation	<8.3.1>
		☒ connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	<8.3>
		☒ movement of threatened species that maintains their life cycle	<8.3>
		☒ water quality, waterbodies and hydrological processes that sustain threatened species and threatened ecological communities	<8.3.2>
		☒ assessment of the impacts of wind turbine strikes on protected animals	<8.3.3>
		☒ assessment of the impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC	<8.3.3>
		☒ evaluate the consequences of prescribed impacts	<0>
		☒ describe impacts that are uncertain	<8.2 & 0>
		☒ document limitations to data, assumptions and predictions	<8.2 & 0>
		Maps and tables	
		☒ Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts	<**4.5.2**>
		Data	
		N/A	–
Mitigation and management of impacts	Chapter 8, Sections 8.4 and 8.5	Information	
		Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Sections 8.4 and 8.5 including:	8.4

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ techniques, timing, frequency and responsibility ☒ identify measures for which there is risk of failure ☒ evaluate the risk and consequence of any residual impacts	<Table 26 >
		☒ document any adaptive management strategy proposed	<1.1>
		Identification of measures for mitigating impacts related to:	–
		☒ displacement of resident fauna (as described in BAM Subsection 8.4.1(2.)) ☒ 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)	<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)	<1.1>
		Maps and tables	
		☒ 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 26>
		Data	
		N/A	–
Impact summary	Chapter 9	Information	
		Identification and assessment of impacts on TECs and threatened species that are at risk of a serious and irreversible impacts (SAII, in accordance with BAM Section 9.1) including:	–
		☒ addressing all criteria in Subsection 9.1.1 for each TEC listed as at risk of an SAII present on the Subject Land	<Table 27>
		☐ for each TEC, report the extent of the TEC in NSW	
		☐ addressing all criteria in Subsection 9.1.2 for each threatened species at risk of an SAII present on the Subject Land	
		☐ for each threatened species, report the population size in NSW	
		☐ documenting assumptions made and/or limitations to information ☐ documenting all sources of data, information, references used or consulted ☐ clearly justifying why any criteria could not be addressed	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☐ Identification of impacts requiring offset in accordance with BAM Section 9.2	-
		☐ Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1(3.)	-
		☐ Identification of areas not requiring assessment in accordance with BAM Section 9.3	-
		Maps and tables	
		☐ Map showing the extent of TECs at risk of an SAII within the Subject Land	-
		☐ Map showing location of threatened species at risk of an SAII within the Subject Land	-
		Map showing location of:	-
		☐ impacts requiring offset	-
		☐ impacts not requiring offset	-
		☐ areas not requiring assessment	-
		Data	
		Digital shape files of:	–
		☐ extent of TECs at risk of an SAII within the Subject Land	–
		☐ location of threatened species at risk of an SAII 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	–
Impact summary	Chapter 10	Information	
		Ecosystem credits and species credits that measure the impact of the development on biodiversity values, including:	–
		☒ future vegetation integrity score for each vegetation zone within the Subject Land (Equation 25 and Equation 26 in BAM Appendix H) ☒ change in vegetation integrity score (BAM Subsection 8.1.1)	<Table 29>

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ number of required ecosystem credits for the direct impacts of the proposal on each vegetation zone within the Subject Land (BAM Subsection 10.1.2)	
		☒ biodiversity risk weighting for each	<Table 29>
		☒ number of required species credits for each candidate threatened species that is directly impacted on by the proposal (BAM Subsection 10.1.3)	<Table 29>
		Maps and tables	
		☒ Table of PCTs requiring offset and the number of ecosystem credits required	<Table 28>
		☒ Table of threatened species requiring offset, and the number of species credits required	<Table 29>
		Data	
		☒ Submitted proposal in the BAM Calculator	–
Biodiversity credit report	Chapter 10	Information	
		☒ Description of credit classes for ecosystem credits and species credits at the development or clearing site or land to be biodiversity certified (BAM Section 10.2)	<Table 32 & Table 33>
		☒ BAM credit report in pdf format	<Appendix I>
		Maps and tables	
		☒ Table of credit class and matching credit profile	<**Table 31.**>
		Data	
		☒ BAM credit report in pdf format	<Appendix I>

Appendix B. Biodiversity Values Map and Threshold tool report

Department of Planning and Environment

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		21/11/2024 10:26 AM
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 ALL BV Mapping within the development footprinted 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**	111,227.2 sqm
2.2	**Native Vegetation Area Clearing Estimate (NVACE)** (within development/clearing footprint)	111,227.2 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: _____ Date: _____

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

21/11/2024 10:26 AM

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.

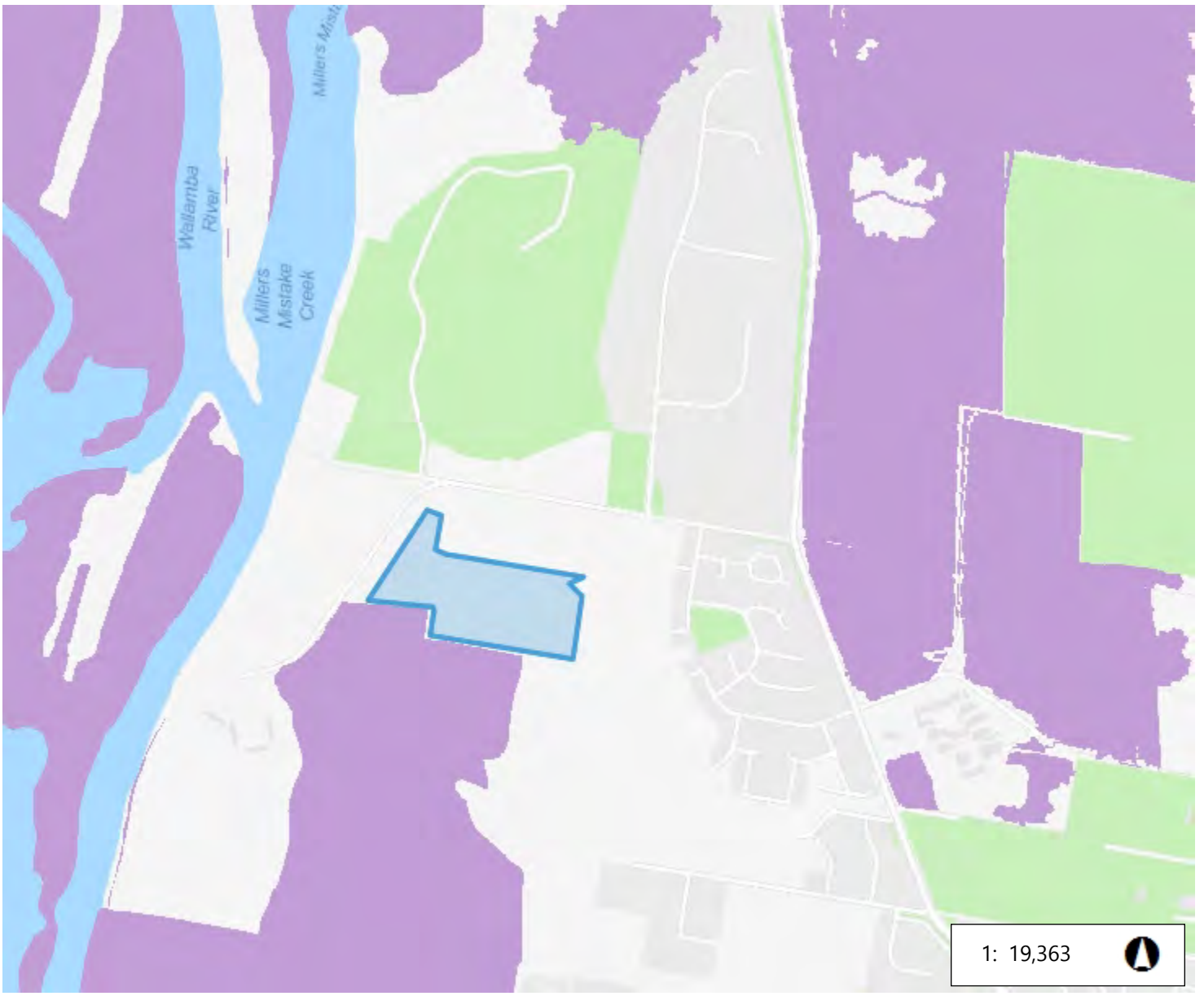
This report may be used as evidence for development applications submitted to councils. You may also use this report when considering native vegetation clearing under the State Environmental Planning Policy (Biodiversity and Conservation) 2021 - Chapter 2 vegetation in non-rural areas.

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



983.7 0 491.83 983.7 Metres

WGS_1984_Web_Mercator_Auxiliary_Sphere

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.

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

21/11/2024 10:26 AM

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 C. Test of Significance

Test of Significance is not the reason for entry into the BOS.

– This Appendix Intentionally left Blank –

Appendix D. Determination of excluded impacts

There are not excluded impacts associated with the proposal.

– This Appendix Intentionally left Blank –

Appendix E. Matters of national environmental significance

An EPBC Act Protected Matters Search (accessed August 13th, 2024) was undertaken to generate a list of those Matters of National Environmental Significance (MNES) from within 10 km of the Subject Land. An assessment of those MNES relevant to biodiversity has been undertaken in accordance within EPBC Act Policy Statement 1.1 Significant Impact Guidelines Matters of National Environmental Significance (DoE, 2013). The Matters of National Environmental Significance protected under national environment law include:

- Listed threatened species and communities;
- Listed migratory species;
- Ramsar wetlands of international importance;
- Commonwealth marine environment;
- World heritage properties;
- National heritage places;
- The Great Barrier Reef Marine Park;
- Nuclear actions; and
- A water resource, in relation to coal seam gas development and large coal mining development.

Listed Threatened Species and Communities:

A total of 96 threatened species and seven (7) threatened ecological communities listed under the EPBC Act have been recorded on the protected matters search. A likelihood of occurrence assessment for these MNES has been completed below. With one (1) TEC identified within the site.

Threatened Species

20 threatened birds, 10 mammals, 3 amphibians, and 18 plants were recorded on the protected matters search. Of these, four species were considered to have the potential to occur within Subject Land:

- *Pteropus poliocephalus* (Grey-headed Flying-fox) (V)
- *Litoria aurea* (Green and Golden Bell Frog) (V)
- *Mixophyes iteratus* (Giant Barred Frog, Southern Barred Frog) (V)
- *Calidris acuminata* (Sharp-tailed Sandpiper) (V)

This assessment concluded that the proposal is unlikely to have significant impacts to any of the listed threatened species or threatened ecological communities listed under the EPBC Act.

Listed Migratory Species:

The protected matters search nominated 71 migratory species or species habitat that may occur with the 10 km Subject Land buffer search area. No listed migratory species were observed within the Subject Land. One listed migratory species was considered to have the potential to occur within the subject site.

- *Actitis hypoleucos* (Common Sandpiper) (-)

The assessment concluded that, no habitat within the Subject Land or Study Area is critical to their survival. Therefore, it is unlikely that the proposal over the Subject Land will impact migratory species.

Wetlands of International Significance (declared Ramsar wetlands):

The Subject Land is not a wetland of international significance or declared Ramsar wetland. No wetlands of international significance are in close proximity.

Commonwealth Marine Areas:

The Subject Land is not part of a Commonwealth Marine Area, however Commonwealth Marine Areas (EPBC Act). Is identified within the buffer area only

World Heritage Properties:

The Subject Land is not a World Heritage area and is not in close proximity to any such area.

National Heritage Places:

The Subject Land is not a National Heritage area and is not in close proximity to any such area.

Great Barrier Reef Marine Parks:

The Subject Land is not part of or within close proximity to any Great Barrier Reef Marine Park.

Nuclear Actions:

The proposal over the Subject Land is not and does not form part of a Nuclear action.

Water Resources in relation to Coal Mining and CSG:

The proposal over the Subject Land is related to build form development (MHE) and as such is not or does not form part of a coal mining and/or CSG proposal.

Summary - In summary, the proposed action is unlikely to have an impact to MNES assessed herewith at the time of BDAR production based on the assessment criteria set out in relevant Commonwealth policies and advice as at the time of this assessment.

Appendix F. EPBC Likelihood table

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
Threatened Ecological Communities							
Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community			E	L	Low.; Not recorded within the Subject Land	Low	No
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland			E	L	High.; Recorded as present within the Subject Land	Low	Yes
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia			CE	L	Low.; Not recorded within the Subject Land	Low	No
Lowland Rainforest of Subtropical Australia			CE	L	Low.; Not recorded within the Subject Land	Low	No
Posidonia australis seagrass meadows of the Manning-Hawkesbury ecoregion			E	L	Low.; Not recorded within the Subject Land	Low	No
Subtropical and Temperate Coastal Saltmarsh			V	L	Low.; Not recorded within the Subject Land	Low	No
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions			E	L	Low.; Not recorded within the Subject Land	Low	No

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
Flora							
Allocasuarina simulans	Nabiac Casuarina		V	K	Low. 151 OEH Bionet records occur within a 10km radius of the site. This species was not recorded within the site during surveys.	Low. Historical land management practices have left a majority of the site lacking a canopy stratum, furthermore the species was not detected during targeted surveys.	No
Arthraxon hispidus	Hairy-joint Grass		V	L	Low. No OEH Bionet records occur within a 10km radius of the subject site. The species was not recorded within the site during surveys.	Low	No
Asperula asthenes	Trailing Woodruff		V	K	Low. 67 OEH Bionet records were recorded within a 10km radius of the subject site. The species was not recorded within the subject site was not recorded within the site during surveys.	Low	No
Corunastylis littoralis	Tuncurry Midge Orchid		CE	K	Low. No OEH Bionet records occur within a 10km radius of the subject site. The species was not recorded within the site during surveys.	Low	No
Cryptostylis hunteriana	Leafless Tongue-orchid		V	L	Low. No OEH Bionet records occur within a 10km radius of the subject site. This species was not recorded within the site during surveys.	Low	No
Cynanchum elegans	White-flowered Wax Plant		E	K	Low. 8 OEH Bionet records occur within a 10km radius of the subject site. This species was not recorded within the site during surveys.	Low	No
Eucalyptus glaucina	Slaty Red Gum		V	M	Low. No OEH Bionet records occur within a 10km radius of the subject site. The species was	Low. Historical land management practices	No

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
					not recorded within the site during surveys, the species is conspicuous and is unlikely to be overlooked.	have left a majority of the site lacking a canopy stratum.	
Euphrasia arguta	null		CE	M	Low. No OEH Bionet records occur within a 10km radius of the subject site. This species was not recorded within the site during surveys.	Low	No
Leichhardtia longiloba	Clear Milkvine		V	M	Low. No OEH Bionet records occur within a 10km radius of the subject site. This species was not recorded within the site during surveys.	Low	No
Macadamia integrifolia	Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak		V	M	Low. No OEH Bionet records occur within a 10km radius of the subject site. This species was not recorded within the site during surveys.	Low	No
Persicaria elatior	Knotweed, Tall Knotweed		V	M	Low. No OEH Bionet records occur within a 10km radius of the subject site. Historical management practices have reduced suitable habitat. Furthermore, specie's was not recorded within the site during surveys.	Low. Species was not determined as present within the site during targeted surveys.	No
Phaius australis	Lesser Swamp-orchid		E	M	Low. No OEH Bionet records occur within a 10km radius of the subject site. This species was not recorded within the site during surveys.	Low.	No
Rhizanthella slateri	Eastern Underground Orchid		E	M	Low. No OEH Bionet records occur within a 10km radius of the subject site. This species was not recorded within the site during surveys.	Low. Species was not determined as present within the site during targeted surveys. Furthermore, the site	No

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
						lacks dense leaf litter coverage which constitutes as potential habitat for the species.	
Rhodamnia rubescens	Scrub Turpentine, Brown Malletwood		CE	K	Low. 5 OEH Bionet records occur within a 10km radius of the subject site. This species was not recorded within the site during surveys.	Low. Historical land management practices have left a majority of the site lacking a canopy/mid stratum, furthermore the species was not detected during targeted surveys.	No
Rhodomyrtus psidioides	Native Guava		CE	K	Low. 5 OEH Bionet records occur within a 10km radius of the subject site. This species was not recorded within the site during surveys.	Low. Historical land management practices have left a majority of the site lacking a canopy/mid stratum, furthermore the species was not detected during targeted surveys.	No
Syzygium paniculatum	Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry		V	K	Low. 6 OEH Bionet records occur within a 10km radius of the subject site. This species was not recorded within the site during surveys.	Low. Historical land management practices have left a majority of the site lacking a canopy/mid stratum, furthermore the species was not detected during targeted surveys.	No
Tetratheca juncea	Black-eyed Susan		V	L	Low. No OEH Bionet records occur within a 10km radius of the subject site. Was not recorded within the site during surveys, site does	Low. Due to the site lacking potential habitat for this species it is	No

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
					not offer potential habitat due to frequent inundation.	unlikely to be impacted by the proposal.	
Thesium australe	Austral Toadflax, Toadflax		V	L	Low. No OEH Bionet records occur within a 10km radius of the subject site. Was not recorded within the site during surveys	Low.	No
Vincetoxicum woollsii	null		E	M	Low. No OEH Bionet records occur within a 10km radius of the subject site. Was not recorded within the site during surveys	Low.	No
Birds							
Anthochaera phrygia	Regent Honeyeater		CE	L	Low. No OEH Bionet records occur within a 10km radius of the subject site. The site is not mapped within Important Habitat Mapping for the species. The species is unlikely to occur within the subject site.	Low. Species will not be impacted by the proposal.	No
Botaurus poiciloptilus	Australasian Bittern		E	K	Low. No OEH Bionet records occur within a 10km radius of the subject site. The species is associated with PCT's identified on-site. However, the site offers low quality habitat in the form of small managed farm dams.	Low. The site lacks dense wetland vegetation, as such the site would provide marginal low quality foraging habitat. The proposal is unlikely to significantly impact the species.	No
Callocephalon fimbriatum	Gang-gang Cockatoo		E	L	Moderate. No OEH Bionet records occur within a 10km radius of the subject site. The site offers potential breeding habitat in the form of hollow bearing trees; however, it is noted that the species was not detected as present within the	Low. It is unlikely that the proposal will impact upon the species as potential breeding habitat will be avoided.	No

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
					site during targeted surveys. Furthermore, the identified hollow bearing trees will be retained as part of the proposal.		
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo		V	K	Moderate. 27 OEH Bionet records occur within a 10km radius of the subject site. The site offers potential foraging habitat in the form of *Casuarina glauca* albeit in a degraded state.	Low. Although potential foraging habitat occurs within the site, it would make up a small, degraded portion. No further assessment required.	No
Climacteris picumnus victoriae	Brown Treecreeper (south-eastern)		V	L	Low. No OEH Bionet records occur within a 10km radius of the subject site. The species is unlikely to utilise the site for foraging or breeding habitat, this species prefers open dry woodlands.	Low. It is unlikely that the species will be significantly impacted by the proposal due to the lack of viable foraging/breeding habitat.	No
Diomedea antipodensis gibsoni	Gibson's Albatross		V	L	Low. No OEH Bionet records occur within a 10km radius of the subject site. The site does not constitute foraging habitat. This species feeds pelagically on squid, fish and crustaceans. Off the coast.	Low. It is unlikely that this species will be impacted by the proposal.	No
Erythrotriorchis radiatus	Red Goshawk		E	M	Low. No OEH Bionet records occur within a 10km radius of the subject site.	Low.	No
Falco hypoleucos	Grey Falcon		V	M	Low. No OEH Bionet records occur within a 10km radius of the subject site. Unlikely to occur on site due to the species being restricted to shrubland, grassland and wooded watercourses	Low. The species is unlikely to be impacted by the proposal as the vegetation within the site	No

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
					of arid and semi-arid regions. No further assessment required.	does not constitute habitat.	
Fregetta grallaria grallaria	White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian)		V	L	Low. No OEH Bionet records occur within a 10km radius of the subject site. The species habitat is not commensurate with habitat identified within the site as the species habitat is associated off the coast rocky islands.	Low. The proposal will not impact upon the species as the species habitat is restricted to oceans and rocky islands.	No
Grantiella picta	Painted Honeyeater		V	L	Low. No OEH Bionet records occur within a 10km radius of the subject site. Unlikely to occur in the Subject Land as the species typically occurs on the inland slopes of the Great Dividing Range. No further assessment required	Low. The species is not likely to occur within the site, it is unlikely that the proposal will impact the species.	No
Lathamus discolor	Swift Parrot		CE	K	Low. 18 OEH Bionet records occur within a 10km radius of the subject site. The site has not been mapped as containing important habitat on important habitat mapping. Coupled with the lack of structural complexity of the Subject Land indicates that this species would not occur within the site.	Low. The proposal is unlikely to impact upon the species.	No
Limosa lapponica baueri	Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit		E	K	Low. 28 OEH Bionet records occur within a 10km radius of the subject site. The site does not contain habitat in the form of large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays.	Low. The proposal is unlikely to impact upon the species as potential habitat is not found within the site.	No
Melanodryas cucullata cucullata	South-eastern Hooded Robin, Hooded Robin (south-eastern)		E	M	No OEH Bionet records occur within a 10km radius of the subject site.	Low The proposal is unlikely to impact upon the species as potential	No

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
						habitat is not found within the site.	
Neophema chrysostoma	Blue-winged Parrot		V	M	No OEH Bionet records occur within a 10km radius of the subject site.	Low The proposal is unlikely to impact upon the species as potential habitat is not found within the site.	No
Pachyptila turtur subantarctica	Fairy Prion (southern)		V	K	Low. No OEH Bionet records occur within a 10km radius of the subject site. This species is a pelagic marine bird, the subject site does not contain habitat for this species.	Low. This marine bird will not be impacted by the proposal as the subject site does not constitute habitat.	No
Pterodroma leucoptera leucoptera	Gould's Petrel, Australian Gould's Petrel		E	M	Low. No OEH Bionet records occur within a 10km radius of the subject site. The species is a marine bird that breeds and forages of the coast.	Low. The proposal will not impact the species.	No
Pterodroma neglecta neglecta	Kermadec Petrel (western)		V	M	Low. No OEH Bionet records occur within a 10km radius of the subject site. The habitat within the site does not constitute habitat as the species is a vagrant marine bird.	Low. The proposal will not impact the species significantly.	No
Rostratula australis	Australian Painted Snipe		E	L	Low. No OEH Bionet records occur within a 10km radius of the subject site. The site contains costal swamp forests with tussock grass vegetation albeit in a degraded state, the species has the potential to utilise the site as foraging habitat.	Low. The proposal is unlikely to impact upon the species as the site would offer only marginal foraging habitat in poor condition.	No
Stagonopleura guttata	Diamond Firetail		V	L	No OEH Bionet records occur within a 10km radius of the subject site. The species prefers drier dense vegetation with ample shrub/ mid	Low. The proposal is unlikely to impact upon the species as the site	No

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
					stratum cover. Due to the hydrology of the site along with its managed nature it is unlikely that the species would occur within the site.	does not contain suitable habitat.	
Sternula nereis nereis	Australian Fairy Tern		V	M	No OEH Bionet records occur within a 10km radius of the subject site. Unlikely to occur within the site as this species is predominantly a pelagic marine bird.	Low. As the species is unlikely to utilise the site, it is unlikely that the species will be impacted by the proposal.	No
Thalassarche bulleri platei	Northern Buller's Albatross, Pacific Albatross		V	M	No OEH Bionet records occur within a 10km radius of the subject site. Unlikely to occur within the site as this species is predominantly a pelagic marine bird.	Low. As the species is unlikely to utilise the site, it is unlikely that the species will be impacted by the proposal.	Low
Mammals							
Chalinolobus dwyeri	Large-eared Pied Bat, Large Pied Bat		E	L	Low. No OEH Bionet records occur within a 10km radius of the subject site. No cliffs, caves, crevices or krasts occur within the site or within a 2.5km buffer. The site may potentially offer poor quality marginal foraging habitat, however due to the lack of roosting/breeding habitat within the site or local area it is unlikely that this species would occur. No further assessment is required.	Low. due to the low likelihood of occurrence within the site, it is highly unlikely that this species would be impacted by the proposal.	No
Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)		E	K	Low. 12 OEH Bionet records occur within a 10km radius of the subject site. The site offers limited habitat due to its managed nature, this species is known to occupy extensive home ranges, as such there is potential for this species to traverse through the site, however due to the condition of	Low. due to the managed nature of the site and the fact that habitat connectivity will not be adversely affected by this proposal it is unlikely that this species	No

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
					the vegetation this is unlikely. No further assessment is required.	will be impacted by the proposed development.	
Notamacropus parma	Parma Wallaby		V	M	Low. No OEH Bionet records occur within a 10km radius of the subject site. This species was not detected on-site during surveys, the species prefers moist eucalypt forest with a thick shrubby understory. Due to historic clearing within the site, the site does not offer supporting habitat for this species, no further assessment required.	Low. the species is unlikely to be impacted by the proposal.	No
Petauroides volans	Greater Glider (southern and central)		E	K	Low. No OEH Bionet records occur within a 10km radius of the subject site. This species occupies large home ranges of continuous forest with dense canopy cover, due to historic clearing within the site, the site does not offer potential or preferred habitat for this species, as such its unlikely to occur within the site. No further assessment required.	Low. No preferred habitat occurs within the subject site, as such it's unlikely that the development will impact upon the species.	No
Petaurus australis australis	Yellow-bellied Glider (south-eastern)		V	L	Low. No OEH Bionet records occur within a 10km radius of the subject site. This species prefers tall mature eucalypt forests due to historic clearing practices the site lacks mature eucalypt forests consisting predominantly of managed grassland. No further assessment is required.	Low. The species is unlikely to utilise the site as preferred habitat is not present. It is unlikely that the proposed development will impact upon the species.	No
Petrogale penicillata	Brush-tailed Rock-wallaby		V	M	Low. No OEH Bionet records occur within a 10km radius of the subject site. This species occupies rocky escarpments, outcrops and cliffs with a preference for complex structures. As no such habitat features occur within the site, it is	Low. Due to a lack of onsite habitat features, it is unlikely that the proposal will impact the species.	No

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
					unlikely that the species would occur within the site. No further assessment required.		
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)	Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)		E	K	Low. 77 OEH Bionet records occur within a 10km radius of the subject site. Targeted surveys did not detect the species within the site. furthermore, the site is generally lacking in habitat for this species due to a majority of the site being managed lacking a canopy stratum. No further assessment required.	Low. Presence was not detected onsite despite sufficient survey effort; it is unlikely that this species will be impacted by the proposal.	No
Potorous tridactylus tridactylus	Long-nosed Potoroo (northern)		V	L	Low. 6 OEH Bionet records occur within a 10km radius of the subject site. Targeted surveys did not detect the species within the site, no further assessment required.	Low. Presence was not detected onsite despite sufficient survey effort; it is unlikely that this species will be impacted by the proposal.	No
Pseudomys novaehollandiae	New Holland Mouse, Pookila		V	K	Low.2 OEH Bionet records occur within a 10km radius of the subject site. The frequent inundation of the site along with its ability to retain water would suggest preferred habitat for this species does not occur within the site, as the species prefers substrates that are able to support burrows. No further assessment required.	Low. It is unlikely that the species will occur within the site due to inadequate environment present, the species is unlikely to be impacted by the proposal.	No
Pteropus poliocephalus	Grey-headed Flying-fox		V	k	Moderate. No OEH Bionet records occur within a 10km radius of the site. The site offers potential foraging habitat in the form of dry sclerophyll forest however this forest would constitute poor marginal foraging habitat due to past clearing practices.	Low. Due to the limited nature of potential poor quality marginal foraging habitat coupled with the retention of larger areas of intact native vegetation within the site, the proposal is	Yes

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
						unlikely to cause a significant impact.	
Herpetofauna							
Litoria aurea	Green and Golden Bell Frog		V	L	Moderate. No OEH Bionet records occur within a 10km radius of the site.	Moderate	Yes
Mixophyes balbus	Stuttering Frog, Southern Barred Frog (in Victoria)		V	L	Low. No OEH Bionet records occur within a 10km radius of the site. The site is not located within victoria.	Low	No
Mixophyes iteratus	Giant Barred Frog, Southern Barred Frog		V	M	Moderate. No OEH Bionet records occur within a 10km radius of the site.	Moderate	Yes
Listed Migratory Species							
Actitis hypoleucos	Common Sandpiper			M	Moderate. 3 OEH Bionet records occur within a 10km radius of the subject site. Due to the frequent inundations of the site along with on-site dams. This species will be assessed further.	Low. The site would only offer marginal foraging habitat for this species, due to the species high mobility it is unlikely to be significantly impacted by the proposal.	Yes
Anous stolidus	Common Noddy			L	Low. No OEH Bionet records occur within a 10km radius of the subject site. This species is a marine bird that has the potential to fly over the site however this species is predominantly arial and it is unlikely to occur within the site. No further assessment is required.	Low. due to the aerial nature of this species it is unlikely that this species will be impacted by the proposal.	No

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
Apus pacificus	Fork-tailed Swift			L	Low. No OEH Bionet records occur within a 10km radius of the subject site. This species is predominantly arial, as such it has the potential to fly over the site however it is unlikely that this species would utilise this site in any capacity. No further assessment is required.	Low. as this species is predominantly aerial it is unlikely that the proposal would impact the species.	No
Ardenna carneipes	Flesh-footed Shearwater, Fleshy-footed Shearwater			K	Low. No OEH Bionet records occur within a 10km radius of the subject site. This species is a pelagic seabird species as such it is unlikely that this species would utilise the site for foraging. No further assessment is required.	Low. The proposal is unlikely to impact upon the species.	No
Ardenna grisea	Sooty Shearwater		V	L	Low. 8 OEH Bionet records occur within a 10km radius of the subject site. This species is a pelagic seabird species as such it is unlikely that this species would utilise the site for foraging. No further assessment is required.	Low. The proposal is unlikely to impact upon the species.	No
Arenaria interpres	Ruddy Turnstone		V	K	Low. 4 OEH Bionet records occur within a 10km radius of the subject site. This species occurs along the coast often within regions of exposed rock. The site does not offer potential habitat for the species. No further assessment.	Low. The proposal is unlikely to impact upon the species.	No
Calidris acuminata	Sharp-tailed Sandpiper		V	K	Medium. 6 OEH Bionet records occur within a 10km radius of the subject site. This species has the potential to occur within the site due to potential habitat in the form of damns along with wetland habitat. Further assessment required.	Low. The site only offers potential foraging habitat for the species, it is unlikely that this species would be impacted by the proposal.	Yes
Calidris canutus	Red Knot, Knot		V	K	Low. One OEH Bionet record occurs within a 10km radius of the subject site. The species is	Low. Due to the site not offering potential habitat,	No

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
					known to inhabit intertidal mudflats, sandflats and sandy beaches as the site does not contain viable habitat to the species it is unlikely that it would occur within the site.	the proposal will not impact the species.	
Calidris ferruginea	Curlew Sandpiper		CE	K	Low. 3 OEH Bionet records occur within a 10km radius of the subject site. The species is known to inhabit intertidal mudflats, sandflats and sandy beaches as the site does not contain viable habitat to the species it is unlikely that it would occur within the site.	Low. Due to the site not offering potential habitat, the proposal will not impact the species.	No
Calidris melanotos	Pectoral Sandpiper			M	Medium. No OEH Bionet records occur within a 10km radius of the subject site. The site offers potential habitat in the form of inundated grasslands. However, due to the managed nature of the site, it is unlikely that the species would utilise habitat.	Low. Due to low utilisation potential the species will not be impacted by the proposal.	No
Calidris ruficollis	Red-necked Stint			K	Medium. No OEH Bionet records occur within a 10km radius of the subject site. The site offers potential habitat in the form of inundated grasslands. However, due to the managed nature of the site, it is unlikely that the species would utilise habitat.	Low. Due to low utilisation potential the species will not be impacted by the proposal.	No
Calonectris leucomelas	Streaked Shearwater			M	Low. This species is a pelagic marine species, the species may have the potential to fly over the site however the site does not offer potential habitat for the species.	Low. Due to the nature of the species, it will not be impacted by the proposal.	No
Charadrius bicinctus	Double-banded Plover			K	Low. No OEH Bionet records occur within a 10km radius of the subject site. The site offers potential habitat in the form of inundated	Low. Due to low utilisation potential the species will not be	No

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
					grasslands. However, due to the managed nature of the site, it is unlikely that the species would utilise habitat.	impacted by the proposal.	
Charadrius leschenaultii	Greater Sand Plover, Large Sand Plover		V	L	Low. The species is associated with intertidal mudflats or sandbanks, as well as sandy estuarine lagoons, and inshore reefs, rock platforms, small rocky islands or sand cays on coral reefs. Which do not occur within the site, as such it is unlikely that the species would utilise the site.	Low. The proposal will not impact upon the species as suitable habitat does not occur.	No
Charadrius mongolus	Lesser Sand Plover, Mongolian Plover		E	K	Low, the species inhabits beaches of sheltered bays, harbours and estuaries. The site does not constitute habitat for the species as such it is unlikely to occur within the site.	Low. The proposal will not impact upon the species as the species does not utilise habitat present within the site.	No
Cuculus optatus	Oriental Cuckoo, Horsfield's Cuckoo			M	Low, Due to the managed nature of the site with limited canopy cover it is unlikely that the species would utilise the site.	Low. The proposal is unlikely to impact upon the species.	No
Diomedea antipodensis	Antipodean Albatross		V	L	Low. This species is a pelagic marine species, the species may have the potential to fly over the site however the site does not offer potential habitat for the species.	Low. Due to the nature of the species, it will not be impacted by the proposal.	No
Diomedea epomophora	Southern Royal Albatross		V	L	Low. This species is a pelagic marine species, the species may have the potential to fly over the site however the site does not offer potential habitat for the species.	Low. Due to the nature of the species, it will not be impacted by the proposal.	No
Diomedea exulans	Wandering Albatross		V	L	Low. This species is a pelagic marine species, the species may have the potential to fly over the	Low. Due to the nature of the species, it will not	No

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
					site however the site does not offer potential habitat for the species.	be impacted by the proposal.	
Diomedea sanfordi	Northern Royal Albatross		E	M	Low. This species is a pelagic marine species, the species may have the potential to fly over the site however the site does not offer potential habitat for the species.	Low. Due to the nature of the species, it will not be impacted by the proposal.	No
Fregata ariel	Lesser Frigatebird, Least Frigatebird			L	Low. This species is a pelagic marine species, the species may have the potential to fly over the site however the site does not offer potential habitat for the species.	Low. Due to the nature of the species, it will not be impacted by the proposal.	No
Fregata minor	Great Frigatebird, Greater Frigatebird			L	Low. This species is a pelagic marine species, the species may have the potential to fly over the site however the site does not offer potential habitat for the species.	Low. Due to the nature of the species, it will not be impacted by the proposal.	No
Gallinago hardwickii	Latham's Snipe, Japanese Snipe		V	K	Moderate. The site offers potential forging habitat in the form of flooded grasslands with surrounding waterbodies.	Low.	No
Gallinago megala	Swinhoe's Snipe			L	Low. The site does not offer potential habitat due to its managed nature.	Low. the species is unlikely to be impacted by the proposal, sue to the managed nature of the site.	No
Gallinago stenura	Pin-tailed Snipe			L	Low. The site does not offer suitable habitat due to its managed nature, as the species prefers dense areas of Grass/shrub with good cover.	Low. the managed nature of the site will not impact upon the species.	No

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
Hirundapus caudacutus	White-throated Needletail		V	K	Low. As the species is almost exclusively aerial it is unlikely to occur within the site, however, to does have the potential to fly over.	Low. Due to the species aerial nature, it is unlikely to be impacted by the proposal.	No
Limosa lapponica	Bar-tailed Godwit			K	Low. The species is known to inhabit areas of large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays, as these habitats do not occur within the site it is unlikely that the species would be found within the site.	Low. Due to the site not containing suitable habitat for the species, it is unlikely that the species will be impacted by the proposal.	No
Macronectes giganteus	Southern Giant-Petrel, Southern Giant Petrel		E	M	Low. This species is a pelagic marine species, the species may have the potential to fly over the site however the site does not offer potential habitat for the species.	Low. Due to the nature of the species, it will not be impacted by the proposal.	No
Macronectes halli	Northern Giant Petrel		V	L	Low. This species is a pelagic marine species, the species may have the potential to fly over the site however the site does not offer potential habitat for the species.	Low. Due to the nature of the species, it will not be impacted by the proposal.	No
Monarcha melanopsis	Black-faced Monarch			K	Low. The species is predominantly found within rainforest vegetation. As this vegetation does not occur within the site, it is unlikely that the species would occur within the site.	Low. As suitable habitat for the species does not occur, it is unlikely to be impacted by the proposal.	No
Myiagra cyanoleuca	Satin Flycatcher			L	Moderate. The specie has the potential to occur within the site as suitable foraging habitat occurs within the site.	Low. As the site consists of managed grasslands prone to inundation it is unlikely that the species	No

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
						will be impacted by the proposal.	
Numenius madagascariensis	Eastern Curlew, Far Eastern Curlew		CE	K	Low. The species is associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. As the site does not contain suitable habitat it is therefore unlikely to occur.	Low. The species will not be impacted upon by the proposal as the site does not offer suitable habitat.	No
Numenius phaeopus	Whimbrel			K	Low. The species is associated with intertidal mudflats, lagoons and estuaries with mangroves. As the site does not contain suitable habitat for the species it is unlikely to occur.	Low. Due to the lack of suitable habitat within the site it is unlikely that the species will be impacted by the proposal.	No
Pandion haliaetus	Osprey			K	Low. The species requires extensive areas of open fresh, brackish or saline water for foraging. As the site does not contain suitable habitat due to its managed nature, it is unlikely that the species would occur within the site.	Low. Due to the lack of suitable habitat within the site, it is unlikely that the proposal would impact the species.	No
Phoebetria fusca	Sooty Albatross		V	M	Low. This species is a pelagic marine species, the species may have the potential to fly over the site however the site does not offer potential habitat for the species.	Low. Due to the nature of the species, it will not be impacted by the proposal.	No
Pluvialis fulva	Pacific Golden Plover			K	Low. The species is associated with beaches, mudflats and sandflats, as thew site does not contain suitable habitat, it is unlikely to occur within the site's boundary.	Low. due to the site lacking potential habitat it is unlikely to be impacted by the proposal.	No

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
Pluvialis squatarola	Grey Plover		V	K	Low. the species inhabits sheltered embayment's, estuaries and lagoons, as the site does not contain suitable habitat for the species it is unlikely to occur.	Low. Due to the site lacking potential habitat for the species, it is unlikely to be impacted upon by the proposal.	No
Rhipidura rufifrons	Rufous Fantail			K	Low. The species prefers vegetation containing dense shrubby understory. As the site predominantly consists of managed grasslands in poor condition lacking a shrubby understory it is unlikely that the species will occur within the site.	Low. Due to the site not containing suitable habitat for the species it is unlikely to be impacted upon by the proposal.	No
Sternula albifrons	Little Tern			M	Low. The species known habitat consists of low dunes or sandy beaches. As the site consists predominantly of managed grassland in poor condition it is unlikely that the species would utilise the site.	Low. As the site does not contain suitable habitat for the species it is unlikely that the proposal would impact the species.	No
Symposiachrus trivirgatus	Spectacled Monarch			K	Low. The species prefers thick understory within rainforest and waterside vegetation. The site does not provide suitable habitat in the form of rainforest vegetation, nor does it provide habitat in the from of a thick understory surrounding waterbodies due to its managed nature, it is unlikely that the species would utilise the site for habitat.	Low. As the site lacks suitable habitat for the species it is unlikely that it would be impacted by the proposal.	No
Thalassarche bulleri	Buller's Albatross, Pacific Albatross		V	M	Low. This species is a pelagic marine species, the species may have the potential to fly over the site however the site does not offer potential habitat for the species.	Low. Due to the nature of the species, it will not be impacted by the proposal.	No

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
Thalassarche carteri	Indian Yellow-nosed Albatross		V	L	Low. This species is a pelagic marine species, the species may have the potential to fly over the site however the site does not offer potential habitat for the species.	Low. Due to the nature of the species, it will not be impacted by the proposal.	No
Thalassarche cauta	Shy Albatross		E	L	Low. This species is a pelagic marine species, the species may have the potential to fly over the site however the site does not offer potential habitat for the species.	Low. Due to the nature of the species, it will not be impacted by the proposal.	No
Thalassarche eremita	Chatham Albatross		E	M	Low. This species is a pelagic marine species, the species may have the potential to fly over the site however the site does not offer potential habitat for the species.	Low. Due to the nature of the species, it will not be impacted by the proposal.	No
Thalassarche impavida	Campbell Albatross, Campbell Black-browed Albatross		V	M	Low. This species is a pelagic marine species, the species may have the potential to fly over the site however the site does not offer potential habitat for the species.	Low. Due to the nature of the species, it will not be impacted by the proposal.	No
Thalassarche melanophris	Black-browed Albatross		V	L	Low. This species is a pelagic marine species, the species may have the potential to fly over the site however the site does not offer potential habitat for the species.	Low. Due to the nature of the species, it will not be impacted by the proposal.	No
Thalassarche salvini	Salvin's Albatross		V	L	Low. This species is a pelagic marine species, the species may have the potential to fly over the site however the site does not offer potential habitat for the species.	Low. Due to the nature of the species, it will not be impacted by the proposal.	No
Thalassarche steadi	White-capped Albatross		V	M	Low. This species is a pelagic marine species, the species may have the potential to fly over the	Low. Due to the nature of the species, it will not	No

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of Occurrence	Potential Impacts	ToS Req'd
					site however the site does not offer potential habitat for the species.	be impacted by the proposal.	
Tringa brevipes	Grey-tailed Tattler			K	Low. The species is found within habitat consisting of sheltered coasts with reefs and rock platforms or with intertidal mudflats. As the site does not contain this potential habitat it is unlikely to occur within the site.	Low. As no suitable habitat is found within the site the proposal is unlikely to impact the species.	No
Tringa nebularia	Common Greenshank, Greenshank		E	K	Low. The species is known occur in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. As the site does not contain suitable habitat the species is unlikely to occur within the site.	Low. As the site lacks suitable habitat the species is unlikely to be impacted by the proposal.	No
Xenus cinereus	Terek Sandpiper		V	K	Low. The species is known to inhabit coastal mudflats, lagoons, creeks and estuaries, as the site lacks suitable habitat the species is unlikely to occur.	Low. The site lacks suitable habitat for the species; therefore, it is unlikely that the species would be impacted by the proposal.	No

Key:

V = Vulnerable M = Migratory A= Marine

E = Endangered CE = Critically Endangered P=Protected

K = Known where there are confirmed records, specimens or otherwise verified sightings in any CMA subregion overlapping the search area

P = Predicted where there is high expectation by relevant experts that a species is likely to be present in any CMA subregion overlapping the search area, based on known presence of suitable habitat and distribution with adjoining subregions

1 – NSW BioNet Atlas, Office of Environment and Heritage (Accessed 13-08-2024).

2 – Commonwealth Protected Matters Search Tool, Department of the Environment (Accessed 13-08-2024).

Appendix G. EPBC Assessment of Significance

EPBC Act Assessment of Significance for species listed as Vulnerable

***Pteropus poliocephalus* (Grey-headed Flying-fox)**	
Significant Impact Guideline	Assessment
Lead to a long-term decrease in the size of an important population of a species	No. survey effort within the site did not detect the presence of the species, furthermore the proposal seeks the removal of 12 ha of potential low-quality habitat predominantly consisting of managed grass vegetation. Therefore, it is unlikely that the proposal will lead to long-term decrease in the size of an important population.
Reduce the area of occupancy of an important population	No. As the species was not detected within the site during surveys it is unlikely the proposal will reduce the area of occupancy of an important population.
Fragment an existing important population into two or more populations	No. The proposal will not create new points of fragmentation. The proposal will decrease habitat by 12 ha. However, a large majority of this vegetation consists of managed grassland in which the species will not utilise. Furthermore intact conservation land surrounding the development is being retained.
Adversely affect habitat critical to the survival of a species	The vegetation to be removed within the site would not constitute habitat critical to the survival of the species as suitable vegetation found within site would only make up a small portion of suitable foraging habitat for the species. The removal of which would not negatively impact the survival of the species.
Disrupt the breeding cycle of an important population	No. The site does not contain a breeding camp for the species, the closest recorded breeding camp occurs approximately 7.5km to the Southeast of the site. The proposal will not disrupt the breeding cycle of a nearby population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposal will not modify, destroy, remove isolate, or decrease habitat to the extent that the species is likely to decline at a regional scale or local. The species is able to forage over large distances, as such the proposal would not decrease habitat extent as such that the species would decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The site already contains multiple weed species listed as high threat exotics. Additionally, the Subject Land is likely already habitat for a range of pest species, including foxes (*Vulpes vulpes*), rabbits (*Oryctolagus cuniculus*) and cats (*Felis catus*). The proposal is unlikely to alter the potential for impacts from these species.
Interfere with the recovery of the species.	As no breeding sites have been established within the proposed development along with the site offering poor quality marginal foraging habitat and the species ability to forage over large distances, it is unlikely that the proposal would interfere with the recovery of the species as no impact to the species is likely to occur.

***Pteropus poliocephalus* (Grey-headed Flying-fox)**	
Conclusion	Non-significant impact

***Litoria aurea* (Green and Golden Bell Frog)**	
Significant Impact Guideline	Assessment
Lead to a long-term decrease in the size of an important population of a species	No. survey effort within the site did not detect the presence of the species, furthermore the proposal seeks the removal of one farm dam within the site. However, the proposal seeks to retain 1.62 of suitable high quality potential habitat. As such the proposal is unlikely to decrease the long-term size of an important population.
Reduce the area of occupancy of an important population	No. As the species was not detected within the site during surveys it is unlikely the proposal will reduce the area of occupancy of an important population.
Fragment an existing important population into two or more populations	No. The proposal will not create new points of fragmentation. The proposal will remove areas of vegetation that would provide only limited connectivity for the species, as such no important population will be split into two or more populations.
Adversely affect habitat critical to the survival of a species	The vegetation to be removed within the site would not constitute habitat critical to the survival of the species as suitable vegetation found within site would only make up a small portion of suitable foraging or breeding habitat for the species. The removal of which would not negatively impact the survival of the species as larger areas of suitable habitat exist to the South and east of the site.
Disrupt the breeding cycle of an important population	No. No recorded breeding individuals were recorded within the site. As retained vegetation within the site would constitute higher quality habitat for the species as this area is being retained the proposal would not disrupt the breeding cycle of an important population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposal will not modify, destroy, remove isolate, or decrease habitat to the extent that the species is likely to decline at a regional scale or local. Due to the retention of 1.62 ha of suitable quality habitat within the site the proposal will not decrease availability of habitat to the extent that thew species is likely to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The site already contains multiple weed species listed as high threat exotics. Additionally, the Subject Land is likely already habitat for a range of pest species, including foxes (*Vulpes vulpes*), rabbits (*Oryctolagus cuniculus*) and cats (*Felis catus*). The proposal is unlikely to alter the potential for impacts from these species.
Interfere with the recovery of the species.	Due to the retention of high-quality habitat within the site as part of the proposal, the proposal is unlikely to interfere with the recovery of the species.
Conclusion	Non-significant impact

***Mixophyes iteratus* (Giant Barred Frog, Southern Barred Frog)**	
Significant Impact Guideline	Assessment
Lead to a long-term decrease in the size of an important population of a species	No. survey effort within the site did not detect the presence of the species, furthermore the proposal seeks the removal of one farm dam within the site. However, the proposal seeks to retain 1.62 of suitable high quality potential habitat. As such the proposal is unlikely to decrease the long-term size of an important population.
Reduce the area of occupancy of an important population	No. As the species was not detected within the site during surveys it is unlikely the proposal will reduce the area of occupancy of an important population.
Fragment an existing important population into two or more populations	No. The proposal will not create new points of fragmentation. The proposal will remove areas of vegetation that would provide only limited connectivity for the species, as such no important population will be split into two or more populations.
Adversely affect habitat critical to the survival of a species	The vegetation to be removed within the site would not constitute habitat critical to the survival of the species as suitable vegetation found within site would only make up a small portion of suitable foraging or breeding habitat for the species. The removal of which would not negatively impact the survival of the species as larger areas of suitable habitat exist to the South and east of the site.
Disrupt the breeding cycle of an important population	No. No recorded breeding individuals were recorded within the site. As retained vegetation within the site would constitute higher quality habitat for the species as this area is being retained the proposal would not disrupt the breeding cycle of an important population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposal will not modify, destroy, remove isolate, or decrease habitat to the extent that the species is likely to decline at a regional scale or local. Due to the retention of 1.62 ha of suitable quality habitat within the site the proposal will not decrease availability of habitat to the extent that thew species is likely to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The site already contains multiple weed species listed as high threat exotics. Additionally, the Subject Land is likely already habitat for a range of pest species, including foxes (*Vulpes vulpes*), rabbits (*Oryctolagus cuniculus*) and cats (*Felis catus*). The proposal is unlikely to alter the potential for impacts from these species.
Interfere with the recovery of the species.	Due to the retention of high-quality habitat within the site as part of the proposal, the proposal is unlikely to interfere with the recovery of the species.
Conclusion	Non-significant impact

***Calidris acuminata* (Sharp-tailed Sandpiper)**	
Significant Impact Guideline	Assessment
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	The proposal will impact up to 12 ha of native vegetation serving as potential habitat for the species. Habitat within the Subject Land is deemed marginal, only suitable for the species after large rain events where areas of the site become inundated. Available similar habitat in the form of semi-cleared pastures is widespread within the locality. The site is unlikely to serve as important habitat for the species.
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or	The Subject Land is likely already habitat for a range of pest species, including foxes (*Vulpes vulpes*), rabbits (*Oryctolagus cuniculus*) and cats (*Felis catus*). The proposal is unlikely to alter the potential for impacts from these species.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	The proposal will impact up to 12 ha of marginal habitat for the species, of which is unlikely to serve as important habitat for a population (see above). Therefore, it is unlikely that the proposal will disrupt the lifecycle of the species.
Conclusion	Non-significant impact

Appendix H. Vegetation survey data

Table 34. Vegetation survey data and locations

plot	pct	area	patchsize	condition class	zone	easting	northing	bearing	compTree	compShrub	compGrass	compForbs	compFerns	compOther	strucTree	strucShrub	strucGrass	strucForbs	strucFerns	strucOther	funLargeTrees	funHollowtrees	funLitterCover	funLenFallenLogs	funTreeStem5to9	funTreeStem10to19	funTreeStem20to29	funTreeStem30to49	funTreeStem50to79	funTreeRegen	funHighThreatExotic	Plot-based vegetation survey?	Vegetation integrity survey?
B01	4006	0.05	101	Good	56	450891.4	6441813.25	78	4	5	5	6	3	2	33.5	6.8	66.1	1.5	17	0.2	7	1	77	47	1	1	1	1	1	1	3		Y
B09	4006	0.4	101	Intact	56	450977.6	6441877.4	3	3	4	8	6	3	1	21	5.5	101.4	0.6	2.3	0.1	1	0	56	11	1	1	1	1	1	1	0.6		Y
B02	4006	0.16	101	Moderate	56	451049	6441775.1	60	2	2	8	2	2	1	16	7	21	0.2	11	0.1	0	0	41	3	1	1	1	0	0	1	0		Y
B07	4006	3.51	101	Poor	56	451108.5	6441975.6	200	1	3	7	2	3	0	0.1	10.3	92.6	0.2	8	0	0	0	18.6	0	0	0	0	0	0	1	1.2		Y
B08	4006	3.51	101	Poor	56	451099.6	6441837	230	0	3	4	1	1	1	0	6.2	100.2	0.1	0.1	0.1	0	0	15	0	0	0	0	0	0	0	5.1		Y
B04	4006	1.53	101	Poor-Grassland	56	451032.35	6442011.9	180	2	0	6	3	1	0	0.2	0	100.9	0.3	0.2	0	0	0	10	0	0	0	0	0	0	1	0		Y
B12	4006	1.53	101	Poor-Grassland	56	450852.8	6441906	124	0	0	3	4	1	0	0	0	100.2	0.4	2	0	0	0	27	0	1	0	0	0	0	1	0		Y
B10	4006	1.93	101	Moderate-Grassland	56	450974.1	6442057	203	1	0	4	5	0	0	0.1	0	70.1	0.5	0	0	0	0	67	0	1	0	0	0	0	1	5.1		Y
B13	4006	1.93	101	Moderate-Grassland	56	450955	6441943.5	330	1	0	4	5	0	1	0.1	0	35.3	0.5	0	0.1	0	0	21	0	0	0	0	0	0	1	20.1		Y
B06	4006	1.69	101	Managed-Grassland	56	451232.2	6441934.3	90	0	1	5	3	1	0	0	0.5	76.1	0.3	2	0	0	0	75	5	0	0	0	0	0	0	1.1		Y
B03	3544	0.83	101	Poor	56	451254.2	6441755.6	23	0	9	5	3	1	3	0	0	1.3	18.1	1.5	30	0.4	0	56	43	1	0	1	1	0	1	0		Y
B05	3544	1.97	101	Managed	56	451311.5	6441870	218	0	8	5	3	1	0	0	5	37.6	0.4	10	0	0	0	23.8	2	0	0	0	0	0	0	10.1		Y
B11	*4004*	*1.62*	*101*	*Good*	*56*	*450828.1*	*6441741.65*	*298*	*4*	*5*	*5*	*7*	*4*	*2*	*33.5*	*6.8*	*66.1*	*1.6*	*18*	*0.2*	*3*	*0*	*60*	*63*	*1*	*1*	*1*	*1*	*1*	*1*	*3*		*Y*

Italic plot (B11) was conducted in the identification of the southern C2 zoned land, this vegetation was assessed in determining the PCT and condition state of the vegetation. However, as no impact is to occur within this vegetation zone the associated BAM plot data has not been added into the BAM-C.

B01					
Species Name	**GF**	**Status**	**Species Other**	**Cover**	**Abundance**
Melaleuca quinquenervia	TG	N		5	5
Eucalyptus robusta	TG	N		25	10
Casuarina glauca	TG	N		3	3
Glochidion ferdinandi	TG	N		0.5	5
Melaleuca stypheloides	SG	N		5	10
Melaleuca linariifolia	SG	N		1	10
Acacia longifolia	SG	N		0.2	3
Callistemon salignus	SG	N		0.5	3
Homalanthus populifolius	SG	N		0.1	1
Stephania japonica	OG	N		0.1	5
Kennedia rubicunda	OG	N		0.1	10
Gahnia clarkei	GG	N		30	300
Oplismenus aemulus	GG	N		0.1	50
Carex appressa	GG	N		10	100
Gahnia sieberiana	GG	N		25	100
Phragmites australis	GG	N		1	50
Gonocarpus chinensis subsp. verrucosus	FG	N		0.1	50
Alternanthera denticulata	FG	N		0.1	10
Hydrocotyle sibthorpioides	FG	N		0.1	50
Viola hederacea	FG	N		0.1	50
Persicaria strigosa	FG	N		0.1	50
Alocasia brisbanensis	FG	N		1	20
Pteridium esculentum	EG	N		15	300
Cyclosorus interruptus	EG	N		1	100
Telmatoblechnum indicum	EG	N		1	50
Cortaderia selloana	-	HTE		3	3

	Comp	Struct
TG	4	33.5
SG	5	6.8
GG	5	66.1
FG	6	1.5
EG	3	17
OG	2	0.2
HTE		3

B02					
Species Name	**GF**	**Status**	**Species Other**	**Cover**	**Abundance**
Eucalyptus robusta	TG	N		15	20
Melaleuca quinquenervia	TG	N		1	5
Pultenaea blakelyi	SG	N		5	20
Acacia longifolia	SG	N		2	30
Desmodium varians	OG	N		0.1	30
Baloskion tetraphyllum	GG	N		2	100
Isachne globosa	GG	N		1	200
Baumea rubiginosa	GG	N		5	100
Juncus usitatus	GG	N		0.5	50
Gahnia sieberiana	GG	N		1	4
Imperata cylindrica	GG	N		1	20
Ischaemum australe	GG	N		10	100
Baumea gunnii	GG	N		0.5	50
Gonocarpus chinensis subsp. verrucosus	FG	N		0.1	20
Hydrocotyle sibthorpioides	FG	N		0.1	20
Pteridium esculentum	EG	N		10	200
Blechnum indicum	EG	N		1	30
Setaria sphacelata	-	E		0.5	3

	Comp	Struct
TG	2	16
SG	2	7
GG	8	21
FG	2	0.2
EG	2	11
OG	1	0.1
HTE		

B03					
Species Name	**GF**	**Status**	**Species Other**	**Cover**	**Abundance**
Pultenaea blakelyi	SG	N		0.5	20
Oxylobium arborescens	SG	N		0.1	5
Hibbertia linearis	SG	N		0.1	10
Acacia ulicifolia	SG	N		0.1	10
Persoonia linearis	SG	N		0.1	1
Persoonia levis	SG	N		0.1	1
Leptospermum margarodes	SG	N		0.1	10
Polyscias sambucifolia	SG	N		0.1	10
Leptospermum trinervium	SG	N		0.1	5
Kennedia rubicunda	OG	N		0.1	10
Hibbertia scandens	OG	N		0.1	5
Xanthorrhoea macronema	OG	N		0.2	1
Baloskion tetraphyllum	GG	N		1	50
Lomandra longifolia	GG	N		10	500
Gahnia sieberiana	GG	N		5	30
Carex appressa	GG	N		2	50
Ischaemum australe	GG	N		0.1	5
Dianella caerulea	FG	N		0.5	10
Pomax umbellata	FG	N		0.5	300
Dianella revoluta	FG	N		0.5	40
Pteridium esculentum	EG	N		30	100

	Comp	Struct
TG	0	0
SG	9	1.3
GG	5	18.1
FG	3	1.5
EG	1	30
OG	3	0.4
HTE		

B04					
Species Name	**GF**	**Status**	**Species Other**	Cover	**Abundance**
Melaleuca quinquenervia	TG	N		0.1	2
Kennedia rubicunda	OG	N		0.2	50
Baumea rubiginosa	GG	N		50	500
Isachne globosa	GG	N		50	500
Ischaemum australe	GG	N		0.5	50
Baumea gunnii	GG	N		0.2	50
Baumea juncea	GG	N		0.1	10
Imperata cylindrica	GG	N		0.1	20
Philydrum lanuginosum	FG	N		0.1	5
Centella asiatica	FG	N		0.1	2
Persicaria strigosa	FG	N		0.1	50
Pteridium esculentum	EG	N		0.2	50
Setaria sphacelata	-	E		1	50
Lotus pedunculatus	-	E		0.1	20

	Comp	Struct
TG	2	0.2

SG	0	0
GG	6	100.9
FG	3	0.3
EG	1	0.2
OG	0	0
HTE		

B05					
Species Name	**GF**	**Status**	**Species Other**	**Cover**	**Abundance**
Acacia longifolia	SG	N		1	20
Leptospermum trinervium	SG	N		2	30
Leucopogon leptospermoides	SG	N		0.1	20
Monotoca elliptica	SG	N		1	20
Persoonia levis	SG	N		0.1	5
Hibbertia diffusa	SG	N		0.1	5
Leptospermum margarodes	SG			0.2	5
Baloskion tetraphyllum	GG	N		5	100
Imperata cylindrica	GG	N		2	100
Eragrostis brownii	GG	N		0.5	100
Ficinia nodosa	GG	N		0.1	2
Lomandra longifolia	GG	N		30	200
Gonocarpus teucroides	FG	N		0.2	100
Gonocarpus micranthus	FG	N		0.1	5
Pomax umbellata	FG	N		0.1	100
Pteridium esculentum	EG	N		10	300
Andropogon virginicus	-	HTE		10	1000
Rumex acetosella	-	E		0.1	5
Senecio madagascariensis	-	HTE		0.1	10

	Comp	Struct
TG	0	0
SG	8	5
GG	5	37.6
FG	3	0.4
EG	1	10
OG	0	0
HTE		10.1

B06					
Species Name	**GF**	**Status**	**Species Other**	**Cover**	**Abundance**
Acacia longifolia	SG	N		0.5	5
Imperata cylindrica	GG	N		65	1000
Ischaemum australe	GG	N		5	500
Baloskion tetraphyllum	GG	N		1	50
Baumea rubiginosa	GG	N		5	50
Cyperus polystachyos	GG	N		0.1	2
Hydrocotyle sibthorpioides	FG	N		0.1	50
Ranunculus inundatus	FG	N		0.1	20
Gonocarpus chinensis subsp. verrucosus	FG	N		0.1	50
Pteridium esculentum	EG	N		2	50
Setaria sphacelata	-	E		2	50
Lotus pedunculatus	-	E		0.1	20
Senecio madagascariensis	-	HTE		0.1	10
Conyza bonariensis	-	E		0.1	10
Paspalum urvillei	-	HTE		1	20
Hypochaeris glabra	-	E		0.1	50
Cirsium vulgare	-	E		0.1	10

	Comp	Struct
TG	0	0
SG	1	0.5

GG	5	76.1
FG	3	0.3
EG	1	2
OG	0	0
HTE		1.1

B07					
Species Name	**GF**	**Status**	**Species Other**	**Cover**	**Abundance**
Eucalyptus robusta	TG	N		0.1	1
Acacia longifolia	SG	N		10	10
Ozothamnus diosmifolius	SG	N		0.1	1
Melaleuca linariifolia	SG	N		0.2	1
Kennedia rubicunda	OG	N		0.1	10
Ischaemum australe	GG	N		65	5000
Baloskion australe	GG	N		10	100
Gahnia sieberiana	GG	N		5	20
Baumea rubiginosa	GG	N		10	500
Isachne globosa	GG	N		0.5	100
Baumea gunnii	GG	N		2	100
Eragrostis brownii	GG	N		0.1	50
Hydrocotyle sibthorpioides	FG	N		0.1	50
Centella asiatica	FG	N		0.1	10
Pteridium esculentum	EG	N		7	100
Blechnum indicum	EG	N		1	50
Senecio madagascarensis	-	HTE		0.1	10
Paspalum urvillei	-	HTE		1	50
Vicia sativa	-	E		0.1	20
Juncus articulatus	-	HTE		0.1	1
Symphyotrichum subulatum	-	E		0.1	5
Gomphocarpus physocarpus	-	E		0.1	20
Lotus uliginosa	-	E		0.1	20

	Comp	Struct
TG	1	0.1
SG	3	10.3
GG	7	92.6
FG	2	0.2
EG	3	8
OG	0	0
HTE		1.2

B08					
Species Name	**GF**	**Status**	**Species Other**	**Cover**	**Abundance**
Acacia longifolia	SG	N		5	20
Banksia ericifolia	SG	N		1	2
Hakea teretifolia	SG	N		0.2	1
Kennedia rubicunda	OG	N		0.1	50
Ischaemum australe	GG	N		60	1000
Baumea rubiginosa	GG	N		40	500
Juncus usitatus	GG	N		0.1	50
Baumea juncea	GG	N		0.1	5
Hydrocotyle sibthorpioides	FG	N		0.1	5
Pteridium esculentum	EG	N		0.1	5
Setaria sphacelata	-	E		2	50
Paspalum urvillei	-	HTE		5	50
Senecio madagascarensis	-	HTE		0.1	5
Plantago lanceolata	-	E		0.1	5
Vicia sativa	-	E		0.1	5
Hypochaeris glabra	-	E		0.1	5
Gomphocarpus fruticosus	-			0.1	5

	Comp	Struct
TG	0	0
SG	3	6.2
GG	4	100.2
FG	1	0.1
EG	1	0.1
OG	1	0.1
HTE		5.1

B09					
Species Name	**GF**	**Status**	**Species Other**	**Cover**	**Abundance**
Eucalyptus robusta	TG	N		5	2
Melaleuca quinquenervia	TG	N		15	10
Casuarina glauca	TG	N		1	5
Melaleuca linariifolia	SG	N		5	10
Acacia longifolia	SG	N		0.2	2
Callistemon salignus	SG	N		0.1	1
Pultenaea blakelyi	SG	N		0.2	2
Kennedia rubicunda	OG	N		0.1	10
Gahnia sieberiana	GG	N		10	50
Phragmites australis	GG	N		1	500
Baumea rubiginosa	GG	N		60	200
Isachne globosa	GG	N		30	500
Baumea gunnii	GG	N		0.1	50
Baumea juncea	GG	N		0.1	20
Juncus usitatus	GG	N		0.1	30
Cyperus polystachyos	GG	N		0.1	10
Ranunculus inundatus	FG	N		0.1	100
Philydrum lanuginosum	FG	N		0.2	30
Dianella revoluta	FG	N		0.1	20
Alternanthera denticulata	FG	N		0.1	50
Centella asiatica	FG	N		0.1	20
Persicaria strigosa	FG	N		0.2	100
Blechnum indicum	EG	N		2	100
Pteridium esculentum	EG	N		0.2	50
Cyclosorus interruptus	EG	N		0.1	10
Paspalum urvellei	-	HTE		0.5	20
Juncus articulatus	-	HTE		0.1	10
Lotus uliginosus	-	E		0.1	10
Symphyotrichum subulatum	-	E		0.1	10
Setaria sphacelata	-	E		0.2	20

	Comp	Struct
TG	3	21
SG	4	5.5
GG	8	101.4
FG	6	0.6
EG	3	2.3
OG	1	0.1
HTE		0.6

B10					
Species Name	**GF**	**Status**	**Species Other**	**Cover**	**Abundance**
Casuarina glauca	TG	N		0.1	2
Isachne globosa	GG	N		45	3000
Baumea articulata	GG	N		5	50
Eragrostis brownii	GG	N		0.1	100
Baumea juncea	GG	N		20	500
Hydrocotyle sibthorpioides	FG	N		0.1	20
Ranunculus inundatus	FG	N		0.1	20

Hydrocotyle sibthorpioides	FG	N		0.1	20
Gonocarpus micranthus	FG	N		0.1	20
Persicaria strigosa	FG	N		0.1	20
Setaria sphacelata	-	E		45	1000
Paspalum urvillei	-	HTE		5	50
Lotus uliginosus	-	E		0.1	50
Senecio madagascariensis	-	HTE		0.1	10
Aster subulatus	-	E		0.1	20

	Comp	Struct
TG	1	0.1
SG	0	0
GG	4	70.1
FG	5	0.5
EG	0	0
OG	0	0
HTE		5.1

B11					
Species Name	**GF**	**Status**	**Species Other**	**Cover**	**Abundance**
Melaleuca quinquenervia	TG	N		5	5
Eucalyptus robusta	TG	N		25	20
Casuarina glauca	TG	N		3	3
Glochidion ferdinandi	TG	N		0.5	5
Melaleuca styphelioides	SG	N		5	10
Melaleuca linariifolia	SG	N		1	10
Acacia longifolia	SG	N		0.2	3
Callistemon salignus	SG	N		0.5	3
Homalanthus populifolius	SG	N		0.1	1
Stephania japonica	OG	N		0.1	5
Kennedia rubicunda	OG	N		0.1	10
Gahnia clarkei	GG	N		30	300
Oplismenus aemulus	GG	N		0.1	50
Carex appressa	GG	N		10	100
Phragmites australis	GG	N		1	50
Cortaderia selloana	-	HTE		3	3
Gahnia sieberiana	GG	N		25	100
Galium Leiocarpum	FG	N		0.1	50
Persicaria strigosa	FG	N		0.1	50
Gonocarpus chinensis subsp. verrucosus	FG	N		0.1	50
Alocasia brisbanensis	FG	N		1	20
Alternanthera denticulata	FG	N		0.1	10
Hydrocotyle sibthorpioides	FG	N		0.1	50
Viola hederacea	FG	N		0.1	50
Blechnum indicum	EG	N		1	50
Pteridium esculentum	EG	N		15	300
Cyclosorus interruptus	EG	N		1	100
Blechnum camfieldii	EG	N		1	100

	Comp	Struct
TG	4	33.5
SG	5	6.8
GG	5	66.1
FG	7	1.6
EG	4	18
OG	2	0.2
HTE		3

B12					
Species Name	**GF**	**Status**	**Species Other**	**Cover**	**Abundance**
Baumea rubiginosa	GG	N		70	300
Isachne globosa	GG	N		30	500
Carex appressa	GG	N		0.2	20
Ranunculus inundatus	FG	N		0.1	50
Hydrocotyle sibthorpioides	FG	N		0.1	50
Alternanthera denticulata	FG	N		0.1	20
Persicaria strigosa	FG	N		0.1	50
Pteridium esculentum	EG	N		2	100
Setaria sphacelata	-	E		5	50
Lotus uliginosa	-	E		0.1	20
Paspalum urvillei	-	HTE		0.1	20
Aster subulatus	-	E		0.1	10

	Comp	Struct
TG	0	0
SG	0	0
GG	3	100.2
FG	4	0.4
EG	1	2
OG	0	0
HTE		

B13					
Species Name	**GF**	**Status**	**Species Other**	**Cover**	**Abundance**
Melaleuca quinquenervia	TG	N		0.1	1
Kennedia rubicunda	OG	N		0.1	5
Isachne globosa	GG	N		25	500
Carex appressa	GG	N		0.2	20
Baumea juncea	GG	N		10	200
Baumea gunnii	GG	N		0.1	1
Ranunculus inundatus	FG	N		0.1	50
Philydrum lanuginosum	FG	N		0.1	20
Hydrocotyle sibthorpioides	FG	N		0.1	20
Centella asiatica	FG	N		0.1	20
Persicaria strigosa	FG	N		0.1	10
Bidens pilosa	-	HTE		0.1	5
Setaria sphacelata	-	E		60	500
Paspalum urvillei	-	HTE		20	200
Lotus uliginosa	-	E		0.1	10
Cirsium vulgare	-	E		0.1	5
Aster subulatus	-	E		0.1	5

	Comp	Struct
TG	1	0.1
SG	0	0
GG	4	35.3
FG	5	0.5
EG	0	0
OG	1	0.1
HTE		20.1

Appendix I. Credit reports

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00041658/BAAS17044/23/00041659

Proposal Name
82 Chapmans Road - Tuncurry

BAM data last updated *
28/10/2024

Assessor Name
Matt Doherty

Assessor Number
BAAS17044

BAM Data version *
Current classification (live - default) (80)

Proponent Names

Report Created
17/12/2024

BAM Case Status
Finalised

Assessment Revision
8

BOS entry trigger
BOS Threshold: Area clearing threshold

Assessment Type
Part 4 Developments (General)

Date Finalised
17/12/2024

* 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.

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

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
No Changes

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
4006-Northern Paperbark-Swamp Mahogany Saw-sedge Forest	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	0.6	2	17	19
4006-Northern Paperbark-Swamp Mahogany Saw-sedge Forest	Not a TEC	8.7	0	113	113
3544-Coastal Sands Apple-Blackbutt Forest	Not a TEC	2.8	0	23	23

BAM Biodiversity Credit Report (Like for like)

3544-Coastal Sands Apple-Blackbutt Forest

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Coastal Dune Dry Sclerophyll Forests This includes PCT's: 3544, 3545, 3546, 3547, 3548, 3549, 3550, 3551, 3552, 3553, 3554, 3555, 3556	Coastal Dune Dry Sclerophyll Forests <50%	3544_Poor	No	9	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Coastal Dune Dry Sclerophyll Forests This includes PCT's: 3544, 3545, 3546, 3547, 3548, 3549, 3550, 3551, 3552, 3553, 3554, 3555, 3556	Coastal Dune Dry Sclerophyll Forests <50%	3544_Managed	No	14	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

4006-Northern Paperbark-Swamp Mahogany Saw-sedge Forest

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region

	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions This includes PCT's: 3272, 3906, 3983, 3985, 3986, 3988, 3989, 3990, 3995, 3997, 3998, 4000, 4001, 4004, 4006, 4009, 4013, 4019, 4020, 4021, 4044, 4047, 4057	-	4006_Good	Yes	2	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions This includes PCT's: 3272, 3906, 3983, 3985, 3986, 3988, 3989, 3990, 3995, 3997, 3998, 4000, 4001, 4004, 4006, 4009, 4013, 4019, 4020, 4021, 4044, 4047, 4057	-	4006_Intact	No	14	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions This includes PCT's: 3272, 3906, 3983, 3985, 3986, 3988, 3989, 3990, 3995, 3997, 3998, 4000, 4001, 4004, 4006, 4009, 4013, 4019, 4020, 4021, 4044, 4047, 4057	-	4006_Moderate	No	3	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

4006-Northern Paperbark-Swamp Mahogany Saw-sedge Forest	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region

	Coastal Swamp Forests This includes PCT's: 1731, 3983, 3984, 3985, 3986, 3987, 3988, 3989, 3990, 3991, 3992, 3993, 3995, 3996, 3997, 3998, 4000, 4001, 4002, 4003, 4004, 4005, 4006, 4007, 4008, 4009, 4010, 4012, 4013, 4156	Coastal Swamp Forests <50%	4006_Poor	No	45	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Coastal Swamp Forests This includes PCT's: 1731, 3983, 3984, 3985, 3986, 3987, 3988, 3989, 3990, 3991, 3992, 3993, 3995, 3996, 3997, 3998, 4000, 4001, 4002, 4003, 4004, 4005, 4006, 4007, 4008, 4009, 4010, 4012, 4013, 4156	Coastal Swamp Forests <50%	4006_Poor-Grassland	No	21	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Coastal Swamp Forests This includes PCT's: 1731, 3983, 3984, 3985, 3986, 3987, 3988, 3989, 3990, 3991, 3992, 3993, 3995, 3996, 3997, 3998, 4000, 4001, 4002, 4003, 4004, 4005, 4006, 4007, 4008, 4009, 4010, 4012, 4013, 4156	Coastal Swamp Forests <50%	4006_Moderate-Grassland	No	27	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Coastal Swamp Forests This includes PCT's: 1731, 3983, 3984, 3985, 3986, 3987, 3988, 3989, 3990, 3991, 3992, 3993, 3995, 3996, 3997, 3998, 4000, 4001, 4002, 4003, 4004, 4005, 4006, 4007, 4008, 4009, 4010, 4012, 4013, 4156	Coastal Swamp Forests <50%	4006_Managed-Grassland	No	20	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

BAM Biodiversity Credit Report (Like for like)

Species	Vegetation Zone/s	Area / Count	Credits
Crinia tinnula / Wallum Froglet	**4006_Good, 4006_Intact, 4006_Moderate, 4006_Poor, 4006_Poor-Grassland, 4006_Moderate-Grassland**	1.7	24.00
Turnix maculosus / Red-backed Button-quail	**4006_Good, 4006_Intact, 4006_Moderate, 4006_Poor, 4006_Poor-Grassland, 4006_Moderate-Grassland, 4006_Managed-Grassland, 3544_Managed, 3544_Poor**	12.1	201.00

Credit Retirement Options

Like-for-like credit retirement options

Crinia tinnula / Wallum Froglet	Spp	IBRA subregion
	Crinia tinnula / Wallum Froglet	Any in NSW
Turnix maculosus / Red-backed Button-quail	Spp	IBRA subregion
	Turnix maculosus / Red-backed Button-quail	Any in NSW

BAM Credit Summary Report

Proposal Details

Assessment Id
00041658/BAAS17044/23/00041659

Proposal Name
82 Chapmans Road - Tuncurry

BAM data last updated *
28/10/2024

Assessor Name
Matt Doherty

Report Created
17/12/2024

BAM Data version *
Current classification (live - default) (80)

Assessor Number
BAAS17044

BAM Case Status
Finalised

Date Finalised
17/12/2024

Assessment Revision
8

BOS entry trigger
BOS Threshold: Area clearing threshold

Assessment Type
Part 4 Developments (General)

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

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

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits
Coastal Sands Apple-Blackbutt Forest												
8	3544_Poor	Not a TEC	28.1	28.1	0.83	PCT Cleared - 22%	High Sensitivity to Gain			1.50		9

9	3544_Managed	Not a TEC	18.8	18.8	2	PCT Cleared - 22%	High Sensitivity to Gain			1.50		14
											Subtotal	**23**
Northern Paperbark-Swamp Mahogany Saw-sedge Forest												
1	4006_Good	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	91.9	91.9	0.05	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		2
2	4006_Intact	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	68.2	68.2	0.4	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		14

3	4006_Moderate	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	40.1	40.1	0.17	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		3
											Subtotal	**19**
Northern Paperbark-Swamp Mahogany Saw-sedge Forest												
4	4006_Poor	Not a TEC	34.1	34.1	3.5	PCT Cleared - 23%	High Sensitivity to Gain			1.50		45
5	4006_Poor-Grassland	Not a TEC	36.2	36.2	1.5	PCT Cleared - 23%	High Sensitivity to Gain			1.50		21
6	4006_Moderate-Grassland	Not a TEC	37.7	37.7	1.9	PCT Cleared - 23%	High Sensitivity to Gain			1.50		27

7	4006_Managed-Grassland	Not a TEC	31.4	31.4	1.7	PCT Cleared - 23%	High Sensitivity to Gain			1.50		20
											Subtotal	**113**
											Total	**155**

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
Crinia tinnula / Wallum Froglet (Fauna)									
4006_Good	91.9	91.9	0.03	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	1
4006_Intact	68.2	68.2	0.06	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	2
4006_Moderate	40.1	40.1	0.09	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	1

4006_Poor	34.1	34.1	0.68	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	9
4006_Poor-Grassland	36.2	36.2	0.65	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	9
4006_Moderate-Grassland	37.7	37.7	0.17	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	2
								Subtotal	**24**
Turnix maculosus / Red-backed Button-quail (Fauna)									
4006_Good	91.9	91.9	0.05	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Not Listed	False	2
4006_Intact	68.2	68.2	0.4	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Not Listed	False	14

4006_Moderate	40.1	40.1	0.17	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Not Listed	False	3
4006_Poor	34.1	34.1	3.5	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Not Listed	False	60
4006_Poor-Grassland	36.2	36.2	1.5	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Not Listed	False	28
4006_Moderate-Grassland	37.7	37.7	1.9	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Not Listed	False	36
4006_Managed-Grassland	31.4	31.4	1.7	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Not Listed	False	27
3544_Managed	18.8	18.8	2	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Not Listed	False	19

3544_Poor	28.1	28.1	0.83	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Not Listed	False	12
								Subtotal	**201**

Appendix J. Koala Assessment Report

Koala Assessment Report - SEPP (Biodiversity and Conservation) 2021

1 Introduction

This Koala Assessment Report (KAR) has been prepared by MJD Environmental alongside the Biodiversity Development Assessment Report (BDAR) (MJD, 2024) to accompany a Development Application for the land at part of Lot 11/-/DP615229 and is located at 82 Chapmans Rd, Tuncurry., hereafter referred to as the 'Site'. This assessment is to be assessed by Mid Coast Council under Part 4 of the EP&A Act.

1.1 Proposal Description

The Development seeks approval for the construction of multiple building (approximately 195 residential lots within stage 2) inclusive of sites, infrastructure and access toads, Asset protection zones (APZs), Internal Roads, Signage and Landscaping. The proposed application seeks approval for the following works:

- Site clearing of vegetation within the area of the subject land
- Bulk earthworks to create level development pads for future construction
- Creation of construction access and lay down area
- Residential buildings
- Associated drainage works inclusive of stormwater basins, services and landscaping
- Fencing

Refer to **Appendix A** for plans of the proposal.

1.2 Application of the SEPP

The Chapter 4 of the SEPP (Biodiversity and Conservation) 2021 applies due to:

- the land being located within the Mid Coast Council LGA which is listed under the SEPP [*Part 4.1 Clause 4.4(1)* and Schedule 1];
- there being no approved Koala Plan of Management for the Subject Site;
- the land contains trees listed under the Schedule 2 Koala Use Tree species; and
- the land has an area of more than 1 ha (including adjoining land within the same ownership).

1.3 Aims and Objectives

This KAR has been developed to address the requirements of the SEPP (Biodiversity and Conservation) 2021. In doing this the KAR must address the stated key principles and their associated detailed criteria and assess the subject site for its potential to be defined as 'Core Koala Habitat'.

1.4 Suitably Qualified Person

This report has been prepared by Kurtis Mumford (B. Env. Sc. & Mgmt), under the guidance of Director Matt Doherty (BAAS# 17044) of MJD Environmental.

Matt Doherty's tertiary qualification and experience spanning over 20 years in the field of ecological consulting – including undertaking general ecological field surveys for NSW flora and fauna (including the Koala) and the associated reporting – satisfies the SEPP criteria defining a suitably qualified and experienced person [*Part 4.11 Clause 4.2 (1)*].

2 Koala Assessment Report

2.1 Koala Habitat Value (criteria 1 and 2)

A review of the OEH BioNet Atlas using a search of the locality, revealed the site, on which the proposed development is to occur, has four existing records occurring within 2.5 km in the last 18 years these records being a resulting factor of local bushfire events, and a further 7 historic records within 10km. However, when cross referenced with a Sydney-Hunter Sub-IBRA region Bionet search there is a single record within a 10km buffer of the site. Koala use tree species listed under Schedule 2 of the SEPP occur within the development footprint and constitute at least 15% of the total number of trees in the upper stratum, therefore 'koala habitat' is present in accordance with the SEPP definition.

2.1.1 Site Description

The Site is situated on Lot 11/-/DP615229, known as 82 Chapmans Rd, Tuncurry and located at Chapmans Rd, Tuncurry, NSW, and is situated over two (2) land zones including R2 Low Density Residential and C2 Environmental Conservation. The Subject Site is situated over predominantly cleared pastures.

Vegetation observed within the Subject Land is characterised by nine Vegetation Zones (VZ's). VZ1 and VZ2 (PCT) 4006 are characterised by a canopy of *Melaleuca quinquenervia* (Broad Leaved Paperbark), *Eucalyptus robusta* (Swamp Mahogany). With VZ's 3-7 (PCT) 4006 consisting of predominantly managed pasture, VZ's 9-10 (PCT) 3544 contain scattered *Eucalyptus pilularis* (Blackbutt) with a disturbed understory lacking a dominant mid stratum.

Exotic species occur in high abundance and density within areas of low elevation. The site appears to have been heavily degraded and is subject to ongoing management practices through slashing.

On this basis, two Plant Community Types (PCT's) were identified within the Subject land.

- PCT 4006: *Northern Paperbark-Swamp Mahogany Saw-sedge Forest*
- PCT 3544: *Coastal Sands Apple-Blackbutt Forest*

The BDAR found that the proposal will remove/modify up to:

- 9.26 ha of *Northern Paperbark-Swamp Mahogany Saw-sedge Forest*
- 2.80 ah of *Coastal Sands Apple-Blackbutt Forest*

The BDAR found that within the subject area the proposal will retain up to:

- 2.38 ha of *Northern Paperbark-Swamp Mahogany Saw-sedge Forest*
- 0.24 ha of *Coastal Sands Apple-Blackbutt Forest*
- 1.62 ha of *Northern Melaleuca quinquenervia Swamp Forest*

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 1:
SITE LOCATION

Legend

- Subject Land
- Study Area
- Cadastral Boundary
- Proposed Layout

N
W E
S

0 60 120 180 240

Metres
1:3000

MJD Environmental

Aerial: Nearmap (2024) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services (2024) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-15 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

2.1.2 Targeted Koala Surveys

During the Biodiversity Assessment carried out by MJD Environmental, formal surveys were undertaken to target the Koala in accordance with the BAM (2020). Field surveys were undertaken on the 23rd of November 2023 and the 24th, 25th and 31st January 2024. The prevailing weather conditions during the surveys are presented in a **Table 1** below.

Table 1 Prevailing Weather Conditions

Date	Min Temp (°C)	Max Temp (°C)	Rain (mm)	Wind (km/h)
23/11/2023	18.6	24.7	0.2	SE-26 WSW-9
24/01/2024	16.3	30.3	0	SSE-13 SE-15
25/01/2024	17.1	39.1	0	E-17
29/01/2024	22.3	28.1	0	NNW-6 NE-24
30/01/2024	23.8	30.4	0	NE-13 ENE-26
31/01/2024	19.9	29.5	0	ESE-20

Sources: http://www.bom.gov.au/climate/dwo/IDCJDW0200.shtml
http://www.ga.gov.au/bin/geodesy/run/sunrisenset

In accordance with the Biodiversity and Conservation SEPP 2021, the following survey activities were undertaken to determine the presence of Koalas:

- Spot Assessment Technique – SAT search (following Phillips and Callaghan 2011). The standard method is 30 trees per 250m x 250m area. One (1) SAT was conducted on 31st January 2024 (refer to **Figure 2**). Additionally, most large trees on the site were incidentally searched for faecal pellet presence / absence throughout the surveys for the BDAR. A minimum of 30 trees were then searched in the main footprint area (refer to **Figure 1**). In keeping with the survey guidelines, the area had not experienced heavy rain in the three (3) days prior to the survey, which was reinforced by the rainfall record from the nearest weather station (refer to **Table 1**).
- Koala use trees present within the Subject Land included. *Melaleuca quinquenervia* (Broad Leaved Paperbark), *Eucalyptus robusta* (Swamp Mahogany) and *Eucalyptus pilularis* (Blackbutt).
- During the SAT search, and in addition to the required survey effort, secondary indications of Koala usage / occupation of local trees was carried out. This included searching trees for Koala signs such as trunk scratches, fur and urine stains.
- Spotlighting. Conducted over three (3) nights on the 23rd of November 2023 and the 24th, 25th January 2024(refer to **Figure 2**), all trees within the Subject Site were checked in line with Department of Planning and Environment (DPE), 2022, *Koala (Phascolarctos cinereus) Biodiversity Assessment Method Survey Guidelines.*

There were no scratch marks displayed on trees within the site and no recent secondary indications such as belly rubs, loose fur nor scats were detected. Despite presence of suitable habitat (through Koala use tree species), there was no recent evidence of Koala presence in or around the Site observed during any of the survey efforts. No Koalas were observed during spotlighting and / or opportunistic observation, and no Koala scats were identified around the base of any Koala use trees during the SAT search.

2.1.3 Site Context

The surrounding environment of the Subject Land consists of a mosaic of land clearings, roads and rural properties. The native vegetation cover of the Subject Site and 1,500m buffer was carried out by API of high-quality aerial photography using GIS Software (QGIS). The native vegetation cover has been assessed at 56%.

The proposal will remove areas of remnant vegetation in a semi-fragmented state with connectivity being limited due to the large open areas of derived native grassland over the site. Nonetheless, the proposal will not result in new points of fragmentation.

There are four existing records occurring within 2.5 km in the last 18 years these records being a resulting factor of local bushfire events, and a further 7 historic records within 10km. However, when cross referenced with a Sydney-Hunter Sub-IBRA region Bionet search there is a single record within a 10km buffer of the site.

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 2:
SURVEY EFFORTS

Legend

- Subject Land
- Study Area
- Cadastral Boundary
- Nocturnal Survey Transects
- Diurnal Survey Transects
- Koala SAT

N
W E
S

0 50 100 150 200

Metres
1:2500

MJD Environmental

Aerial: Nearmap (2024) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services (2024) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-15 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

82 CHAPMANS ROAD,
TUNCURRY

FIGURE 3:
BIONET RECORDS

Legend

- Subject Land
- Study Area
- 2.5 km from Subject Land
- 10 km from Subject Land

N
W E
S

0 1,500 3,000 4,500 6,000

Metres

1:80000

MJD Environmental

Aerial: Maxar Vivid (2023) | Data: MJD Environmental, ADW Johnson, ALLAMS, NSW Spatial Services, NSW Office of Environment & Heritage (2024) | Datum/Projection: GDA2020 / MGA zone 56 | Date: 2024-11-15 | Version: 3 | Z:\22055 - 40-80 Chapmans Road, Tuncurry | This plan should not be relied upon for critical design dimensions.

2.2 Measures taken to avoid impacts to koalas – (criteria 3, 4, 5, 6, 7, & 8)

The proposed location of the development is situated in an area of historic disturbance. The proposal will remove no more than 12.05 ha of native vegetation with 8.5 ha of this consisting of managed and derived native grasslands. The proposed development should not further impede the movement by Koalas across the landscapes as movement is already limited due to large areas of open grassland. or impact recovery and / or expansion of Koala populations as the areas of highest value within the Subject Area are to be retained as part of the proposal.

Precautionary measures were taken to determine the likelihood of koalas occurring on site in accordance with the SEPP 2021. No evidence of koalas was observed.

2.3 Analysis of potential impacts (criteria 9)

The BDAR found that the proposal will remove / modify up to:

- 9.26 ha of Northern Paperbark-Swamp Mahogany Saw-sedge Forest
- 2.80 ah of Coastal Sands Apple-Blackbutt Forest

In addition, the following indirect impacts may occur because of the development:

- Vehicle Strike - The proposal will create additional roads and there will be increased vehicle movement during construction.
- Edge effects – The removal or modification of vegetation within the Subject Site may increase the risk of weed invasions from disturbance of construction and from neighbouring land.
- Disturbance - Unauthorised disturbance of Koala habitat as a result of construction and operation. Note that mitigation measures have been proposed within the BAR for the duration of construction period; and
- Introduction or spread of disease - Increased vehicle movement will be likely during the construction phase that has potential to increase the risk of introduction of *Phytophthora cinnamomi* to the study area via ground disturbance and construction activity combined with machinery bringing spores into the area. Note that mitigation measures have been proposed within the BAR for the duration of construction period.

2.4 Plan to manage and protect koalas and their habitat (criteria 10, 11, 12 & 13)

Impact	Management measures
Vehicle strike	Traffic speed limits throughout the site during construction (10-20 km/hr) and 50km therefore after.
Noise and light disturbance	Suitably qualified ecologist or similar to inspect vegetation for all fauna (Inc. Koalas) before development commences, including surrounding trees to Subject Site. If a koala is identified during construction, temporary suspension of works that might disturb the koala and / or prevent from moving itself to adjacent undisturbed habitat.
Introduction or spread of disease, Edge effects	Ensure that all equipment is free of plant material and soil that may contain weed seeds or soil-borne diseases prior to entering the subject site. Vehicles should be washed down at an appropriate location where weeds are regularly managed prior to commencing work. If machinery is transported from an area of confirmed infection of *Phytophthora cinnamomi* or Exotic Rust Fungi to the subject site, stringent wash down must be completed before leaving the area, removing all soil and vegetative material from cabins, trays, and under carriages;
Disturbance to Koala habitat	Ensure the extent of clearing is clearly marked in the field prior to the commencement of vegetation clearing. Ensure that only the minimum vegetation clearing required is undertaken. Suitably qualified ecologist or similar to inspect vegetation for all fauna (Inc. Koalas) before development commences. If a koala is identified during construction, temporary suspension of works that might disturb the koala and / or prevent from moving itself to adjacent undisturbed habitat

3 Conclusion

This Koala Assessment Report (KAR) has been prepared by MJD Environmental alongside the Biodiversity Development Assessment Report (BDAR) (MJD, 2024) to accompany a Development Application for the land at part Lot 11/-/DP615229 and is located at 82 Chapmans Rd, Tuncurry. This assessment is to be assessed by Mid Coast Council under Part 4 of the EP&A Act.

Owing to the lack of evidence of Koala use within the Site, it is not considered necessary to prescribe monitoring/adaptive management plans or compensatory measures for the proposal. The proposal should not impact the connectivity of the Site within the wider area, nor the ability of any Koala's present to move through the surrounding landscape.

4 References

Department of Planning and Environment (2022) *Koala (Phascolarctos cinereus) Biodiversity Assessment Method Survey Guide.*

MJD Environmental (2022), *Biodiversity Assessment Report*

NSW Environment Energy and Science (2020a) BioNet Atlas: http://www.bionet.nsw.gov.au/ (accessed October 2024)

NSW Environment Energy and Science (2020b) *Threatened Species Profile Search* - http://www.environment.nsw.gov.au/threatenedSpeciesApp/ (accessed October 2024)

NSW Department of Planning, Industry and Environment (2021) *Koala Habitat Protection SEPP* https://www.planning.nsw.gov.au/Policy-and-Legislation/Environment-and-Heritage/Koala-Habitat-Protection-SEPP, DPIE 8 March 2021 (accessed October 2024)

NSW Department of Planning, Industry and Environment (2019) *Koala Habitat Protection SEPP – Koala Habitat Protection Guideline: Implementing State Environmental Planning Policy*

Phillips and Callaghan (2011). The Spot Assessment Technique: A tool for determining localised levels of habitat use by Koalas Phascolarctos cinereus. *Australian Zoologist* 35(3)

State Environmental Planning Policy (Biodiversity and Conservation) 2021 www.legislation.nsw.gov.au

State Environmental Planning Policy (Koala Habitat Protection) 2021 www.legislation.nsw.gov.au

Appendix K. Fauna Species List

Scientific Name	Common Name	BC Act	EPBC Act
Birds			
Ardea pacifica	White-necked Heron		
Cacomantis variolosus	Brush Cuckoo		
Caligavis chrysops	Yellow-faced Honeyeater		
Calyptorhynchus funereus	Yellow-tailed Black-Cockatoo		
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	V
Centropus phasianinus	Pheasant Coucal		
Centropus phasianinus	Pheasant Coucal		
Colluricincla harmonica	Grey Shrike-thrush		
Columba livia livia			
Coracina novaehollandiae	Black-faced Cuckoo-shrike		
Corvus coronoides	Australian Raven		
Cracticus nigrogularis	Pied Butcherbird		
Cracticus tibicen	Australian Magpie		
Dacelo novaeguineae	Laughing Kookaburra		
Egretta novaehollandiae	White-faced Heron		
Elanus axillaris	Black-shouldered Kite		
Gerygone olivacea	White-throated Gerygone		
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	
Malurus cyaneus	Superb Fairy-wren		
Malurus lamberti	Variegated Fairy-wren		
Manorina melanocephala	Noisy Miner		
Megalurus timoriensis	Tawny Grassbird		
Meliphaga lewinii	Lewin's Honeyeater		
Neochmia temporalis minor			
Ninox strenua	Powerful Owl	V	
Pachycephala pectoralis	Golden Whistler		
Pelecanus conspicillatus	Australian Pelican		
Psophodes olivaceus	Eastern Whipbird		
Rhipidura albiscapa	Grey Fantail		
Sphecotheres vieilloti	Australasian Figbird		
Threskiornis molucca	Australian White Ibis		
Todiramphus sanctus	Sacred Kingfisher		
Turnix maculosus	Red-backed Button-quail		
Turnix pyrrhothorax	Red-chested Button-quail		
Frogs			
Crinia parinsignifera	Eastern Sign-bearing Froglet		
Crinia signifera	Common Eastern Froglet		
Crinia tinnula	Wallum Froglet	V	
Limnodynastes peronii	Brown-striped Frog		
Limnodynastes tasmaniensis	Spotted Grass Frog		

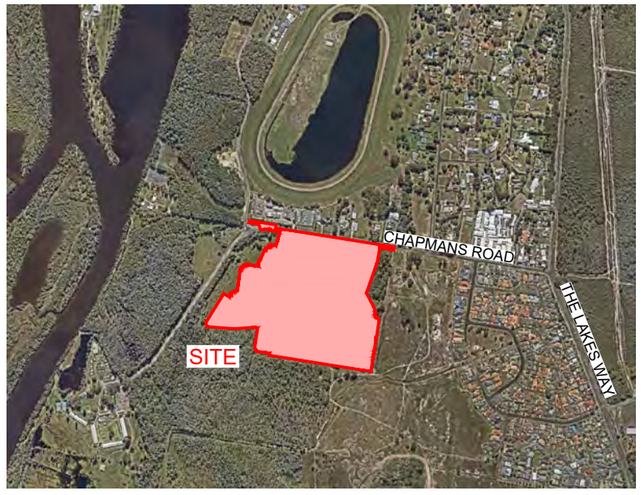
Litoria fallax	Eastern Dwarf Tree Frog		
Litoria Fallax	Eastern Dwarf Tree Frog		
Litoria gracilenta	Dainty Green Tree Frog		
Litoria peronii	Peron's Tree Frog		
Litoria revelata	Revealed Frog		
Litoria tyleri	Tyler's Tree Frog		
Litoria Tyleri	Tyler's Tree Frog		
Uperoleia fusca	Dusky Toadlet		
Uperoleia laevigata	Smooth Toadlet		
Mammals			
Antechinus flavipes/stuarti	Yellow-footed/Brown Antechinus		
Antechinus stuartii *Chalinolobus gouldii*	Brown Antechinus Gould's Wattled Bat		
Perameles nasuta	Long-nosed Bandicoot		
Petaurus breviceps	Sugar Glider		
Pseudocheirus peregrinus	Common Ringtail Possum		
Trichosurus vulpecula	Common Brushtail Possum		
Wallabia bicolor	Swamp Wallaby		
Reptiles			
Intellagama lesueurii	Eastern Water Dragon		
Lampropholis guichenoti	Pale-flecked Garden Sunskink		
Morelia spilota variegata	Top End Carpet Python		

Appendix L. Staff Qualifications

Name	Title	Qualifications	Roles
Matt Doherty	Director	▪ BAM Assessor (#BAAS17044) ▪ B. Landscape Management and Conservation (Soil and Water Management) ▪ Bush Regeneration Cert IV	Review and Approval of BDAR for submission Review of BDAR and BAM-C
Robert Fay	Ecologist	▪ B. Environmental Science and Management (Honours)	Preparation of BDAR Field Work
Stephanie Sheehy	Ecologist	▪ B. Environmental Science and Management	Preparation of BDAR Field work including threatened fauna surveys
Kurtis Mumford	Ecologist	▪ B. Environmental Science and Management	Preparation of BDAR
Mathew Grassi	Ecologist	▪ B. Environmental Science and Management (Ecosystems and Biodiversity)	Field work
Laura Grassi	Field Ecologist	▪ B. Environmental Science and Management (Marine)	Field work
Marcus Lulham	Field Ecologist	▪ Msc: Environmental Management	Field work
Nixon Jowett	Field Ecologist	▪ B. Environmental Science and Management ▪ Graduate Certificate Geospatial Intelligence	Field work
Justin Croft	Field Ecologist	▪ Assoc Deg in Environmental Science ▪ NSW Biosecurity Legislation Online Certificate	Field work
Laidlaw Puha	GIS Officer	▪ B. Science ▪ QGIS for Geologists ▪ Cert IV in Information Technology	Mapping & assisting with BDAR production (Figures & mapping)

Appendix M. Plan of Proposal

DEVELOPMENT APPLICATION
"PROPOSED MANUFACTURED HOME ESTATE"
LOT 100, D.P.12865248 & LOT 11, D.P.615229
40-80, 82 CHAPMANS ROAD, TUNCURRY



LOCALITY SKETCH
NOT TO SCALE

INDEX OF DRAWINGS	
DRAWING No.	DRAWING NAME
190835-S2-DA-001	COVER SHEET, INDEX OF DRAWINGS & LOCALITY SKETCH
190835-S2-DA-010	OVERALL SITE PLAN
190835-S2-DA-011	LAND ZONING PLAN
190835-S2-DA-012	CONSTRUCTION STAGING PLAN
190835-S2-DA-013	SITE DEMOLITION & TREE CLEARING PLAN
190835-S2-DA-014	OPEN SPACE PLAN
190835-S2-DA-015	FLOOR SPACE RATIO PLAN
190835-S2-DA-101	SORRENTO OVERALL DETAIL PLAN
190835-S2-DA-102	DETAIL PLAN - SHEET 1
190835-S2-DA-103	DETAIL PLAN - SHEET 2
190835-S2-DA-104	DETAIL PLAN - SHEET 3
190835-S2-DA-105	DETAIL PLAN - SHEET 4
190835-S2-DA-111	TYPICAL ROAD SECTIONS
190835-S2-DA-121	VEHICLE SWEPT PATH PLAN - SHEET 1
190835-S2-DA-122	VEHICLE SWEPT PATH PLAN - SHEET 2
190835-S2-DA-123	VEHICLE SWEPT PATH PLAN - SHEET 3
190835-S2-DA-124	VEHICLE SWEPT PATH PLAN - SHEET 4

NOT FOR CONSTRUCTION

BEFORE YOU DIG www.byda.com.au

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	09.12.2024	INITIAL ISSUE	LK	JY	DATUM: GDA2020 MGA56 CONTOUR INTERVAL: N/A	NOT TO SCALE	

drawing title:
COVER SHEET, INDEX OF DRAWINGS & LOCALITY SKETCH

location: 40-80, 82 CHAPMANS ROAD, TUNCURRY

council: MIDCOAST COUNCIL

dwg ref: 190835-S2-DA-001

client: ALLAM PROPERTY GROUP

adw johnson
central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
www.adwjohnson.com.au

working beyond expectations

190835-S2-DA-001

190835-S2-DA-010

TUNCURRY FORSTER JOCKEY CLUB

LOT 23 DP1119858

LOT 14 DP1102422

LOT 16 DP1102422

LOT 15 DP1102422

LOT 37 DP815191

LOT 36 DP815191

LOT 35 DP815191

LOT 34 DP815191

LOT 33 DP815191

LOT 7 DP513151

TULLOCH ROAD

ROAD 1

TO THE LAKES WAY

CHAPMANS ROAD

LOT 100 DP1286524

LOT 11 DP615229

LOT 120 DP1290862

LOT 194 DP1193875

LOT 59 DP753207

EXISTING SUBDIVISION

TO TUNCURRY LAKES RESORT

ORIGIN OF LEVELS
BENCH MARK
S.S.M. 85979
E 452087.036
N 6441590.858
R.L. 5.707 A.H.D.

LEGEND

- PROPERTY BOUNDARY
- LIMIT OF WORKS BOUNDARY
- PROPOSED SITE BOUNDARY
- EXISTING LOT BOUNDARY
- PROPOSED SITE
- FOOTPATH
- ROAD PAVEMENT
- VERGE (INCLUDING LANDSCAPING)
- OPEN SPACE
- RAINGARDEN
- DETENTION BASIN

NOT FOR CONSTRUCTION

BEFORE YOU DIG www.byda.com.au

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	09.12.2024	INITIAL ISSUE	LK	JY	DATUM: GDA2020 MGA56 CONTOUR INTERVAL:	A1 1:1500 — 0 30 60 75m — A3 1:3000	

drawing title:

OVERALL SITE PLAN

location: 40-80, 82 CHAPMANS ROAD, TUNCURRY

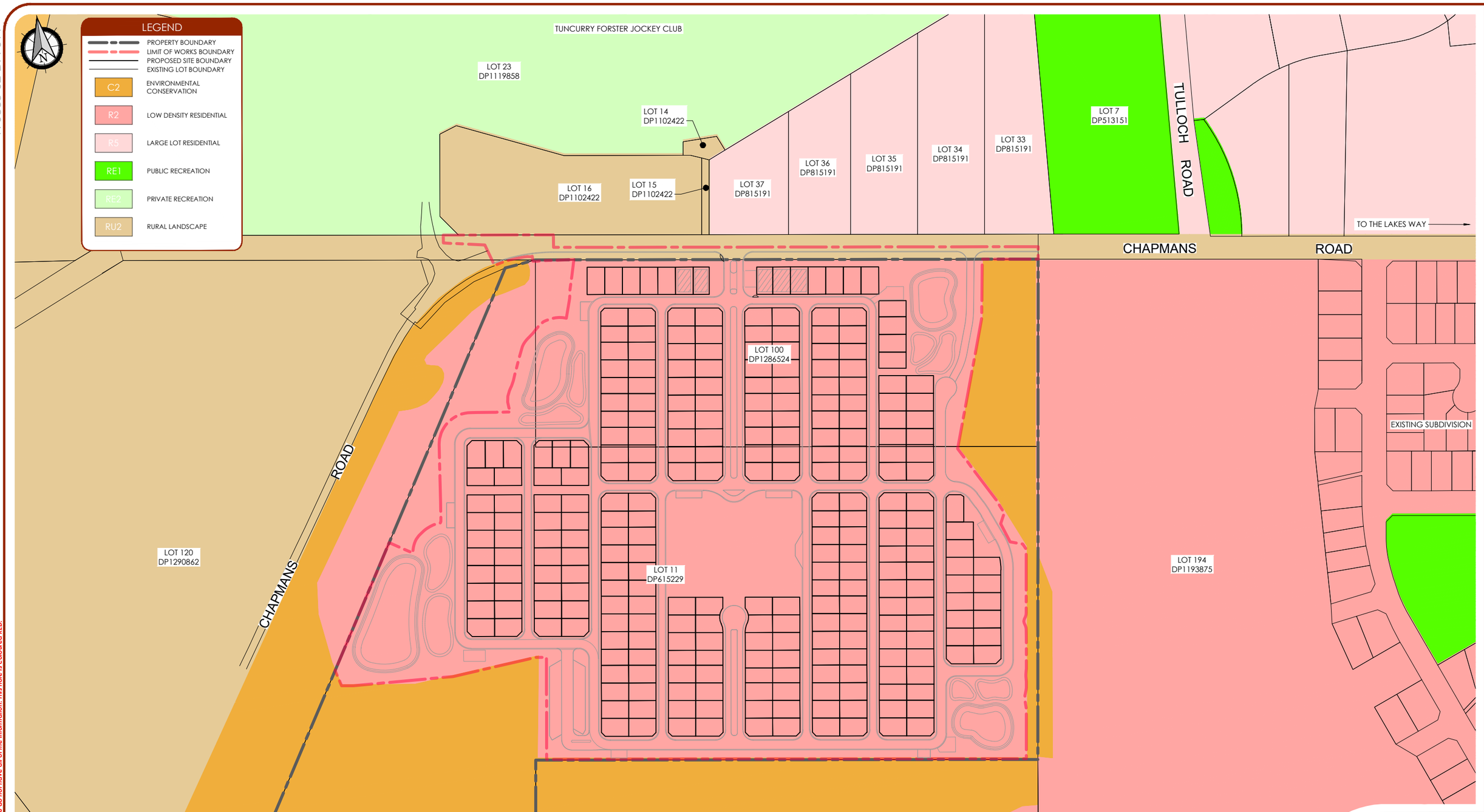
council: MIDCOAST COUNCIL

dwg ref: 190835-S2-DA-010

client: ALLAM PROPERTY GROUP

adw johnson
central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
www.adwjohnson.com.au

working beyond expectations



NOT FOR CONSTRUCTION

BEFORE YOU DIG www.byda.com.au

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	09.12.2024	INITIAL ISSUE	LK	JY	DATUM: GDA2020 MGA56 CONTOUR INTERVAL:	A1 1:1500 0 30 60 75m A3 1:3000	

drawing title:

LAND ZONING PLAN

location: 40-80, 82 CHAPMANS ROAD, TUNCURRY

council: MIDCOAST COUNCIL

dwg ref: 190835-S2-DA-011

client: ALLAM PROPERTY GROUP

adw johnson
central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
www.adwjohnson.com.au

working beyond expectations

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

190835-S2-DA-011

Plotted By: Lachlan Kay Plot Date: 09/12/24 2:28:44PM Cad File: S:\190835\DWG\PLANNING\DA S2\190835-S2-DA-011.DWG

This plan includes coloured information. If you have a black and white copy you do not have all of the information. This note is coloured RED.

190835-S2-DA-012

LOT 23 DP1119858

LOT 16 DP1102422

LOT 15 DP1102422

LOT 37 DP815191

LOT 36 DP815191

LOT 35 DP815191

LOT 34 DP815191

LOT 33 DP815191

LOT 7 DP513151

ROAD 1B

ROAD 1A

CHAPMANS ROAD

TO THE LAKES WAY

LOT 120 DP1290862

CHAPMANS ROAD

TO TUNCURRY LAKES RESORT

LOT 100 DP1286524

LOT 11 DP615229

LOT 59 DP753207

LOT 194 DP1193875

ROAD 10B

ROAD 10A

ROAD

No.1

No.2

No.3

No.4

No.5

No.6

No.7

No.8

No.9

No.11

No.12

LEGEND

- PROPERTY BOUNDARY
- LIMIT OF WORKS BOUNDARY
- STAGING BOUNDARY
- PROPOSED SITE BOUNDARY
- EXISTING LOT BOUNDARY
- STAGE 1 WORKS
- STAGE 2 WORKS
- STAGE 3 WORKS
- STAGE 4 WORKS

NOT FOR CONSTRUCTION

BEFORE YOU DIG www.byda.com.au

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	09.12.2024	INITIAL ISSUE	LK	JY	DATUM: GDA2020 MGA56 CONTOUR INTERVAL:	A1 1:1000 0 25 50m A3 1:2000	

drawing title:

CONSTRUCTION STAGING PLAN

location: 40-80, 82 CHAPMANS ROAD, TUNCURRY

council: MIDCOAST COUNCIL

dwg ref: 190835-S2-DA-012

client: ALLAM PROPERTY GROUP

adw johnson
central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
www.adwjohnson.com.au

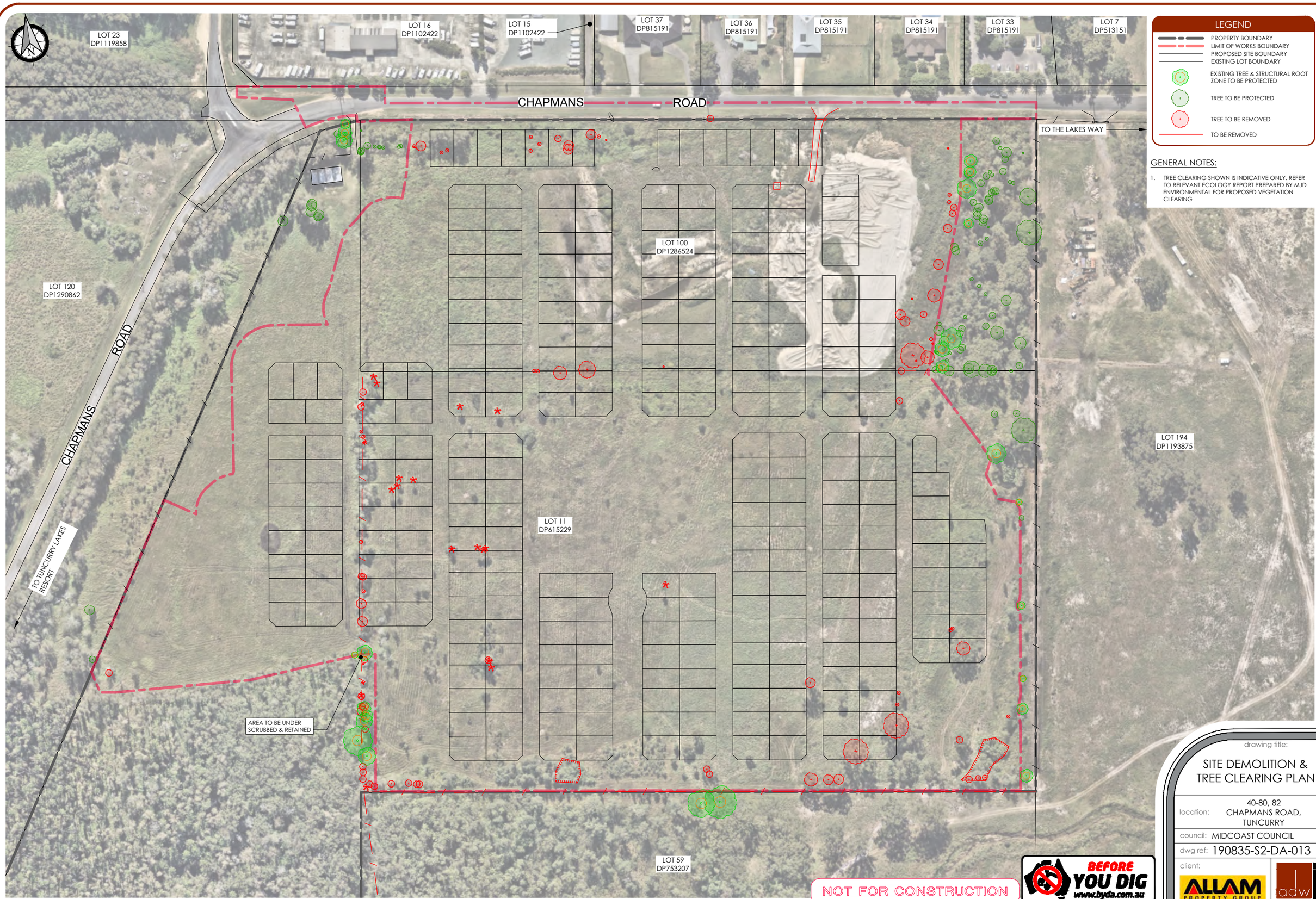
working beyond expectations

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

Plotted By: Lachlan Kay Plot Date: 09/12/24 2:28:52PM Cad File: S:\190835\DWG\PLANNING\DA S2\190835-S2-DA-012.DWG

This plan includes coloured information. If you have a black and white copy you do not have all of the information. This note is coloured RED.

190835-S2-DA-013



LEGEND

- PROPERTY BOUNDARY
- LIMIT OF WORKS BOUNDARY
- PROPOSED SITE BOUNDARY
- EXISTING LOT BOUNDARY
- EXISTING TREE & STRUCTURAL ROOT ZONE TO BE PROTECTED
- TREE TO BE PROTECTED
- TREE TO BE REMOVED
- TO BE REMOVED

GENERAL NOTES:

1. TREE CLEARING SHOWN IS INDICATIVE ONLY. REFER TO RELEVANT ECOLOGY REPORT PREPARED BY MJD ENVIRONMENTAL FOR PROPOSED VEGETATION CLEARING

NOT FOR CONSTRUCTION

BEFORE YOU DIG www.byda.com.au

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	09.12.2024	INITIAL ISSUE	LK	JY	DATUM: GDA2020 MGA56 CONTOUR INTERVAL:	A1 1:1000 — 0 25 50m — A3 1:2000	

drawing title:

SITE DEMOLITION & TREE CLEARING PLAN

location: 40-80, 82 CHAPMANS ROAD, TUNCURRY

council: MIDCOAST COUNCIL

dwg ref: 190835-S2-DA-013

client: ALLAM PROPERTY GROUP

adw johnson
central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
www.adwjohnson.com.au

working beyond expectations

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

190835-S2-DA-014

LOT 23 DP1119858
LOT 16 DP1102422
LOT 15 DP1102422
LOT 37 DP815191
LOT 36 DP815191
LOT 35 DP815191
LOT 34 DP815191
LOT 33 DP815191
LOT 7 DP513151

ROAD 1B
ROAD 1A
CHAPMANS ROAD
TO THE LAKES WAY

LOT 120 DP1290862
CHAPMANS ROAD
TO TUNCURRY LAKES RESORT

LOT 100 DP1286524
LOT 11 DP615229
LOT 194 DP1193875
LOT 59 DP753207

ROAD No.6
ROAD No.3
No.2
ROAD
No.6
No.5
No.1
ROAD
No.4
No.3
No.12
ROAD
ROAD
No.9
No.8
No.7
ROAD
ROAD
ROAD
ROAD
ROAD
No.8
No.9
ROAD
ROAD
No.11
No.10
ROAD
ROAD
ROAD
ROAD
ROAD
No.8
ROAD 10B
ROAD 10A

LEGEND

- PROPERTY BOUNDARY
- LIMIT OF WORKS BOUNDARY
- STAGING BOUNDARY
- PROPOSED SITE BOUNDARY
- EXISTING LOT BOUNDARY
- OPEN SPACE
- TOTAL SITE

OPEN SPACE

DESCRIPTION	AREA
OPEN SPACE	3.17Ha
TOTAL SITE	19.43Ha
OPEN SPACE RATIO	16.3%

NOT FOR CONSTRUCTION

BEFORE YOU DIG www.byda.com.au

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	09.12.2024	INITIAL ISSUE	LK	JY	DATUM: GDA2020 MGA56 CONTOUR INTERVAL:	A1 1:1000 — 0 25 50m — A3 1:2000	

drawing title:

OPEN SPACE PLAN

location: 40-80, 82 CHAPMANS ROAD, TUNCURRY

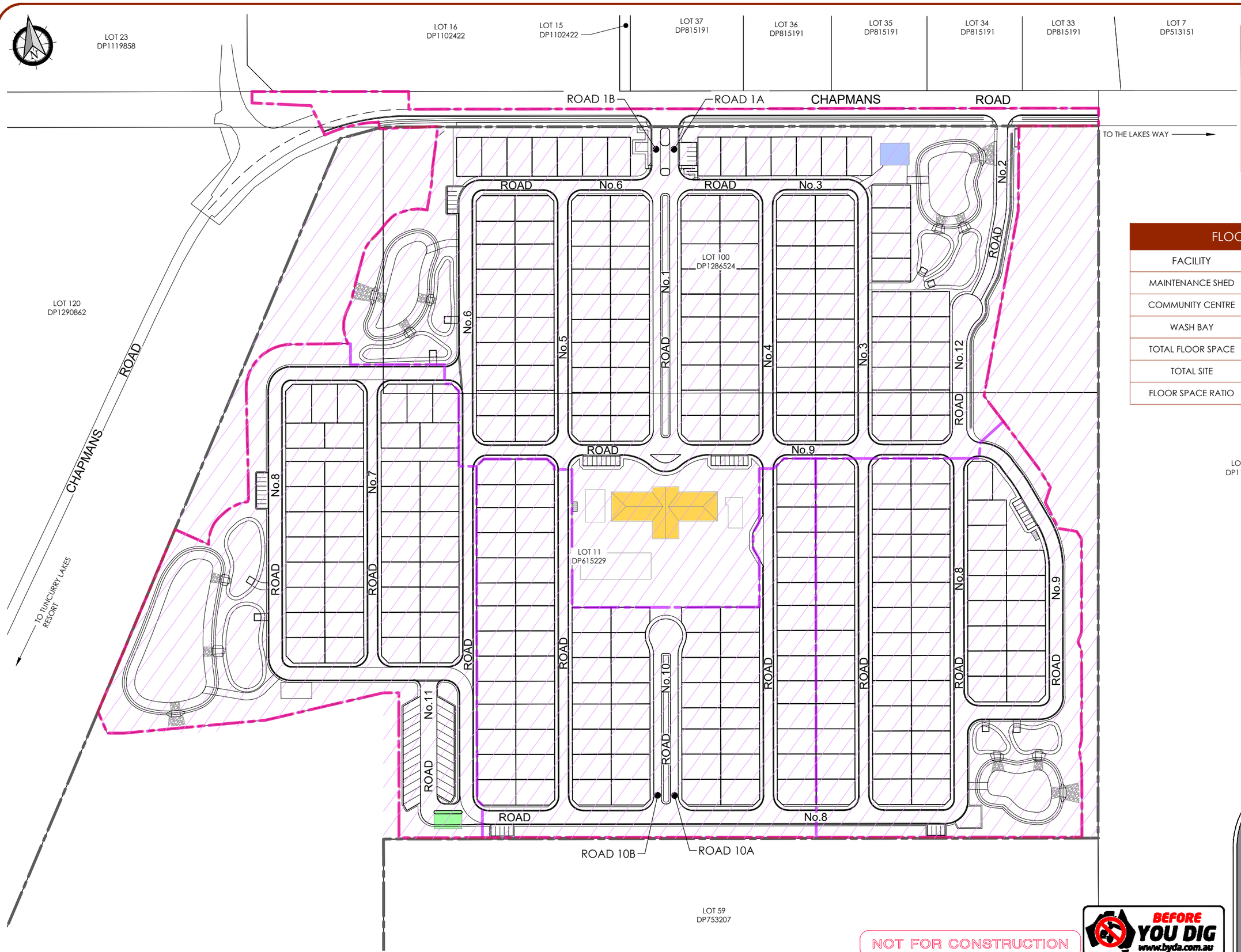
council: MIDCOAST COUNCIL

dwg ref: 190835-S2-DA-014

client: ALLAM PROPERTY GROUP

adw johnson
central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
www.adwjohnson.com.au

working beyond expectations



LEGEND

- PROPERTY BOUNDARY
- LIMIT OF WORKS BOUNDARY
- STAGING BOUNDARY
- PROPOSED SITE BOUNDARY
- EXISTING LOT BOUNDARY
- TOTAL SITE
- MAINTENANCE SHED
- COMMUNITY CENTRE
- WASH BAY

FLOOR SPACE

FACILITY	FLOOR SPACE AREA
MAINTENANCE SHED	0.02Ha
COMMUNITY CENTRE	0.11Ha
WASH BAY	0.02Ha
TOTAL FLOOR SPACE	0.15Ha
TOTAL SITE	19.43Ha
FLOOR SPACE RATIO	1:99

NOT FOR CONSTRUCTION

BEFORE YOU DIG www.byda.com.au

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	09.12.2024	INITIAL ISSUE	LK	JY	DATUM: GDA2020 MGA56 CONTOUR INTERVAL:	A1 1:1000 — 0 25 50m — A3 1:2000	

drawing title:

FLOOR SPACE RATIO PLAN

location: 40-80, 82 CHAPMANS ROAD, TUNCURRY

council: MIDCOAST COUNCIL

dwg ref: 190835-S2-DA-015

client: ALLAM PROPERTY GROUP

adw johnson
central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
www.adwjohnson.com.au

working beyond expectations

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

190835-S2-DA-015

Plotted By: Lachlan Kay Plot Date: 09/12/24 2:29:11 PM Cad File: S:\190835\DWG\PLANNING\DA S2\190835-S2-DA-015.DWG

This plan includes coloured information. If you have a black and white copy you do not have all of the information. This note is coloured RED.

190835-S2-DA-101

LOT 23 DP1119858 | LOT 16 DP1102422 | LOT 15 DP1102422 | LOT 37 DP815191 | LOT 36 DP815191 | LOT 35 DP815191 | LOT 34 DP815191 | LOT 33 DP815191 | LOT 7 DP513151

SHEET 102 | SHEET 103 | SHEET 104 | SHEET 105

ROAD 1 | CHAPMANS ROAD

TEMPORARY COMMUNITY FACILITIES | ENTRY SIGN | TEMP OPEN SPACE | ELECTRONIC SLIDING VEHICLE ACCESS GATE | CARPARK 8 | PEDESTRIAN GATE | SALES OFFICE AND 2 DISPLAYS | MAINTENANCE SHED | HALF ROAD CONSTRUCTION AND FOOTPATH UPGRADES

TO THE LAKES WAY | PROPOSED GATE | DETENTION BASIN | RAINGARDEN | EMERGENCY ACCESS ONLY | INDICATIVE SUBSTATION LOCATION

CARPARK 1 | CARPARK 2 | CARPARK 3 | CARPARK 4 | CARPARK 5 | CARPARK 6 | CARPARK 7

DETENTION BASIN | RAINGARDEN | SPS | CARAVAN PARKING | DUMP POINT | WASH DOWN BAY | PICKLEBALL COURT | BOWLING GREEN | SWIMMING POOL | BUS PARKING

LOT 120 DP1290862 | LOT 100 DP1286524 | LOT 11 DP615229 | LOT 194 DP1193875 | LOT 59 DP753207

TO TUNCURRY LAKES RESORT

ROAD No.1 | ROAD No.2 | ROAD No.3 | ROAD No.4 | ROAD No.5 | ROAD No.6 | ROAD No.7 | ROAD No.8 | ROAD No.9 | ROAD No.10 | ROAD No.11 | ROAD No.12

LEGEND

- PROPERTY BOUNDARY
- LIMIT OF WORKS BOUNDARY
- APZ
- PROPOSED SITE BOUNDARY
- EXISTING LOT BOUNDARY
- PROPOSED SITE
- FOOTPATH
- ROAD PAVEMENT
- VERGE (INCLUDING LANDSCAPING)
- OPEN SPACE
- RAINGARDEN
- DETENTION BASIN

GENERAL NOTES:

1. REFER TO 190835-S2-CENG & 190835-S2-WCMP FOR FURTHER DETAILS

NOT FOR CONSTRUCTION

BEFORE YOU DIG www.byda.com.au

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	09.12.2024	INITIAL ISSUE	LK	JY	DATUM: GDA2020 MGA56 CONTOUR INTERVAL:	A1 1:1000 — 0 25 50m — A3 1:2000	

drawing title:

SORRENTO OVERALL DETAIL PLAN

location: 40-80, 82 CHAPMANS ROAD, TUNCURRY

council: MIDCOAST COUNCIL

dwg ref: 190835-S2-DA-101

client: ALLAM PROPERTY GROUP

adw johnson
central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
www.adwjohnson.com.au

working beyond expectations

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

190835-S2-DA-102-105

EXISTING SWALE UPGRADES & TIE IN WORKS

PROVIDE NEW STORMWATER CROSSING

LOT 16 DP1102422

LOT 37 DP815191

ROAD No.1A (5m WIDE)

(4m WIDE HALF ROAD RECONSTRCUTION)

ROAD No.1B (5m WIDE)

CHAPMANS ROAD

ROAD REMEDIATION TO SUIT PROPOSED BOX CULVERT LEVELS & CREATE SMOOTH CONNECTION WITH EXISTING ROAD LEVELS

TEMPORARY COMMUNITY FACILITIES

MAX GRADE 4%

MAX GRADE 7.14%

TEMPORARY SALES OFFICE

LOT 120 DP1290862

LOT 11 DP615229

LOT 100 DP1286524

ROAD No.6 (8m WIDE)

ROAD No.8 (8m WIDE)

ROAD No.7 (6m WIDE)

ROAD No.5 (6m WIDE)

ROAD No.9 (6m WIDE)

ROAD No.4 (6m WIDE)

ROAD No.3 (6m WIDE)

No.1B (4.5m WIDE)

No.1A (4.5m WIDE)

REFER TO LANDSCAPE PLANS FOR FURTHER DETAILS

REFER TO LANDSCAPE & ARCHITECTURAL PLANS FOR FURTHER DETAILS

PICKLEBALL COURT

CLUB HOUSE

PROPOSED SUBSTATION

REFER SHEET 104 FOR CONTINUATION

REFER SHEET 103 FOR CONTINUATION

NOT FOR CONSTRUCTION

BEFORE YOU DIG www.byda.com.au

LEGEND

- PROPERTY BOUNDARY
- LIMIT OF WORKS BOUNDARY
- APZ
- PROPOSED SITE BOUNDARY
- EXISTING LOT BOUNDARY
- MAJOR NATURAL CONTOURS
- MINOR NATURAL CONTOURS
- MAJOR DESIGN CONTOURS
- MINOR DESIGN CONTOURS
- PROPOSED KERB
- EXTENTS OF BATTER
- PROPOSED SWALE
- PROPOSED OVERLAND FLOW PATH
- SW PROPOSED STORMWATER
- ex sw EXISTING STORMWATER
- PROPOSED SW PIT
- PROPOSED LINTEL
- PROPOSED HEADWALL

GENERAL NOTES:

1. FOR TYPICAL ROAD CROSS SECTIONS SHOWING ROAD AND VERGE WIDTHS REFER TO SHEET 111.
2. STORMWATER LAYOUT IS INDICATIVE ONLY.
3. REFER TO 190835-S2-CENG & 190835-S2-WCMP FOR FURTHER DETAILS
4. FLOOD PLANNING LEVEL RL 2.7m MIN. FLOOR LEVEL RL 3.2

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	09.12.2024	INITIAL ISSUE	LK	JY	DATUM: GDA2020 MGA56 CONTOUR INTERVAL:	A1 1:500 · 0 · 12.5 · 25.0m · A3 1:1000	

drawing title:

DETAIL PLAN SHEET 1

location: 40-80, 82 CHAPMANS ROAD, TUNCURRY

council: MIDCOAST COUNCIL

dwg ref: 190835-S2-DA-102

client: ALLAM PROPERTY GROUP

adw johnson
central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
www.adwjohnson.com.au

working beyond expectations

LOT 37 DP815191 | LOT 36 DP815191 | LOT 35 DP815191 | LOT 34 DP815191 | LOT 33 DP815191 | LOT 7 DP513151

ROAD No.1B (5m WIDE)

ROAD No.1A (5m WIDE)

CHAPMANS ROAD

(4m WIDE HALF ROAD RECONSTRCUTION)

MAX GRADE 4%

MAX GRADE 7.14%

TEMPORARY SALES OFFICE

REFER TO LANDSCAPE & ARCHITECTURAL PLANS FOR FURTHER DETAILS

MAINTENANCE SHED

PROPOSED 1.8m HIGH COLORBOND FENCE.

ROAD No.2 (6m WIDE)

ROAD No.3 (6m WIDE)

ROAD No.4 (6m WIDE)

ROAD No.9 (6m WIDE)

LOT 100 DP1286524

LOT 194 DP1193875

NO WORKS PROPOSED IN C2 CONSERVATION AREA

CLUB HOUSE

POOL

REFER SHEET 102 FOR CONTINUATION

REFER SHEET 105 FOR CONTINUATION

LEGEND

- PROPERTY BOUNDARY
- LIMIT OF WORKS BOUNDARY
- APZ
- PROPOSED SITE BOUNDARY
- EXISTING LOT BOUNDARY
- MAJOR NATURAL CONTOURS
- MINOR NATURAL CONTOURS
- MAJOR DESIGN CONTOURS
- MINOR DESIGN CONTOURS
- PROPOSED KERB
- EXTENTS OF BATTER
- PROPOSED SWALE
- PROPOSED OVERLAND FLOW PATH
- SW PROPOSED STORMWATER
- ex SW EXISTING STORMWATER
- PROPOSED SW PIT
- PROPOSED LINTEL
- PROPOSED HEADWALL

GENERAL NOTES:

1. FOR TYPICAL ROAD CROSS SECTIONS SHOWING ROAD AND VERGE WIDTHS REFER TO SHEET 111.
2. STORMWATER LAYOUT IS INDICATIVE ONLY.
3. REFER TO 190835-S2-CENG & 190835-S2-WCMP FOR FURTHER DETAILS
4. FLOOD PLANNING LEVEL RL 2.7m MIN. FLOOR LEVEL RL 3.2

NOT FOR CONSTRUCTION

BEFORE YOU DIG www.byda.com.au

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	09.12.2024	INITIAL ISSUE	LK	JY	DATUM: GDA2020 MGA56 CONTOUR INTERVAL:	A1 1:500 / A3 1:1000 (0, 12.5, 25.0m)	

drawing title:

DETAIL PLAN SHEET 2

location: 40-80, 82 CHAPMANS ROAD, TUNCURRY

council: MIDCOAST COUNCIL

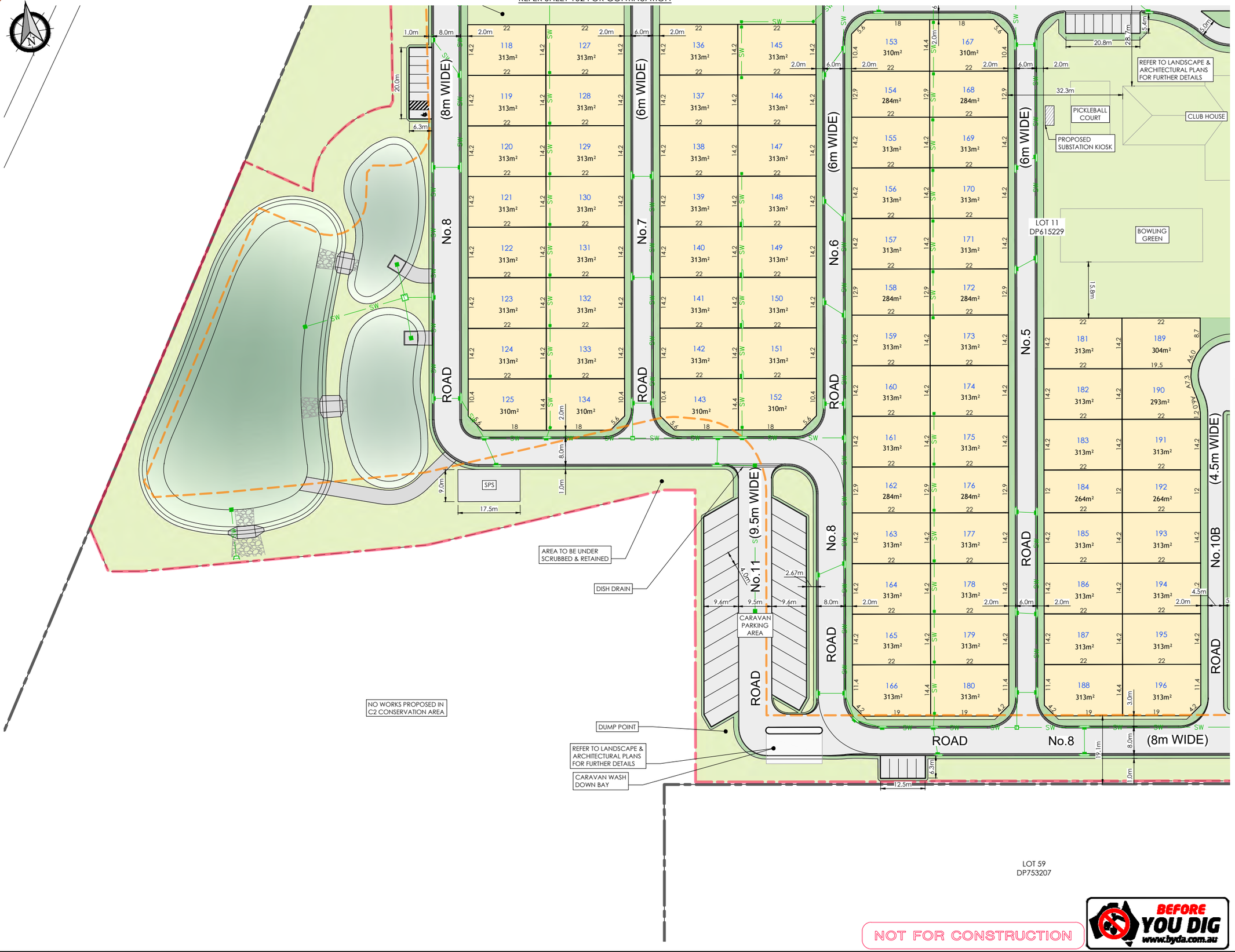
dwg ref: 190835-S2-DA-103

client: ALLAM PROPERTY GROUP

adw johnson
central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
www.adwjohnson.com.au

working beyond expectations

REFER SHEET 102 FOR CONTINUATION



LEGEND

- PROPERTY BOUNDARY
- LIMIT OF WORKS BOUNDARY
- APZ
- PROPOSED SITE BOUNDARY
- EXISTING LOT BOUNDARY
- MAJOR NATURAL CONTOURS
- MINOR NATURAL CONTOURS
- MAJOR DESIGN CONTOURS
- MINOR DESIGN CONTOURS
- PROPOSED KERB
- EXTENTS OF BATTER
- PROPOSED SWALE
- PROPOSED OVERLAND FLOW PATH
- SW — PROPOSED STORMWATER
- ex SW — EXISTING STORMWATER
- PROPOSED SW PIT
- PROPOSED LINTEL
- PROPOSED HEADWALL

GENERAL NOTES:

1. FOR TYPICAL ROAD CROSS SECTIONS SHOWING ROAD AND VERGE WIDTHS REFER TO SHEET 111.
2. STORMWATER LAYOUT IS INDICATIVE ONLY.
3. REFER TO 190835-S2-CENG & 190835-S2-WCMP FOR FURTHER DETAILS
4. FLOOD PLANNING LEVEL RL 2.7m MIN. FLOOR LEVEL RL 3.2

REFER SHEET 105 FOR CONTINUATION

NOT FOR CONSTRUCTION

BEFORE YOU DIG www.byda.com.au

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	09.12.2024	INITIAL ISSUE	LK	JY	DATUM: GDA2020 MGA56 CONTOUR INTERVAL:	A1 1:500 — 0 12.5 25.0m — A3 1:1000	

drawing title:

DETAIL PLAN SHEET 3

location: 40-80, 82 CHAPMANS ROAD, TUNCURRY

council: MIDCOAST COUNCIL

dwg ref: 190835-S2-DA-104

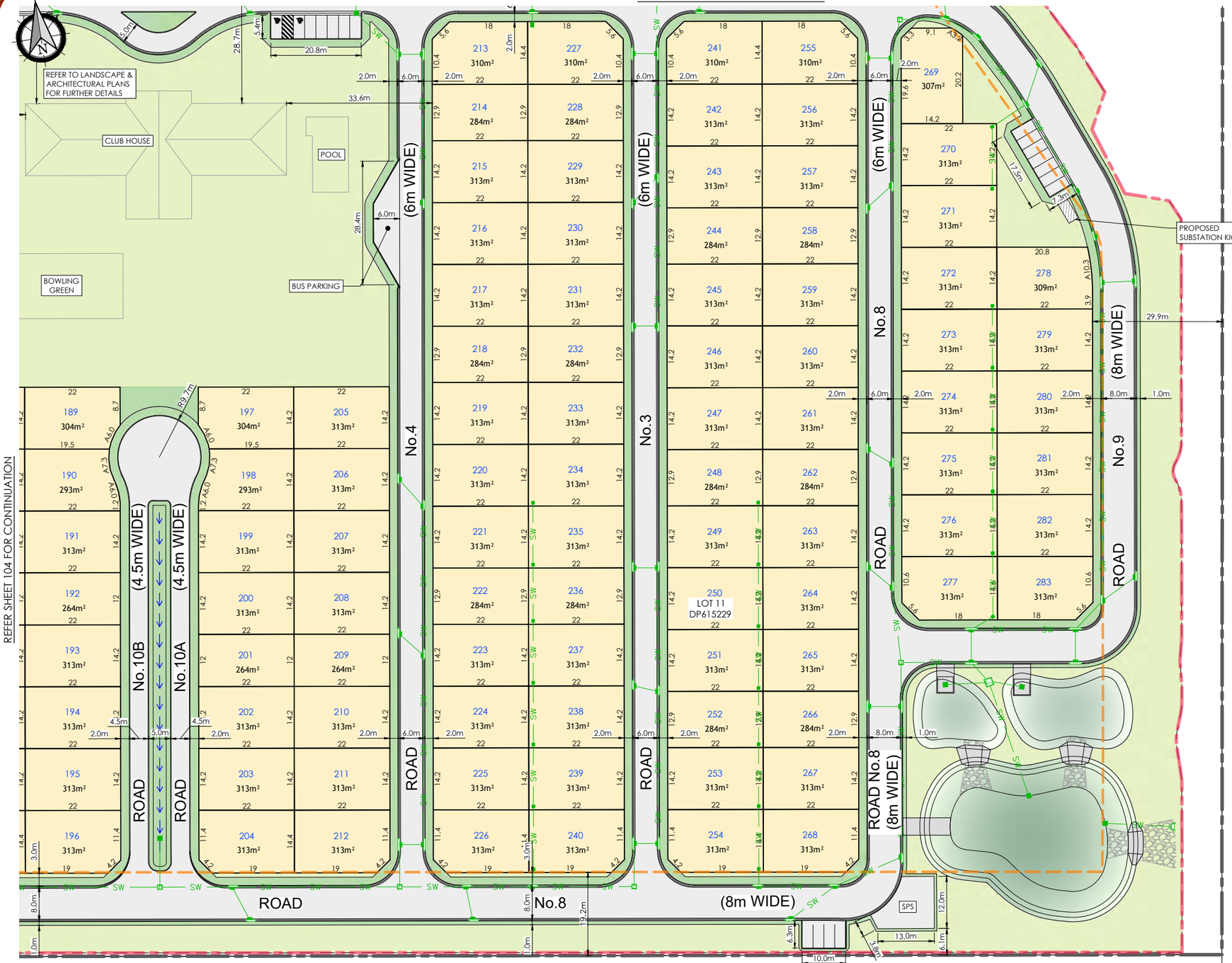
client: ALLAM PROPERTY GROUP

adw johnson
central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
www.adwjohnson.com.au

working beyond expectations

REFER SHEET 103 FOR CONTINUATION

REFER SHEET 104 FOR CONTINUATION



LEGEND

- PROPERTY BOUNDARY
- LIMIT OF WORKS BOUNDARY
- APZ
- PROPOSED SITE BOUNDARY
- EXISTING LOT BOUNDARY
- MAJOR NATURAL CONTOURS
- MINOR NATURAL CONTOURS
- MAJOR DESIGN CONTOURS
- MINOR DESIGN CONTOURS
- PROPOSED KERB
- EXTENTS OF BATTER
- PROPOSED SWALE
- PROPOSED OVERLAND FLOW PATH
- SW — PROPOSED STORMWATER
- ex SW — EXISTING STORMWATER
- PROPOSED SW PIT
- PROPOSED LINTEL
- PROPOSED HEADWALL

GENERAL NOTES:

1. FOR TYPICAL ROAD CROSS SECTIONS SHOWING ROAD AND VERGE WIDTHS REFER TO SHEET 111.
2. STORMWATER LAYOUT IS INDICATIVE ONLY.
3. REFER TO 190835-S2-CENG & 190835-S2-WCMP FOR FURTHER DETAILS
4. FLOOD PLANNING LEVEL RL 2.7m MIN. FLOOR LEVEL RL 3.2

NOT FOR CONSTRUCTION

BEFORE YOU DIG www.byda.com.au

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	09.12.2024	INITIAL ISSUE	LK	JY	DATUM: GDA2020 MGA56 CONTOUR INTERVAL:	A1 1:500 — 0 12.5 25.0m — A3 1:1000	

drawing title:

DETAIL PLAN SHEET 4

location: 40-80, 82 CHAPMANS ROAD, TUNCURRY

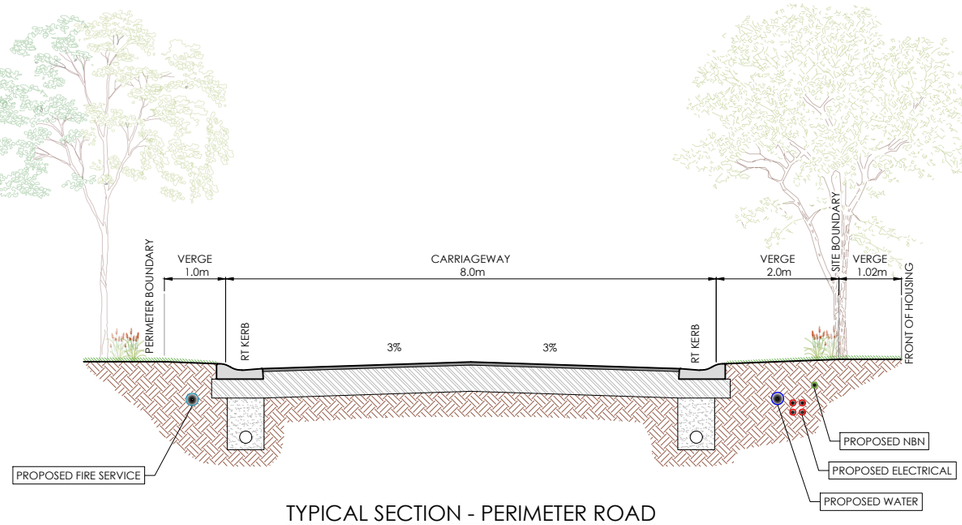
council: MIDCOAST COUNCIL

dwg ref: 190835-S2-DA-105

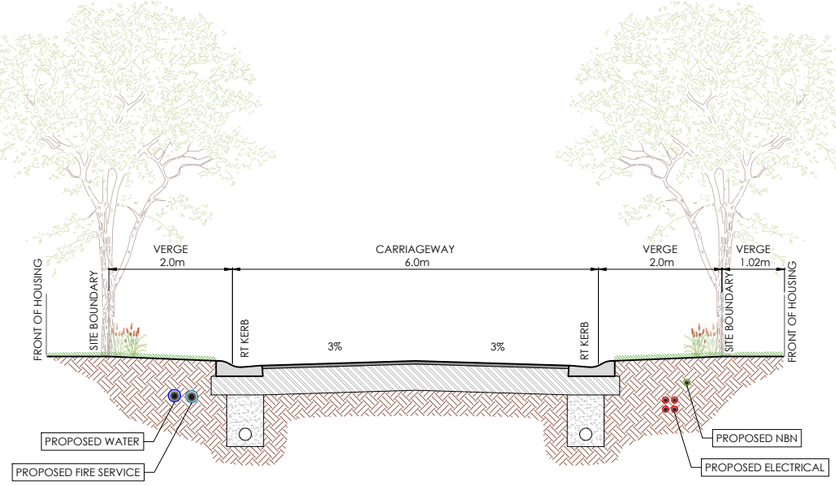
client: ALLAM PROPERTY GROUP

adw johnson
central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
www.adwjohnson.com.au

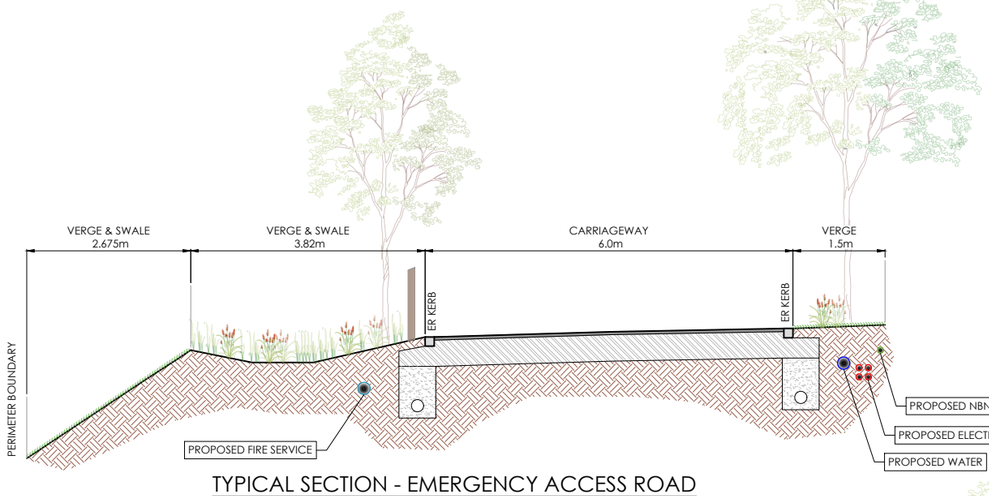
working beyond expectations



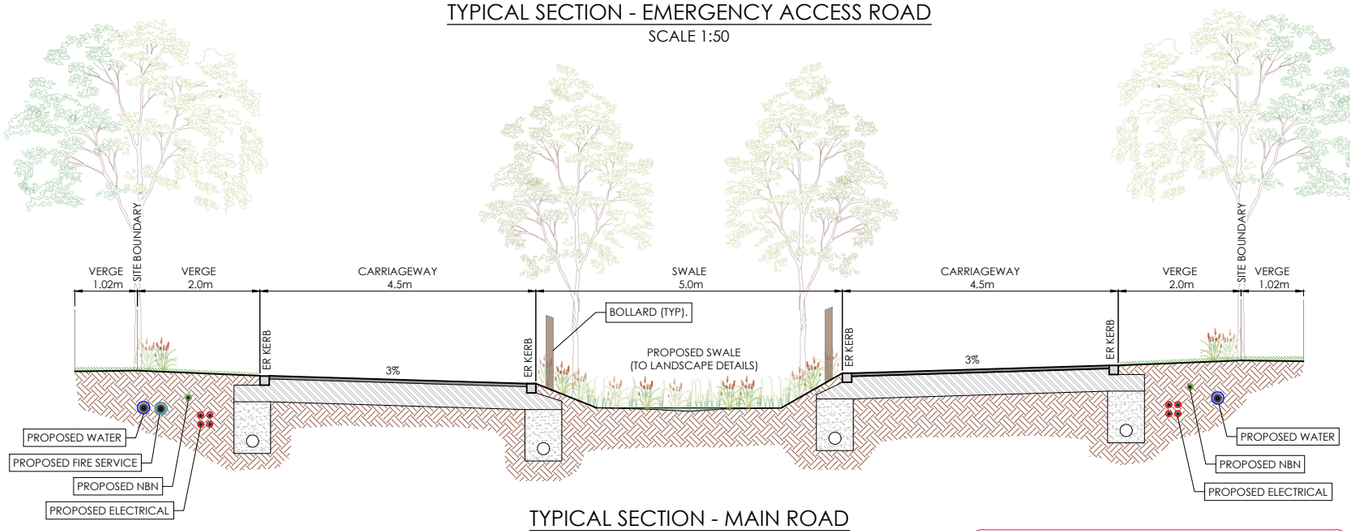
TYPICAL SECTION - PERIMETER ROAD
SCALE 1:50



TYPICAL SECTION - STANDARD ROAD
SCALE 1:50



TYPICAL SECTION - EMERGENCY ACCESS ROAD
SCALE 1:50



TYPICAL SECTION - MAIN ROAD
SCALE 1:50

NOT FOR CONSTRUCTION

BEFORE YOU DIG www.byda.com.au

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	09.12.2024	INITIAL ISSUE	LK	JY	DATUM: GDA2020 MGA56 CONTOUR INTERVAL:	A1 1:50 · 0 · 1.25 · 2.5 m · A3 1:100	

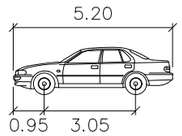
drawing title:
TYPICAL ROAD SECTIONS

location: 40-80, 82 CHAPMANS ROAD, TUNCURRY
council: MIDCOAST COUNCIL
dwg ref: 190835-S2-DA-111
client: ALLAM PROPERTY GROUP

adw johnson
central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
www.adwjohnson.com.au

working beyond expectations

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

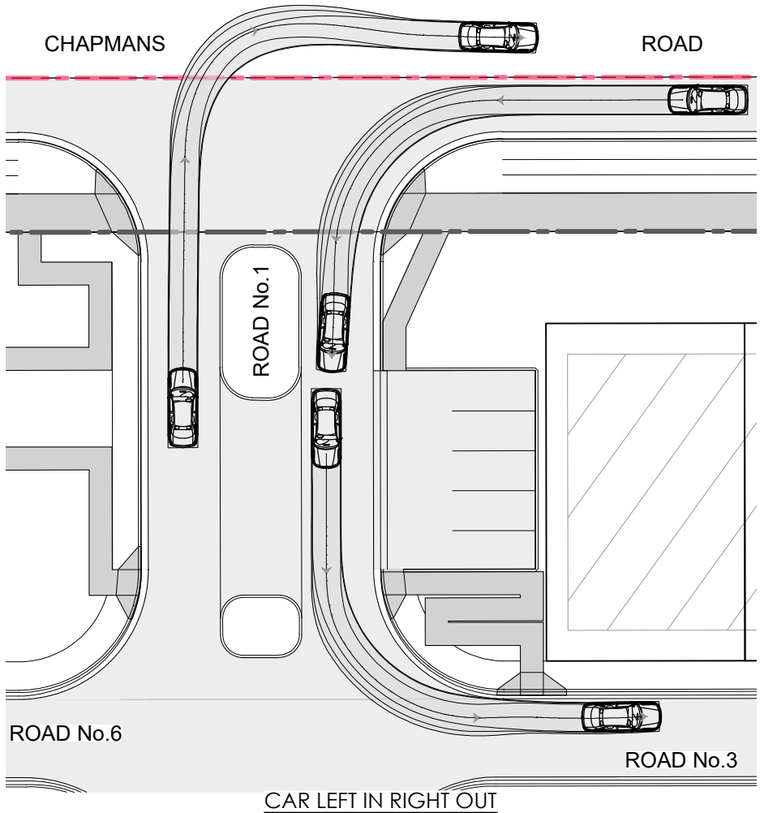


B99 PASSENGER–CAR

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.6

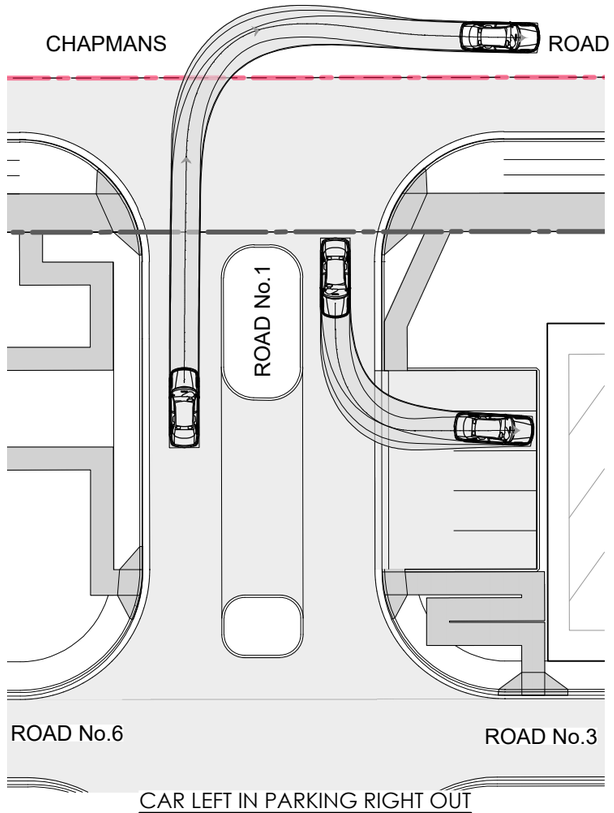
LEGEND

- PROPERTY BOUNDARY
- LIMIT OF WORKS BOUNDARY
- PROPOSED SITE BOUNDARY
- EXISTING LOT BOUNDARY



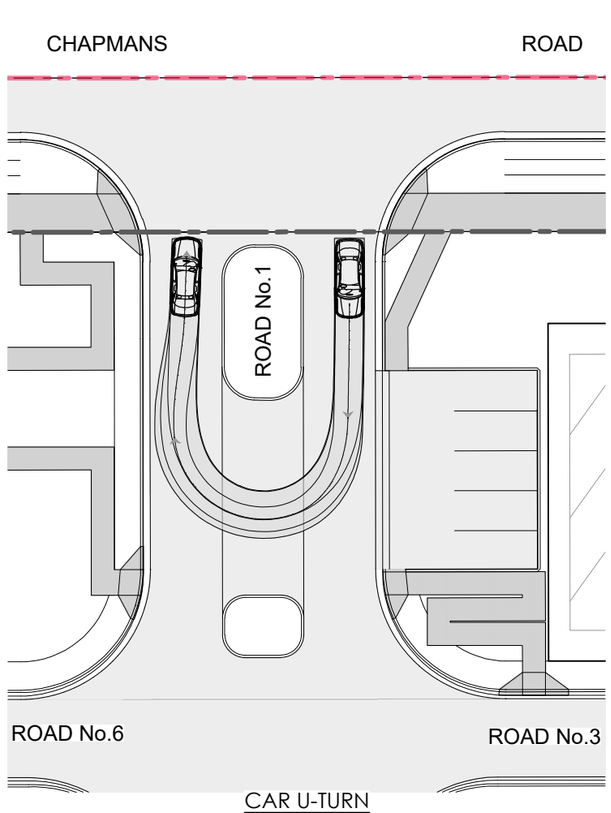
CAR LEFT IN RIGHT OUT

SCALE 1:200



CAR LEFT IN PARKING RIGHT OUT

SCALE 1:200



CAR U-TURN

SCALE 1:200

NOT FOR CONSTRUCTION

BEFORE YOU DIG www.byda.com.au

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	09.12.2024	INITIAL ISSUE	LK	JY	DATUM: GDA2020 MGA56 CONTOUR INTERVAL:	A1 1:200 — 0 5.0 10.0m — A3 1:400	

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

drawing title:

VEHICLE SWEPT PATHS PLAN SHEET 1

location: 40-80, 82 CHAPMANS ROAD, TUNCURRY

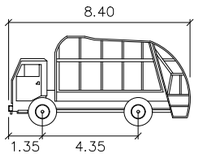
council: MIDCOAST COUNCIL

dwg ref: 190835-S2-DA-121

client: ALLAM PROPERTY GROUP

adw johnson
central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
www.adwjohnson.com.au

working beyond expectations

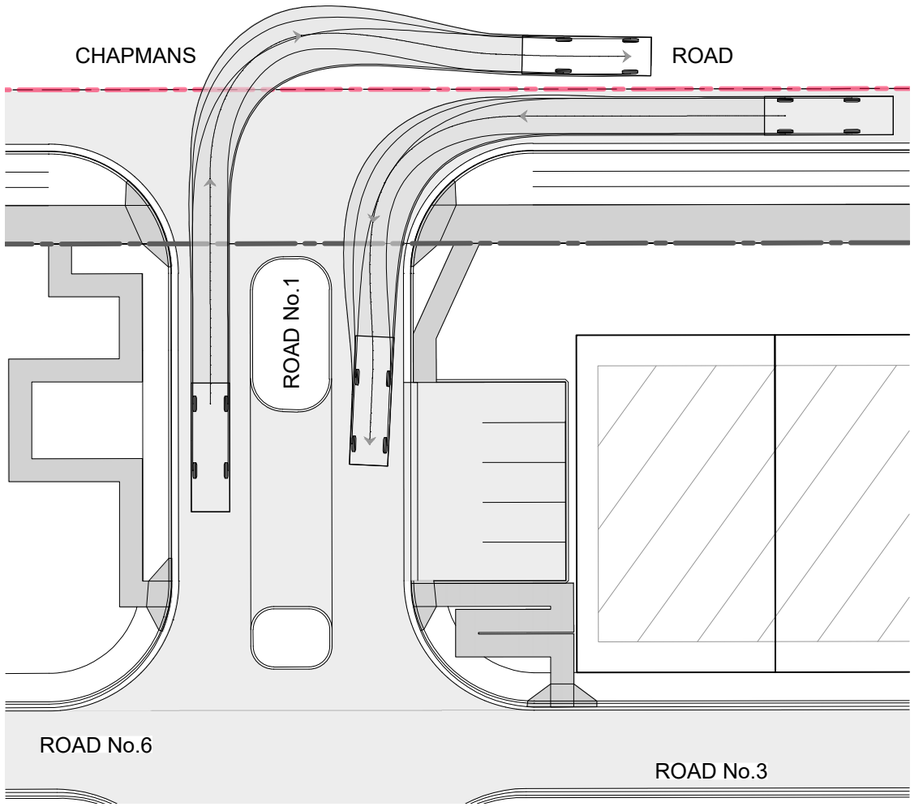


8.4m Garbage truck

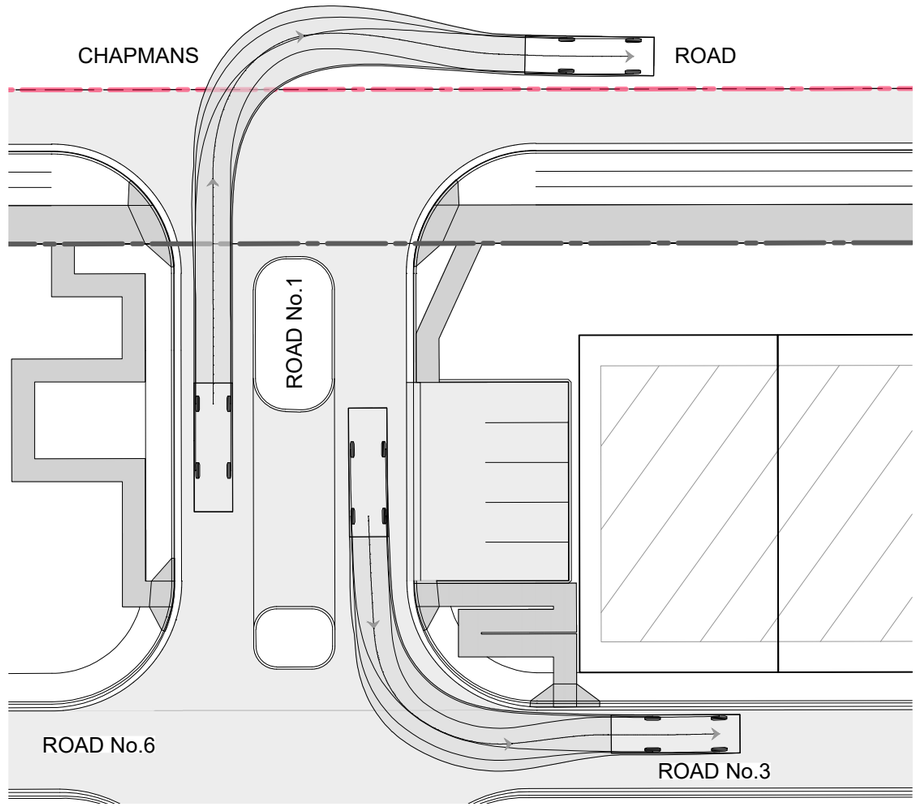
	meters
Width	: 2.50
Track	: 2.30
Lock to Lock Time	: 6.0
Steering Angle	: 36.0

LEGEND

- PROPERTY BOUNDARY
- LIMIT OF WORKS BOUNDARY
- PROPOSED SITE BOUNDARY
- EXISTING LOT BOUNDARY



GARBAGE TRUCK LEFT IN RIGHT OUT
SCALE 1:200



GARBAGE TRUCK LEFT IN RIGHT OUT
SCALE 1:200

NOT FOR CONSTRUCTION

BEFORE YOU DIG www.byda.com.au

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	09.12.2024	INITIAL ISSUE	LK	JY	DATUM: GDA2020 MGA56 CONTOUR INTERVAL:	A1 1:200 — 0 5.0 10.0m — A3 1:400	

drawing title:
VEHICLE SWEPT PATHS PLAN SHEET 2

location: 40-80, 82 CHAPMANS ROAD, TUNCURRY

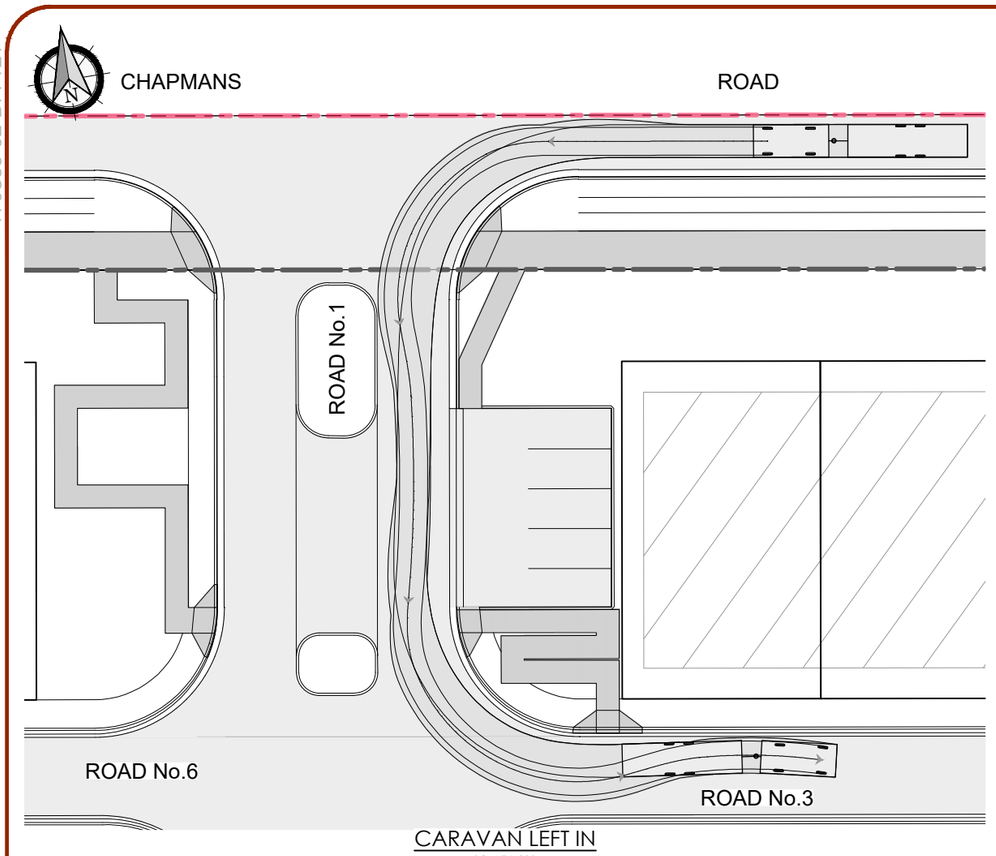
council: MIDCOAST COUNCIL

dwg ref: 190835-S2-DA-122

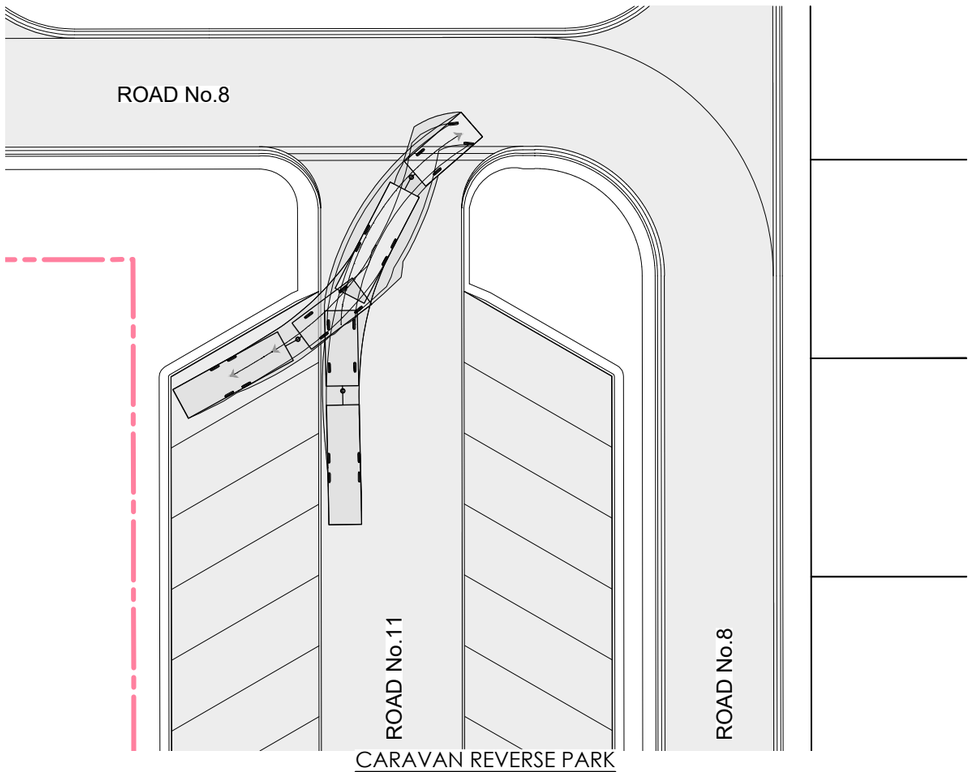
client: ALLAM PROPERTY GROUP

adw johnson
central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
www.adwjohnson.com.au

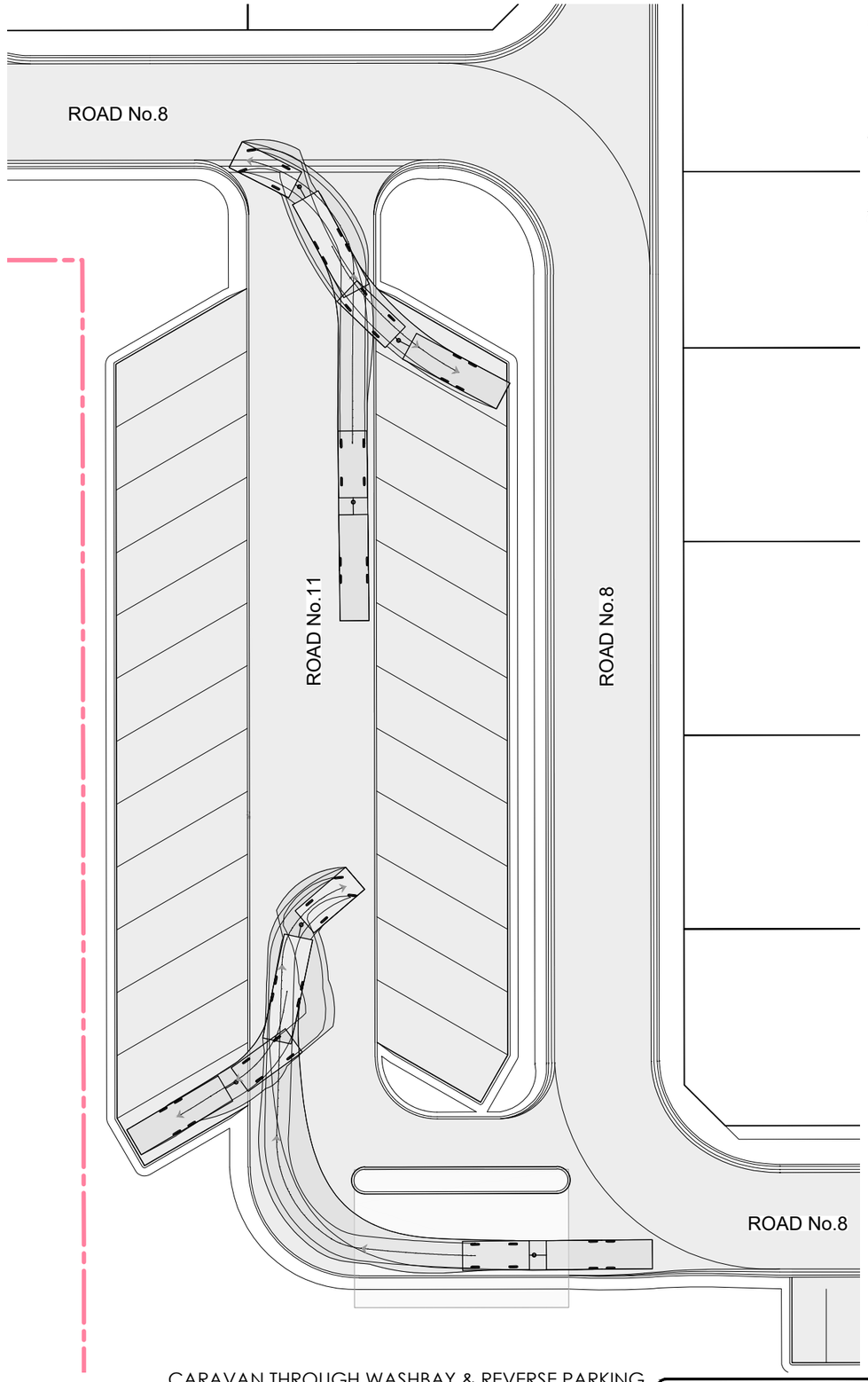
working beyond expectations



CARAVAN LEFT IN
SCALE 1:200



CARAVAN REVERSE PARK
SCALE 1:200



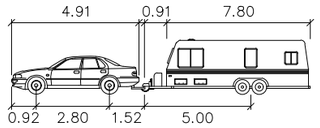
CARAVAN THROUGH WASHBAY & REVERSE PARKING
SCALE 1:200

NOT FOR CONSTRUCTION

BEFORE YOU DIG www.byda.com.au

LEGEND

- PROPERTY BOUNDARY
- LIMIT OF WORKS BOUNDARY
- PROPOSED SITE BOUNDARY
- EXISTING LOT BOUNDARY



B85 + Caravan

	meters
Car Width	: 2.13
Trailer Width	: 2.13
Car Track	: 1.83
Trailer Track	: 2.13
Lock to Lock Time	: 6.0
Steering Angle	: 31.2
Articulating Angle	: 70.0

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	09.12.2024	INITIAL ISSUE	LK	JY	DATUM: GDA2020 MGA56 CONTOUR INTERVAL:	A1 1:200 0 5.0 10.0m A3 1:400	

drawing title:
VEHICLE SWEPT PATHS PLAN SHEET 3

location: 40-80, 82 CHAPMANS ROAD, TUNCURRY

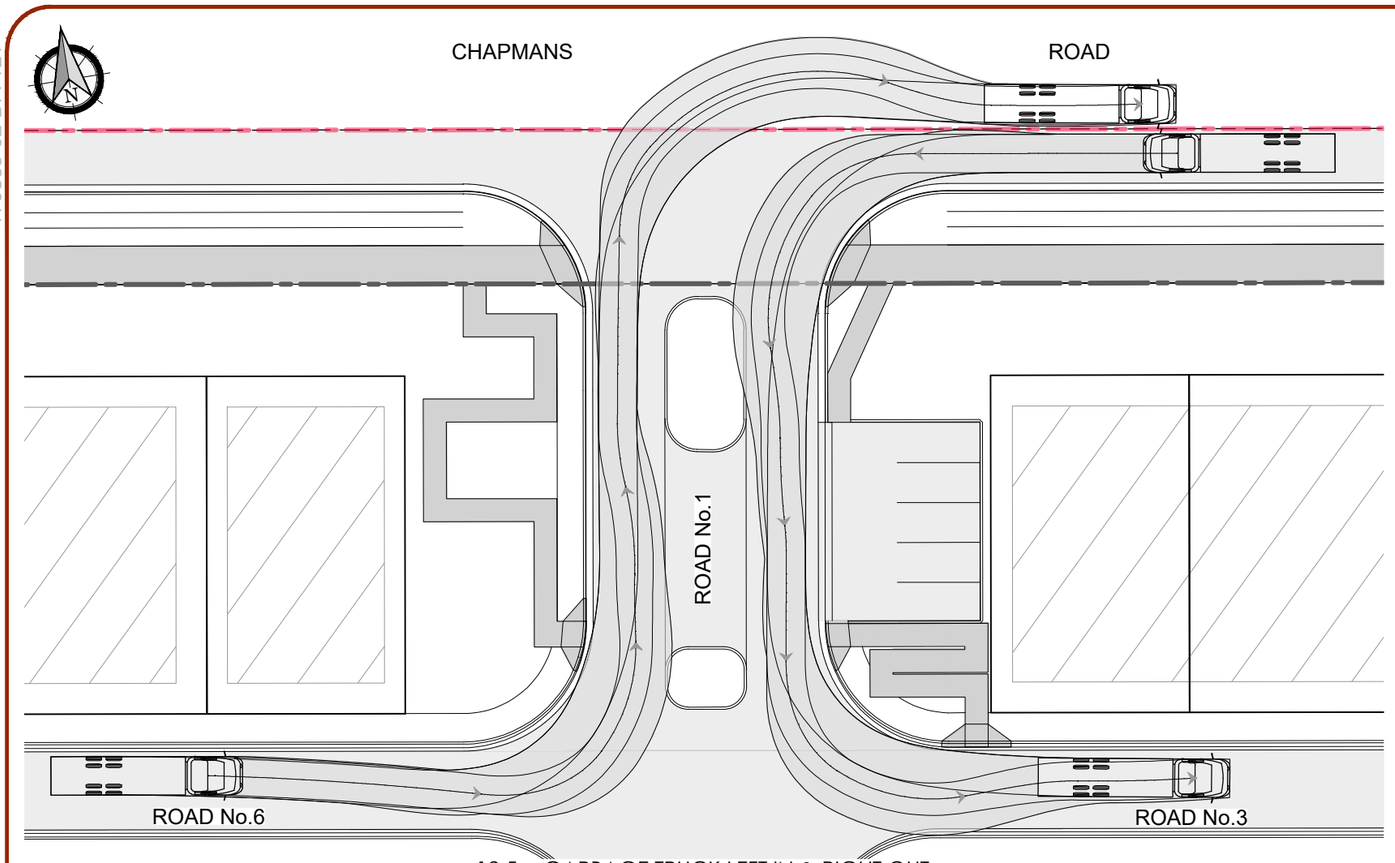
council: MIDCOAST COUNCIL

dwg ref: 190835-S2-DA-123

client: ALLAM PROPERTY GROUP

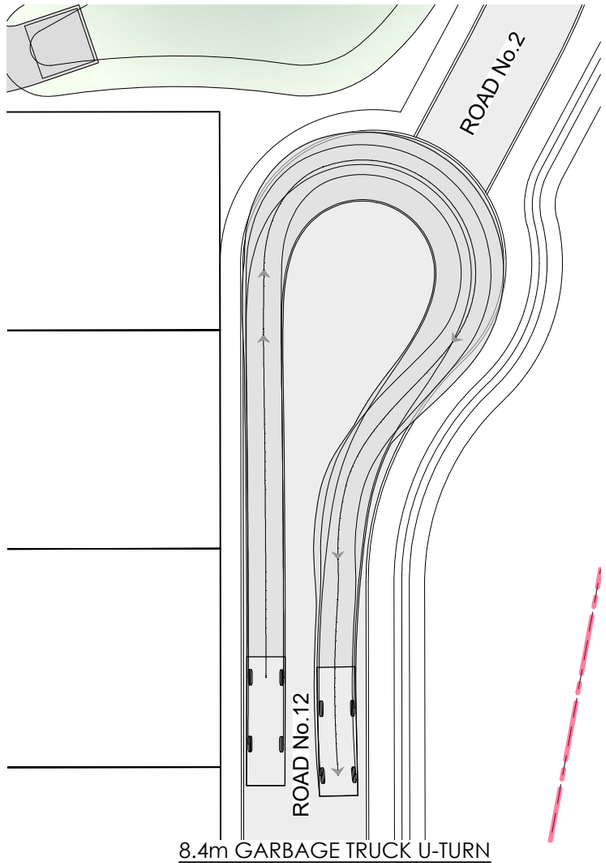
adw johnson
central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
www.adwjohnson.com.au

working beyond expectations



12.5m GARBAGE TRUCK LEFT IN & RIGHT OUT

SCALE 1:200

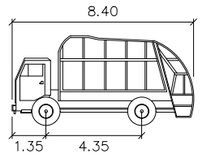


8.4m GARBAGE TRUCK U-TURN

SCALE 1:200

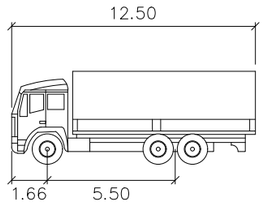
LEGEND

- PROPERTY BOUNDARY
- LIMIT OF WORKS BOUNDARY
- PROPOSED SITE BOUNDARY
- EXISTING LOT BOUNDARY



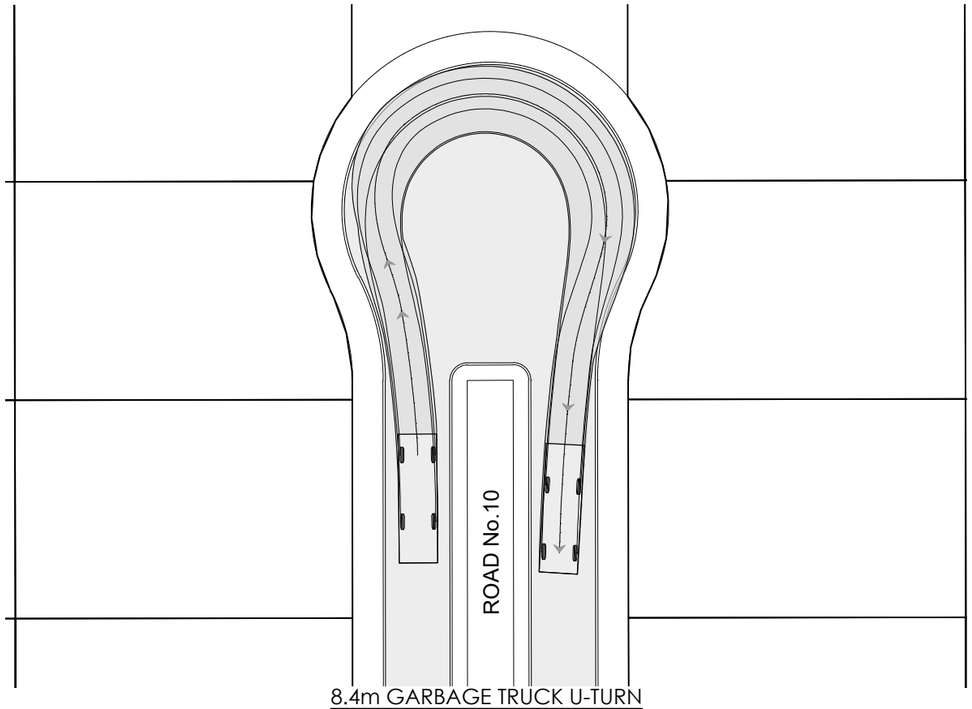
8.4m Garbage truck SCC

	meters
Width	: 2.50
Track	: 2.30
Lock to Lock Time	: 6.0
Steering Angle	: 36.0



PCC GARBAGE TRUCK

	meters
Width	: 2.80
Track	: 2.80
Lock to Lock Time	: 6.0
Steering Angle	: 56.1



8.4m GARBAGE TRUCK U-TURN

SCALE 1:200

working beyond expectations

NOT FOR CONSTRUCTION

BEFORE YOU DIG www.byda.com.au

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	09.12.2024	INITIAL ISSUE	LK	JY	DATUM: GDA2020 MGA56 CONTOUR INTERVAL:	A1 1:200 — 0 5.0 10.0m — A3 1:400	

drawing title:
VEHICLE SWEPT PATHS PLAN SHEET 4

location: 40-80, 82 CHAPMANS ROAD, TUNCURRY

council: MIDCOAST COUNCIL

dwg ref: 190835-S2-DA-124

client: ALLAM PROPERTY GROUP

adw johnson
central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
www.adwjohnson.com.au

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