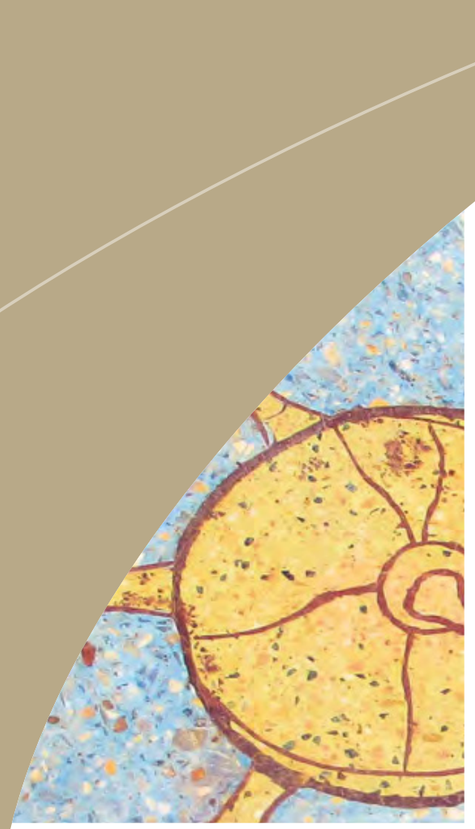
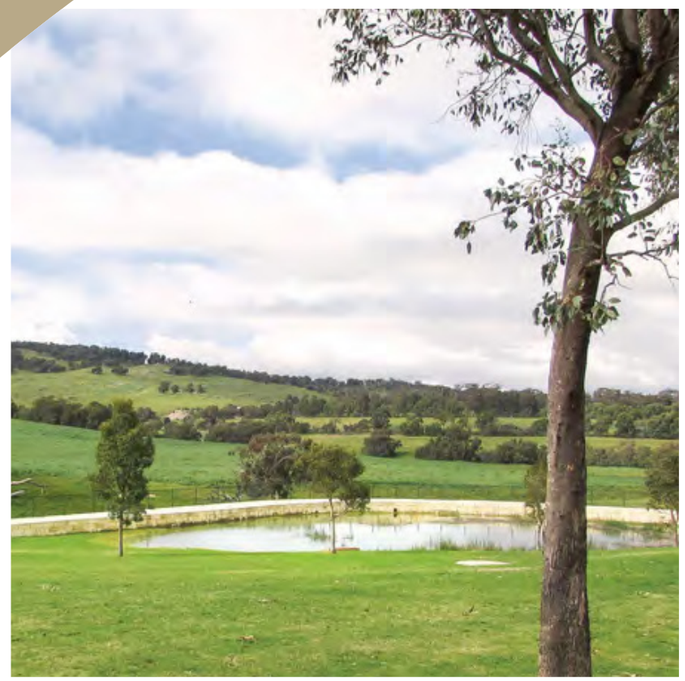
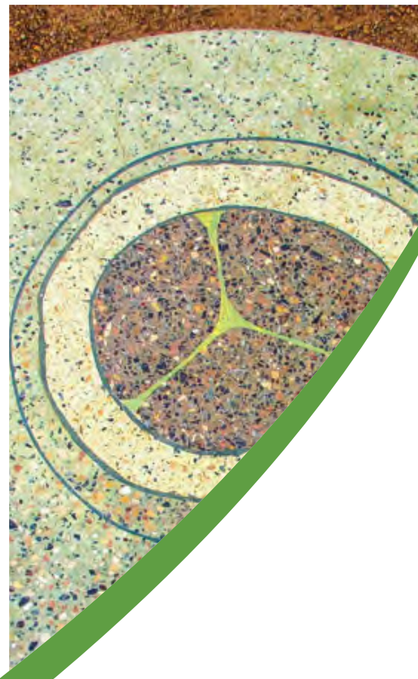
Amendment No. 1 to the Bullsbrook Townsite
District Structure Plan

Bullsbrook North Urban Expansion Area





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ENDORSEMENT PAGE

This structure plan is prepared under the provisions of the City of Swan
Local Planning Scheme No.17

IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON:

16 JUNE 2026

In accordance with Schedule 2, Part 4, Clause 28 (2) and refer to Part 1, 2. (b) of the *Planning and Development (Local Planning Schemes) Regulations 2015*.

Date of Expiry: **11 APRIL 2028**

Executive Summary

This report has been prepared by Rowe Group on behalf of the Bullsbrook North Landowner Group, in support of a formal request to Amend the Bullsbrook Townsite District Structure Plan ('DSP'), which was adopted by the City of Swan and the Western Australian Planning Commission ('WAPC') in 2018. The proposed Amendment will be referenced as "Amendment No.1 to the Bullsbrook Townsite District Structure Plan".

The need for a review of the Bullsbrook Townsite DSP was identified on the basis that substantial further planning and development has occurred within the central and southern expansion areas, while the majority of the Bullsbrook North precinct remains identified as a "Future Investigation Area". The Future Investigation Area was identified in response to a number of land use constraints that were applicable in 2018, but no longer apply. This Amendment proposal provides the required investigation to include the Bullsbrook North precinct as a mix of Future Residential, Conservation, Public Open Space and related uses in the DSP.

The Amendment Area comprises 21 landholdings and an area of 354 hectares, with approximately 335.6 hectares (or 95 per cent) held by the main coordinated Bullsbrook North Landowner Group. The Amendment Area is commonly referred to as the "Bullsbrook North Urban Expansion Area", and will ultimately provide for an estimated 4,028 dwellings, to accommodate a future population of up to 11,278 people, three primary schools, a neighbourhood centre and areas of district open space.

Development of the broader DSP area is progressively occurring, with Metropolitan Region Scheme ('MRS') amendments to the Bullsbrook South and Central urban expansion areas having been granted approval in 2019. Local structure plans have, or are being, progressed for these areas and, accordingly, this Amendment considers only the required district planning for Bullsbrook North.

This Amendment report represents the accumulation of technical supporting work undertaken by the specialist Project Team in responding to the investigation of the following specific matters:

- Waste Water Treatment Plant and associated buffer;
- Traffic and safety, particularly regarding a new East-West link road connecting Great Northern Highway and Chittering Road; the delivery of which will be necessary to satisfy State Planning Policy 3.7 – Bush fire as the district level;
- Residential land supply;
- Urban servicing;
- A rural / urban transition between the Amendment Area and surrounding Rural zoned properties;
- Opportunities for retention of good quality vegetation and significant mature trees, both within public open space and road reserves, as well as residential landholdings.

The purpose of the Amendment to the DSP is ultimately to provide a plan and associated framework to guide the future local structure planning, subdivision and development of the Bullsbrook North Urban Expansion Area, for generally residential purposes. Consistent with the Amendment Area's identification in the WAPC's Sub-Regional Planning Framework for "Urban Expansion", Bullsbrook North represents the logical northern extension of the Bullsbrook Townsite. This Amendment provides the framework for staged growth in a coordinated and environmentally sensitive manner over time.

	Bullsbrook Townsite DSP (Per Approved DSP, 2018)	Bullsbrook North (Per Approved DSP, 2018)	Bullsbrook North (Per Amendment No. 1, 2026)
Total Area:	1,583 ha	354.6 ha	354.6 ha
Area of each land use proposed:			
Residential	488 ha	70 ha	338.3 ha
Industrial	505 ha	110 ha	0 ha
Commercial	17.1 ha	2 ha *	2 ha
Estimated Lot Yield[3]:	6, 599 lots	3,577 lots comprising:	4,028 lots
		- 800 lots (Future Residential Area)	
		- 2,777 lots (Future Investigation Area)	
Estimated Population Yield[4]:	18,478 people	10,016 people comprising:	11,278 people
		- 2,240 people (Future Residential Area)	
		- 7,776 people[1] (Future Investigation Area)	
Number of High Schools:	2 (1 existing)[2]	0	0
Number of Primary Schools[5]:	3 (Not including Future Investigation Area)	1 (Not including Future Investigation Area)	3 (Including previous Investigation Area as residential)
Estimated Commercial Floor Space:	10,000m²	4000m²	4,000m²
Employment (Industry) Labour Force[6]:	11,000 jobs[7] (Industrial corridor on Stock Road, plus District Centre)	Neighbourhood Centre only[7]	Neighbourhood Centre only[7]
Provision of Public Open Space:			
Unrestricted	50.5ha	3.7ha	18.9 ha
Restricted	12.6ha	0 ha	8.7 ha*
Notes	*1 This figure does not include the existing population of 6,048.* *2 The addition of a second high school will be subject to a number of factors, described at Section 3.1 of the DSP report (2018).* *3 At 22 lots per net site ha (15 dwellings per gross urban zoned ha) for 'Connected City' under the WAPC's North-East Sub-Regional Planning Framework.* *4 At 2.8 people per household (Forecast id: average for 2011).* *5 At 1/1500 lots – Liveable Neighbourhoods – WAPC.* *6 Members of population working full time, part time or currently looking for work.* *7 This figure includes only employment generated within the industrial estate at 30 employees per hectare (Macroplan, 2013). On top of this figure will include commercial, retail and community use employment.*		

Table 1: Land Use and Population Yield.

Approximately 75 hectares of the Bullsbrook North Urban Expansion Area is already identified for "Future Residential" on the approved DSP, though the land has been included in this Amendment request to ensure the updated district planning considers the entirety of Bullsbrook North as a coordinated planning area.

The following provides a brief summary of the key land use changes proposed by this Amendment:

- Reduction and relocation of the "Investigation Area" designation;
- Extension of the district road network;
- Relocation and addition of primary schools and public open space;
- Removal of buffer notation associated with the Waste Water Treatment Plant (which is being decommissioned);
- Removal of the "Potential Industrial" designation;
- Identification of "Future Residential" designation; and
- Identification of "Conservation" and "Open Space".

Amendment No.1 to the Bullsbrook Townsite DSP is divided into three parts, being:

- **Part One: Implementation** – Part One outlines the key tasks to be undertaken to facilitate further planning of the Amendment Area. Part One also includes the Bullsbrook Townsite District Structure Plan Map (Plan 1) as amended, and the Bullsbrook Townsite District Structure Plan – Bullsbrook Townsite District Structure Plan – Inset (Plan 2).
- **Part Two: Explanatory Section** – Part Two outlines all relevant information that has informed the preparation of the Amendment, incorporating material from more detailed technical studies.
- **Part Three: Technical Appendices** – A substantial number of technical studies have been completed to inform the Amendment. These are included in Part Three and include:
  - Bushfire Management Plan;
  - Environmental Assessment Report;
  - Geotechnical Investigation;
  - District Water Management Strategy;
  - Economic Justification Report;
  - Landscape Master Plan;
  - Traffic Impact Assessment;
  - Engineering Servicing Report;
  - Development Contribution Plan Scoping Paper;
  - Basic Fauna Survey and Black Cockatoo Assessment;
  - Stage 1 Aboriginal Cultural Heritage Due Diligence Assessment; and
  - Stage 2 Aboriginal Cultural Heritage Due Diligence Assessment.

District Structure Plan Amendment Summary

	Bullsbrook North (Per Amendment No. 1, 2026)	Section Reference
Total Area:	354.6 ha	1.4
Area of each land use proposed:		
Residential	338.3 ha	5.2
Commercial	2 ha	5.7
Industrial	0 ha	3.6.2
Estimated Lot Yield[3]:	4,028 lots	5.2
Estimated Population Yield[4]:	11,278 people	5.2
Number of High Schools:	0	5.6.1
Number of Primary Schools[5]:	3	5.6.2
Estimated Commercial Floor Space:	4,000m²	5.7
Employment (Industry) Labour Force[6]:	Neighbourhood Centre only[7]	5.7
Provision of Public Open Space:		
Restricted	8.7 ha	5.6.2
Unrestricted	18.9 ha	5.3.2

Note: All information and areas are approximate only and subject to detailed review at Local Structure Plan Stage.

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Technical Appendices

Appendix Number	Document Title	Nature of Document	Referral/ Approval Agency	Approval Status
1	Bullsbrook Townsite District Structure Plan (2018)	Structure Plan	N/A	Adopted
2	Bushfire Management Plan and Bushfire Hazard Level Assessment	Approval Required	DFES, City of Swan	Approved, subject to modifications
3	Environmental Assessment Report	Supporting	-	-
4	Preliminary Geotechnical Investigation	Supporting	-	-
5	District Water Management Strategy	Approval Required	DWER, City of Swan	Approved by DWER
6	Economic Justification Report	Supporting	-	-
7	Landscape Master Plan	Supporting	-	-
8	Traffic Impact Assessment	Supporting	-	-
9	Engineering Servicing Report	Supporting	-	-
10	Bullsbrook North Urban Expansion Area Development Contribution Plan Scoping Paper	Supporting	-	-
11	Basic Fauna Survey and Black Cockatoo Assessment	Supporting	-	-
12	Stage 1 Aboriginal Cultural Heritage Due Diligence Assessment	Supporting		
13	Stage 2 Aboriginal Cultural Heritage Due Diligence Assessment	Supporting		

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Part One
Implementation

1. Structure Plan Amendment Area

The District Structure Plan Amendment applies to the land located north of Kimberley Street and south of Morrissey Road within the Bullsbrook Townsite District Structure Plan Area (the 'Amendment Area'). The Amendment Area is defined as the land contained within the inner edge of the line denoting the Structure Plan Amendment Area on **Plan 1 and Plan 2 – Bullsbrook Townsite District Structure Plan (As Amended)**.

2. Operation

Pursuant to Clause 28, Schedule 2 of the *Planning and Development (Local Planning Schemes) Regulations 2015* (the 'Regulations'), this District Structure Plan Amendment shall come into operation when it is approved by the Western Australian Planning Commission ('WAPC').

Pursuant to Clause 28 (1) of the Regulations, the approval of the Bullsbrook Townsite District Structure Plan has effect for a period of 10 years commencing on the day on which the WAPC approves the District Structure Plan, or another period as determined by the WAPC. Pursuant to Clause 28 (4) of the Regulations, the Bullsbrook Townsite District Structure Plan is taken to have been approved on 11 April 2018.

By endorsement of (this) Amendment No.1 to the Bullsbrook Townsite District Structure Plan, the WAPC grants approval to the Structure Plan under Clause 28 (1) (b) for a period of 10 years, commencing on the day which approval to Amendment No.1 is granted.



3. Objectives

The strategic objectives of the District Structure Plan are to:

- Provide a coordinated approach to future urban development and implementation of associated infrastructure for those areas in Bullsbrook identified for urban expansion, particularly in relation to land use.
- Incorporate key transport routes throughout the District Structure Plan area.
- Identify suitable community facilities, open space and employment generating sites that provide equitable access for existing and future residents.
- Ensure that future urban development provides for environmentally sensitive design, protecting existing landscape and natural features.
- Ensure that future urban development minimises conflict with existing agricultural uses that are significant to the supply of produce to the Perth metropolitan region and beyond.
- Provide for diversity of housing stock by promoting a range of residential densities within the District Structure Plan area.
- Provide for development which is consistent with Liveable Neighbourhoods principles, incorporating walkable catchments and a well serviced public transport system.
- Provide for a self-sustainable community by promoting a mix of residential and non-residential uses, including industrial, commercial, community-based uses, and mixed-use development.
- Protect existing major land uses including Pearce RAAF Base, various resource extraction operations and adjacent agricultural and horticultural activities.

4. District Structure Plan Implementation

Acknowledging that relevant planning and environmental approvals have been (or are being) progressed for areas outside the Amendment Area in accordance with Section 3.6 of the DSP, the following provisions apply to the Amendment Area only.

Two (2) Local Structure Plan Areas are identified on the Plan 1 – District Structure Plan Map (As Amended). The preparation of the future local structure plans will give detailed effect to the District Structure Plan.

The Amendment also recognises that, following rezoning and in conjunction with local structure plans, a Development Contribution Plan will be required across the Bullsbrook North Urban Expansion Area for the equitable sharing of infrastructure costs pertaining to the identified regional road network and public open space.

4.1. Metropolitan Region Scheme Amendments

The Amendment provides guidance on the required changes needed to the Metropolitan Region Scheme ('MRS') within the Amendment Area.

Rezoning of Land within the DSP Area:

All land within the Amendment Area will require rezoning to 'Urban' under the MRS, in conjunction with detailed local structure planning and local scheme rezoning.

It is anticipated the Amendment Area would seek urban rezoning in two stages, consistent with the Local Structure Plan areas shown on Plan 1:

- **Stage 1:** Lots located in the south-east portion of the Amendment Area, which have been previously considered by the City of Swan and the WAPC for rezoning and are already predominantly identified for "Future Residential" on the existing DSP. It is anticipated an MRS Amendment seeking an 'Urban' zone would be lodged in the first instance.
- **Stage 2:** Land comprising the remaining Bullsbrook North Urban Expansion Area, which has not previously been considered as part of an MRS Amendment and is not already identified for "Future Residential" in the DSP. It is anticipated an MRS Amendment seeking an 'Urban Deferred' zoning would be lodged in the first instance. A subsequent 'Lifting of Urban Deferment' request would be required when all servicing and staging issues are documented.

The WAPC's 'Lifting of Urban Deferment Guidelines' set out the information requirements necessary to support a request for the Lifting of Urban Deferment. These include requirements for a conceptual layout of the land being 'lifted', demonstration that essential urban services (including reticulated water and wastewater) can be provided and demonstration of landowner support.

4.2. Local Planning Scheme Amendments

Implementation of the District Structure Plan will also require amendments to the City of Swan Local Planning Scheme No.17 ('LPS 17') to ensure consistency with the MRS. The WAPC may concurrently rezone land within the Amendment Area to both 'Urban' under the MRS, and 'Residential Development' under LPS 17, pursuant to Section 126 (3) of the *Planning and Development Act 2005*.

The 'Residential Development' zone is considered the most appropriate zone under LPS 17 as it will facilitate the preparation and adoption of local structure plans.

Should concurrent amendments not be supported, stand alone amendments to LPS 17 will be necessary.

4.3. Local Structure Plans

Local structure plans are required to be prepared for the two (2) identified areas on Plan 1 – Bullsbrook Townsite District Structure Plan Map (As Amended). The Local Structure Plan areas on Plan 1 are indicative and subject to refinement as detailed local planning occurs.

The transition of Rural to Urban land use within the DSP Amendment Area is expected to occur on a local structure plan basis, where the separation of any potential land use conflicts will be investigated in detail.

The formal process to prepare a local structure plan is detailed under Part 4, Section 15 of the *Planning and Development (Local Planning Schemes) Regulations 2015* and may commence concurrently with lodgement of a local planning scheme amendment under LPS 17.

4.4. Development Contribution Plan

Subdivision and development within the Amendment 1 area is expected to provide for the equitable funding of infrastructure in accordance with a Development Contribution Plan that is to be prepared at the earliest opportunity consistent with the *State Planning Policy 3.6 – Infrastructure Contributions and the associated Guidelines*.

The items to be included in the Development Contribution Plan are to be determined through an amendment to the City of Swan Local Planning Scheme No. 17, and are anticipated to include provision for the east-west road connection to Great Northern Highway, the upgrading of Morrissey Road and its intersection with Great Northern Highway, and contributions towards the associated upgrades to Great Northern Highway. The Development Contribution Plan may also consider the potential to include the north-south and east-west roads, other potential intersections and road upgrades, and the provision of public open space, including associated playing fields, and community buildings.

4.5. Subdivision & Development

The provisions of the District Structure Plan and subsequent local structure plans are to be given due regard in the preparation and assessment of subdivision and development applications.

5. District Structure Plan Elements

Consistent with Section 3 of the DSP (2018), the vision for Bullsbrook is to:

> *"Promote the Bullsbrook Townsite as the City of Swan's northern gateway to accommodate this growing community in a liveable town which is sustainable, vibrant and prosperous" (p30).*

This Amendment identifies two (2) Local Structure Plan areas between Kimberley Street and Morrissey Road. Refinement of these structure plan areas will occur as detailed local planning takes place and is intended as a guide only. A Local Structure Plan may be undertaken as landownership and service infrastructure supports.

Local Structure Plans shall demonstrate consistency with this DSP and the North-East Sub-Regional Planning Framework, including the Framework's designation of density targets at 15 dwellings per gross urban hectare. Medium density should be considered in proximity to the neighbourhood centre identified within the Amendment Area in accordance with State Planning Policy 4.2 – Activity Centres for Perth and Peel ('SPP 4.2'). Lower density should be considered on the periphery of the Amendment Area where it abuts existing rural zoned land.

Final density requirements in these areas shall be determined in the relevant local structure plan.

5.1. Local Structure Plan Area 1 – Kimberley Street North

Local Structure Plan Area 1 – Kimberley Street North comprises an area of approximately 77 hectares in area across 13 landholdings (Lots 17 – 19 and 80 – 83 Ashton Road, Lots 451 and 452 Chittering Road and Lots 21 – 22 and 27 – 28 Kimberley Street). The Structure Plan area is defined as being bound by Kimberley Street to the south and Ashton Road to the east.

Key matters to be considered in the preparation of the local structure plan are:

- Confirmation of the location and specific requirements of the primary school site with the Department of Education;
- Consideration of the interface with adjoining Bush Forever Site No.88;
- Confirmation of the need for local development and community infrastructure coordination that would require funding through a Development Contribution Plan;
- Coordination of access and infrastructure staging;
- Confirmation of the land requirements to facilitate the East – West Link Road; and
- Consideration in design for the retention of remnant vegetation, specifically significant trees.

5.2. Local Structure Plan Area 2 – Morrissey Road South

Local Structure Plan Area 2 – Morrissey Road South precinct an area of approximately 250.8 hectares, across five landholdings (Lot 23 Kimberley Road, Lot 3 Ashton Road,and Lots 800 – 802 Morrisey Road). The precinct is bound by Morrissey Road in the north and Kimberley Road to the south.

Key matters to be considered in the preparation of the local structure plan are:

- Review the design interface and functionality of the linear east-west open space reserve, having regard to its drainage function, vegetation retention and open space integration functions;
- Appropriate retention of existing vegetation, having regard to environmental, bushfire and landscape advice and approvals;
- Confirmation of the location and specific requirements of the primary school site(s) with the Department of Education;
- Consideration of the various land use interface requirements including to the adjoining 'Rural' landholdings, to Great Northern Highway and to Bush Forever Site No.294;
- Confirmation of the need for local development and community infrastructure coordination that would require funding through a Development Contribution Plan;
- Coordination of access and infrastructure staging; and
- Confirmation of the land requirements to facilitate the East – West Link Road;
- Consideration in design for the retention of remnant vegetation, specifically significant trees.

5.3. Investigation Area

An area of approximately 26.3 hectares, comprising Lot 24 Kimberley Street and Lots 4 and 5 Great Northern Highway, is to be set aside as a 'Investigation Area'. This area is to be excluded from local structure planning until such time as an appropriate zoning and land use permissibility has been resolved, having consideration for impacts associated with the RAAF Pearce Air Base operations, including amenity and safety considerations.

5.4. Staging

Given the size and scale of the Amendment Area, development will occur over multiple stages as demand for residential land within the north-east corridor and the Bullsbrook Townsite evolves. The Amendment area is expected to be developed in accordance with the staging areas shown on Plan 1, being:

- **Local Structure Plan Area 1:** rezoning to 'Urban' under the MRS;
- **Local Structure Plan Area 2:** rezoning to 'Urban Deferred' under the MRS in the first instance, with Lifting requests occurring as the development front progresses westward toward Great Northern Highway, and northwards to Morrisey Road; and
- **Investigation Area:** Investigations to be progressed to identify land uses compatible with the RAAF Pearce Air Base operations.

Staging will be informed by infrastructure planning, landowner intentions and the need to provide orderly sequencing of development for bushfire risk mitigation. The availability and capacity of services and residential land demand will also inform the lifting of urban deferment request(s) where required.

6. Amended Plans & Figures

The following figures and tables of the 2018 Bullsbrook Townsite DSP (refer **Appendix 1**) are updated to reflect this Amendment:

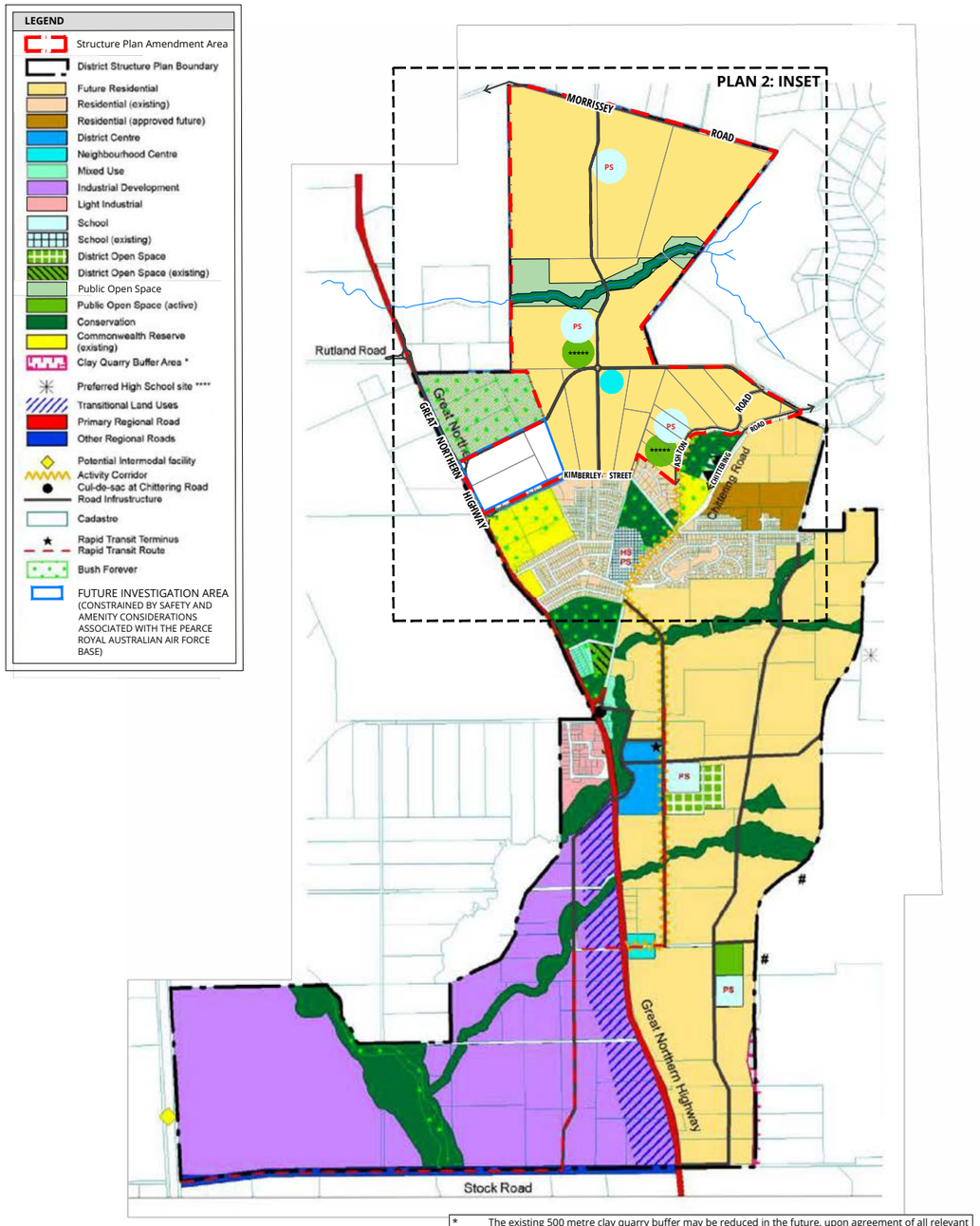
Part One: Implementation

- **Plan 1:** Bullsbrook Townsite District Structure Plan (As Amended)
- **Plan 2:** Bullsbrook Townsite District Structure Plan (As Amended) – Inset

Part Two: Explanatory Section

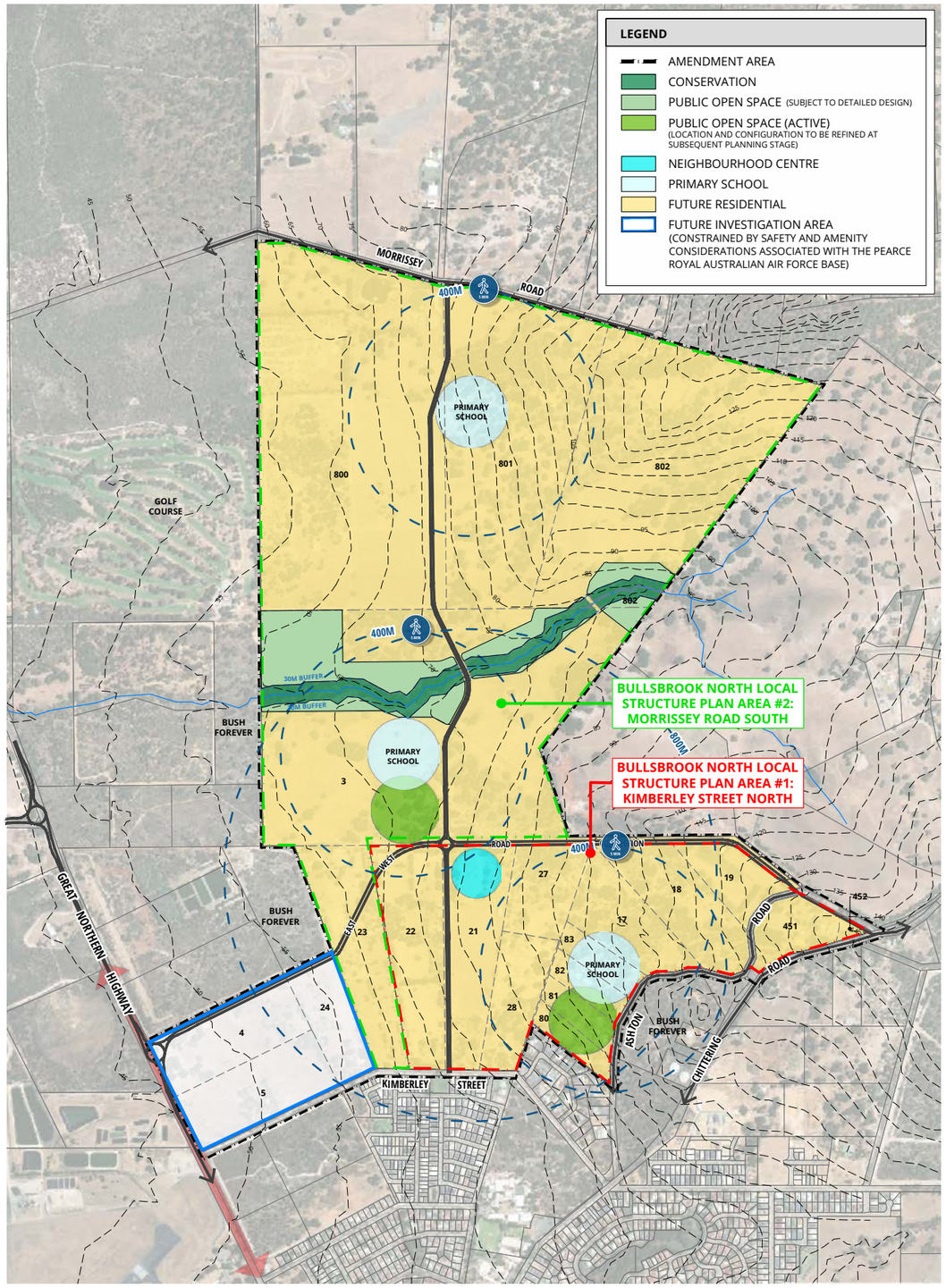
- **Figure 18:** Bullsbrook Townsite District Structure Plan
- **Section 3.1:** Land Use Table
- **Section 3.1.1:** Residential Table
- **Figure 19:** Bullsbrook Townsite District Structure Plan: Residential Component
- **Section 3.2:** Public Open Space Table
- **Figure 22:** Bullsbrook Townsite District Structure Plan: Traffic Movement Network
- **Figure 23:** Bullsbrook Townsite District Structure Plan: Indicative Staging Plan

All remaining text and figures within the 2018 District Structure Plan remain. Given the advanced nature of zoning and detailed planning outside of the Amendment Area, the original DSP is retained as **Appendix 1** for reference and contains a 'superseded' watermark in relation to the above items.



AMENDMENT No.	SUMMARY OF THE AMENDMENT	AMENDMENT TYPE	DATE APPROVED BY WAPC
1	NORTHERN PRECINCT - MODIFIED LAND USE DESIGNATION; INTRODUCTION OF PART 1 OF THE DSP	STANDARD	-

Plan 1 – District Structure Plan Map (As Amended)



Plan 2 – District Structure Plan Map (As Amended) – Inset

Part Two
Explanatory Section

1. Planning Background

1.1. Introduction & Purpose

The purpose of Part Two of this report is to provide the planning background and explanatory information used to prepare this proposed Amendment No.1 to the Bullsbrook Townsite District Structure Plan ('DSP'). It addresses relevant development standards and demonstrates the proposed amendment is suitable and appropriate having regard to the current planning framework and technical input.

The Bullsbrook Townsite DSP Area continues to evolve, with a number of more detailed local structure plans being progressed throughout the south and central precincts. This Amendment has been designed to be read in conjunction with the original DSP (2018), and accordingly the document is appended (refer **Appendix 1**). Where applicable, plans and figures within the appended document have been marked 'superseded' to avoid confusion.

This Amendment to the DSP has been prepared on behalf of a group of coordinated landowners, referred to as the 'Bullsbrook North Landowner Group', and who own approximately 95 per cent of the land within the Amendment Area. Amendment No.1 is prepared to provide the required investigations to support urban residential development. The land subject to this Amendment is identified on **Figure 2** and is herein referred to as the 'Bullsbrook North Urban Expansion Area' or the 'Amendment Area'.

Refer Figure 1 – Regional Context and Figure 2 – Site Plan.

The WAPC's Perth and Peel @ 3.5 Million, and the associated North-East Sub-Regional Planning Framework sets out broad population growth estimates, with approximately 241,000 additional people expected to reside within the City of Swan by 2050. With the Amendment Area's designation within the Sub-Regional Planning Framework for "Urban Expansion", it is appropriate that this planning for the Amendment Area be undertaken.

The Amendment to the DSP is the first step in establishing a detailed land use planning framework for the Bullsbrook North Urban Expansion Area to ultimately facilitate development of the land for urban residential use, consistent with the Sub-Regional Planning Framework.

The purpose of this Amendment is to:

- Establish a clear vision for the Bullsbrook North Urban Expansion Area;
- Undertake the necessary investigations required to support urban residential development;
- Provide a coordinated land use planning and infrastructure framework;
- Identify areas of environmental importance for conservation or consideration in subsequent planning;
- Identify precincts for further local structure planning; and
- Identify service and infrastructure requirements including movement networks and access.

The Amendment to the DSP will guide future land use and development over the Bullsbrook North Urban Expansion Area and provide a framework for local structure planning and local planning scheme rezonings to occur. The provisions of the DSP are to be given 'due regard' by planning decision makers determining subdivision and development within the Amendment Area.

The Amendment has been prepared by a multidisciplinary project team, engaged by the Proponent:

Discipline	Consultant
Project Management	Watson Property Group & Whalan Consulting
Town Planning & Urban Design	Rowe Group
Landscape and Sense of Place	LD Total
Water Management	JDA Hydrologists
Bushfire Management	Lushfire Planning Western Environmental
Environmental	PGV Environmental
Engineering Servicing	Porter Consulting Engineers and Cossill & Webley
Traffic	KCTT (now known as 'Premise')
Geotech	Brown Geotechnical
Economic & Supply Analysis	Macroplan
Ethnography & Heritage	Ethnosciences

Table 2: Project Team.

Rowe Group is the primary contact for all matters relating to this Amendment submission.

The following sections provide further detail and explanation to Part 1 of this DSP.

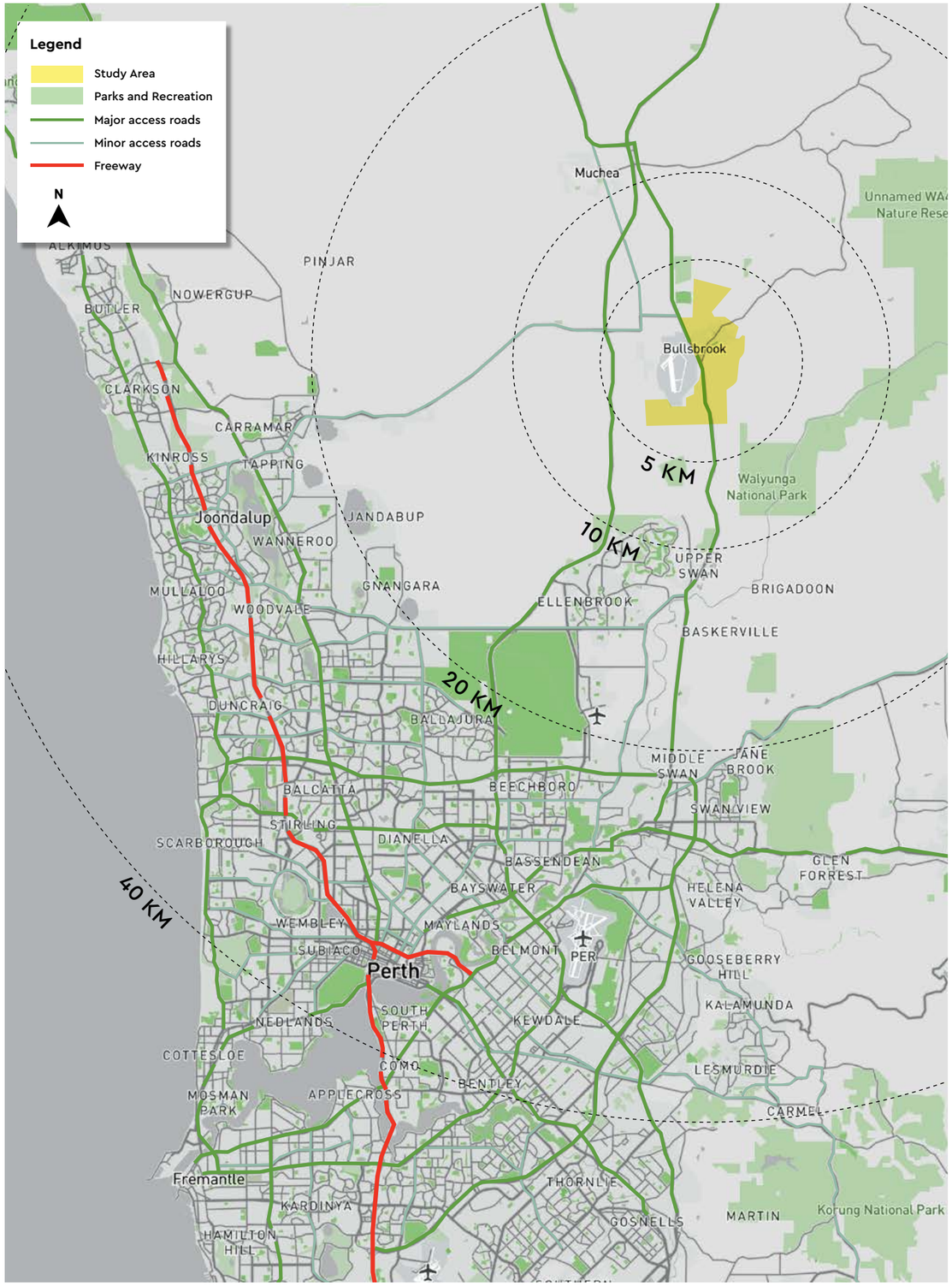


Figure 1 – Regional Context



Figure 2 – Site Plan

1.2. Background

Rowe Group prepared and lodged a Request to Amend the Metropolitan Region Scheme ('MRS') in 2015 on behalf of Whalan Consulting over the portion of the Amendment Area that is identified for "Future Residential" on the approved DSP (Lots 17 – 19 and 80 – 83 Ashton Road, 21 – 23 and 27 – 28 Kimberley Street, and Lots 451 and 452 Chittering Road, Bullsbrook), now "LSP Area 1" under this DSP Amendment. The request (MRS 1325/41) was lodged originally seeking an 'Urban' rezoning for part of the Amendment Area, though was later amended on the advice of the Department of Planning, Lands and Heritage ('DPLH') to seek an 'Urban Deferred' zoning over the land.

The Request was initiated by the Western Australian Planning Commission ('WAPC') at its meeting of 28 June 2016, alongside MRS Amendment 1323/41 – South Bullsbrook Urban Precinct and MRS Amendment 1324/41 – Central Bullsbrook Urban Precinct. The three amendments were advertised for public comment between 2 March 2018 and 8 June 2018.

The WAPC set out a list of requirements for the lifting of 'Urban Deferment', being:

- *A District Structure Plan ('DSP') or the Bullsbrook Townsite Land Use Master Plan ('BTLUMP') being approved by the WAPC to guide the development of the Bullsbrook Townsite.*

  The DSP or BTLUMP should consider matters such as: a spatial staging plan, district developer contribution plan, MRS reservations (e.g. High Schools, Other or Primary Regional Roads etc), buffers (e.g. landfill and extractive industries etc), environmental constraints, transport modelling and traffic analysis (amongst other matters) in consultation with the relevant State Government agencies and the City of Swan.

  This was ultimately addressed with the adoption of this Bullsbrook Townsite District Structure Plan in 2018.

- *Confirmation of water and wastewater infrastructure.*

  This continues to be reviewed as ongoing infrastructure service planning is updated.

- *Confirmation of the location of a High School site.*

  This High School site, in addition to the existing High School site, was identified within the DSP as being preferably located immediately east of the Bullsbrook Central area, if required.

- *Confirmation of road upgrading requirements to support the proposed scale of development.*

  This was ultimately addressed with the adoption of the Development Control Area 7 ('DCA 7') Bullsbrook Townsite District Contribution Plan. A complimentary DCP is acknowledged as being necessary for the Amendment Area and is considered herein.

The three MRS Amendments were supported by the City of Swan and the WAPC for final recommendation to the Minister, though, ultimately while the central and south MRS Amendments were supported, the Northern Amendment was declined. The Minister's decision noted the need to further consider the North Bullsbrook area, and surrounding locality, in consultation with landowners. The Minister indicated such further review should consider: alternative land use options, Chittering Road capacity constraints, the Bullsbrook Waste Water Treatment Plant buffer, Industrial interface issues and environmental considerations, prior to any further land use changes.

In commencing this Bullsbrook Townsite District Structure Plan review, and the potential to progress this Amendment, the project team met with the office of the Hon. Minister for Planning at the outset to further consider the above matters. In that context, a project team was assembled, and a participating landowner group formed (the "Bullsbrook North Landowner Group") to ensure a coordinated plan is considered and local landowner input is sought and responded to.



1.3. Pre-Lodgement Engagement

Since 2021, a range of engagement with landowners and key stakeholders has occurred with associated technical review being undertaken. **Table 3** below details the Proponent led consultation that occurred prior to lodgement of the proposed amendment with the City of Swan in June 2023.

Date	Agency/ Stakeholder	Method of Consultation	Summary/Outcomes
27 January 2021	Department of Education	Meeting at Department of Education	Meeting to discuss the need for school sites in Bullsbrook North and reconfirm of the possible second High School preferred location east of the Townsite (as per the DSP).
25 May 2021	Office of the Minister for Planning	Minister's Office	Meeting to receive feedback on why Minster declined to support previous MRS amendment. Discussed issues including Waste Water Treatment Plant, Chittering Road, Landownership and Planning Framework. Agreed to meet again following further investigation of these matters.
17 June 2021	Water Corporation	Meeting at Water Corporation	Discuss WWTP buffer, water/sewer servicing
27 October 2021	Bullsbrook North Landowners Group	Meeting at Watson Property Group Offices	BNLG Meeting No. 1 - Introduction to Planning Framework & Meet Developers
13 December 2021	Bullsbrook North Landowners Group	Meeting at Watson Property Group Offices	BNLG Meeting No. 2. Introduce Concept Sketch to Landowners Group for review
24 January 2022	Department of Planning, Lands and Heritage	Microsoft Teams Meeting	Discuss MRS Amendment over broader Bullsbrook North Urban Expansion Precinct. Introduce 'consolidated plan' for precinct to address previously identified issues
25 January 2022	Office of the Minister for Transport; Planning and Ports	Office of the Minister for Transport; Planning and Ports	Show concept plan for "Investigation Area" under District Structure Plan. Agreed east-west link critical, MRS amendment required to identify east-west link delivery
21 February 2022	Project Team (Engineering)	Microsoft Teams Meeting	Project team (engineering) meeting following Water Corporation meeting
24 February 2022	Department of Planning, Lands and Heritage	Meeting at DPLH Offices	Discuss MRS Amendment over broader Bullsbrook North Urban Expansion Precinct. Show Concept Plan for review
2 March 2022	Department of Defence	Meeting at RAAF Base Pearce	Show draft concept plan for Bullsbrook North. Department of Defence Advised RAAF Pearce in operation for foreseeable future. Whalen Consulting to send plan to assist future planning.
11 April 2022	Main Roads WA	Microsoft Teams Meeting	Meeting to discuss proposed East-West Link and its future intersection to Great Northern Highway.
11 May 2022	City of Swan	Meeting at City of Swan Offices	Meeting to discuss overall proposal, introduce concept sketch and confirm intent to lodge amendment to the DSP.
7 June 2022	Councillor Cate McCullough	Dome, Ellenbrook	Meeting to discuss overall proposal, introduce concept sketch and confirm intent to lodge amendment to the DSP.
14 June 2022	Kevin Bailey	Laneway 7 Ellenbrook	Meeting to introduce concept sketch and seek feedback.
21 July 2022	Bullsbrook North Landowners Group	Meeting at Watson Property Group Offices	BNLG Meeting No. 3 - Introduce Concept District Structure Plan & Concept, update BNLG on process, reporting and program for lodgement.
1 September 2022	Councillor Tanya Richardson	Rose and Crown Hotel Guildford	Meeting to discuss overall proposal, introduce concept sketch and confirm intent to lodge amendment to the DSP.
13 September 2022	Councillor Aaron Bowman	Dome Ellenbrook	Meeting to discuss overall proposal, introduce concept sketch and confirm intent to lodge amendment to the DSP.
5 October 2022	Councillor Patty Jones	Dome Ellenbrook	Meeting to discuss overall proposal, introduce concept sketch and confirm intent to lodge amendment to the DSP.
24 October 2022	Bullsbrook Residents and Ratepayers Association	Tailwinds Café Bullsbrook	Meeting to introduce the proposal and seek early feedback to the Master Plan.
26 October 2022	Department of Defence	Via Telephone	Meeting to discuss the proposal, particularly the new East-West link road to Great Northern Highway via Commonwealth landholdings.
14 December 2022	Ellen Brockman Integrated Catchment Group	Tailwinds Café Bullsbrook	Meeting to introduce the project, and seek feedback regarding proposed drainage, public open space and ecological considerations for Bullsbrook North.
28 February 2023	Jessica Shaw MP	Jessica Shaw's Electoral Office	Meeting to provide a pre-lodgement briefing for the project.
13 March 2023	Cindy Robinson & David Robinson	59 Ashton Road Bullsbrook	Meeting to discuss the project and address prior concerns about primary school and District Open space locations.
30 March 2023	Kevin Love	Via Phone	Update to status of project and invitation to presentation to Bullsbrook Residents and Ratepayers Association.
3 April 2023	Bullsbrook Residents and Ratepayers Association	Ethel Warren Community Centre	Presentation to the Bullsbrook Residents and Ratepayers Association regarding the DSP Amendment and future MRS Amendments, followed by a Question-and-Answer session.

Table 3: Pre-Lodgement Engagement Record.

Post lodgement, the Amendment was publicly advertised twice and stakeholder engagement has continued through the assessment and determination process.

1.4. Land Description

1.4.1. Location

The Amendment Area is located within the municipality of the City of Swan, approximately 36 kilometres north east of the Perth Central Business District, and approximately 25 kilometres north of the Midland Strategic Metropolitan Centre.

The subject land is bound by Morrissey Road to its north, Kimberley Street to the south, reserved 'Bush Forever' lands to its west ('Parks and Recreation' and 'Commonwealth' land), and existing 'Rural' zoned land to its east. Great Northern Highway, a Primary Regional Road, partially abuts the Amendment Area at the south western boundary.

Refer Figure 3 – Local Location.

The Amendment Area comprises 21 freehold lots with an area of 355 hectares, and is currently serviced by Morrissey Road, Kimberley Street and Ashton Road.

1.4.2. Area & Land Use

Land to the west of the Amendment Area comprises the Chequers Golf Course (adjacent Lots 3 and 800) and land reserved for 'Public Purposes – Commonwealth Government', which currently accommodates the Bullsbrook Waste Water Treatment Plant ('WWTP') (currently being decommissioned). Land further west of Great Northern Highway comprises the Royal Australian Air Force ('RAAF') Pearce Airbase.

The Amendment Area currently accommodates a range of rural land pursuits as well as the associated single dwellings, outbuildings and infrastructure. While the land has historically been cleared and subdivided to provide for rural land uses, including pasture paddocks, the site accommodates a mix of mature native and introduced species located sporadically throughout the Amendment Area. Lot 3 Ashton Road accommodates an existing creek, which traverses the site in an east-west direction.

Land to the north and east of the Amendment Area is zoned 'Rural' under the MRS, and 'Landscape' under the City of Swan Local Planning Scheme No.17 ('LPS 17'). It comprises generally rural living development and is subject to "Landscape Protection" controls under the LPS 17.

Land south of Kimberley Street comprises existing residential development, ranging from densities of R5 to R30, and which has been progressively developed as part of the Townsite expansion.

Refer Figure 4 – Context Analysis Plan.

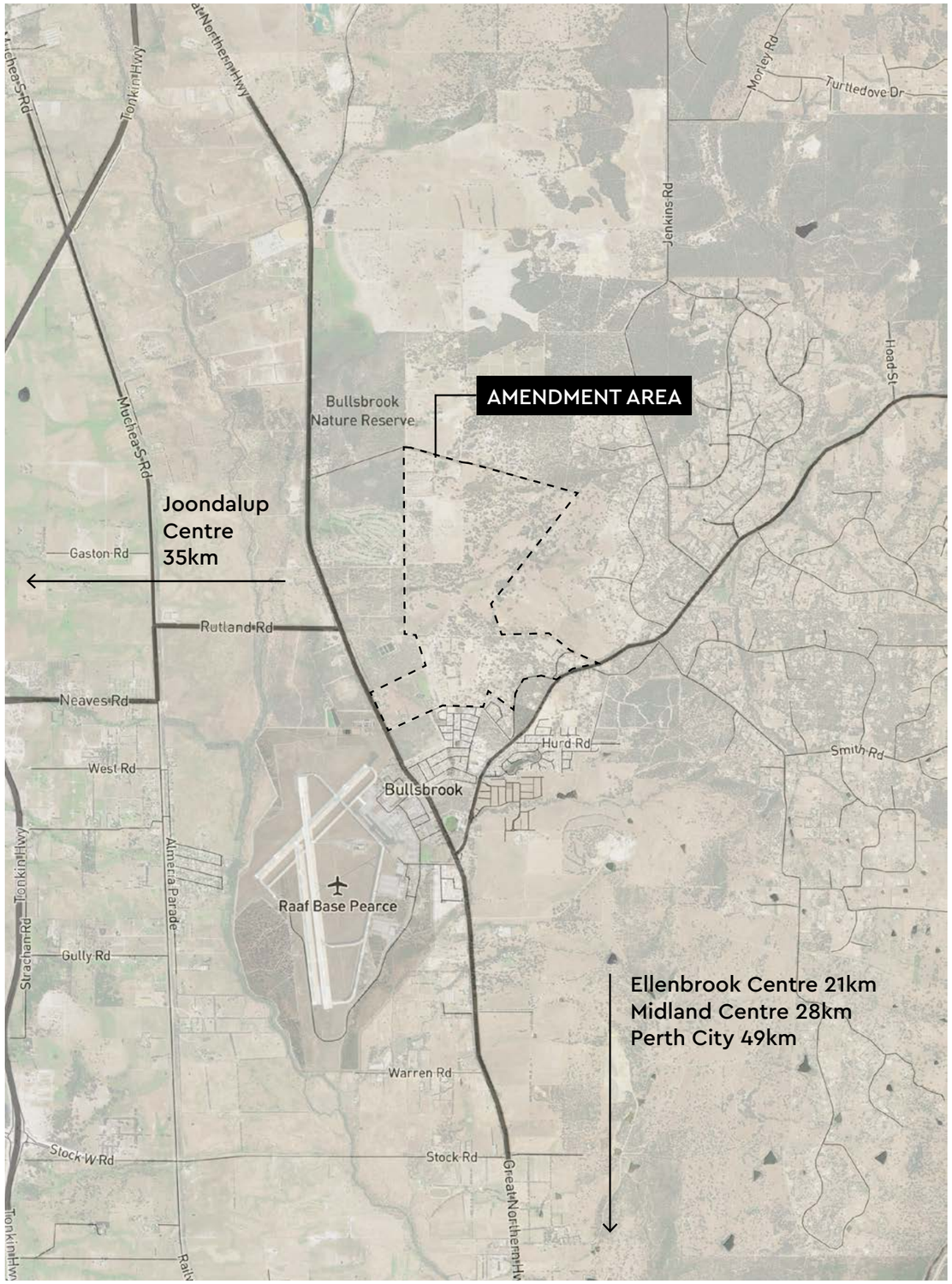


Figure 3 – Local Location

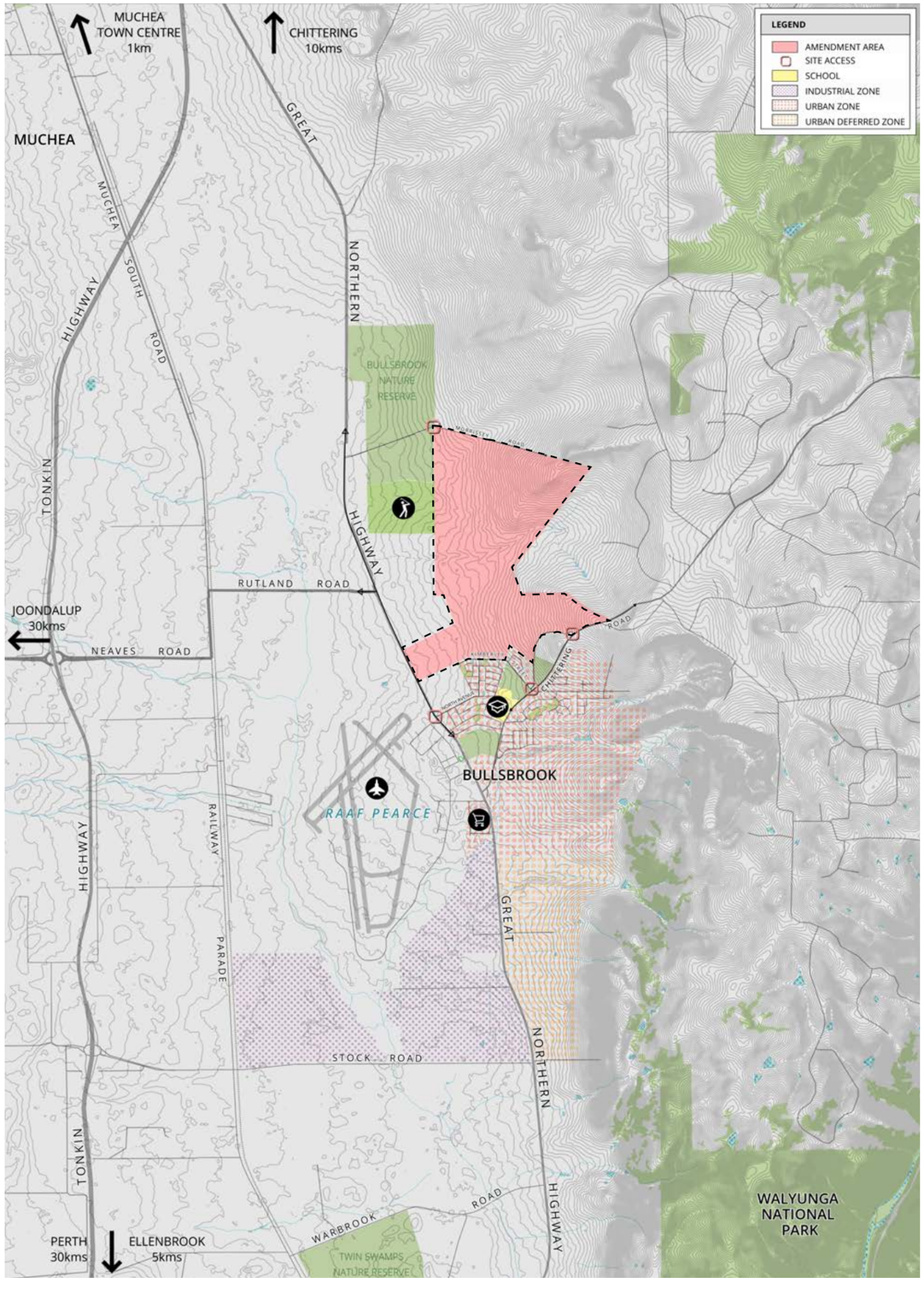


Figure 4 – Context Analysis

1.4.3. Legal Description & Ownership

The Amendment Area comprises 21 separate landholdings, serviced by Kimberley Road, Morrisey Road and Ashton Road. The Bullsbrook North Urban Expansion Area comprises a total area of 354.6 hectares, legally described in **Table 4** below.

The coordinated Bullsbrook North Landowner Group comprises 17 of the 21 landowners within the Amendment Area, representing approximately 338.16 hectares or 95 per cent of the land in support of this DSP Amendment.

Refer Figure 5 – Landowner Plan.

Lot No.	Plan	Vol/ Folio	Address	Landowner	Area (Ha)
800	P43493	2584/578	168 Morrissey Road	Terrance William Cockram	68.527
801	P49675	2628/316	Lot 801 Morrissey Road	Finwave Ltd	41.002
802	P49675	2628/317	Lot 802 Morriseey Road	WPG Landholding No. 5 Pty Ltd	48.246
3	D32225	13/365A	135 Ashton Road	WPG Landholding No. 5 Pty Ltd	80.558
4	P4911	1462/91	2748 Great Northern Highway	Noel Pomery Su-Mei Pomery	10.016
5	P4911	1462/92	2710 Great Northern Highway	Noel Pomery Su-Mei Pomery	10.036
24	P4911	1590/955	94 Kimberley Street	Lynette Esther Fondacaro	6.252
23	P4911	1399/130	82 Kimberley Street	Murray Craig Atkinson Louise Ann Atkinson	12.687
22	P4911	1399/129	72 Kimberley Street	Carlo Italiano Sherri Neeling	12.983
21	P4911	1422/758	68 Kimberley Street	DJM Bullsbrook Pty Ltd	12.834
27	D54352	1505/320	48 Kimberley Street	Kimberley Street Investment Pty Ltd	6.781
28	D54352	1603/699	58 Kimberley Street	James Francis Bennett Carol Jean Hohnke	6.781
80	D99697	2197/579	49 Ashton Road	Xiaobo Wang	2.289
81	D99697	2197/580	59 Ashton Road	David Charles Robinson Cindy Jane Robinson	2.525
82	P27363	2508/481	69 Ashton Road	Kevin James Love Barbara Anne Love	2.502
83	P27363	2508/482	71 Ashton Road	ADP Timing Pty Ltd Andrew Douglas Peterson	2.665
17	P4911	1414/117	81 Ashton Road	Bullsbrook Investment Co Pty Ltd	8.203
18	P4911	1414/492	93 Ashton Road	Ashton Road Investment Co Pty Ltd	9.758
19	P4911	1404/234	131 Ashton Road	131 Ashton Pty Ltd	4.909
451	P66577	2754/472	247 Chittering Road	Christine Lindsay	4.604
452	P66577	2754/473	261 Chittering Road	Kain Jean Gorkal	0.486
Total Area					**354.64**

Table 4: Summary of Landownership.

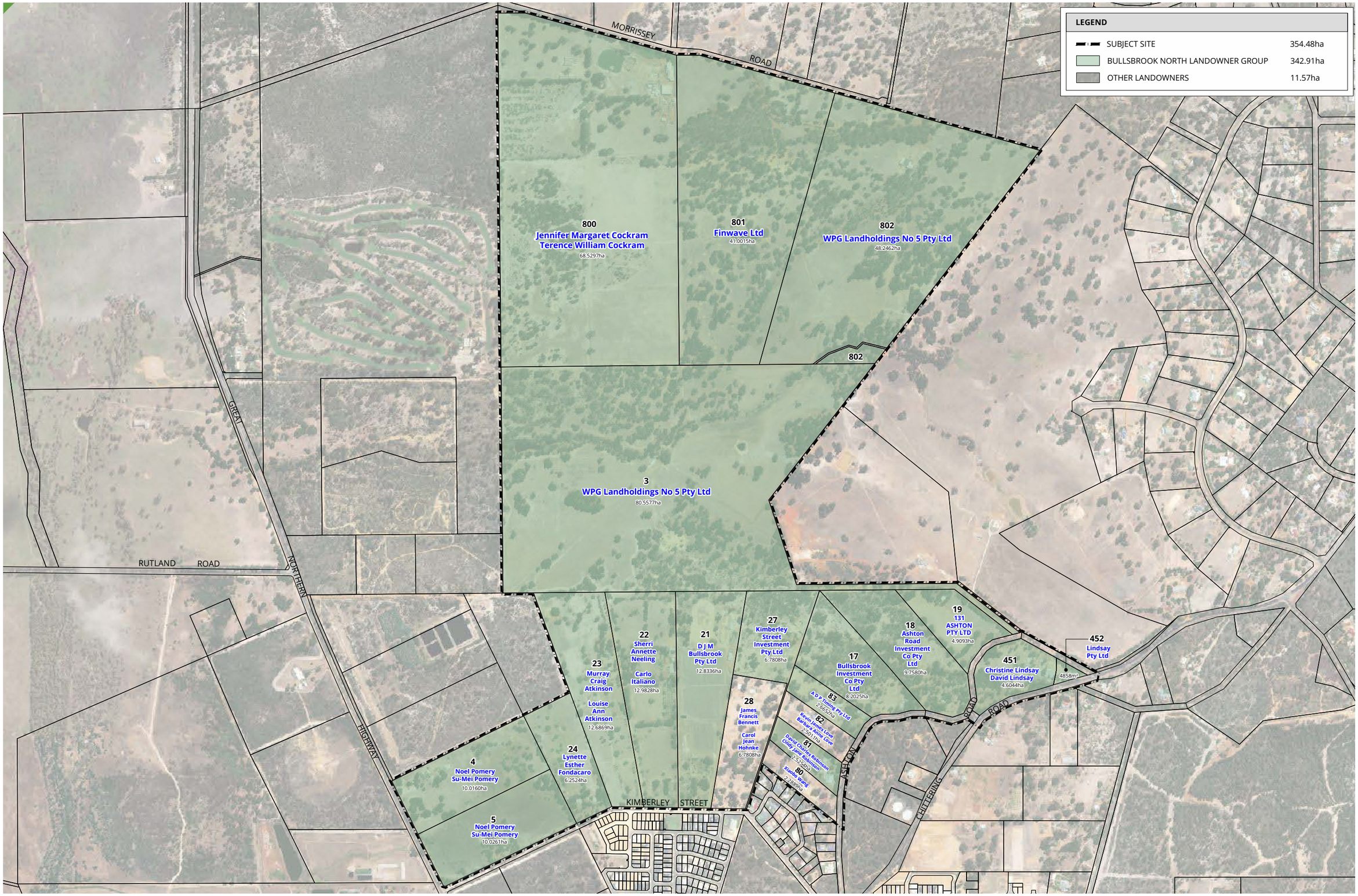


Figure 5 – Landowner Plan



2. Planning Framework

2.1. Zoning & Reservations

2.1.1. Metropolitan Region Scheme

The Amendment Area is currently zoned 'Rural' under the Metropolitan Region Scheme ('MRS'), consistent with the landholdings located to the north and east of the subject land. Land to the south of Kimberley Street is zoned 'Urban' under the MRS and has been developed for residential purposes.

Various landholdings, generally west of the subject land, are reserved for 'Public Purposes – Commonwealth Government' under the MRS and are vested to the Department of Defence. Bush Forever Site No.294 is also designated over these lots, with an additional Bush Forever Site (No.88) located outside of the Amendment Area, to the east of Ashton Road.

Great Northern Highway, which abuts the Amendment Area to its west, is reserved as a 'Primary Regional Road' under the MRS.

Refer Figure 6 – Metropolitan Region Scheme Zoning Plan.

Consistent with Part One of this Amendment, rezoning to 'Urban' under the MRS is required to be undertaken prior to urban residential development. It is envisaged this would occur over two (2) stages.

Based on this Amendment to the DSP, there is no requirement to further reserve land for Primary or Other Regional Roads, Public Purposes or Parks and Recreation.

2.1.2. City of Swan Local Planning Scheme No.17

The subject land is currently zoned 'General Rural' under the City of Swan Local Planning Scheme No.17 ('LPS 17'). Land to the east is zoned 'Landscape' under LPS 17, comprising both Rural and Rural- Residential development, while land south of Kimberley Street is zoned 'Urban Development'.

Lot 800 (located at the north west corner of the Amendment Area) is included within Schedule 2 – Additional Uses of LPS 17 as Additional Use Site No.40, relating to the land's current use as 'Construction Yard', and a future proposal to accommodate a 'Caravan Park'.

Refer Figure 7 – Local Planning Scheme No.17 Zoning Plan.

An Amendment to rezone the Bullsbrook North Urban Expansion Area to 'Residential Development' zone under LPS 17 will be required to facilitate the ultimate urban residential development contemplated by this Amendment.

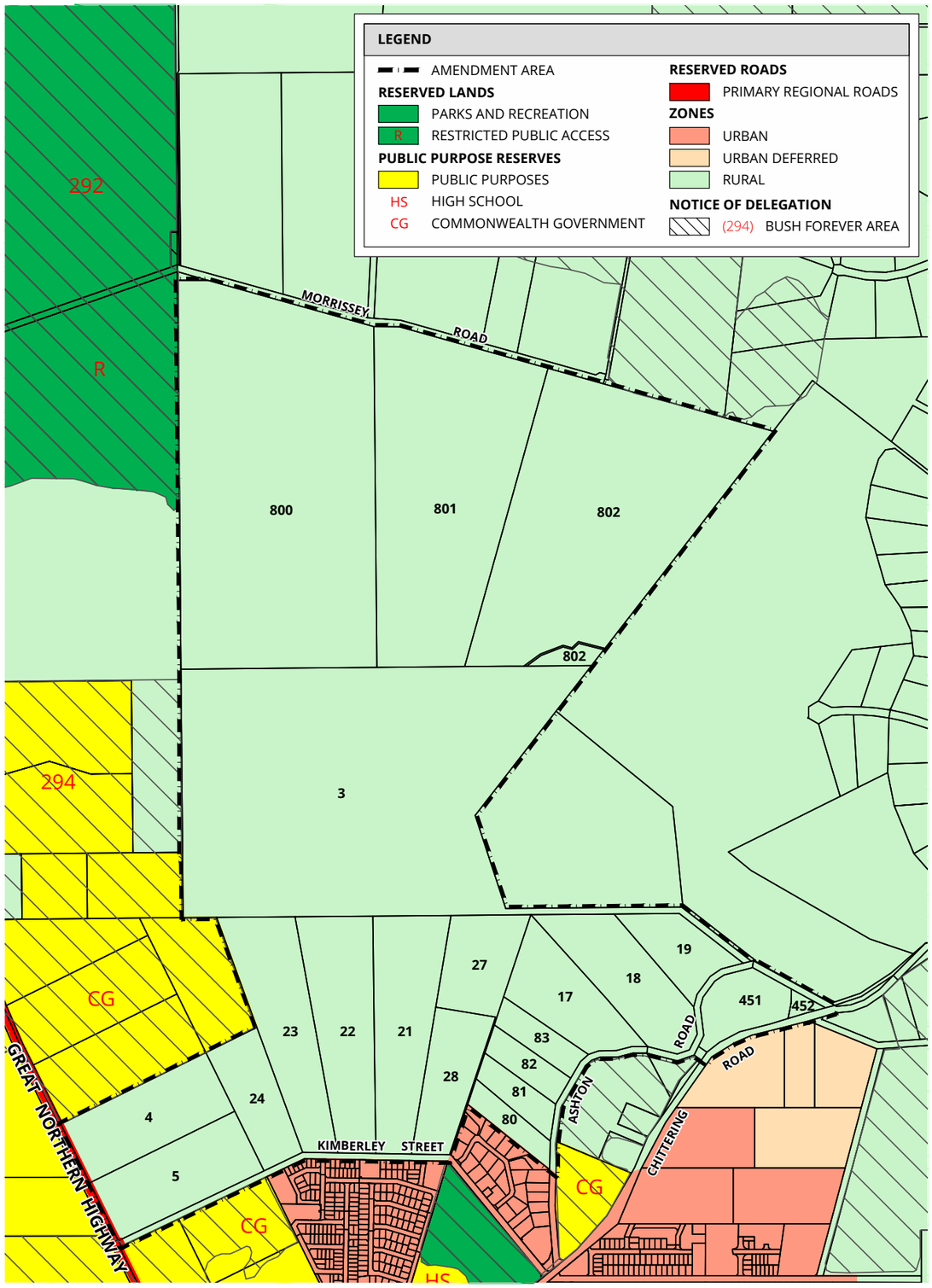


Figure 6 – Metropolitan Region Scheme Zoning Plan

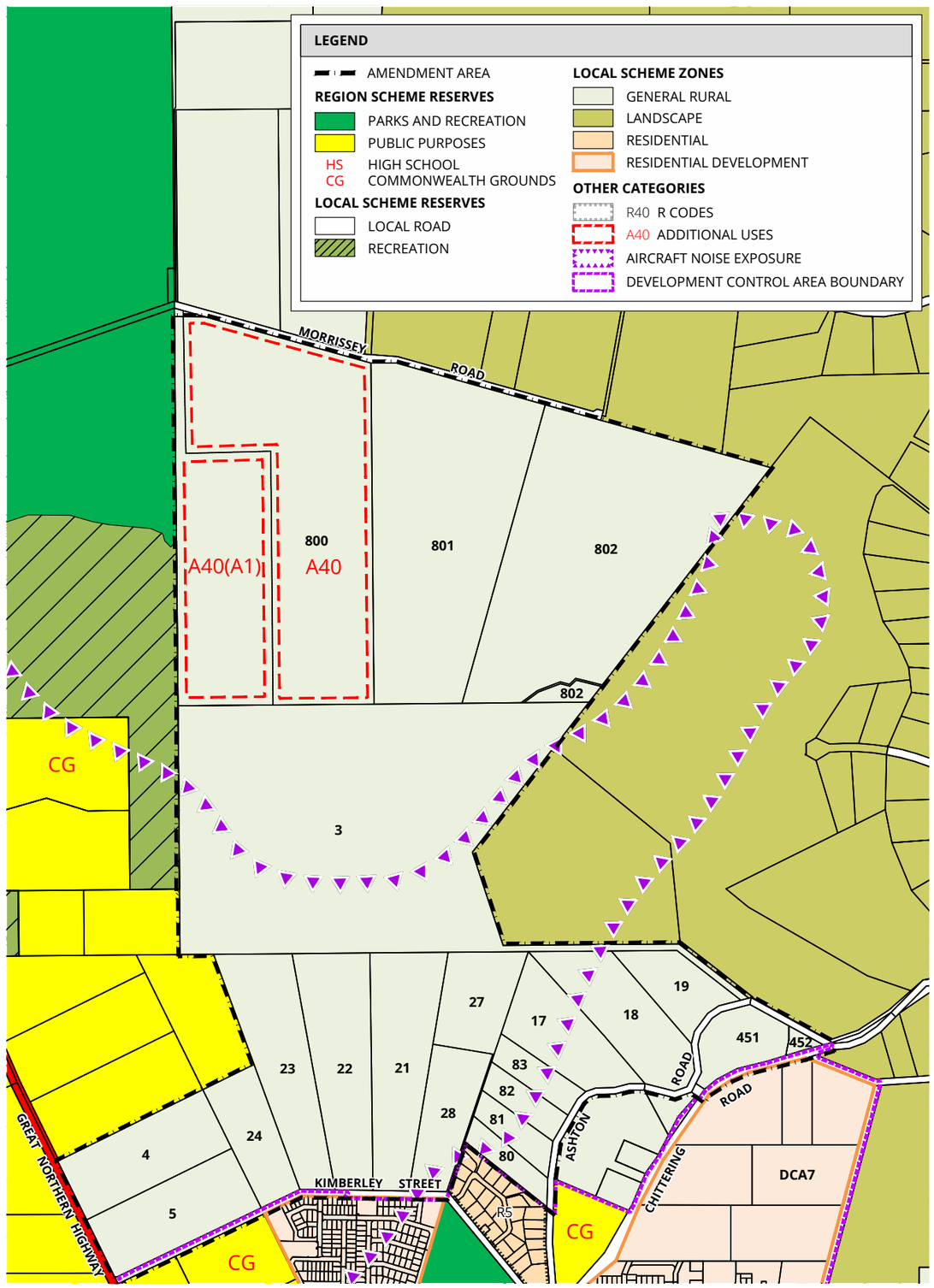


Figure 7 – Local Planning Scheme No.17 Zoning Plan

2.2. Strategic Planning Framework

2.2.1. Perth & Peel @ 3.5 Million

The Perth and Peel @ 3.5 Million suite of documents were prepared and released by the WAPC in March 2018, setting a framework for the development of the Perth and Peel Regions in the lead up to an estimated population growth to 3.5 million people by the year 2050. Perth and Peel @ 3.5 Million notes that approximately 800,000 new homes would be required to accommodate the predicted population and sets targets to deliver these through a mix of infill and greenfield development, with targets of 47% and 53% respectively. The document provides a framework that seeks to meet the various targets identified within Directions 2031 and the State Planning Strategy 2050.

Perth and Peel @ 3.5 Million provides four separate Sub-Regional Planning Frameworks for the Central, North-West, North-East and South Metropolitan Peel Sub-Regions. The Amendment Area is located within the North-East Sub-Regional Planning Framework ('Framework').

2.2.2. North-East Sub-Regional Planning Framework

The Amendment Area is identified for 'Urban Expansion' (approximately 244 hectares) and 'Industrial Expansion' (approximately 110 hectares) in the Sub-Regional Planning Framework.

Refer Figure 8 – North-East Sub-Regional Planning Framework.

Population projections for the North-East sub-region anticipate a more than 50 percent increase, growing from 209,156 people in 2011 to over 450,500 people in 2050: with this growth predominantly occurring within the municipality of the City of Swan. The Framework sets a target of 25,690 new dwellings within the municipality by 2050, reflecting the expectation of Bullsbrook Townsite accommodating a planned, significant population increase over the medium-to-long term.

The Framework incorporates a high-level staging and sequencing guide both to assist land supply considerations and to guide infrastructure service planning. There is also an expectation that development be undertaken in a sequential manner, as logical extensions to existing development fronts, to assist land supply. The Framework identifies Bullsbrook North for medium – long term development, with an anticipated development timeframe of '2022+'. When considering the future planning and development processes that are required to facilitate development of the site, the proposed Amendment is entirely consistent with the timing outlined in the Framework's Urban Staging Plan.

Refer Figure 9 – North-East Sub Regional Planning Framework: Urban Staging Plan.

Further review of the identified 'Industrial Expansion' land has suggested that its identification was in response to the land use buffers applied to the Bullsbrook WWTP and a Titanium Zircon resource. This land is, however, isolated in the context of the broader 'industrial' precinct identified west of Great Northern Highway (the Bullsbrook Freight and Industrial Land Use Strategy Area) and is unlikely to provide a meaningful or successful industrial offering. Further to this, as outlined in the body of this report, the land use buffers originally driving this land use zoning will fall away. This DSP Amendment proposes Future Residential, Conservation and Public Open Space over the entire Bullsbrook North Urban Expansion Area, thereby removing the "Potential Industrial" designation. As further discussed in Section 3.6.2 of this report, industrial land use is not appropriate in this location. This is consistent with the landowners' aspirations for the land and recognises the existing 'Additional Use' rights under LPS 17 (noted earlier) for a Caravan Park.

The proposed Amendment to the DSP is consistent with the Sub-Regional Planning Framework as it:

- Will provide for the additional dwellings required to meet the density and population targets forecast for the Bullsbrook locality, and more broadly, the City of Swan municipality. Based on the indicative yield calculations for the Amendment Area (Refer section 4.3 of this Report), Bullsbrook North has the potential to achieve approximately 4,465 dwellings. Based on 2021 Census data, an average household size of 2.8 persons would yield an additional population of approximately 12,502 people.
- Has been identified for land use change under the Framework, in response to the site being recognised as a logical extension to the existing urban development.
- Will contribute to meeting the WAPC's long term housing forecasts through to 2050 and beyond and provides clear staging processes to ensure a constant stock is maintained in the pipeline.

2.2.3. City of Swan Local Planning Strategy

The *City of Swan Local Planning Strategy* ('Strategy') was prepared by the City and endorsed by the WAPC on 30 June 2020, setting out the strategic framework for development within the City of Swan municipality to 2030. Map 1: Local Planning Strategy identifies the majority of the Amendment Area as a 'Future Urban Area', consistent with the land use proposed by this Amendment. A small portion of land in the north western corner of the Amendment Area is designated for 'Future Industrial Area', consistent with the land use designation under the Sub-Regional Planning Framework. As outlined in Section 2.2.2, the proposed Amendment to the DSP seeks to remove the identified 'Industrial Expansion' designation, based on there being significant oversupply of industrial land within the North-East corridor, in the context of significant areas of more appropriately sited land forming the 'Bullsbrook Freight and Industrial Land Use Strategy' area (to the west of Great Northern Highway), and the affected landowners' aspirations for the land.

Refer Figure 10 – Local Planning Strategy Map.

Map 4: Activity Centres, Community Facilities and Housing of the Strategy identifies the majority of the Amendment Area as a growth area being delivered in the medium term. Three other future urban areas are identified in the Strategy, being North Ellenbrook, West Ellenbrook and Gidgegannup.

Having regard to the existing development located directly south of Kimberley Street, and progressively developing Bullsbrook Townsite, the Bullsbrook North Urban Expansion Area is considered to represent a logical and appropriate growth corridor. It is acknowledged the development timeframe of the Bullsbrook Future Urban Areas is 'Medium-Long (2022+)' term, consistent with the urban staging identified for the North Ellenbrook Growth Area.

The development of the land for urban purposes is generally consistent with the land use designation for the Amendment Area under the City's Local Planning Strategy.

2.2.3.1. City of Swan Local Rural Planning Strategy

The Local Rural Planning Strategy was adopted by the City of Swan in 2016 and provides a strategic framework to guide the future development of the City's 'rural' zoned areas. The Strategy identifies Bullsbrook as an existing rural settlement, acknowledging the future growth of the area in terms of housing and employment as contemplated by the state strategic framework. In this regard, the Strategy prioritises achieving a balance between urban expansion and the protection of existing agricultural areas.

Future local structure plans identified for the Bullsbrook North Urban Expansion Area will need to consider and respond to the rural-urban interface and minimise (or avoid) the potential for land use conflict with the rural surrounds. This land use transition is discussed further in Section 5.2 of this report.

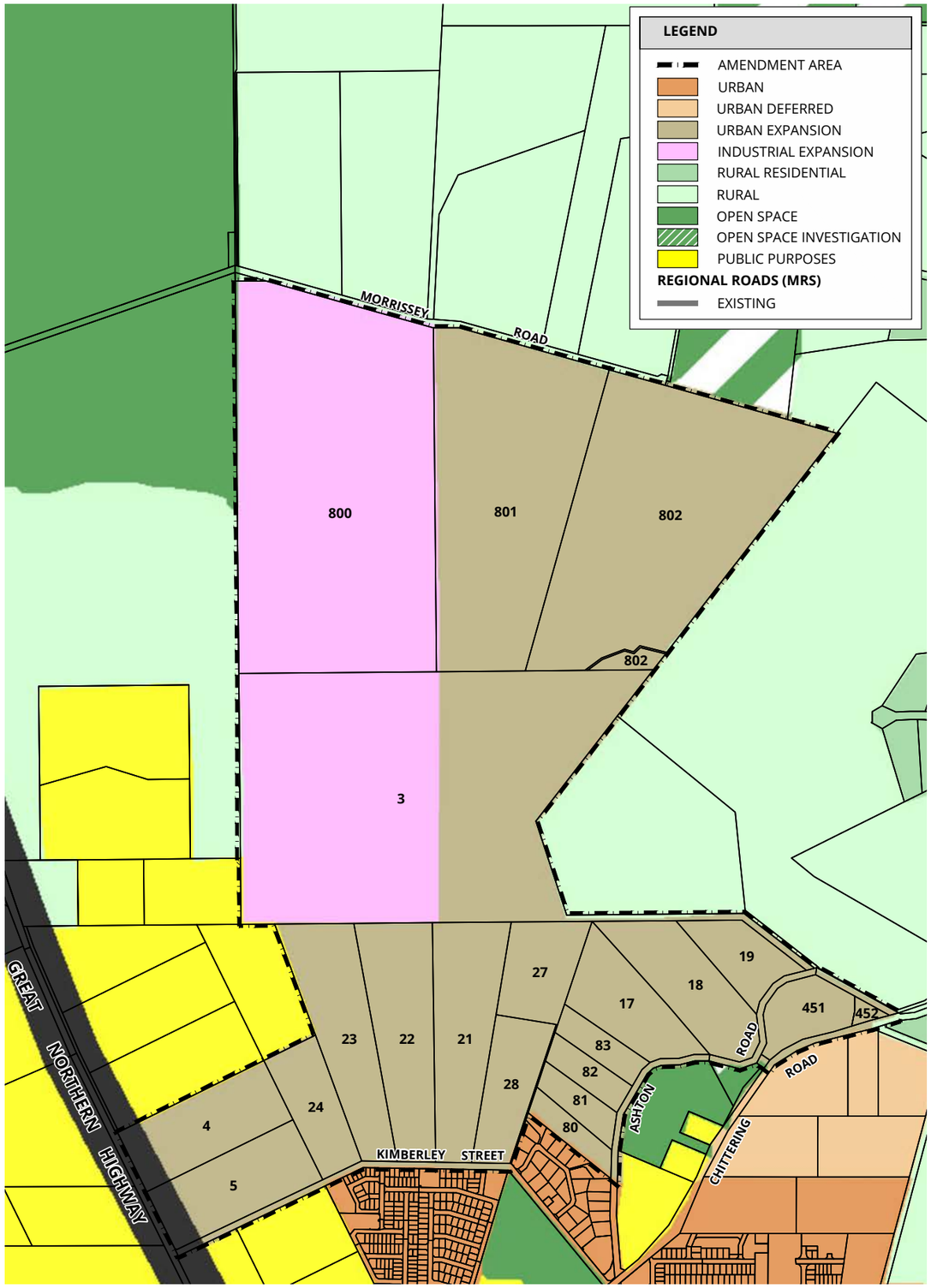


Figure 8 – North-East Sub-Regional Planning Framework

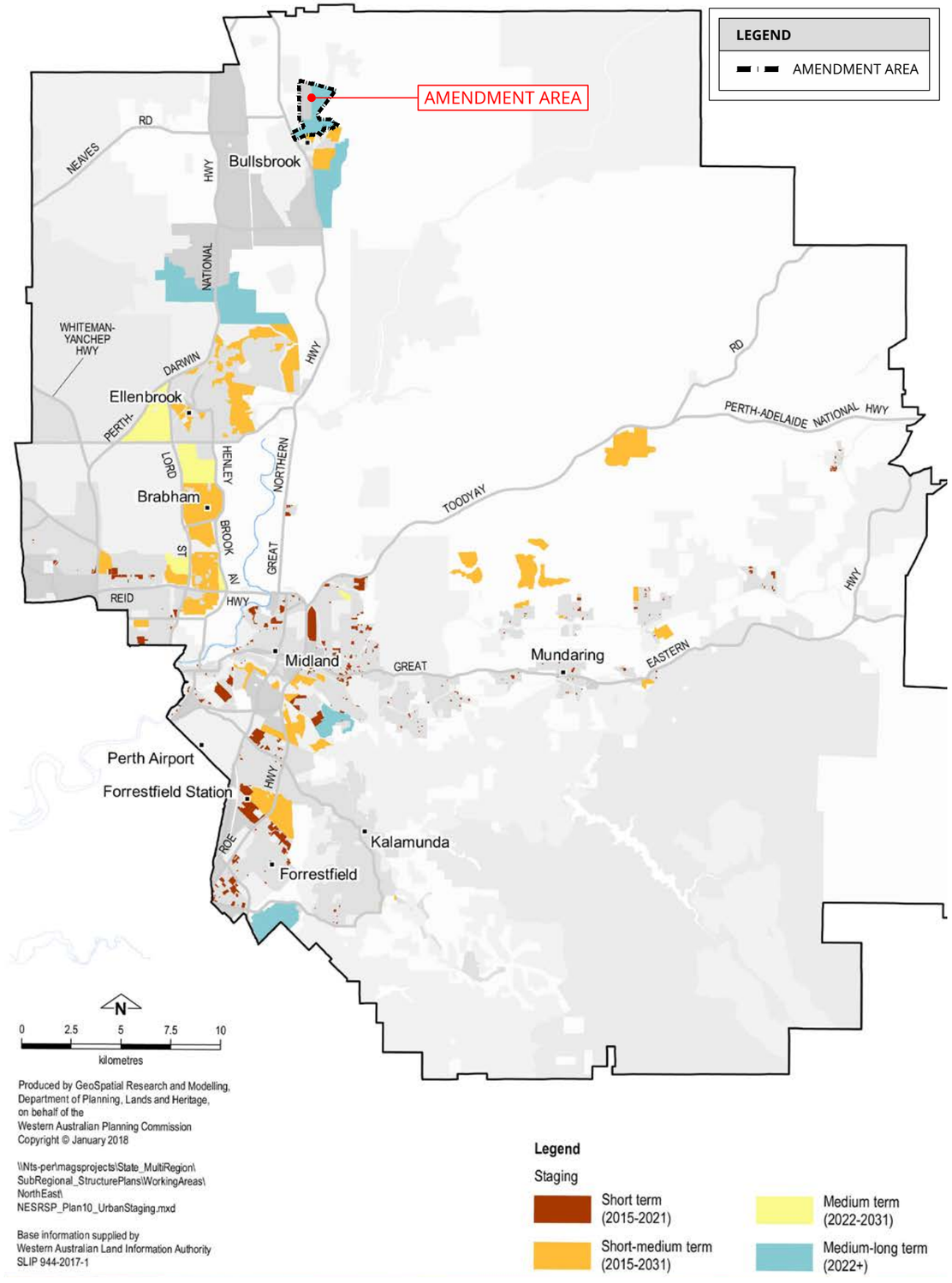


Figure 9 – North-East Sub Regional Planning Framework: Urban Staging Plan

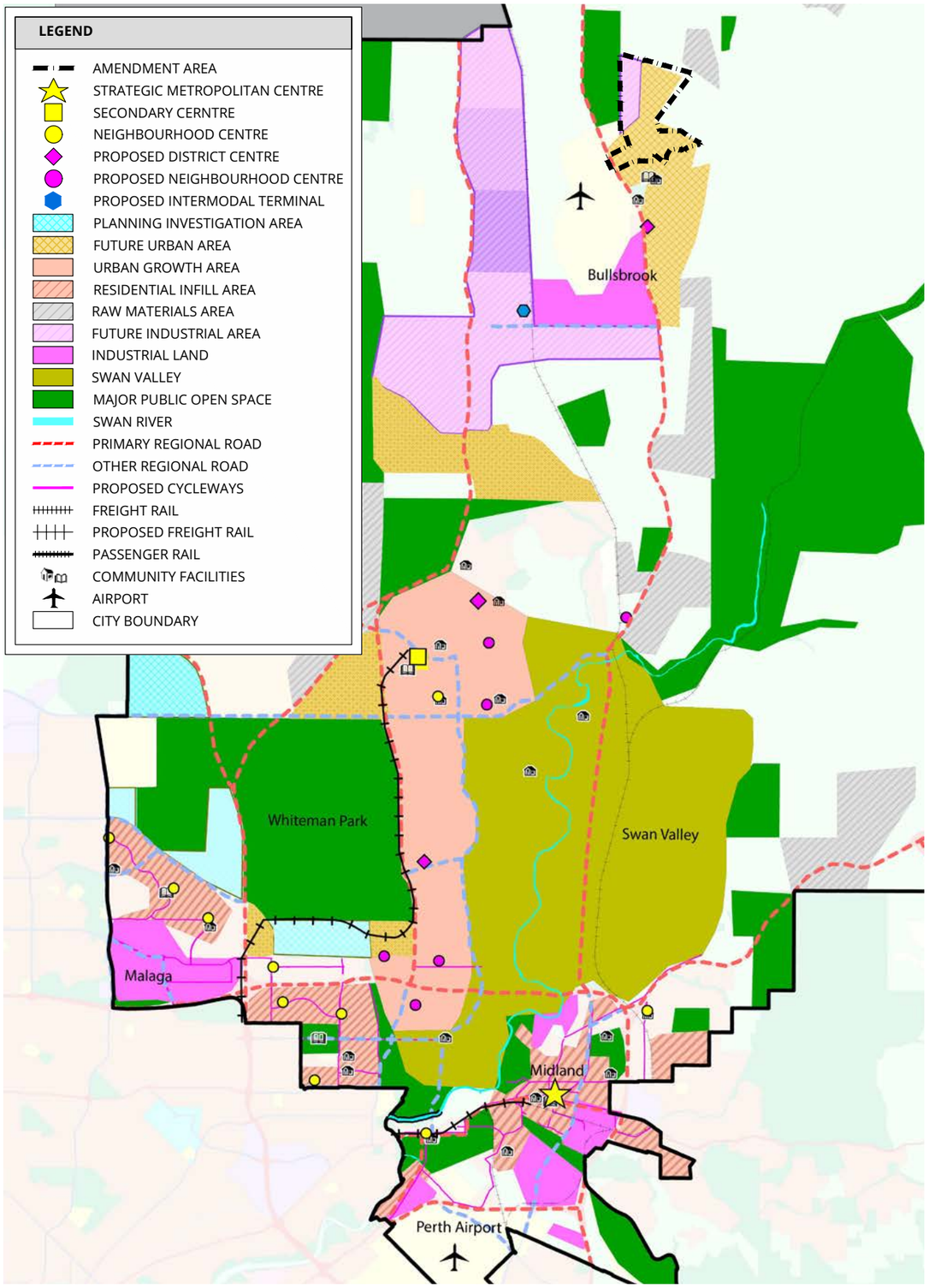


Figure 10 – Local Planning Strategy Map

2.3. State Planning Policies

2.3.1. State Planning Policy 2 – Environment & Natural Resources

State Planning Policy 2 – Environment and Natural Resources ('SPP 2') seeks to facilitate the principles of sustainable development in land use planning and development decision making and promote the integration of the natural and built environments.

Amendment No.1 to the DSP identifies the existing creekline and associated vegetation for retention and protection by including these areas within "Public Open Space" and "Conservation" reserves on Plan 1. The associated technical reporting (both to support this Amendment and the future local structure plan) will detail the management requirements for the wider Amendment Area, ensuring the rehabilitation of this key landscape, and other features.

2.3.2. State Planning Policy 2.4 – Basic Raw Materials

State Planning Policy 2.4 – Basic Raw Materials ('SPP 2.4') seeks to guide the use and extraction of Basic Raw Materials ('BRM') from land where such extraction is considered appropriate on planning and environmental grounds. The policy document is an update to an earlier version released in 2000.

While the subject land is not specifically identified on the policy mapping as containing any regionally significant geological supplies, the Amendment Area contains sand resource which is considered a BRM under the policy, given it is essential to the construction industry. Future planning processes (including rezoning the subject land to 'Urban' and 'Urban Deferred' under the MRS) can allow for the extraction of the resource or use for a cut to fill strategy to service the Amendment Area, prior to urban/residential development occurring (i.e., sequential land use). Accordingly, the proposal is entirely consistent with SPP 2.4.

The Department of Mines, Industry Regulation and Safety ('DMIRS') GeoView desktop mapping identifies a Significant Geographical Supply of Titanium Zircon resource (and associated 500-metre buffer) and clay.

While further geotechnical investigations will occur, where required, to inform the local structure plan (LSP Area 2), it is noted that much of the wider escarpment area has identified clay and Titanium Zircon resources. Most notably though, the mapped areas extending into this Amendment Area are predominantly located on land subject to Bush Forever designation under the MRS. While the resources are mapped as being regionally significant, the environmental conservation status of the area will serve as a significant barrier to physical extraction of the material, given the impacts to vegetation, flora/fauna habitat and landscape values.

2.3.3. State Planning Policy 2.9 – Planning for Water

State Planning Policy 2.9 – Planning for Water (SPP 2.9) was prepared to ensure planning and development considers water resource management and includes appropriate water management measures to achieve optimal water resource outcomes. In this regard, the DSP Amendment is supported by a District Water Management Strategy ('DWMS'), demonstrating the water resource management for the Amendment Area is consistent with SPP 2.9. More specifically, the DWMS demonstrates the development as contemplated by the DSP Amendment can appropriately manage stormwater and groundwater, and will not negatively impact the surrounding environment, including the existing creekline. The DWMS was approved by the Department of Water and Environmental Protection in June 2025.

The DSP Amendment is consistent with SPP 2.9.

2.3.4. State Planning Policy 3 – Urban Growth & Settlement

State Planning Policy 3 – Urban Growth and Settlement ('SPP 3') sets out the principles and considerations which apply to urban growth and settlement planning in Western Australia. A number of the key objectives of SPP 3, as outlined below, are relevant to this Structure Plan:

- To promote a sustainable and well-planned pattern of settlement across the State, with sufficient and suitable land to provide for a wide variety of housing, employment, recreation facilities and open space;
- To build on existing communities with established local and regional economies, concentrate investment in the improvement of services and infrastructure, and enhance the quality of life in those communities;
- To manage the growth and development of urban areas in response to the social and economic needs of the community in recognition to the social and economic needs of the community in recognition of the relevant climatic, environmental, heritage and community values and constraints.

The Amendment to the DSP satisfies the criteria set out in the above objectives. Specifically, the Amendment Area's capacity to assist in providing a diversity in housing, taking advantage of the proximity of the subject land to the established and progressively developing Bullsbrook Townsite (future District Centre). This Amendment is prepared having regard to the local identity and the surrounding area, with future local structure plans further detailing the rural/urban transition.

With the Amendment Area being in very close proximity to existing services offered within the Bullsbrook Townsite, the subject land is well placed to access the existing and planned employment, commercial, recreational and other essential infrastructure. Further, development of the land as contemplated will provide the critical mass to facilitate the efficient use of existing services and provide for the provision of new services and recreational areas to be developed. The proposed DSP Amendment is consistent with SPP 3.

2.3.5. State Planning Policy 3.6 – Infrastructure Contributions

State Planning Policy 3.6 – Infrastructure Contributions ('SPP 3.6') was adopted by the WAPC in 2021. It seeks to set out the principles and requirements that apply to the establishment and collection of infrastructure contributions in greenfield and brownfield areas.

As noted within Part One of this Amendment, it is acknowledged that a Development Contribution Plan ('DCP') would likely be required to facilitate development of the Amendment Area as contemplated.

Refer Appendix 11 – Bullsbrook North Urban Expansion Area Development Contribution Plan Scoping Paper.

2.3.6. State Planning Policy 3.7 – Planning in Bushfire Prone Areas

State Planning Policy 3.7 – Planning in Bushfire Prone Areas ('SPP 3.7') outlines the measures for strategic planning, subdivision and development applications to reduce the impact of bushfire on property and infrastructure.

The subject land is identified as a Bushfire Prone Area on the Department of Fire and Emergency Services ('DFES') mapping. Accordingly, a Bushfire Management Plan ('BMP') is required to support any strategic planning applications for the development the subject land, prepared in accordance with the requirements of SPP 3.7. A BMP and Bushfire Hazard Level Assessment has therefore been prepared by Lushfire & Planning (with a subsequent Addendum prepared by Western Environmental) in support of this Amendment to the DSP.

Refer Appendix 2 – Bushfire Management Plan.

The outcome of the BMP demonstrates that, subject to the delivery of the east-west connection to Great Northern Highway, two creek line crossings and further detailed planning, the proposed Amendment will be subject to a moderate or low bushfire hazard level and can be appropriately managed to further mitigate the risk. This is discussed in Section 3.4 of this report.

2.3.7. State Planning Policy 5.1 – Land Use Planning in the Vicinity of Perth Airport

State Planning Policy 5.1 – Land Use Planning in the Vicinity of Perth Airport ('SPP 5.1') was adopted by the WAPC in 2015 for the purpose of protecting Perth Airport from the unreasonable encroachment of noise sensitive (incompatible) development. While the Amendment Area is not within the Perth Airport aircraft noise area, SPP 5.1 is considered a relevant planning instrument in the context of the Amendment Area's proximity to the RAAF Pearce Air Base.

SPP 5.1 sets out specific zoning and development criteria for land affected by the various intervals of the Australian Noise Exposure Forecast ('ANEF') contours. As further discussed in Section 3.6.3 of this report, the Amendment Area is not impacted by any critical ANEF contour and accordingly, the proposed development is consistent with the provisions of SPP 5.1.

2.3.8. State Planning Policy 5.4 – Road & Rail Noise

State Planning Policy 5.4 – Road and Rail Noise ('SPP 5.4') was prepared to assist in minimising the adverse impact of road and rail noise on noise sensitive land use and/or development, within the specified trigger distance of strategic freight and major traffic routes (including Great Northern Highway). SPP 5.4 has informed the preparation of the Amendment, specifically in relation to the land uses of future residential development to Great Northern Highway, which partially abuts the south western portion of the Amendment Area. In this regard, the local structure plan for the impacted lots will need to be supported by a Noise Assessment confirming the noise mitigation measures required (if required) to support development.

2.3.9. Liveable Neighbourhoods

Liveable Neighbourhoods represents the WAPC's primary policy to guide the design and assessment of residential structure plans and subdivision. The underlying objective of Liveable Neighbourhoods is to create safe, sustainable and attractive neighbourhoods with a strong site responsive identity that reduces dependency on private vehicles and are more energy and land efficient.

As such, Liveable Neighbourhoods seeks to promote an urban structure based on walkable, mixed-use neighbourhoods with interconnected street patterns. It functions by drawing together key policy aspects into a single 'integrated planning and assessment policy' to provide for a performance-based approach to planning assessment. Local structure plan design for Areas 1 and 2 will need to address the Liveable Neighbourhoods framework in detail.

2.4. District Structure Planning

2.4.1. Bullsbrook Townsite District Structure Plan

The *Bullsbrook Townsite District Structure Plan* ('DSP') was adopted by the WAPC in April 2018 for the purpose of providing a high level strategic framework to guide the future growth of the Bullsbrook Townsite. The Amendment Area comprises the northern part of the DSP and is currently identified "Future Residential", "Potential Industrial" and "Future Investigation Area" (being the landholdings "quarantined" by various land use buffers). This Amendment provides the investigation of this Bullsbrook North Urban Expansion Area required to support Future Residential, Conservation and Public Open Space uses.

While the land identified for "Potential Industrial" is consistent with the Sub-Regional Planning Framework, this land use designation was included as a response to buffer requirements to the Bullsbrook Waste Water Treatment Plant ('WWTP'), which is now being closed and decommissioned, and a possible buffer should an identified titanium zircon resource be extracted. In this regard, it is evident the environmental and conservation impacts associated with extraction of a resource on Bush Forever land would be difficult and unlikely to gain support given vegetation, habitat and landscape impacts, and the "Potential Industrial" was not a response to any quantified demand for industrial land or strategic location for industrial landholdings. There is limited chance of success for isolated industrial land in this location. The Amendment seeks an urban residential outcome over this portion of the Amendment Area.

Importantly for this Amendment, the approved DSP already notes that the land identified for "Future Investigation Area" is intended to comprise residential land in the long term, following the investigation of land use buffers to the WWTP and Titanium Zircon resource. This report demonstrates these issues are resolved and the land is capable of being developed for urban residential.

The approved DSP contemplates a yield of approximately 2,777 additional lots within the "Future Investigation Area", based on a calculation of 22 lots per net site hectares (minus 40 per cent for roads and public open space). The Amendment adopts the same site area calculations but includes the "Potential Industrial" area in the calculation. The amended Land Use and Population Yield Table is shown at **Table 1** within the Executive Summary and Part 4 of this report.

Refer Figure 11 – Bullsbrook Townsite District Structure Plan.

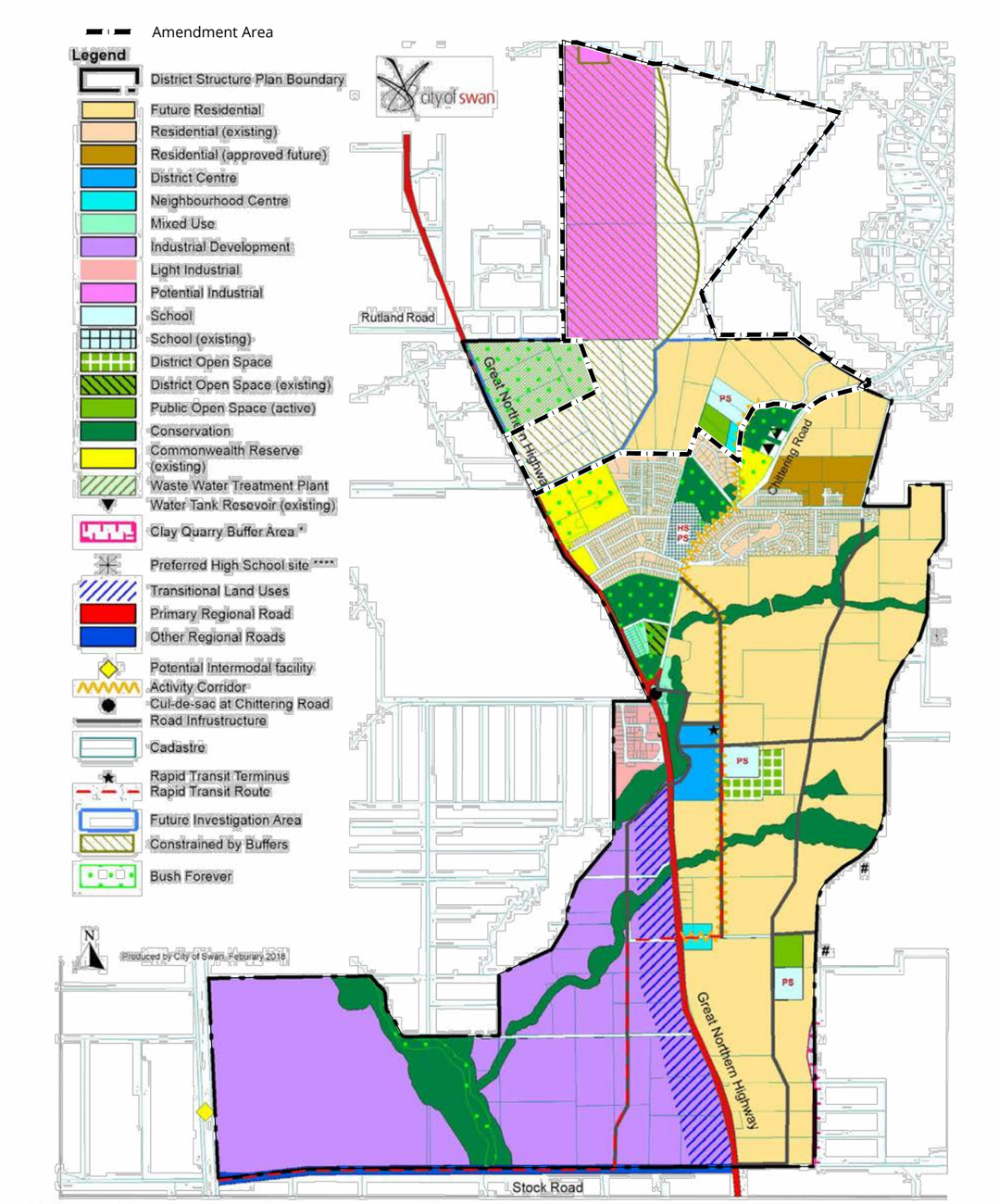
2.4.2. Bullsbrook Freight and Industrial Land Use Planning Strategy

The *Bullsbrook Freight and Industrial Land Use Planning Strategy* ('BFILUPS') is intended to provide a strategic vision for the future development of the industrial land, service infrastructure and transport requirements including support for a proposed intermodal terminal. The DPLH advertised the BFILUPS in early 2022, representing the next stage of planning required to implement the 'Industrial Investigation' identified landholdings located to the south and west of the RAAF Pearce Air Base.

While the Amendment Area does not directly abut the BFILUPS area, it is an important planning consideration given the land currently identified for "Potential Industrial" in the approved DSP, and the intent of this DSP Amendment to facilitate an East-West link road to Rutland Road (being a district level road identified on the BFILIPS). This East-West Road is discussed further in Section 5.4.3 of this report.

The BFILIPS demonstrates that the broader Bullsbrook Industrial Area will adequately cater for industrial land demand in the North East corridor in the short, medium and long term.

Refer Figure 12 – Bullsbrook Freight and Industrial Land Use Planning Strategy.



* The existing 500 metre clay quarry buffer may be reduced in the future, upon agreement of all relevant parties. This buffer is subject to detailed mapping.

** Transitional land uses are required along the western edge of the Great Northern Highway (refer Section 3.1.2 of the Bullsbrook Townsite District Structure Plan report).

*** The location, design and size of the DOS is to be refined through the local structure planning stage.

**** In the event that an additional high school site is required, its siting and location should be determined prior to supporting the first major structure plan. Refer to Section 3.6.1 of the Bullsbrook Townsite District Structure Plan report.

\# It is noted that an existing approved rural local structure plan overlaps in this area. This issue needs to be adressed in future local structure plans.

Figure 11 – Bullsbrook Townsite District Structure Plan (2018)

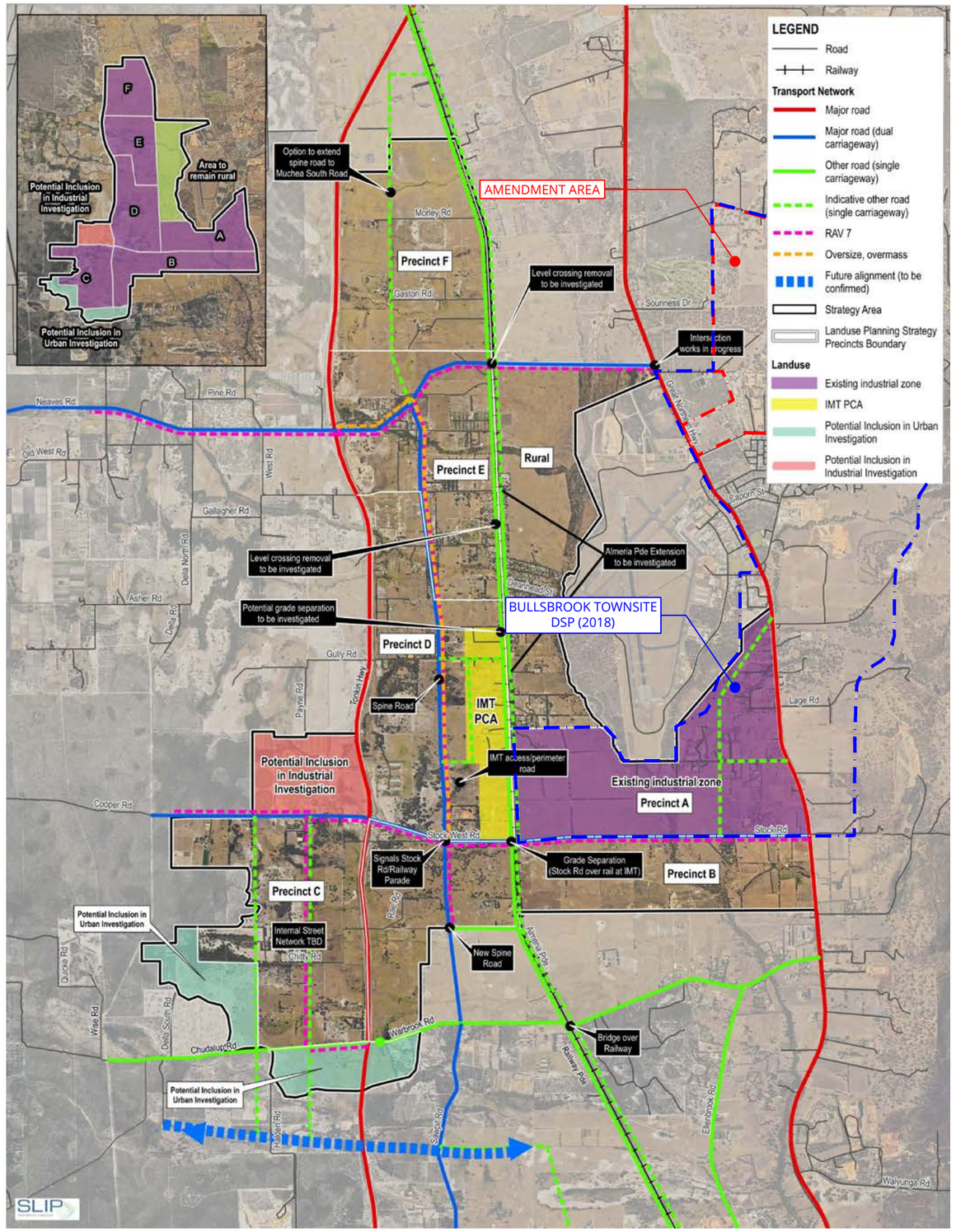


Figure 12 – Bullsbrook Freight and Industrial Land Use Planning Strategy



2.4.3. North Ellenbrook (East & West) District Structure Plans

The North Ellenbrook East and North Ellenbrook West District Structure Plans will collectively provide for up to 10,000 residential dwellings, an associated District Centre, open space and Service Commercial / Light Industrial. These DSPs were endorsed by the WAPC at its meeting of 30 August 2022. While the DSPs similarly provide for urban residential expansion in Perth's North East corridor, they are some 7.6 kilometres from this Amendment Area and are expected (in accordance with the Planning Framework) to equally assist in providing residential housing supply (and diversity of supply) in the medium term.

2.4.4. Muchea Industrial Park Structure Plan

The Muchea Industrial Park Structure Plan was adopted by the WAPC in April 2022 for the purpose of setting out the long term land use plan for developing a strategic industrial hub. The Structure Plan covers approximately 1,150 hectares of land and provides for general and light industrial uses, as well as the associated Restricted Access Vehicle ('RAV') road network.

The North-East Sub-Region Planning Framework does not specifically acknowledge the Muchea Industrial Park, yet it is located only 10 kilometres north of the Bullsbrook Freight and Industrial Land Use Planning Strategy area and is the point where Tonkin Highway connects to the Great Northern Highway and the Brand Highway.

The Muchea Industrial Park Structure Plan is an important consideration, given the extent of industrial zoned land within the Muchea Industrial Park and the North-East corridor generally. It further demonstrates that the proposal to remove the "Potential Industrial" designation from the Amendment Area will not have a material impact on the broader industrial land supply for the corridor.

3. Site Conditions & Constraints

The following provides a summary of the environmental site conditions and constraints relating to the Amendment Area.

For further information, refer to the following reports:

- **Appendix 2** – Bushfire Management Plan & Bushfire Hazard Level Assessment.
- **Appendix 3** – Environmental Assessment Report.
- **Appendix 4** – Preliminary Geotechnical Investigation.
- **Appendix 5** – District Water Management Strategy.

The environmental opportunities and constraints are depicted graphically on the Opportunities and Constraints Plan.

Refer Figure 13 – Opportunities and Constraints Plan.

3.1. Landform & Soils

The elevation of the subject land ranges from approximately 44 metres Australian Height Datum ('AHD') in the south west corner (i.e., Lot 5 abutting Great Northern Highway) and slopes up to 144 metres AHD in the north east corner of the Amendment Area.

The surface geology of the subject land is classified as part of the Dandaragan Plateau, which is typically a gently undulating plateau comprising sandplain and laterite capping. The soil landscape within the Amendment Area varies from the Reagan System generally to the Mogumber System to the east.

Brown Geotechnical undertook a Preliminary Geotechnical Investigation in support of this Amendment, which found the following:

- Topsoil is present, covering granular, non cohesive and relatively free draining soil across the majority of the Amendment Area;
- Gravel and laterite are present in parts (north east of the site), under thin sand deposits;
- Stiff clay was located in two locations;
- Majority of the Amendment Area is 'Class A', with small pockets of 'Class S' and 'Class M';
- Groundwater is likely to be at least 1.5 metres below the current ground level, and in many places much deeper.

Refer Appendix 4 – Preliminary Geotechnical Investigation.



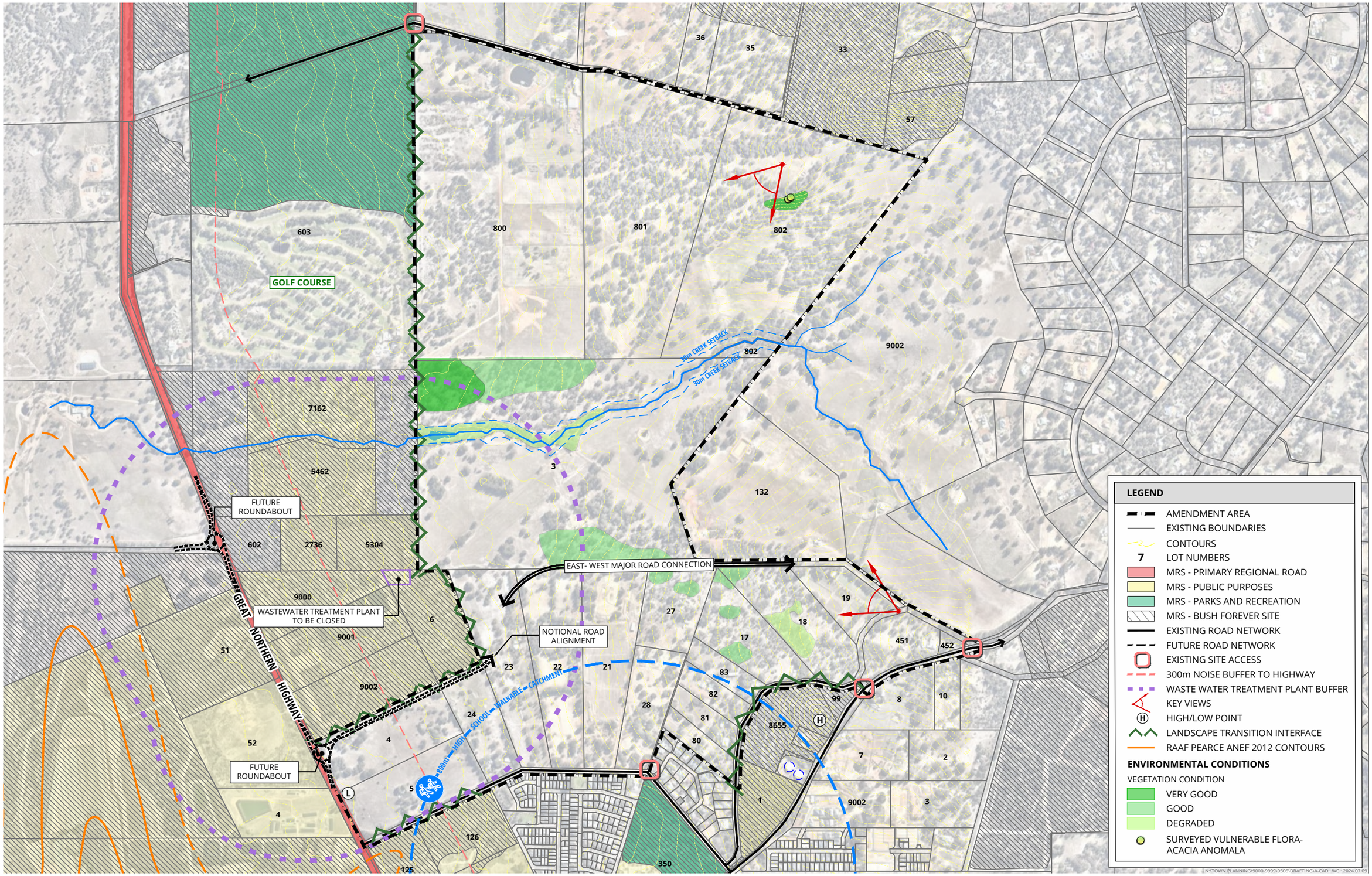


Figure 13 – Opportunities and Constraints Plan

3.1.1. Contaminated Sites

A review of the Department of Water and Environmental Regulation ('DWER') does not identify any registered contaminated sites within the Amendment Area or surrounding locality.

The Royal Australian Air Force ('RAAF') Pearce Air Base is located immediately west of Great Northern Highway. While the Air Base is not a DWER registered contaminated site, the Air Base is registered under the Department of Defence's data base as a Perfluoroalkyl and Polyfluoroalkyl Substances ('PFAS') contaminated site. The Department of Defence has since undertaken sampling investigations, with the most recent investigations indicating:

- There was no PFAS detected at the closest source area to the Amendment Area;
- Groundwater under the identified PFAS areas flows in a westerly direction and is unlikely to impact the Amendment Area;
- The retained creekline on Lot 3 flows into with a creekline that traverses the RAAF Air Base but having regard to the (greater) elevation of the Amendment Area at the creek, it is not considered possible that a contaminate could migrate upstream to the Amendment Area.

Soil, groundwater and surface water sampling on Lot 3 did not detect any traces of PFAS. PFAS Contamination is not considered a risk to the Amendment Area.

3.1.2. Acid Sulphate Soils

DWER's Acid Sulphate Soil Risk Mapping identifies the Amendment Area as having no known risk of Acid Sulphate Soils occurring less than 3 metres of the natural ground surface. Areas of 'High to Moderate' and 'Moderate to Low' risk are identified west of the Amendment Area, which are generally consistent with mapped wetlands.

3.2. Biodiversity & Natural Area Assets

3.2.1. Vegetation & Flora

The Amendment Area is located within the Swan Coastal Plain and Dandaragan Plateau bioregion of the Interim Biographic Regionalisation of Australia ('IBRA'). The Swan Coastal Plain bioregion typically comprises low lying coastal plain with Woodlands vegetation on generally sandy soils. Desktop mapping over the Amendment Area identifies the land as containing two broad vegetation types, summarised as follows:

- **Gingin:** Mainly jarrah and marri, Eucalyptus marginata, Corymbia Calophylia;
- **Pinjarra:** Jarrah, marri and wandoo Eucalyptus marginata, Corymbia calophylla, E. wandoo.

Regional vegetation complexes mapping indicates there are three vegetation complexes across the Amendment Area:

- **Reagan Complex:** Low open woodland to closed heath;
- **Guildford Complex:** Open forest to tall open forest and woodland
- **Beermullah Complex:** Low open forest and open woodland.

PGV Environmental has undertaken a Reconnaissance Flora and a Vegetation Survey, Detailed Flora and Vegetation Survey and Targeted Flora Species Survey over the Amendment Area in support of this DSP Amendment, in accordance with the relevant requirements of the Environmental Protection Authority Technical Guidance. The results of the surveys are summarised in the following sections.

3.2.1.1. Threatened & Priority Flora

A search was conducted on the DBCA Threatened and Priority Flora database, the Western Australian Herbarium flora database and the Environmental Protection and Biodiversity Conservation ('EPBC') Protected Matters Search Tool to define the scope of the flora and vegetation surveys, to determine species that could potentially occur within the Amendment Area. The flora and vegetation surveys undertaken by PGV Environmental conclude that:

- A total of 200 species were recorded during the flora surveys (consisting of 75% native species, and 25% introduced species).
- One small area of intact native vegetation was identified within Lot 802 Morrissey Road, which contained three (3) plants of the Chittering Grass Wattle (Acacia Anomala) species, which is listed as an 'Endangered' species under both the *Biodiversity Conservation Act 2016* ('BC Act') and the *Environmental Protection and Biodiversity Conservation Act 1999* ('EPBC Act').
- No other Threatened or Priority plant species were recorded within the Amendment Area.

3.2.1.2. Vegetation Types & Condition

A total of twelve (12) vegetation types were defined and mapped within the Amendment Area, as summarised in **Table 5**.

Vegetation Type	Description
CcEm[1]	*Corymbia calophylla* (Marri)/*Eucalyptus marginata* (Jarrah) Woodland over *Xanthorrhoea preissii* Low Shrubland on laterite
CcEm[2]	*Corymbia calophylla* (Marri)/*Eucalyptus marginata* (Jarrah) Woodland over *Xanthorrhoea preissii* Open Low Heath on sand
CcEm[3]	*Corymbia calophylla* (Marri)/*Eucalyptus marginata* (Jarrah) Parkland Cleared over pasture
Cc	*Corymbia calophylla* (Marri) Woodland over *Xanthorrhoea preissii*/*Hibbertia hypericoides*/*Caustis dioica* Open Low Heath
CcXp	*Corymbia calophylla* (Marri) Woodland over *Xanthorrhoea preissii* Open Low Heath
Em	*Eucalyptus marginata* (Jarrah) Woodland over weeds
Xp	*Xanthorrhoea preissii* Open Heath over weeds
Ew	*Eucalyptus wandoo* (Wandoo) Woodland over bare ground
EwBs	*Eucalyptus wandoo* (Wandoo) Woodland over Banksia sessilis Shrubland over bare ground
ErCc	*Eucalyptus rudis* (Flooded Gum)/*Corymbia calophylla* (Marri) Woodland over weeds
Ex	Exotic trees
P	Pines

Table 5: Vegetation Types & Description.

The vegetation condition within the Amendment Area was mostly classified "Degraded" (39.766 hectares), and "Completely Degraded" (293.094 hectares) condition having regard to the Area's historical agricultural use. Two areas of "Very Good" (4.488 hectares) vegetation were identified within Lot 802 and Lot 3. Five areas of "Good" condition (12.661 hectares) vegetation were also identified within the Amendment Area, though it is noted that these areas were infested with weeds.

3.2.2. Fauna

A Basic Fauna Survey was undertaken over the Amendment Area by PGV Environmental in accordance with the EPA's Technical Guidance: Fauna Surveys for Environmental Impact Assessment (2020). The survey identified five (5) fauna habitats within the Amendment Area:

- Open Woodland Habitat: 46.7 hectares of habitat within the wooded areas of the land;
- Shrubland Habitat: 3.24 hectares of habitat within the intact native vegetation on the land;
- Creek line Habitat: 6.36 hectares of habitat associated with the creek line and its remnant vegetation;
- Cleared Habitat: 132.76 hectares of open, cleared paddock and other completely cleared paddock;
- Parkland Cleared Habitat: 159.63 hectares comprising the remaining Amendment Area (generally scattered trees over weeded areas).

The survey concludes that the habitat to be predominantly in a 'Highly Degraded' condition, due to the historical disturbance (agricultural activity) and lack of connectivity.

Based on the habitats described above, the following species were considered either likely or potentially occurring on the Amendment Area:

- Southern Brown Bandicoot or Quenda (Priority 4 species);
- Rainbow Bee-eater (Listed Marine under the EPBC Act);
- Black Cockatoo (Carnaby's and Forest Red Tailed).

With respect to Black Cockatoos, the Amendment Area contains habitat for the following species:

- Carnaby's Black Cockatoo (Endangered under both the BC Act and the EPBC Act);
- Forest Red-Tailed Black Cockatoo (Vulnerable under both the BC and EPBC Act);

The identified habitat includes foraging habitat, potential breeding trees and potential roosting habitat.

Refer to Appendix 12 – Basic Fauna Survey and Black Cockatoo Assessment.

Section 5.10 of this DSP Amendment recognises there are multiple steps to the potential urban residential development of the Amendment Area. While this Amendment establishes an orderly and proper planning layout and framework, its implementation requires MRS and LPS 17 Amendments. Following these, the identified local structure plans will be required. With this in mind, this Amendment to the DSP acknowledges that:

- Subsequent MRS / LPS 17 amendment(s) are required to be referred to the Environmental Protection Authority ('EPA') for review; and
- Given the prospect of retaining areas of vegetation and trees, but clearing elsewhere to facilitate development, a referral under the Commonwealth EPBC Act would also be required if more than one hectare of foraging or clearing of more than one breeding habitat tree is proposed.

PGV Environmental note that further environmental reporting and surveys will be undertaken to support these processes, as required at that time.

3.2.3. Reserves & Conservation Areas

Desktop mapping has identified the Amendment Area as abutting several conservation areas, including:

- Bush Forever Site No.88: South of Ashton Road, south east of the Amendment Area;
- Bush Forever Site No.292: North of Chequers Golf Course, both north and south of Morrissey Road;
- Bush Forever Site No.294: west of the Amendment Area, includes the Bullsbrook Waste Water Treatment Plant and the RAAF Pearce Air Base.

The interfaces to, and opportunity for complementary areas of conservation (linkages, creekline environs) with the Bush Forever Areas has been considered in the preparation of this DSP Amendment.

3.3. Groundwater & Surface Water

3.3.1. Groundwater

The subject land is not captured by the Department of Water and Environmental Regulation's ('DWER') long-term groundwater monitoring program, and 12 monitoring bores within the broader Bullsbrook Townsite Area; most of which are located west of Great Northern Highway. The closest DWER monitoring bore is located on the south-west corner of the Chequers Golf Course and approximately 1 kilometre west of the Amendment Area.

The maximum groundwater level at these bores (between 1978 and 2021) is approximately 40 metres AHD. Between 1978 and 2000, the peak groundwater level was recorded at surface, however groundwater levels have dropped substantially in the Gnangara Mound as a result of declining rainfall, groundwater use for public water supply and pine plantations. Since 2010, the peak annual groundwater level has ranged from 36.5 metres AHD to 38 metres AHD; 2 metres to 3.5 metres below the long term maximum.

Groundwater flows generally from north east to south west/west to the Ellen Brook.

There are three aquifers underlying the Amendment Area, being the Cockman Bluff Superficial Swan aquifer (fully allocated), the Bandy Spring Superficial Swan aquifer (fully allocated) and the Swan Confined Leederville aquifer (fully allocated). There are existing license holders within the Amendment Area, which a combined 160,000 kl/year entitlement. It is anticipated this allocation would be transferred and used for future urban development (irrigation of Public Open Space).

Refer Appendix 5 – District Water Management Strategy.

3.3.2. Surface Water

The Amendment Area is located within the Ellen Brook catchment, which is a natural ephemeral waterway and ultimately discharges into the upper reaches of the Swan River. The Ellen Brook catchment is known to be a major contributor of total nitrogen and phosphorus entering the Swan River, caused by historical agricultural uses within the Catchment area.

The Amendment Area accommodates a central waterway (creek) within Lot 3 that drains from a multiple use dampland east of the Amendment Area. The Amendment provides for a nominal 30 metre foreshore buffer to the waterway which is intended to provide for the retention of the remanent vegetation.

3.4. Bushfire Hazard

The subject land is identified as 'Bushfire Prone' on the Department of Fire and Emergency Services ('DFES') Map of Bushfire Prone Areas. Accordingly, this DSP Amendment is supported by a Bushfire Management Plan ('BMP') and Bushfire Hazard Level Assessment prepared by Lushfire & Planning (Addendum prepared by Western Environmental). The BMP has been prepared to address the requirements of SPP 3.7 and the associated Guidelines for Planning in Bushfire Prone Areas and demonstrate that the land is capable of being developed to an appropriate bushfire hazard level.

Refer Appendix 2 – Bushfire Management Plan & Bushfire Hazard Level Assessment.

The BMP (and Bushfire Hazard Level Assessment) confirms bushfire risk is capable of being appropriately mitigated to achieve compliance with the Guidelines. The main considerations relating to bushfire management within the Amendment Area are set out in **Table 6**.

Bushfire Protection Criteria	Proposed Bushfire Management Strategies
Element 1: Location	The post-development scenario for the Amendment Area is expected to demonstrate a moderate to low bushfire hazard, and capable of achieving a Bushfire Attack Level ('BAL') of BAL-29 or less (subject to future detailed design and bushfire mitigation strategy). In this regard, the development is consistent with the objectives of SPP 3.7.
Element 2: Siting and Design	Not able to be assessed at District Structure Plan Stage. Element 2 of the Guidelines will be addressed at both the Local Structure Plan and subdivision stages when the lot layout is defined.
Element 3: Vehicular Access	The broader Amendment Area currently has multiple access to public roads. However a key component of satisfying Element 3 will be the timely delivery of the east-west road connection to Great Northern Highway. The post-development scenario recognises the upgrade of the surrounding road network as well as the construction of a new district level movement network. The network will be further detailed and assessed at the future development stages.
Element 4: Water	The proposed development will be serviced by reticulated water supply.

Table 6: Bushfire Protection Criteria Compliance Table.

Having regard to the above and the information provided within the BMP, the bushfire hazards within and adjacent to the Amendment Area and associated bushfire risks are readily manageable through the standard management responses outlined within the Guidelines and the Australian Standard 3959 – Construction of Buildings in Bushfire Prone Areas ('AS 3959'). These responses have informed the design and staging of the Amendment Area, to ensure a suitable, compliant and effective bushfire management outcome is achieved for the protection of future life, property and environmental assets. It is noted that further detailed bushfire review and assessment will accompany each stage of development, including local structure plan and subdivision / development.

3.5. Heritage

3.5.1. Aboriginal Heritage

The Department of Planning, Lands and Heritage online Aboriginal Heritage Information System identifies two (2) registered Aboriginal Heritage Sites within the Amendment Area, described as follows:

- **Aboriginal Heritage Site ID 3525:**

  Ellenbrook: Upper Swan – is of importance for and significance for its association with the mythological narratives of the Waugal and is associated with the waters and river bed of the Ellen Brook and its tributaries.

- **Aboriginal Heritage Site ID 3583:**

  Ki-It Monger Brook 2 – is of importance and significance as a mythological and ceremonial site, associated with mythological narratives of the Waugal. The site is related to the Brook and its surrounds.

Consistent with the requirements of the ACH Act, engagement with the relevant knowledge holders may be required as part of subsequent planning processes. An Aboriginal Cultural Heritage Due Diligence Assessment, prepared in accordance with Part 6, Section 102 of the 2021 ACH Act (now rescinded) has been prepared for the Amendment Area.

Refer Appendix 13 - Stage 1 Aboriginal Cultural Heritage Due Diligence Assessment.

Refer Appendix 14 - Stage 2 Aboriginal Cultural Heritage Due Diligence Assessment.

3.5.2. European Heritage

A search of the State Heritage Office register has identified there are no State Heritage Sites within the Amendment Area or within a 5 kilometre radius. No World Heritage or National Heritage places are located within a 5 kilometre radius of the subject land.

3.6. Context & Land Use Considerations

3.6.1. Residential Land Supply – North-East Corridor

Bullsbrook North is identified for urban residential land use under the North-East Sub-Regional Planning Framework having regard to its strategic location, serviceability, relatively unconstrained nature and proximity to the Bullsbrook Townsite. The broader North-East Corridor is expected to experience considerable urban growth in order to accommodate the estimated population growth. The sub-region is expected to grow from "209,000 people in 2011 to over 450,000 by 2050". The Framework further states that "this population growth will predominantly occur within the City of Swan, which is estimated to accommodate over 60 per cent of the sub-region's population by 2050".

The proposed Amendment to the DSP is supported by an Economic Justification Report that makes the following key findings:



The WAPC's Urban Land Development Outlook ('ULDO') for the 2020/21 period identifies an impending shortage of residential lots within the Swan Urban Growth Corridor in the short to medium term.



The shortage was accelerated by the increased demand during 2020 – 2021 in response to both the state and federal first home buyers grant programs, which has depleted the development-ready residential land stocks in the corridor.



The UDLO demonstrates that there are currently 22 active land estates within the north-east corridor, with only 9 estates forecast to have supply into the medium term. This highlights a key challenge for the North-East corridor of not only a lack of supply, but also a lack of housing diversity (choice).



In the context of the Bullsbrook locality, only Kingsford Estate has forecast supply for the medium term. The current land price at Kingsford was reflective of the median land price of the Perth Metropolitan Area; and accordingly does little to contribute to the affordable housing market. This, again, highlights a lack of choice and price competition.



The extent of employment land identified in the Sub-Regional Planning Framework and broader strategic planning framework requires the growth of local urban areas to achieve the employment self-sustainability targets set out in the Sub-Regional Planning Framework, as well as the City of Swan's Economic Development Strategy.

The progressive development of the Bullsbrook North Urban Expansion Area as a whole will likely span over 25 years (or longer), depending on approvals and market conditions.

Refer Appendix 6 – Economic Justification Report.

Further to this, the DPLH's Data Analytics team undertook development capacity modelling in support of the assessment of the North Ellenbrook West District Structure Plan. In the context of residential land supply, the assessment concluded:

- Existing zoned residential areas within the established Ellenbrook locality are anticipated to accommodate growth until 2031;
- After 2031, residential growth is expected to be accommodated within new residential areas.

The additional residential land proposed by this DSP Amendment will relieve the forecast shortfall in land supply and contribute to market competition in the Bullsbrook market to further promote housing affordability in the area.

3.6.2. "Potential Industrial" Land & Industrial Supply

As discussed in Section 2.4.2 of this report, planning for the expansion of the Bullsbrook Freight and Industrial Area is progressing, with the North-East Sub-Regional Planning Framework identifying an additional 2,500 hectares of land for industrial development in the North-East Corridor.

The Sub-Regional Planning Framework contemplates a future Intermodal freight terminal within the Bullsbrook Freight and Industrial Area, providing a key connection to the broader industrial road and rail freight route network. This wider industrial area extends to include industrial land at Stock Road within the Bullsbrook Townsite DSP Area.

Current industrial land supply in the North-East corridor is also serviced by the Muchea Industrial Park, which is located outside of the Framework Area but sited approximately 3.5 kilometres north of the Amendment Area. Muchea provides for an additional 1,150 hectares of identified industrial land in addition to that identified in the Framework.

Having regard to the better located industrial land identified in the sub-region, the land identified for "Potential Industrial" in this DSP would not be successful or competitive. The land is proposed as "Future Residential" under this DSP Amendment, having regard to:

- **Exposure** – The identified industrial land does not benefit from either visibility or access to a regional or strategic road and is unlikely to capture any passing trade.
- **Transport Access** – The identified industrial land would have limited access to the regional road network.
- **Market Catchment Area** – The majority of the land's catchment area is captured by either Muchea (north) or Bullsbrook Freight & Industrial Area (south). The land has limited capacity to offer services to reroute the market catchment from these established areas.
- **Co-Location & Proximity to Other Businesses** – Given the limited extent of identified land in this location, and its relative proximity to well-advanced and substantial employment areas (Bullsbrook and Muchea) it is unlikely the subject land would be capable of either contributing to or competing with the other employment areas.

The location is not considered appropriate for industrial land use and development.

The Economic Justification Report (**Appendix 6**) concludes that industrial land identified at Bullsbrook Freight and Industrial Area and Muchea Industrial Park will service the industrial land demand for a sustained period of over 100 years growth. The report further concludes that achieving a local employment base by having local residents (such as those proposed by this Amendment) will be a critical factor to the success of the Bullsbrook and Muchea employment areas.

3.6.3. RAAF Pearce Air Base

The Department of Defence's Royal Australian Air Force ('RAAF') Pearce Air Base is located west of the Amendment Area and directly adjacent Great Northern Highway. The Air Base is an important consideration in the context of the proposed Amendment to the DSP in terms of aircraft noise..

The Australian Noise Exposure Forecast ('ANEF') modelling for the Pearce Air Base was released in 2012 and demonstrate the noise contours emanating from the Air Base. As depicted in **Figure 14**, the critical noise contours do not impact the Amendment Area. This will further be investigated at local structure plan stage (LSP Area 2), in conjunction with the road noise emanating from Great Northern Highway.

Refer Figure 14 – RAAF Pearce ANEF Modelling.

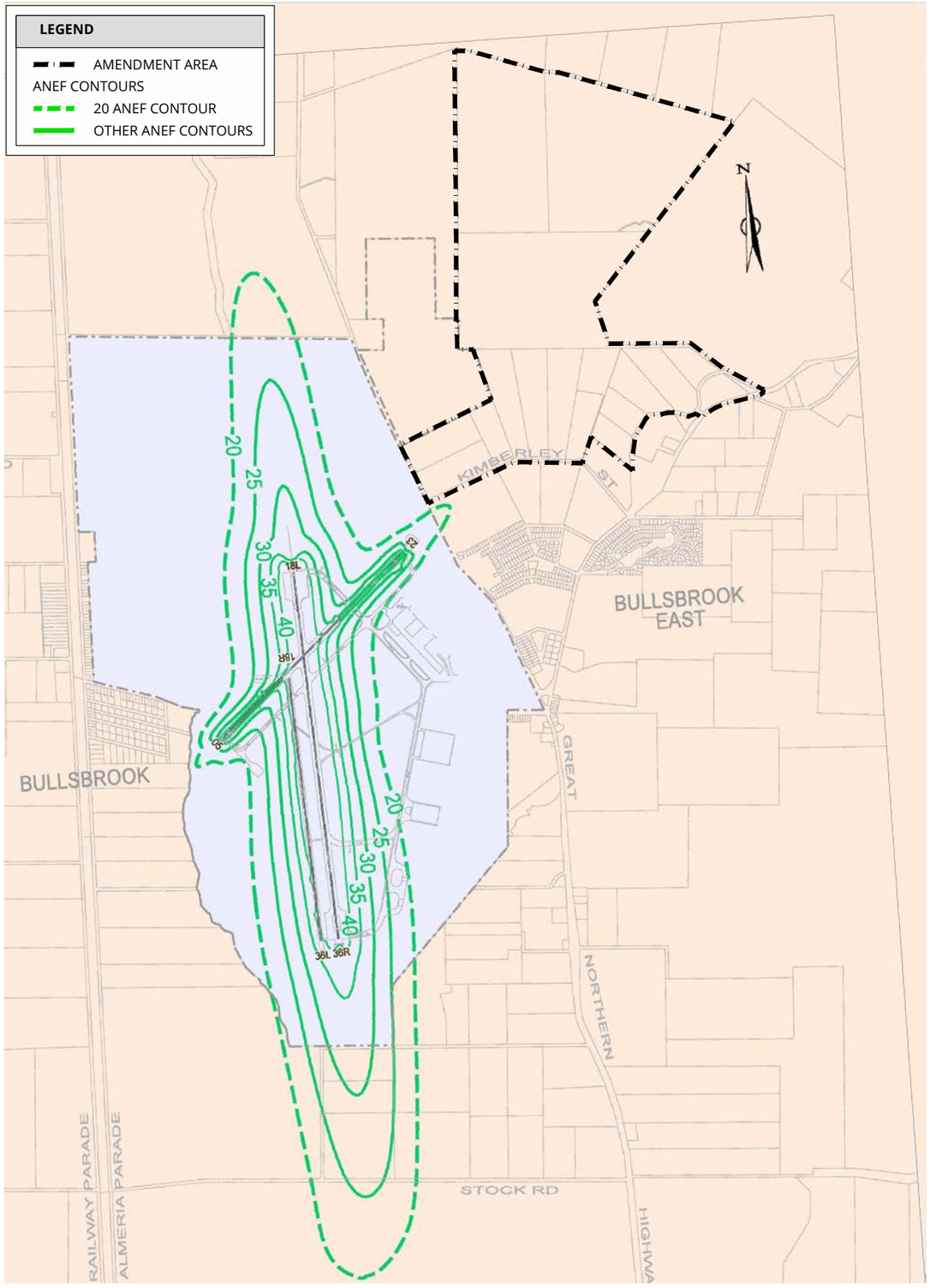


Figure 14 – RAAF Pearce ANEF Modelling

4. The District Structure Plan: Bullsbrook North

This section of the DSP Amendment updates the DSP's consideration of the vision and key design considerations of the Amendment Area where previously noted in Section 3.0 – The District Structure Plan (p 30 – 31) of the 2010 DSP report.

Having regard to the above, this Amendment to the DSP sets out the district level movement network, public open space and servicing requirements which will be further refined within the nominated local structure plan areas.

Refer Plan; 1 and 2 – Bullsbrook Townsite District Structure Plan Map.

This review of the Bullsbrook Townsite District Structure Plan has been guided by the technical input from the team of sub-consultants, which has informed the design and reporting in support of this Amendment No.1.

4.1. Key Design Considerations

The Amendment Area benefits from a high degree of existing amenity, offered by its proximity to the progressively developing Bullsbrook Townsite and Swan Urban Growth Corridor, and natural vegetation and Bush Forever Reserves. The Amendment Area forms the logical northern extension of the Bullsbrook Townsite, with the future local structure plans for the land being required to respond to the existing rural amenity and urban/rural interface surrounding.

Having regard to the existing DSP objectives reflected in Part One, key additional design considerations for the Amendment Area include:

- Providing an integrated planning framework for the Bullsbrook North locality to facilitate the coordinated and logical growth of the locality.
- Providing for urban / residential development in a manner that gradually and appropriately transitions between the established residential development south of Kimberley Street and the surrounding rural residential development (north and east of the site).
- Retention and protection of key environmental features within conservation, and district / public open space areas.
- Providing for a new east-west connection between Great Northern Highway and Chittering Road, diverting traffic from the established Townsite in response to local concerns.
- Facilitate the re-establishment of ecological corridors within public open space, extended road reserves and within lifestyle lots.
- Identifying key areas of good quality vegetation for retention to occur within the Amendment Area, to be provided within useable open space reserves.
- Appropriately locating community and commercial facilities to maximise residential catchment and promote pedestrian connectivity in the area.

4.2. Design Philosophy

This section outlines the design philosophy behind the DSP and Landscape Concept Plan, which will ultimately form the Basis for the future Local Structure Plans.

Environmentally Responsive Design

The DSP has been designed to respond and protect the key environmental (vegetation) features of the site and re-establish meaningful ecological linkages.

The indicative spatial layout allows for urban development to transition to the adjoining rural-residential landholdings, providing an appropriate and sensitive interface at the rural/urban boundary, and ensuring the retention of key landform and vegetation features.

Public Open Space

Areas of open space are located adjacent the existing creek line in the centre of the Amendment Area (capturing high quality vegetation to ensure retention).

Inclusion of an area of public open space of a suitable size and configuration to accommodate local playing fields, situated generally adjacent to the central primary school.

Local open space areas are to accommodate a range of recreation opportunities and facilitate the retention and protection of the land's environmental values.

Neighbourhood Structure

The Amendment Area will ultimately facilitate a well-connected and integrated community nestled within the existing natural amenity.

Structure Planning is to provide for pedestrian permeability that is legible and walkable, and that links the Amendment Area to the broader locality and the community/ recreation facilities provided.

Neighbourhood Centre

The Neighbourhood Centre is located centrally within the Bullsbrook North area with frontage to both district level roads. This ensures the centre will benefit from passing trade and maximises its accessibility to its future catchment.

While subject to future design and development approvals, it is envisaged the centre would provide for 'everyday' services including a small supermarket, day care centre, medical centre and the like.

Movement Network

The Amendment Area is well serviced and accessible via the existing Great Northern Highway (via Morrissey Road) and Chittering Road through to the Bullsbrook Townsite.

The district level road network promotes a high degree of permeability, as well as alleviating traffic congestion for the broader Townsite. Future local structure planning will detail the local road network.

Education Facilities

Notably, the approved DSP already recognises the existing Bullsbrook High School / Primary School and identifies an additional site, located east of the existing Townsite, for a possible future second High School.

The Amendment Area provides for three future primary schools within the subject land, distributed to capture the future residential catchments in both Stage 1 and Stage 2.

The schools are sited along primary connector roads, which make them highly accessible to their future catchments and within walkable proximity to areas of contemplated public open space.

Residential Density

The Amendment Area will ultimately contribute to a diversity of housing types and lot products. It is well-located in proximity to the Bullsbrook Townsite, existing and developing community amenities, and the Bullsbrook Employment Area.

Density bands are identified in Part 4 of this report, to guide the future local structure plans, ensuring medium density is located in areas of higher amenity.

Transitional density is identified on the periphery of the Amendment Area to facilitate a gradual transition to surrounding rural areas.

Landscape Response

The key landscape assets of the Bullsbrook North locality are the existing mature trees and vegetation, and the central creek line. These landscape elements have informed the urban design response to the site.

Future local structure planning is to seek to maximise the retention of trees and vegetation within the site, by including future reserves, including linear public open space reserves, extended road reserves that can meander around retained trees, and in the rear of larger lifestyle lots. The general intent is to re-establish meaningful ecological links.

5. Land Use & Subdivision Requirements

This section of the DSP Amendment updates the approved DSP's consideration of the Amendment Area where previously noted in Sections 3.1 – Land Use to Section 3.8 – Other Requirements, of the 2018 DSP Report.

5.1. Land Use

The objectives above have been considered within the preparation of this Amendment to the District Structure Plan and will guide the preparation of the two future local structure plans over the site.

The District Structure Plan Amendment will provide for:

- An approximate residential yield of 4,028 lots (subject to a refinement of residential densities to be identified at Local Structure Plan stage);
- A new East-West road link providing a new road connection between Chittering Road and Great Northern Highway within the Amendment Area;
- Approximately 27.6 hectares of conservation and open space (in addition to local open space to be identified at local structure plan stage);
- Three (3) new primary schools;
- A two hectare local centre site;
- The introduction of rural / residential transition lots on the eastern and northern periphery, including larger lifestyle lots that are capable of vegetation retention.

A summary of the key land uses and population is summarised in **Table 1**.

	Bullsbrook Townsite DSP (Per Approved DSP, 2018)	Bullsbrook North (Per Approved DSP, 2018)	Bullsbrook North (Per Amendment No. 1, 2026)
Total Area:	1,583 ha	354.6 ha	354.6 ha
Area of each land use proposed:			
Residential	488 ha	70 ha	338.3 ha
Industrial	505 ha	110 ha	0 ha
Commercial	17.1 ha	2 ha *	2 ha
Estimated Lot Yield[3]:	6, 599 lots	3,577 lots comprising:	4,028 lots
		- 800 lots (Future Residential Area)	
		- 2,777 lots (Future Investigation Area)	
Estimated Population Yield[4]:	18,478 people	10,016 people comprising:	11,278 people
		- 2,240 people (Future Residential Area)	
		- 7,776 people[1] (Future Investigation Area)	
Number of High Schools:	2 (1 existing)[2]	0	0
Number of Primary Schools[5]:	3 (Not including Future Investigation Area)	1 (Not including Future Investigation Area)	3 (Including previous Investigation Area as residential)
Estimated Commercial Floor Space:	10,000m²	4000m²	4,000m²
Employment (Industry) Labour Force[6]:	11,000 jobs[7] (Industrial corridor on Stock Road, plus District Centre)	Neighbourhood Centre only[7]	Neighbourhood Centre only[7]
Provision of Public Open Space:			
Unrestricted	50.5ha	3.7ha	18.9 ha
Restricted	12.6ha	0 ha	8.7 ha*
Notes	*1 This figure does not include the existing population of 6,048.* *2 The addition of a second high school will be subject to a number of factors, described at Section 3.1 of the DSP report (2018).* *3 At 22 lots per net site ha (15 dwellings per gross urban zoned ha) for 'Connected City' under the WAPC's North-East Sub-Regional Planning Framework.* *4 At 2.8 people per household (Forecast id: average for 2011).* *5 At 1/1500 lots – Liveable Neighbourhoods – WAPC.* *6 Members of population working full time, part time or currently looking for work.* *7 This figure includes only employment generated within the industrial estate at 30 employees per hectare (Macroplan, 2013). On top of this figure will include commercial, retail and community use employment.*		

Table 1 (Repeated): Land Use and Population Yield.

5.2. Future Residential

This 'Section 5.2 – Future Residential' of the DSP Amendment updates the approved DSP's consideration of the Amendment Area at Section 3.1.1 of the DSP Report (2018), including superseding the following:

- Section 3.1.1: Estimated Yield Table;
- Figure 19: Bullsbrook Townsite District Structure Plan: Residential Component.

This DSP Amendment identifies 338.3 hectares of land for "Future Residential" purposes within the Amendment Area, or approximately 203 net residential hectares. Consistent with the 2018 DSP report, 'net residential hectares' is calculated as the total residential area minus 40 percent for roads, drainage public open space and an allowance for steep terrain.

Based on a net residential density of 22 dwellings per net residential hectare, the Amendment Area has the potential to provide up to 4,028 dwellings, accommodating a population increase of approximately 11,278 persons (based on 2.8 persons per household). The extent and detail of residential land will be further refined through local structure planning.

	Bullsbrook North	Area 1	Area 2
Site Area (ha)	354.6	77.3	277.3
Exclusions			
* Schools	12.25	4.25	8.0
* E-W road	8.9	2.5	6.4
* Local Centre	2.0	2.0	0.0
* Investigation Area	26.3	0.0	26.3
Gross Residential Area (ha)	305.2	68.55	236.6
Less			
* 40% (Roads, POS, Drainage)	122.1	27.4	94.6
Net Residential Area (ha)	**183.1**	**41.1**	**142.0**
Yield Calc (No. Dwellings)	**4028.0**	**904.9**	**3123.1**
Anticipated Population:	11278.3	2533.6	8744.7

Table 7: Estimated Yield Table

Local structure plans will be prepared to provide the further detail with regard to the distribution of density throughout the Amendment Area, ensuring the density targets outlined in Perth and Peel @ 3.5 Million and Liveable Neighbourhoods are achieved.

The Amendment seeks to facilitate a diverse range of housing opportunities, appropriately located throughout the Amendment Area to recognise the landform, proximity to community services and amenity, and facilitate a gradual transition to the existing rural landholdings.

While the DSP does not specify residential density, the following three housing typologies are expected to be evident in the future structure plans:

- **Potential Medium Density:** located in key strategic areas within the Amendment Area (including areas within 400 metres of the Neighbourhood Centre, Primary Schools & Public Open Space), these homesites will offer opportunities for town house / terrace house development and smaller lot product to increase housing affordability.
- **Potential Low to Medium Density:** Expected to contribute toward the majority of housing within the Amendment Area, these homesites will be designed to facilitate the construction of traditional homes.
- **Potential Low Density ("Landscape Transition"):** located on the periphery of the Amendment Areas where abutting existing rural landholdings. These could comprise large lots that are capable of retaining existing trees and contributing to the ecological links through the Amendment Area. These lots could be subject to design requirements (to be detailed at local structure plan stage), including building envelopes, tree retention, bushfire setbacks and fencing criteria.

Dwelling targets for each of the potential housing typologies outlined above are set out in **Table 8**.

Potential Density	Location	Density Target (Dwellings Per Gross Urban Hectare)
Medium	Neighbourhood Centre / Schools (400m)	25
Low to Medium	Residential	15
Low	Landscape Transition	5

Table 8: Dwelling Targets.

5.3. Open Space

This section of the DSP Amendment updates the DSP's consideration of the Amendment Area where previously noted in Section 3.2 – Public Open Space of the 2018 DSP report.

5.3.1. Landscape Strategy

While this DSP Amendment is providing a planning framework for subsequent MRS, LSP 17 and Structure Plan work, effort has been made to consider the potential landscape response and to enshrine this in the DSP at this early stage.

The landscape strategy for the Amendment Area considers the existing vegetation on site, the visual amenity of the site and water management requirements, as indicatively depicted on the Landscape Concept Plan.

Refer Appendix 8 – Landscape Concept Plan.

The overall landscape design strategy aims to:

Creek Line

The existing creek line is a key landscape feature of the Amendment Area. Traversing the land in an east-west direction, the creek creates a delineation between the northern and southern portions of the land, providing an opportunity to be the “lungs” of the Amendment Area.

The creek and its foreshore currently comprise a range of existing trees of varying maturities and species, topography; and this, together with the seasonal changes of the creek line, provides the opportunity for an imaginative space that is the perfect setting to an explorative play space. It is envisaged the creek could comprise a mix of walking trails, nature play, passive recreation, and an opportunity to ‘return to nature’. Retaining this riparian corridor as a significant public open space provides a unique character for the subject land and its community.

Green Links

The Landscape Concept Plan & overall landscape vision for the site seeks to retain ecological, fauna/flora corridors. These could be established along existing Bush Forever Sites (western boundary), public open spaces, homestead “transitional” lots (eastern boundary) and wider road reserves.

The transitional lots, and the green corridor along the eastern boundary provides an opportunity for a softer interface with the rural land and a further opportunity for fauna.

Public Open Space

Consistent with the approach to street alignments, public open space placement and location is driven by the desire to respond to retained vegetation on the site. The subject land has a number of pockets of quality vegetation, with potential for unique public spaces for both passive and active recreation.

Retention of mature trees provides instant shade and a quality of space with an immediate effect. Where public open space has been located that does not have vegetation to be retained, spaces could be designed to provide more active spaces, including kickabout areas, playgrounds / play equipment and the required drainage elements. Linear open spaces provide connectivity and green corridors, increasing walkability and connection, while also retaining mature trees and vegetation. The public open space hierarchy contemplated for the Amendment Area will be detailed at local structure plan stage but will be designed to ensure a variety of public open spaces are provided to facilitate a diversity of recreation opportunity.

Streetscapes

Alignment of streets has been considered in order to retain pockets of vegetation and/or mature trees where possible within road reserves. This retention within the streetscape itself will allow for future treed boulevards and streetscapes, increasing the walkability and amenity within the subject land. This retention of mature trees will also be one of the keystones for sense of place and grounding the future development of the site within the landscape.

It is envisaged that street trees would be planted at a rate of 1 tree per lot and 2 per corner lot, consistent with standard industry practice.

















5.3.2. Public Open Space

Consistent with the DSP Report (2018), it is beyond the scope of the District Structure Plan to specify, in detail, the location and exact amount of local public open space within the Amendment Area. **Table 9** provides an update to the superseded public open space calculation table at page 40 – 41 of the 2018 report.

It is important to note that detailed planning (local structure planning) within the broader DSP area (for Bullsbrook Central and South) has evolved. Many of the original land area calculations outside of this Amendment Area will have changed. In this regard, **Table 9** only seeks to update the Amendment Area calculations.

In summary, the Amendment Area is subject to the following public open space provision:

- **Required public open space: 29.9 hectares, comprising:**
  - Unrestricted public open space: 23.9 hectares.
  - Restricted public open space: 5.9 hectares.
- **Public open space provided for in DSP Amendment: 27.6 hectares, comprising:**
  - Foreshore Reserve: 8.7 hectares.
  - District Open Space: 15.4 hectares
  - Local Playing Fields: 3.5 hectares
- **Public open space to be provided at Local Structure Plan Stage:**
  - Minimum unrestricted public open space: 5.03 hectares.
  - Maximum restricted public open space: 5.98 hectares.

In accordance with Liveable Neighbourhoods, 10 percent of the gross subdivisible area of residential neighbourhoods is required to be developed for local public open space. Future local structure plans within the Amendment Area will be required to demonstrate and provide a minimum of 10 percent of the gross subdivisible area as public open space. These are notionally identified on the attached Landscape Concept Plan and will be refined at local structure plan stage.

Refer Appendix 7 – Landscape Master Plan.

Calculation Of Subdivisible Area and Public Open Space Requirement	Approved Bullsbrook Townsite DSP (2018) (ha)		Amendment No.1 Bullsbrook North (ha)	
Study Area		**1583**		**354.6**
Deductions				
Future Investigation Area	321.2		26.3	
Clay Quarry Buffer Area	2.6		0	
Conservation Sites	35.2		0	
Foreshore Reserves	103.1		8.7	
Public Purpose Sites	24.6		0	
Total Deductions	486.7		35	
Net Site Area		**1096.3**		**319.6**
Deductions				
Primary School Sites	15		12.25	
Town centres and Commercial	30.6		2	
Industrial Land	403		0	
Regional Roads	16.6		6.2	
Total Deductions	465.2		20.45	
Net Subdivisible Area		**631.1**		**299.15**
Public Open Space requirement	63.11		29.91	
Minimum Unrestricted Public Open Space		**50.488**		**23.932**
Less Existing Unrestricted POS				
Existing Local Parks:			0	
Wally Jones Park	0.24			
Existing Neighbourhood Parks:			0	
Ballard Park	0.74		0	
Brearley Park	0.63		0	
Existing District Park:				
Pickett Park	8		0	
Lowrey Park	2.84		0	
Total Existing Unrestricted Public Open Space		**12.45**		**0**
Proposed District Open Space	9.3		15.4	
Other Proposed POS Adjacent Primary Schools	7.7		3.5	
Proposed Unrestricted Public Open Space		**17**		**18.9**
Maximum Restricted Open Space		**12.622**		**5.983**
Less Existing Restricted Public Open Space:				
Existing Restricted Use Sites:				
Ballard Park Drainage Basin	0.15		0	
Future Restricted Use Sites:				
128 North Ave	0.77		0	
9002 North Ave	0.2		0	
Chittering/Hurd/Burley LSP	1.12		0	
Total Existing Restricted Public Open Space		**2.24**		**0**
Proposed Restricted Public Open Space	0		0	
Minimum Unrestricted POS to be Provided		**21.038**		**5.032**
Maximum Restricted POS to be Provided		**10.382**		**5.983**
Minimum Public Open Space to be Provided		**31.42**		**11.015**

Table 9: Calculation of Subdivisible Area and Public Open Space Requirement.



5.3.2.1. Active Public Open Space

The majority of the required active public open space will be provided for through the allocation of district playing fields within the broader Bullsbrook District Structure Plan Area, consistent with the 2018 DSP report. In this regard, the Amendment also makes provision for local playing fields (approx 3.5 hectares) generally adjacent to the central and southern primary school sites. This approach is consistent with the broader DSP Area and allows the Amendment Area to consolidate 'active' open space areas with active spaces required for school sites. It seeks to promote water resource efficiency and use other areas of public open space for the retention of native vegetation throughout the broader Amendment Area.

The exact size and configuration of district open space and local playing fields areas will be further detailed and defined at each of the local structure plan stages.



5.3.2.2. Passive Public Open Space

In accordance with Liveable Neighbourhoods, 10 percent of the gross subdivisible area of residential neighbourhoods is required to be developed for local public open space. Future local structure plans within the Amendment Area will be required to demonstrate and provide a minimum of 10 percent of the gross subdivisible area as public open space. These are notionally identified on the attached Landscape Master Plan and will be refined at local structure plan stage.

Local structure plans will be prepared having regard to the overall landscape strategy for the Amendment Area, and will identify any additional areas of remnant vegetation, conservation mechanisms to formalise the tree retention objectives outlined throughout this Amendment.



5.3.2.3. Foreshore Reserve / Conservation

The Amendment proposes the retention of the existing creek which traverses Lot 3 centrally within the Amendment Area. The creek is an ephemeral waterway that runs into the Ellen Brook. In this regard, it is considered that the creek has high value amenity and landscape value. The creek, and an aproximate 30-metre foreshore buffer (in accordance with the EPA Guidelines) is retained for "Conservation" on the DSP Map (As Amended). The exact wetland definition and buffers will be determined during the local structure planning stage.

The creek line, its foreshore and an adjacent area of "high quality" vegetation comprises approximately 23 hectares or 6.5 percent of the overall Amendment Area. It is noted that, consistent with the approved DSP Report (2018), the Foreshore Reserve portion of this open space area is included as a deduction for the purpose of the public open space calculation.

5.4. Movement Network

The following provides a summary of the existing, planned and proposed movement network for the Amendment Area. For further information, refer to the Transport Impact Assessment ('TIA') prepared by KCTT included at **Appendix 8**.

Refer Appendix 8 – Transport Impact Assessment.

5.4.1. Existing Road Network

The Amendment Area is currently accessed via Kimberly Street to its south, Ashton and Chittering Roads to the east and Morrissey Road to the north. Morrissey Road intersects with Great Northern Highway approximately 1 kilometre west of the subject land. There are no existing road reserves within the Amendment Area.

Great Northern Highway

Great Northern Highway is a 'Primary Regional Road' reserved under the MRS. It is classified as a 'Primary Distributer' under the Main Roads WA road hierarchy, comprising a single carriageway road with an approximate 25 metre wide road reserve and 10 metre pavement. Great Northern Highway has a speed limit of 110km/hour and decreasing to 60km/hour where built up in the Townsite.

Morrissey Road

Morrissey Road is classified an 'Access Road' under the MRWA road hierarchy, comprising a single carriageway undivided road within an approximate 20 metre road reserve. The existing pavement is approximately 6 metres wide, though a portion of Morrissey Road that abuts the site is unsealed. The road is not sign posted and subject to a speed limit of 50km/hour.

Kimberley Street

Kimberley Street is classified an 'Access Road' under the MRWA road hierarchy, comprising an approximate 7 metre wide pavement within a 20 metre reserve. Kimberley Street is currently a single carriageway unmarked and undivided road, with the pavement terminating at the western boundary of Lot 24.

Chittering Road

Chittering Road is classified a 'Regional Distributor' under the MRWA hierarchy, comprising a 7.4 metre wide pavement within a 20 metre reserve. It is a single carriageway undivided road with a 90km/hour speed limit.

Chittering Road currently serves as part of a truck (Restricted Access Vehicle) route, bringing heavy vehicles through the townsite and to Great Northern Highway. Chittering Road carries approximately 5800 vehicles per day (2022 traffic counts).

Ashton Road

Ashton Road is an 'Access Road' under the MRWA road hierarchy, comprising an undivided, unmarked single carriageway within a 20 metre road reserve. The road is not sign posted and is subject to a speed limit of 50km/hour.

5.4.2. Proposed Road Network

The proposed district road network is depicted at **Figure 15**. External access to the Amendment Area is provided at four locations, afforded by a new north-south link (between Morrissey Road and Kimberley Street) and east-west link (between Great Northern Highway and Chittering Road).

Refer Figure 15 – Proposed Movement Network.

The internal road network at this (district) level of planning comprises a simple spine network, providing a basis for four future neighbourhood quadrants, and providing a solid and legible connection to the existing locality. One of the key design objectives for the Amendment Area was providing a traffic solution that provides a safer and more direct route to Great Northern Highway for the heavy vehicles utilising Chittering Road, effectively rerouting these vehicles from accessing the Bullsbrook Townsite. This will be further discussed at Section 5.4.3.

The district road network is proposed to comprise the following road classifications:

Road Classification	Indicative Traffic Volume	Indicative Cross Section
Integrator B	15,000 – 20,000 vehicles per day	31.2 metre reserve to include: • one lane per direction; • one cycling lane per direction; • 7.6 metre pavement; • on street parking; and • 6 metre wide central median.
Neighbourhood Connector A	7,000 vehicles per day	27.6 metre road reserve to include: • one lane per direction; • one cycling lane per direction; • 7.3 metre pavement; • on street parking; and • 3 metre wide central median.

Table 10: Road Classifications.

Refer to Figure 17 – Indicative Road Cross Sections.

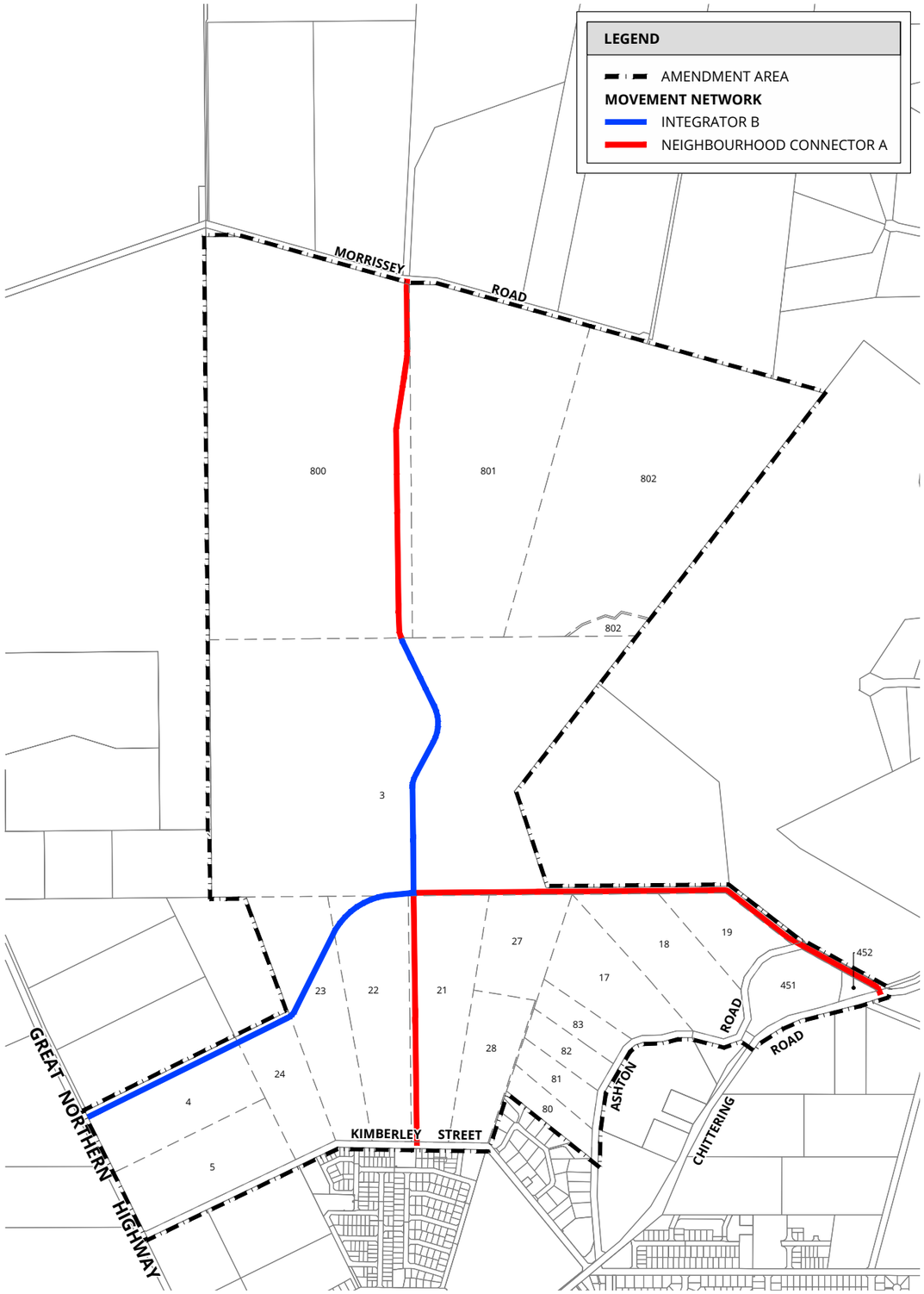


Figure 15 – Proposed Movement Network

5.4.3. Proposed East-West Link Road

Heavy traffic utilising Chittering Road to access Great Northern Highway is a significant issue affecting the Bullsbrook Townsite. Due to the lack of broader sub-regional accessibility, there are limited connections to Great Northern Highway and the regional road network, which has resulted in heavy traffic moving through the Townsite, to use the only intersection to Great Northern Highway. This DSP Amendment seeks to facilitate a new East-West Link road through the Amendment Area to Great Northern Highway, thereby providing a solution which will offer a benefit to the greater Bullsbrook Townsite area, and will also enable the multiple vehicle access requirements of SPP3.7 to be satisfied at the district level.

The proposed East-West road provides a direct connection between Chittering Road and Great Northern Highway.

Traffic modelling to support the Amendment has determined this road would be accommodated within an approximately 20-30 metre road reserve, with a 6 metre central median, however the final reserve width and cross section requirements will be confirmed at subsequent planning stages.

The design of the intersection with Great Northern Highway will determined at subsequent planning stages, in consultation with Main Roads WA.

It is anticipated a Development Contribution Plan would be required to facilitate the funding of the East-West Link Road, as outlined in Section 5.9 of this Report and **Appendix 10**.

Refer Figure 16 – Land Requirement Plan.

5.4.4. Pedestrian & Cycle Network

The TIA identifies an indicative district level pedestrian and cycling network within the movement network. Both of the proposed district level roads shown on Plan 1 are expected to include dedicated cycling lanes (within road pavements) and separate pedestrian paths on both sides of the road. These will be further reviewed and refined at local structure plan stage, however, will tie into the existing bike routes on Chittering Road and Great Northern Highway, connecting the site to the Bullsbrook Townsite.

5.4.5. Public Transport Network

The State Government's Metronet project will add approximately 21km as a spur line from the existing Midland Line east of the Bayswater Station to connect the areas of Morley, Noranda and beyond to Ellenbrook. Completed in 2024, the Ellenbrook Station is the northern terminus and includes a Bus interchange and associated parking area. The journey time to the Perth CBD from Ellenbrook station is approximately 30 minutes.

It is understood that planning for this northern extension has taken into account future growth of the Bullsbrook Townsite, and extensions to the rail / bus network are capable of being extended as the growth and development in this locality occurs; ultimately providing a relatively direct public transport route to Perth CBD.

Pre-lodgement consultation with local residents identified that lack of a frequent bus service was hampering some residents, particularly young people's ability to travel to the wider Perth metropolitan area. The increased population arising from the development of Bullsbrook North adds to the economic case for increasing the frequency of bus services to Bullsbrook.

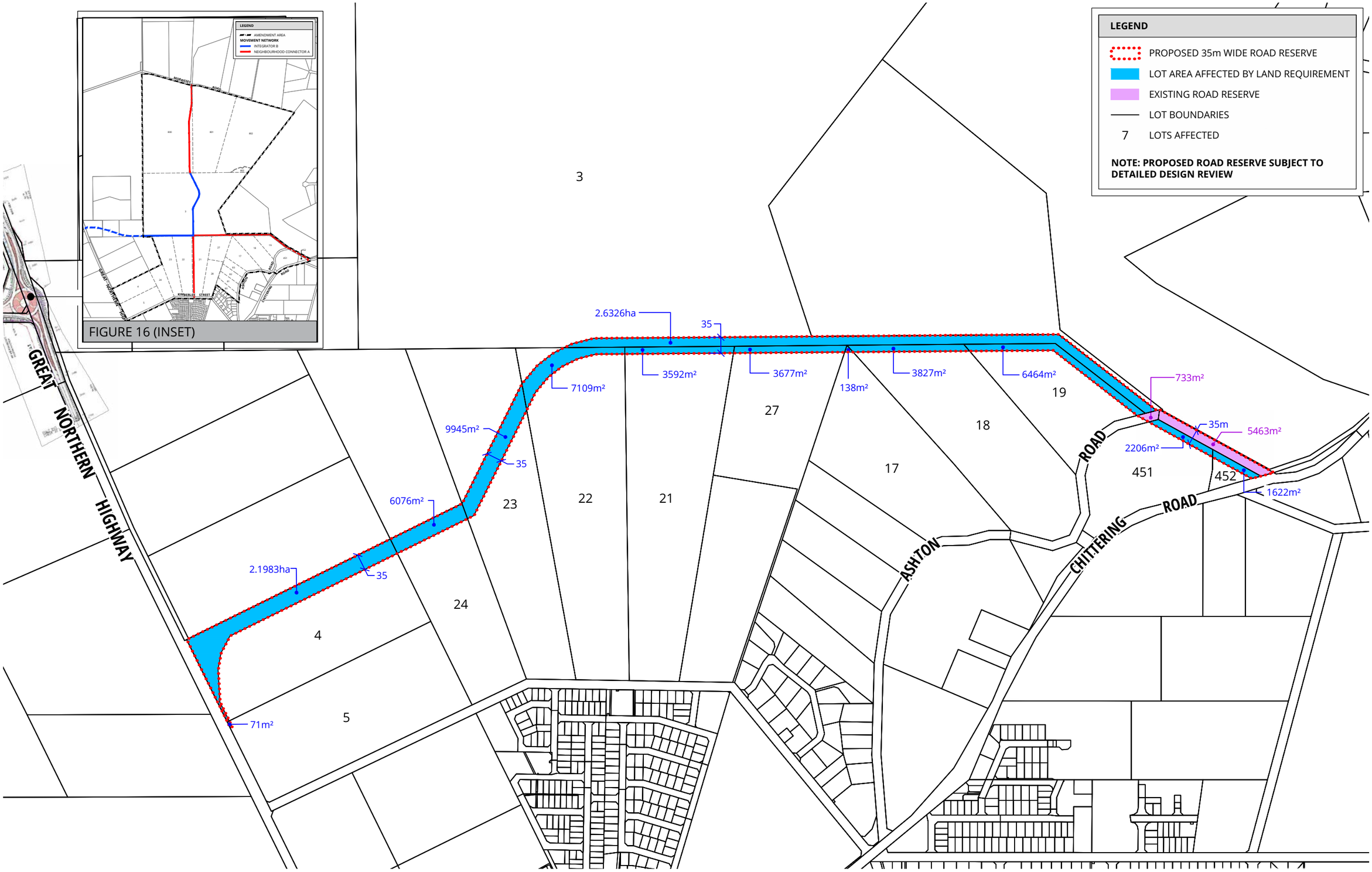
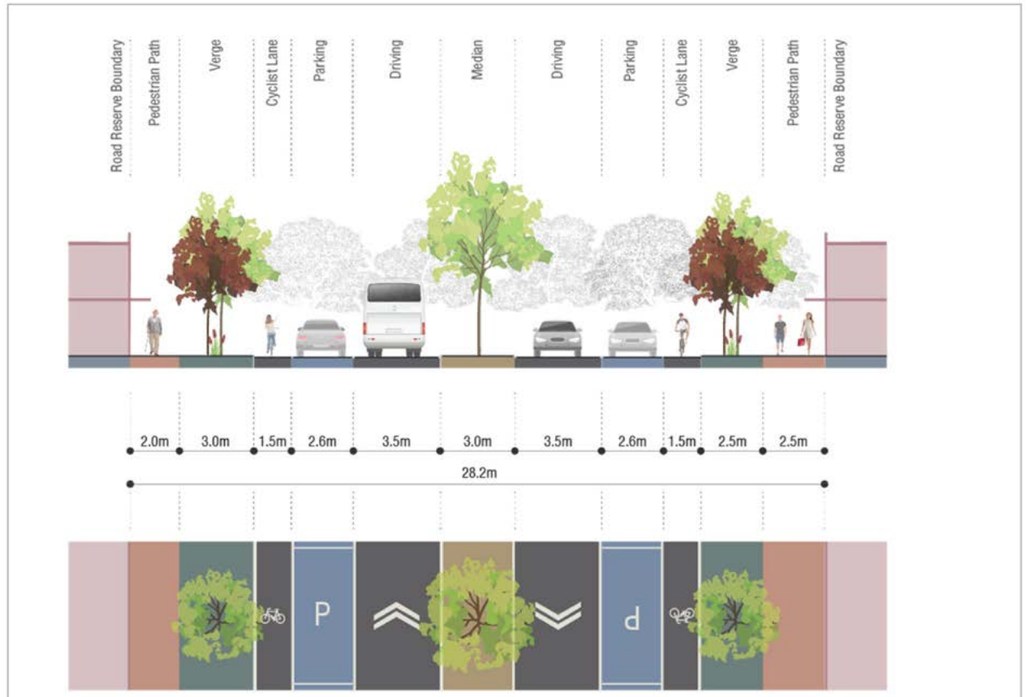
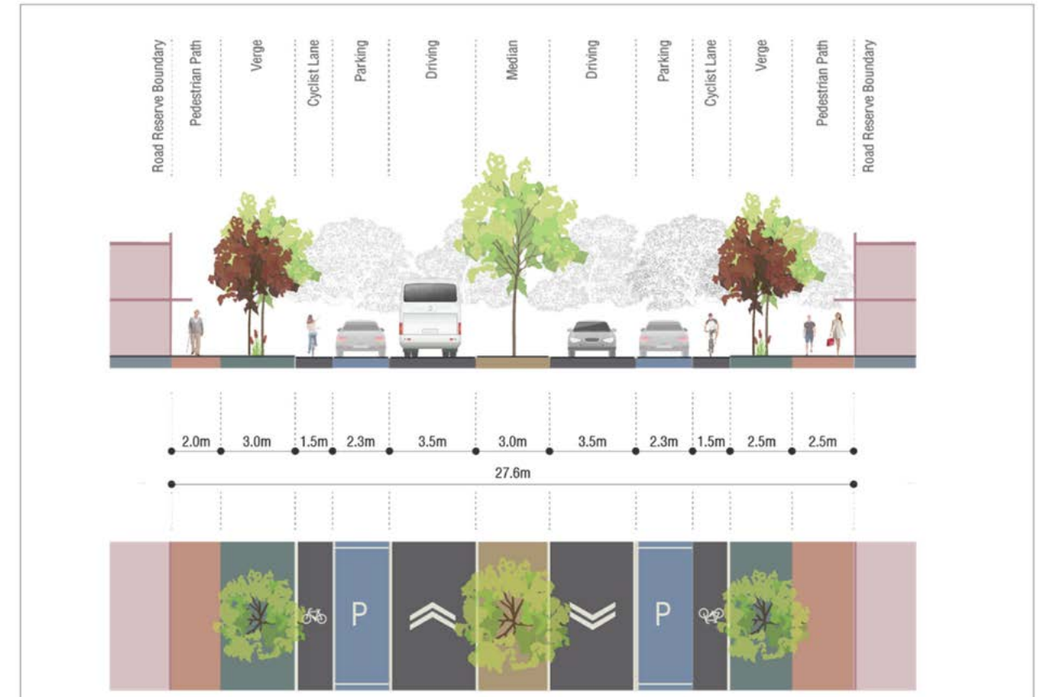


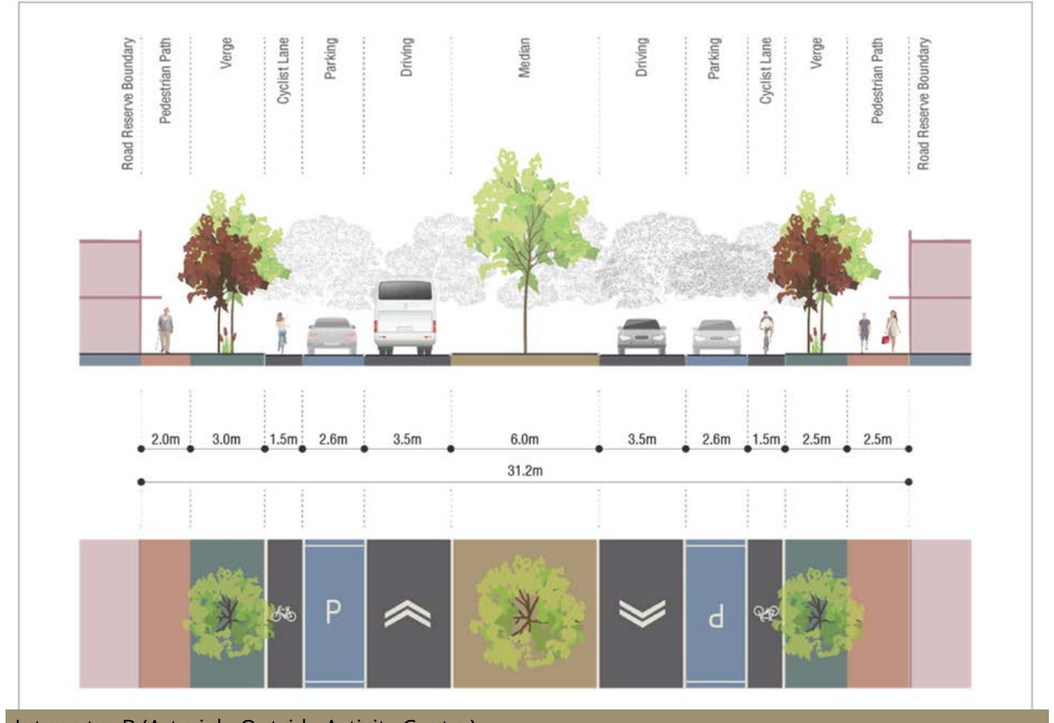
Figure 16 – Land Requirement Plan



Integrator B (Arterial - Activity Centre Main Street)



Neighbour Connector A



Integrator B (Arterial - Outside Activity Centre)

Figure 17 – Indicative Road Cross Sections

Source: KCTT

5.5. Water Management

5.5.1. District Water Management Strategy

A District Water Management Strategy ('DWMS') has been prepared by JDA Consulting Hydrologists in support of this Amendment to the Bullsbrook Townsite DSP. This DWMS is prepared having regard to the overall water management strategy for the Bullsbrook Townsite DSP, as discussed at Section 3.5.1 of the 2018 approved DSP (**Appendix 1**). In this regard, it is prepared having consistency in the guiding principles for the DSP Area and demonstrates the water management within the Amendment Area will not negatively impact the broader Bullsbrook Townsite area.

The DWMS was approved by the Department of Water and Environmental Regulation in June 2025.

Refer Appendix 5 – District Water Management Strategy.

The design objectives of the DWMS are outlined in **Table 11** below.

Key Guiding Principles	
	Facilitate implementation of sustainable best practice for urban water management; Provide integration with the planning process and clarity for agencies involved with implementation; Minimise public risk, including risk of injury or loss of life; Protection of infrastructure and assets from flooding and inundation; Encourage environmentally responsible development.
Category	**Objectives**
Stormwater Management:	▪ Maintenance of pre-development hydrological regime including outflow rates. ▪ Safe conveyance and management of stormwater runoff in accordance with Australian Rainfall and Runoff. ▪ At source detention of first 15 mm ('small') rainfall event. ▪ On site retention/detention of stormwater runoff up to 1% AEP storm event. ▪ Post-development peaks outflows from detention systems to waterways/ outlets are consistent with pre-development peak flows. ▪ Water quality treatment systems and water sensitive urban design structures designed in accordance with Stormwater Management in Western Australia and Stormwater Management Manual for Western Australia. ▪ Non-structural measures to reduce applied nutrient loads.
Groundwater Management:	▪ Ensure adequate separation, minimum of 1.2 m, between finished lot levels and groundwater levels. ▪ Limit hydrological impact to Bush Forever and wetland sites. ▪ Manage fertiliser and pesticide application in streetscapes and public open space to reduce nutrient input.
Water Conservation & Sustainability:	▪ Ensure non-potable water supply systems are considered as part of an integrated water supply. ▪ Household target water use of 100 kL/person/year. ▪ Scheme water target use of 40 to 60 kL/person/year. ▪ Use of waterwise landscaping practices both at development and lot scale.
Water Quality:	▪ Adopt nutrient load reduction design objectives for stormwater runoff. ▪ Use of amended soils and ephemeral bioretention systems to treat stormwater.
Monitoring:	▪ Pre- and post-development program to ensure water quality targets are met.

Table 11: DWMS Design Objectives.

5.5.2. Stormwater Management

Stormwater management will be undertaken consistent with the WAPC's Better Urban Water Management Framework, the Stormwater Management Manual for Western Australia and the Swan River Trust's local Water Quality Improvement Plan Ellen Brook Catchment.

The Amendment Area is located within the Ellen Brook Catchment Area, which comprises the largest catchment in the Swan Coastal Plain. The Ellen Brook Catchment discharges into the upper reaches of the Swan River. Preliminary earthworks design indicates there are 27 surface catchment areas within the Amendment Area. Stormwater runoff within each catchment will drain to a management area at the catchment low-point. A detailed geotechnical investigation will be required at each local structure planning stage to determine the suitability for infiltration, particularly within the sandy upper catchments.

Stormwater system design will adopt the following design criteria:

- Pre-development flows entering and leaving the Amendment Area are to be maintained. Stormwater management systems are to be designed to retain the 'Small' (first 15 mm of rainfall) and retain, where feasible, or detain stormwater runoff for the Minor (20% AEP) and Major (1% AEP) storm events.
- Small event runoff is to be managed by a combination of infiltration structures (swales, underground cells, tree pits, permeable pavers) on the majority of roads in the catchments prior to reaching bio-retention (vegetated treatment) areas in downstream drainage management areas.
- Utilise overland (pipeless) system where possible including roadside or median swales in neighbourhood connector roads.
- Minor and major event runoff is to be managed within the catchment using roadside or median swales, POS, tree pits, flush kerbing adjacent to public open space or underground storage to minimise drainage management areas in the downstream public open space.
- Drainage management areas proximal to the central waterway are to be integrated into areas outside of the waterway foreshore buffer using road and pedestrian crossings as stormwater attenuation points to create living streams. Additional drainage management areas can be located throughout the upper catchment as required. These are to either infiltrate or discharge into the downstream drainage management areas.

- Post-development flows attenuated to pre-development flow rates by detention of runoff in stormwater management areas. These can be located in landscaped public open space, linear multiple use corridors or drainage reserve areas.
- A drainage management area must be located at each catchment outlet to ensure stormwater runoff is retained and infiltrated, where feasible, or attenuated to pre-development flow rates prior to leaving the area.
- Finished floor levels to have a minimum of 0.5m clearance from the 1% AEP water level of the central waterway and be at least 0.3m above the 1% AEP overland flow flood level and drainage management area flood level.

Detailed design of bioretention areas, including the sizing and distribution, will be further detailed within the Local Water Management Strategy prepared to support each of the local structure plans.

Stormwater quality is to be managed through the implementation of best management practices in a treatment train to achieve water sensitive urban design. These include structural and non-structural measures to assist in reducing applied nutrient loads, such as:

- Use of soakwells and/or other underground storage devices on residential lots to retain the small event (15 mm) at source, where groundwater separation and geotechnical conditions permit.
- Gross pollutant traps (GPT) to be installed on catchment stormwater system pipe outlets to remove pollutants including sediment and hydrocarbons prior to discharge.
- Road catchment stormwater runoff from the small rainfall event (15 mm) to be treated by bio-retention areas / amended soils / rain gardens / tree pits / permeable pavers / median or roadside swales / flush kerbing adjacent to public open space in the upper catchment prior to infiltration or discharge to downstream environment.
- Overland (pipeless) conveyance systems including living streams, roadside and median swales planted with vegetation to increase roughness and reduce peak stormwater flows to remove sediment and increase nutrient uptake. These are to be incorporated into the neighbourhood connector roads.

Implementation and appropriate design suitability of these measures will be further investigated during the preparation of Local Water Management Strategies.

5.5.3. Groundwater Management

The key criteria for groundwater management for the Amendment Area, as identified in the Regional Water Management Strategy, are:

- Where a perched water table exists or the predicted maximum groundwater level is at or within 1.2m of natural surface levels, measures should be implemented to ensure adequate separation of building floor slabs from groundwater is achieved. This may include lowering the groundwater levels where possible, the importation of clean fill or installation of subsoil drainage; and
- Proposals to lower groundwater levels must demonstrate no or negligible impact on groundwater dependent ecosystems. In particular, where subsoil drainage is proposed within the groundwater capture zone of wetlands, designs must be developed with consideration of ecological water requirements for groundwater dependent ecosystems.

There is generally greater than 10 metres of separation to the regional groundwater table across the site. A detailed geotechnical investigation will be required to inform the preparation of Local Water Management Strategies and Local Structure Plan stage, to determine if there are any soil horizons of potentially low permeability, which could impede the infiltration of stormwater and result in perched water tables. Should this occur, groundwater management in the form of additional clean sand fill and/or subsoil drainage may be required in some areas to provide a minimum separation to building floor levels from any potential perched water tables (if encountered).

Should management of groundwater levels be required, subsoil drainage areas, inverts, discharge rates and locations are to be established in accordance with Water Resource Considerations when Controlling Groundwater Levels in Urban Development (DWER 2013) and are to further consider:

- Subsoil drainage to manage post-development rise in groundwater levels, particularly in areas where there is potential for perched water tables within 1.2m of natural surface. Subsoil drainage should be installed at or above any low permeability soil horizon and have free-draining outlets.
- Subsoil drainage may be used to provide a controlled groundwater level (CGL) in perched water table areas.
- Appropriate analysis should be performed to assess influence of subsoil drainage on groundwater levels, including extent of groundwater drawdown and mounding between subsoil lines.



5.5.4. Landscaping & Irrigation

Water required for irrigation of public open space and school areas is generally by groundwater abstraction from the superficial aquifer under licence by DWER. It is assumed the central water waterway and associated buffer will be generally maintained in their present condition and establishment irrigation may be required within the buffer.

The portion of the Amendment area requiring irrigation can be broadly identified as the public open space areas, being approximately 10 per cent of the Amendment Area.

Having regard to the Landscape Concept Plan (**Appendix 7**) for the Amendment Area it is assumed that approximately 49 hectares of public open space and up to 12.25 hectares of school sites will require irrigation. Preliminary calculations by LD Total (2023) estimates 50 per cent establishment irrigation and 30 per cent ongoing irrigation for public open spaces and 20 per cent for school sites.

Applying a conservative irrigation rate of 6,750kL/ha/year for public open space, this results in an estimated irrigation requirement of 166,000kL/year would be required for establishment and 110,000kL/ year would be required for ongoing irrigation of the Amendment Area. The existing licenses within the Amendment Area have a combined allocation of 160,260kL/ year and accordingly, it is considered there is sufficient access to irrigation to service the Amendment Area.

5.5.5. Local Water Management Strategy

The WAPC's Better Urban Water Management framework sets out the water management requirements for the various stages of planning processes. In this regard, it is noted a future Local Structure Plan will be required to be supported by a Local Water Management Strategy, and an Urban Water Management Plan will be required as a condition of subdivision(s) approval. These documents are to be prepared having regard to the recommendations and objectives outlined in the DWMS (as outlined above).

Specific issues to be considered at LWMS stage include:

- Hydrological management of the central waterway and protection of environmental assets.
- Survey of waterways and retention of existing flow paths and natural drainage systems located throughout the Amendment Area and preparation of a biophysical assessment for the central waterway.
- Definition of waterway foreshore buffers in accordance with *Operational Policy 4.3: Identifiying and establishing waterway foreshore areas* (DoW 2012) to the satisfaction of DWER.
- Refinement of pre-development modelling based on results of pre-development monitoring and field survey.
- Irrigation supply and water efficiency measures for irrigation of public open space.
- Detailed site geotechnical investigation and earthwork and fill strategy.
- Refine drainage catchment areas, location of drainage infrastructure, flood storage volumes, levels and areas and discharge rates to maintain pre-development flows entering and leaving the site. Assess opportunities to implement further water sensitive urban design.
- Provide further detail on the groundwater management strategy including subsoil drainage design.
- Surface water monitoring to inform the LWMSs and refine the post development monitoring program.

5.6. Education & Community Facilities

5.6.1. High Schools

The Amendment Area is currently serviced by the existing Bullsbrook College. The approved Bullsbrook Townsite District Structure Plan Area already contemplates the potential need for an additional high school to service its contemplated population growth, should the existing high school not be capable of expansion. The "preferred high school" site is identified on the approved DSP, to the east of the established Townsite (east of the Bullsbrook Central Area).

5.6.2. Primary Schools

Based on the residential yield calculations for the Amendment Area, it is envisaged that up to three (3) government primary schools will be required to support the future population, located generally central to the future catchment population consistent with the requirements of Operation Policy 2.4 – Planning for School Sites ('OP 2.4').

The final location, configuration and size of the primary school sites will be determined at local structure plan stage in accordance with Liveable Neighbourhoods, OP 2.4 and in consultation with the Department of Education. Primary schools are to be located adjacent to a 'Neighbourhood Connector' classified road to ensure maximised accessibility.

5.7. Activity Centres & Employment

5.7.1. Neighbourhood Centre

Consistent with the approved Bullsbrook Townsite District Structure Plan, a Neighbourhood Centre is identified within the Amendment Area to service its future population, and is intended to provide amenity and convenience to the future population. The Neighbourhood Centre is located within the LSP Area 1 at the intersection of the two district level arterial roads and is approximately 2 hectares in size and likely to provide approximately 4,000m2 retail floor space.

5.8. Infrastructure Coordination, Servicing & Staging

An Engineering Servicing Report has been prepared by Porter Consulting Engineers and Cossill & Webley in support of this Amendment to the District Structure Plan. The findings of the Engineering Servicing Report are summarised below.

Refer Appendix 9 – Engineering Servicing Report.

5.8.1. Power

The Amendment Area is currently serviced to a rural standard by overhead power lines, with a high voltage overhead line running through the centre of the land.

The development of the Amendment Area will require significant power supply infrastructure upgrades. Subsequent planning stages will investigate, in consultation with Western power, infrastructure upgrade requirements and the potential for existing power supply capacity to service the initial stages of development.

5.8.2. Water

The subject land is not currently serviced by a reticulated water network. The current reticulated water system terminates with the urban development south of Kimberley Street.

Reticulated water in the Bullsbrook Townsite is collected from a water supply tank on the south eastern boundary of the Amendment Area. The water tank has a pressure supply limit and is only capable of servicing lots located on an elevation of less than RL 90m.

The Water Corporation is currently installing a Booster Pump Station near Chittering Road, which will boost local capacity. This is expected to be delivered in January 2026.

Separately, an alternate water tank site will be required (at a higher elevation) to service lots with an elevation of greater than RL 90m (generally the northern portion of the Amendment Area).

The project team have been liaising with Water Corporation regarding the required water scheme planning for Bullsbrook North. The Water Supply Distribution Plan indicates a new Bullsbrook High Level Tank being (potentially) located along Chittering Road with an elevation of up to 189m AHD. This tank site is being negotiated with the City of Swan, with the delivery of infrastructure by Water Corporation.

It is noted that, while this is at very high-level conceptual planning phase, this tank would have the capacity to service the full extent of the Amendment Area (with the highest point of the development being at approximately 140m AHD).This will be further investigated and reviewed as the future stages of planning for Structure Plan Area 2 progress, in consultation with the Water Corporation and to the satisfaction of the WAPC.

5.8.3. Reticulated Sewer

The subject land is not currently serviced by a reticulated sewer system; however, the existing infrastructure does extend to the southern boundary of the Amendment Area, within the Kimberley Street road reserve.

The development of the amendment Area will require significant upgrades to sewer infrastructure, which will need to be investigated in consultation with the Water Corporation.

5.8.3.1. Waste Water Treatment Plant Decommissioning

The Water Corporation recently installed a pipeline diverting waste water from Bullsbrook to Ellenbrook, which will facilitate the decommissioning of the Bullsbrook Wastewater Treatment Plant (located west of the Amendment Area). The ceasing of plant operations will remove the requirement for the existing odour buffer.

5.8.4. Reticulated Gas

There is currently no existing gas supply within the Amendment Area or Bullsbrook Townsite Area generally. A gas supply will not be investigated or planned to service this development.

5.8.5. Telecommunications

The Amendment Area is currently serviced by both the Telstra phone communication network and the National Broadband Network ('NBN') fibre optic network. Both networks are capable of extension to service proposed development.

5.8.6. Earthworks

The earthworks strategy will be developed having regard to both the existing undulating topography of the land and landscape design objectives to maximise tree retention opportunities and minimise retaining walls where possible. In this regard, at this early stage, it is anticipated that:

- The Amendment Area is suitable to achieve Class A lots throughout, using typical construction processes.
- Cut to fill operations will be completed (likely in bulk earthwork phases) across the development area. The requirement for imported fill will be minimal.
- It is anticipated that generally level lots would be achieved, with some retaining.
- Future planning stages will confirm the areas of vegetation to be protected.

5.9. Developer Contribution Arrangements

Consistent with Section 3.7.2 of the approved DSP (2018), it is anticipated that a Development Contribution Plan ('DCP') would be required to fund key public infrastructure required within the Amendment Area. The specifics of the arrangements will ultimately be detailed through a standalone LPS 17 Scheme Amendment process, and the future planning stages, consistent with the provisions of Stage Planning Policy 3.6 – Infrastructure Contributions.

5.9.1. Development Contribution Plan

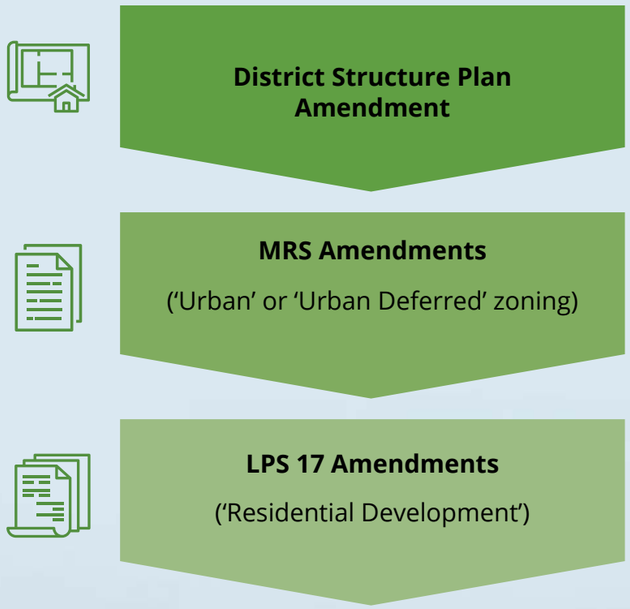
The DSP Amendment has been prepared to coordinate orderly land use and infrastructure planning within the Bullsbrook North Urban Expansion Area. It is acknowledged that a Development Contribution Plan ('DCP') would be required to facilitate the development of key district level infrastructure. This is expected to be complimentary to, but entirely independent of, the existing (operating) Bullsbrook Townsite DCP (DCA 7).

Refer Appendix 10 – Bullsbrook North Urban Expansion Area: Development Contribution Plan Scoping Paper.



5.10. Other Requirements

There are several changes to the existing planning framework that are required to be implemented prior to the subdivision and development of the Amendment Area. The implementation framework is outlined below and illustrates the future stages of planning for the area.



5.10.1. Metropolitan Region Scheme Amendments

The Amendment Area is currently zoned 'Rural' under the MRS. In order for residential development to occur, the land will need to be rezoned to 'Urban' under the MRS. Consistent with the Structure Plan Areas identified in Part 1 of this Report, it is anticipated that two (2) MRS Amendments would be sought:

- **Area 1:** MRS Amendment seeking 'Urban' zoning under the MRS; and
- **Area 2:** MRS Amendment seeking 'Urban Deferred' zoning under the MRS.

In addition to the above, the WAPC's Lifting of Urban Deferment Guidelines set out the information requirements necessary to support a request for the lifting of urban deferment. These include requirements for a conceptual layout of the land being 'lifted'; demonstration that essential urban services (including reticulated water and wastewater) can be provided; and demonstration of landowner support.

5.10.2. Local Planning Scheme Amendments

The Amendment Area is currently zoned 'General Rural' under the City of Swan Local Planning Scheme No. 17 and is required to be rezoned to 'Development' zone prior to endorsement of a local structure plan.

As part of the MRS Amendments, the WAPC may concurrently rezone the land under LPS 17, pursuant to Section 126 (3) of the *Planning and Development Act 2005*.

Subsequent amendments to LPS 17 would be required to facilitate the Development Contribution Plan/s.

5.10.3. Local Structure Plans

Local structure plans are required to be prepared for each of the two areas identified on Plan 2 – District Structure Plan Map – Bullsbrook North (as Amended). These areas are consistent with the boundaries for the MRS Amendment Requests, and generally reflect the anticipated staging of the development.

The formal process to prepare a local structure plan is detailed under Part 4 Section 15 of the *Planning and Development (Local Planning Schemes) Regulations 2015* and may commence concurrently with lodgement of a Local Planning Scheme Amendment under LPS 17. Once Local Structure Plans have been approved by the WAPC, development may proceed.

Key considerations for each of the Local Structure Plan Areas are outlined below:

Structure Plan Area 1 – Kimberley Street North:

- Confirmation of the location and specific requirements of the primary school site with the Department of Education;
- Consideration of the interface with adjoining Bush Forever Site No.88;
- Consideration in design for the retention of remnant vegetation, specifically significant trees;
- Consideration of the need for a Kangaroo Management Plan for the management of displaced kangaroos;
- Confirmation of the need for local development and community infrastructure coordination that would require funding through a Development Contribution Plan;
- Coordination of access and infrastructure staging.

Refer Figure 18 – Local Structure Plan Area 1.



Figure 18 – Local Structure Plan Area 1

Local Structure Plan Area 2 – Morrissey Road South:

- Review the design interface and functionality of the linear east-west open space reserve, having regard to its drainage function, vegetation retention and open space integration functions;
- Appropriate retention of existing vegetation, having regard to environmental, bushfire and landscape advice;
- Consideration of the need for a Kangaroo Management Plan for the management of displaced kangaroos;
- Confirmation of the location and specific requirements of the primary school sites with the Department of Education;
- Consideration of the various land use interface requirements including to the adjoining 'Rural' landholdings, to Great Northern Highway and to Bush Forever Site No.294;
- Confirmation of the need for local development and community infrastructure coordination that would require funding through a Development Contribution Plan;
- Coordination of access and infrastructure staging.

Refer Figure 19 – Local Structure Plan Area 2.

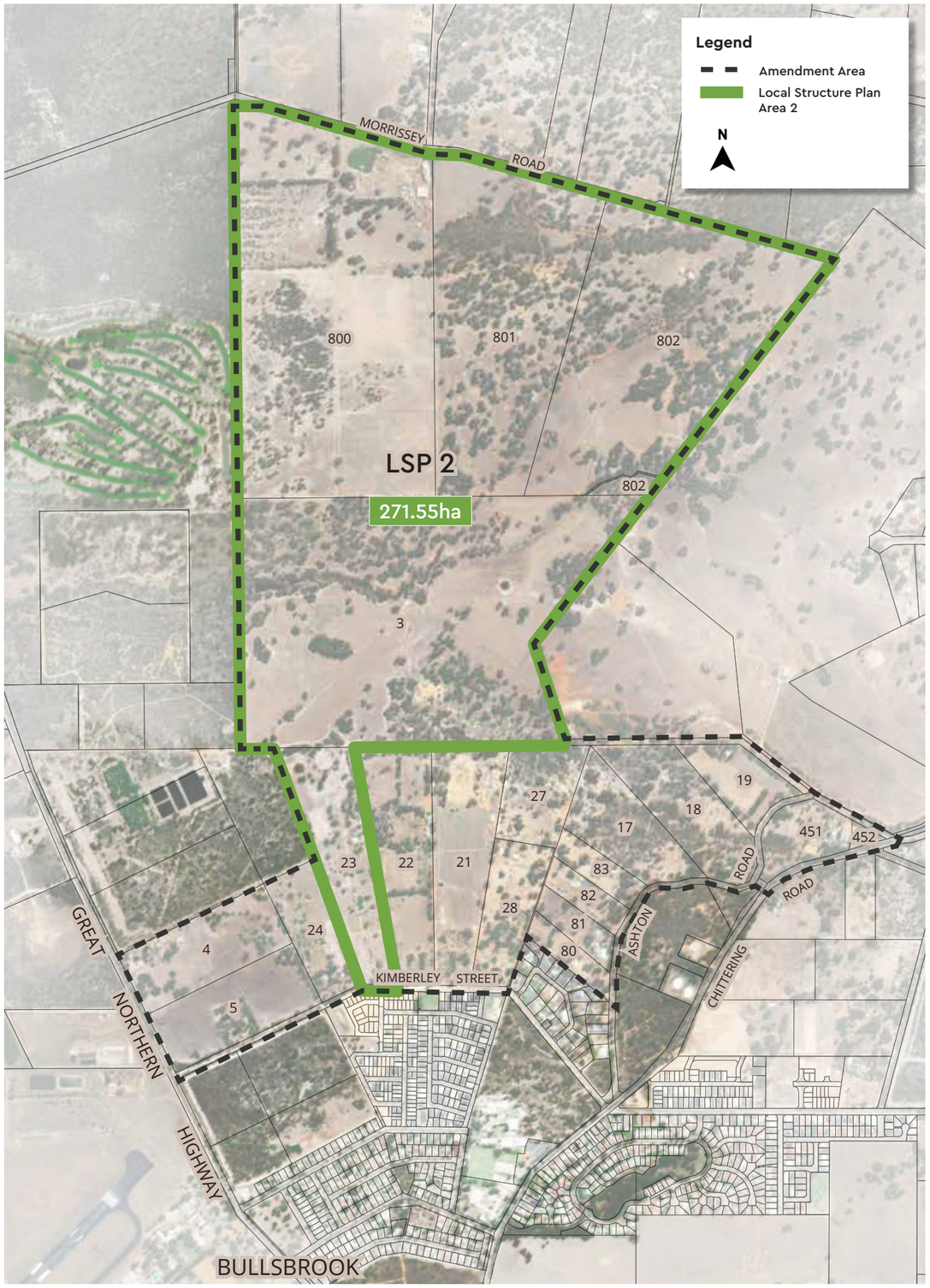


Figure 19 – Local Structure Plan Area 2

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Part Three
Technical Appendices

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APPENDIX 1

Bullsbrook Townsite District Structure Plan (2018)



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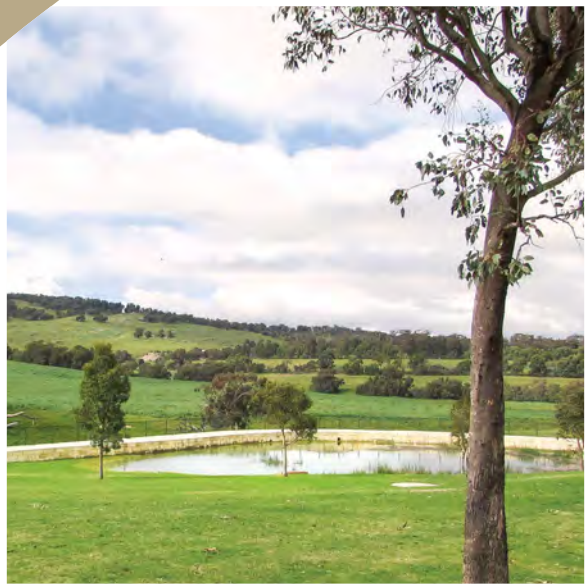
City of Swan

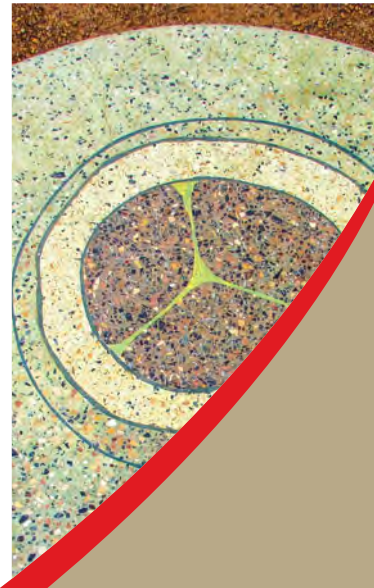
Bullsbrook Townsite
District Structure Plan

Approved April 2018



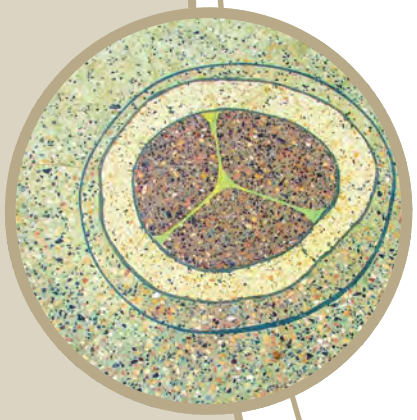










Document Control

Version No	Version Date	Description	Completed	Checked
0.1	15.08.13	First draft – for discussion	P. Heydenrych	R. Dong L. van der Linde
0.2	31.03.14	Second draft – for advertising	A. Prnich	R. Dong L. van der Linde
0.3	10.09.14	Third draft – for endorsement	A. Prnich	R. Dong L. van der Linde
0.4	06.10.14	Endorsed		

Table of Modifications

Version	Description of modification	Date
1	WAPC Statutory Planning Committee Conditional Approval	30.01.2018
2	Submission of WAPC SPC required modifications	08.03.2018
3	Approval of final report	11.04.2018

Table of Amendments

Amendment No.	Summary of the Amendment	Amendment Type	Date Approved by the WAPC
1			
2			
3			

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This structure plan is prepared under the provisions of the City of Swan Local Planning Scheme 17.

IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON:

11 April 2018

Signed for and on behalf of the Western Australian Planning Commission:

an officer of the Commission duly authorised by the Commission pursuant to section 16 of the Planning and Development Act 2005 for that purpose, in the presence of:

Witness

__ 11 April 2018 ____ Date

__ 11 April 2028 ____ Date of Expiry

Executive Summary

The Bullsbrook Townsite District Structure Plan is a strategy for the future development of Bullsbrook townsite. It is intended to provide guidance and advocacy for development of the townsite to 2031 and beyond, as the Western Australian government moves towards accommodating Perth metropolitan area's estimated population of at least 2.2 million.

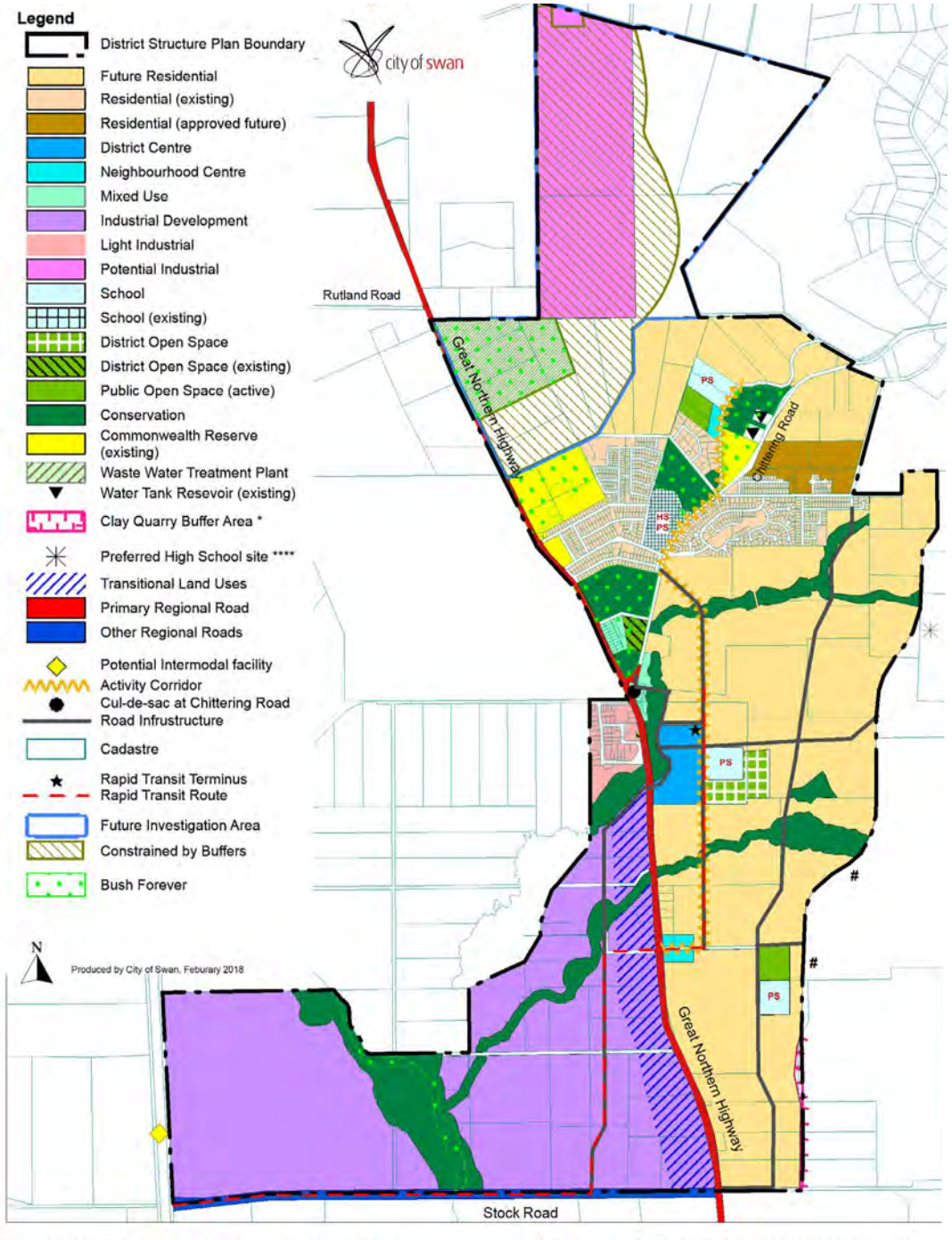
Proposed development is intended to work towards meeting the aims and requirements of the State Government, in particular its vision set out in *Directions 2031 and Beyond—Metropolitan Planning beyond the Horizon* to provide for anticipated population growth in a liveable town which is sustainable, vibrant and prosperous.

Bullsbrook Local Area is forecast to grow from a population of 6,048 (2018) to 16,073 in 2031 and 20,506 in 2036. In summary, this District Structure Plan provides a strategy for the growth of the townsite area to service this growing community as follows:

Item	Data	Section Reference
Total area covered by the District Structure Plan	1,583ha	3.1
Area of each land use within the District Structure Plan (gross) **– Residential** **– Industrial** **– Commercial**	 488ha (293ha net) 505ha (404ha net) 17.7ha	3.1
Estimated lot yield	6,599 lots including 153 urban infill lots (plus 2,777 possible further lot potential from currently from the Future Investigation Area probably post 2031 [potential 34 lots within clay quarry buffer area])	3.1.1
Estimated population yield	18,478 people (plus 7,776 people possible from the Future Investigation Area—probably post 2031)[1]	3.1.1
Number of high schools	2 (1 existing)[2]	3.6.1
Number of primary schools	3	3.6.1
Estimated commercial floor space (for activity centre)	10,000m² net lettable area by 2031 (20,000m² probably post 2031)	3.1.2
Employment **Labour Force**	11,000 jobs 9,093 (probably post 2031)	3.1.2
Provision of Public Open Space **– Unrestricted** **– Restricted**	 50.5ha 12.6ha	3.2

[1] This figure does not include the existing population of 6048.

[2] The addition of a second high school will be subject to a number of factors, described in detail within Section 3.1 of this report.



* The existing 500 metre clay quarry buffer may be reduced in the future, upon agreement of all relevant parties. This buffer is subject to detailed mapping.

** Transitional land uses are required along the western edge of the Great Northern Highway (refer Section 3.1.2 of the Bullsbrook Townsite District Structure Plan report).

*** The location, design and size of the DOS is to be refined through the local structure planning stage.

**** In the event that an additional high school site is required, its siting and location should be determined prior to supporting the first major structure plan. Refer to Section 3.6.1 of the Bullsbrook Townsite District Structure Plan report.

\# It is noted that an existing approved rural local structure plan overlaps in this area. This issue needs to be adressed in future local structure plans.

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Appendix 2.0 Bullsbrook Townsite Land Use Masterplan: Traffic Impact Assessment - Transcore, November 2017.

List of Abbreviations

ASS	Acid Sulphate Soils
BCIP	Bullsbrook Community Infrastructure Plan
BTRS	Bullsbrook Townsite and Rural Strategy
DCA	Development Contribution Area
DCP	Development Contribution Plan
DC2.3	Development Control Policy No. 23: Public Open Space in Residential Areas
DoE	Department of Education
DOW	Department of Water and Environmental Regulation
DOS	District Open Space
EELS	Economic and Employment Land Strategy
EPA	Environmental Protection Authority
GNH	Great Northern Highway
GNH Access Strategy	Great Northern Highway West Swan to Muchea Access Strategy
LPS17	City of Swan Local Planning Scheme No. 17
District Structure Plan	Bullsbrook Townsite District Structure Plan
MRS	Metropolitan Region Scheme
PDNH	Perth to Darwin National Highway
POS	Public Open Space
RAAF	Royal Australian Air Force
RWMS	Regional Water Management Strategy
SPP	State Planning Policy
SPP2.4	State Planning Policy No. 2.4: Basic Raw Materials
SPP2.8	State Planning Policy No. 2.8: Bushland Policy for the Perth Metropolitan Region
SPP4.2	State Planning Policy No. 4.2: Activity Centres for Perth and Peel
SPP5.4	State Planning Policy No. 5.4: Road and Rail Transport Noise and Freight Considerations in Land Use Planning
SPP3.6	State Planning Policy No. 3.6: Development Contributions for Infrastructure
TECs	Threatened Ecological Communities
The City	City of Swan
TN	Total Nitrogen
TP	Total Phosphorous
WWTP	Wastewater Treatment Plant
WA	Western Australia



1.0 Planning Background

1.1 Introduction and purpose

Over the last decade, the Perth metropolitan area has experienced rapid growth, particularly as a result of the mining boom of the early 2000s. The north-east corridor of the Perth metropolitan area is expected to experience a population growth of over half a million people in the next 15–20 years. To assist in accommodating a portion of that growth, Bullsbrook has been identified as a future urban expansion area under the WA State Government's *Directions 2031 and Beyond—Metropolitan Planning beyond the Horizon* ('Directions 2031') and its *Outer Metropolitan Perth and Peel Sub-regional Strategy*.

Bullsbrook, which currently accommodates approximately 6,048 people, is forecast to grow to a population of 16,073 by 2031 and 20,506 by 2036.[3] The majority of this growth is expected to take place in and around the area's existing town centre. The City of Swan is currently facing pressure from strong demand for urbanisation within this area, including commercial, light industrial and residential activities. In order to ensure that a coordinated approach to future development takes place, the City of Swan has prepared a District Structure Plan for the Bullsbrook townsite to provide guidance over future structure planning and subdivision proposals. Figure 1 provides a contextual map showing the Bullsbrook Townsite District Structure Plan study area.

The District Structure Plan has been prepared in order to provide planning guidance for the future urban growth of the area. The District Structure Plan is a strategic document which aims to guide future local structure plans..

The Bullsbrook townsite is currently relatively disconnected from other urban areas within the Perth metropolitan region. In order for the WA State Government (State Government) medium to long term population growth targets of over 20,000 people to be realised, a strategic planning framework (i.e. the District Structure Plan) needs to be established to guide this growth. The District Structure Plan aims to steer the development of a self-sufficient townsite, which provides for diverse land uses and basic infrastructure needs, whilst considering the natural environment and existing major land uses including the Pearce RAAF Base, various resource extraction operations and adjacent agricultural and horticultural activities.

The area requiring a District Structure Plan was generally established in the City of Swan's (The City) Bullsbrook Townsite and Rural Strategy (BTRS), endorsed by the City in September 2008. Many of the recommendations outlined within the BTRS were informed by the outcomes of a comprehensive community consultation process carried out by the City in 2007, in the preparation of the Bullsbrook Place Plan 2008. As a result, the BTRS identified a Bullsbrook Townsite Land Management Precinct. It recommended that detailed planning would be required to facilitate townsite expansion, by guiding land use change in this precinct. Figure 2 indicates the townsite precinct (in brown) as identified in the BTRS.

[3] Source: Forecast id 2018.

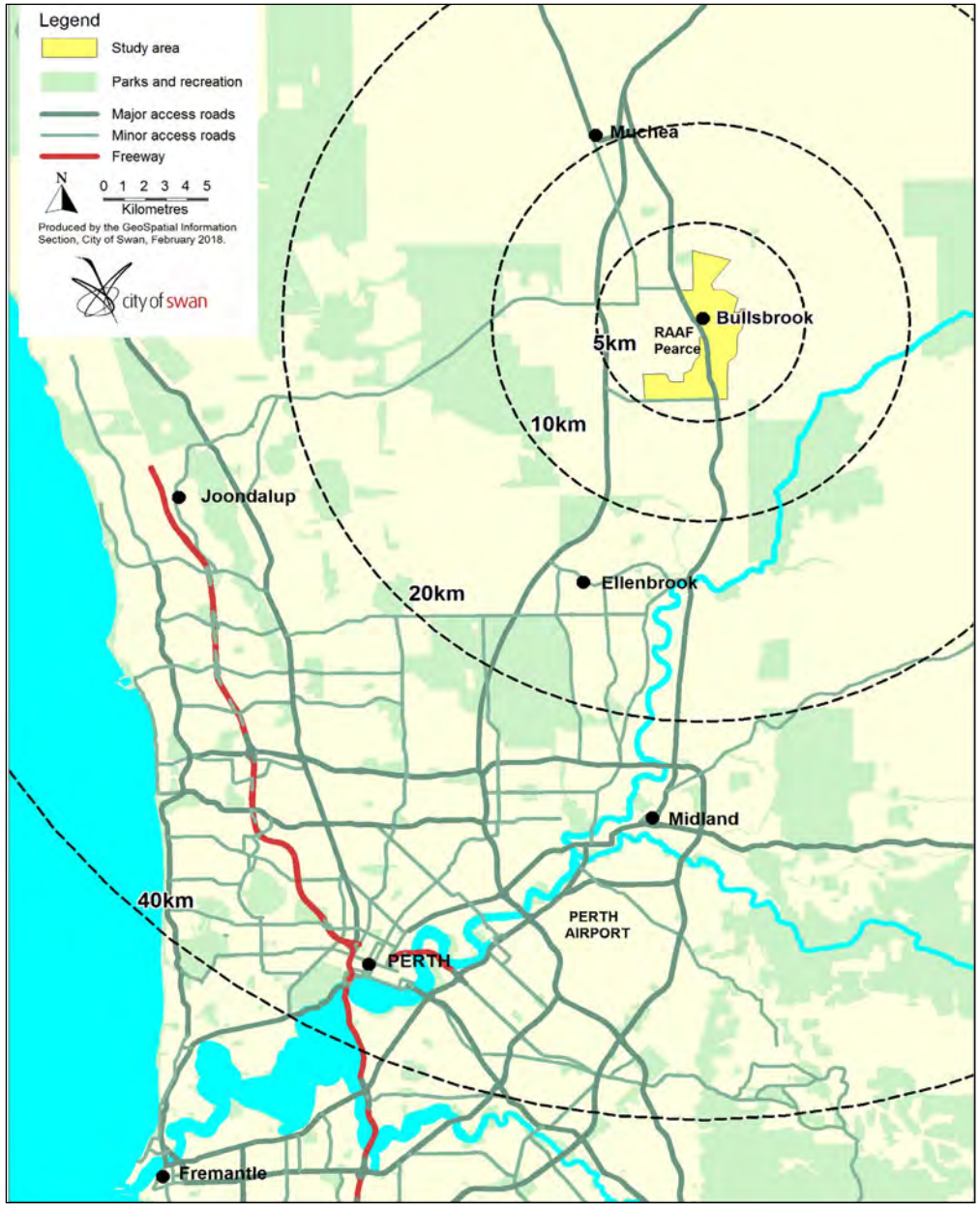


Figure 1. Bullsbrook Townsite District Structure Plan: Study Area in Context of Surrounding Region

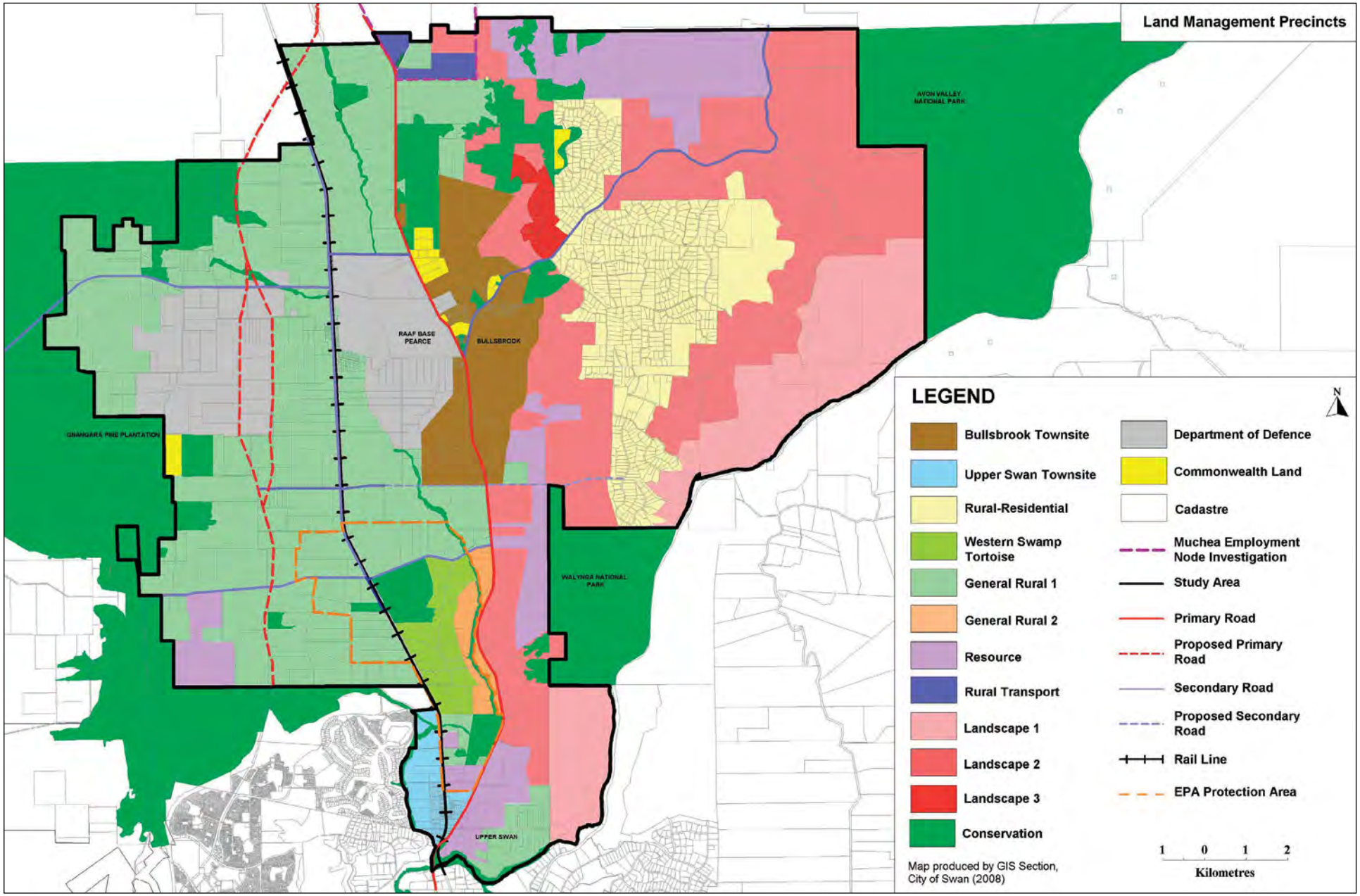


Figure 2. Bullsbrook Townsite and Rural Strategy—Land Management Precinct Study Area

The townsite area requiring a District Structure Plan has since been expanded in the south-west to include more land west of Great Northern Highway (GNH), directly north of Stock Road. This is to reflect the land which was rezoned to Industrial under Metropolitan Region Scheme (MRS) amendment 1219/14.

The current townsite area and subject of this District Structure Plan extends from Morrissey Road in the north to Stock Road in the south, GNH in the west to the Darling Scarp in the east, and south of Royal Australian Air Force (RAAF) Pearce Air Base from the escarpment in the east to Railway Parade in the west.

Of significance to the context of the District Structure Plan, the MRS was recently rezoned to allow a Primary Regional Road (red road) reservation for the Perth to Darwin National Highway (PDNH) approximately 1.6km to the west of the study area, which will eventually have direct access via Stock Road (located on the south boundary of the study area).

Figure 3 provides an aerial photo of the study area, also identifying the townsite in relation to existing roads, the proposed PDNH reserve and the RAAF Base. Superimposed aircraft noise contours illustrate that the townsite area is unaffected by aircraft noise, except for the 'Special Use' zoned industrial area south of the RAAF Base (SUZ No. 22) and a small portion of a reserve east of GNH which belongs to RAAF (this is discussed in further detail in Section 2.7.3).

The District Structure Plan provides strategic guidance for future land use planning and growth of the townsite to:

- allow for a diversity of land uses, which
  - provides for metropolitan and local residential land needs for the growing population
  - creates a vibrant activity centre with increased local employment and business opportunities, as well as improved services
  - assists in addressing the State's land shortage,
  - generates local employment opportunities to contribute to self-sufficiency; and
  - results in essential industrial growth within the existing 'Industrial' zone with an appropriate land use and built form interface along the GNH
- protect the natural environment;
- provide the necessary basic infrastructure (including Public Open Space and community facilities) to support urban development;
- protect existing and identified long-term land uses, including the Pearce RAAF Base, and resources;
- protect existing prime agricultural and horticultural land, where applicable.



The District Structure Plan has been prepared using information from landowners, developers and their consultants, State Government agencies and service providers as well as past State Government and City of Swan studies/strategies, and should be read in conjunction with existing relevant State and City policies.

Much of the land which has been flagged for urban investigation is currently zoned 'Rural' or 'Urban Deferred' under the MRS, and 'General Rural' or 'Landscape' under the City's *Local Planning Scheme No. 17* (LPS17). The District Structure Plan identifies a range of lots which require future rezoning to 'Urban' under the MRS, and appropriate residential or commercial/industrial zonings under LPS17.

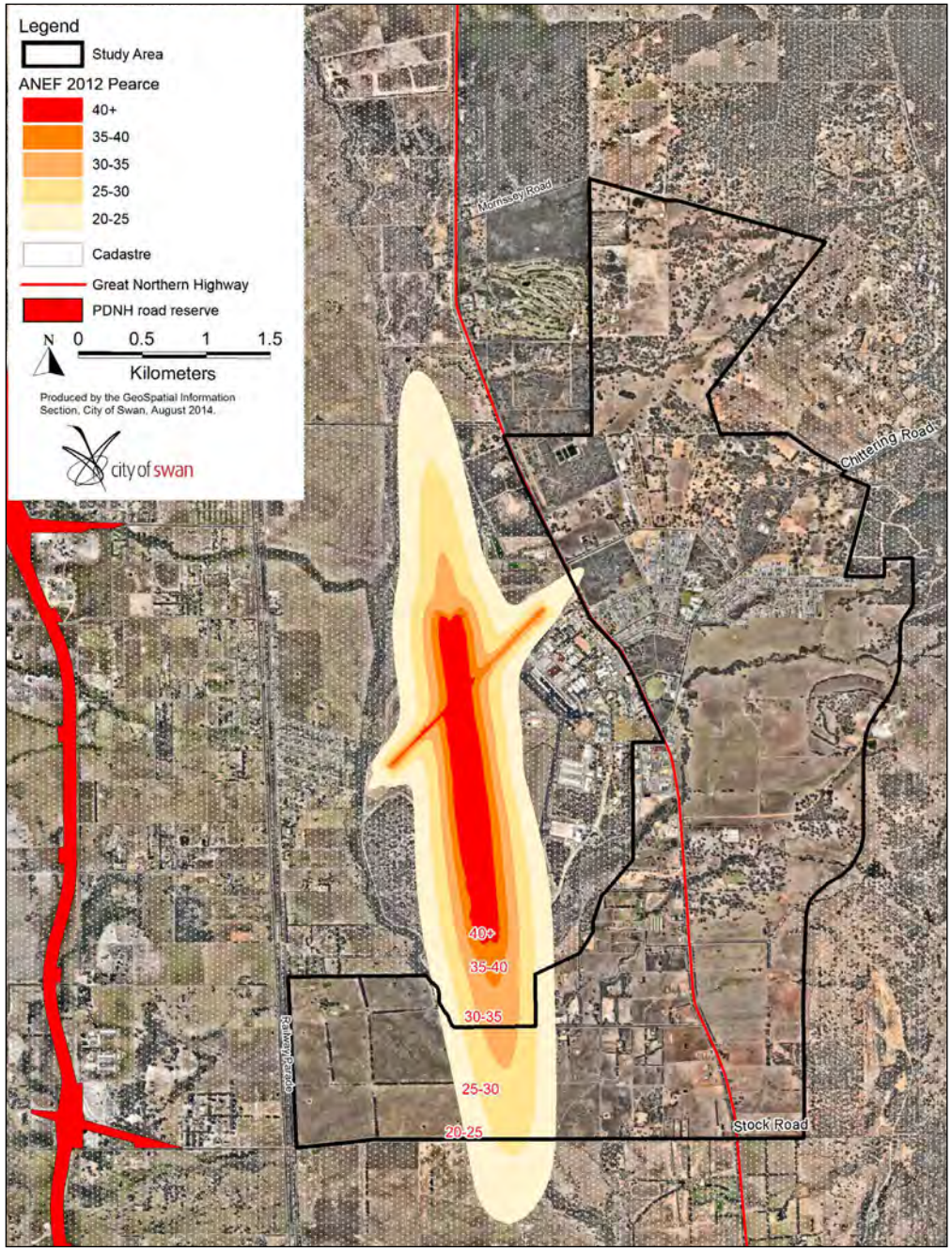
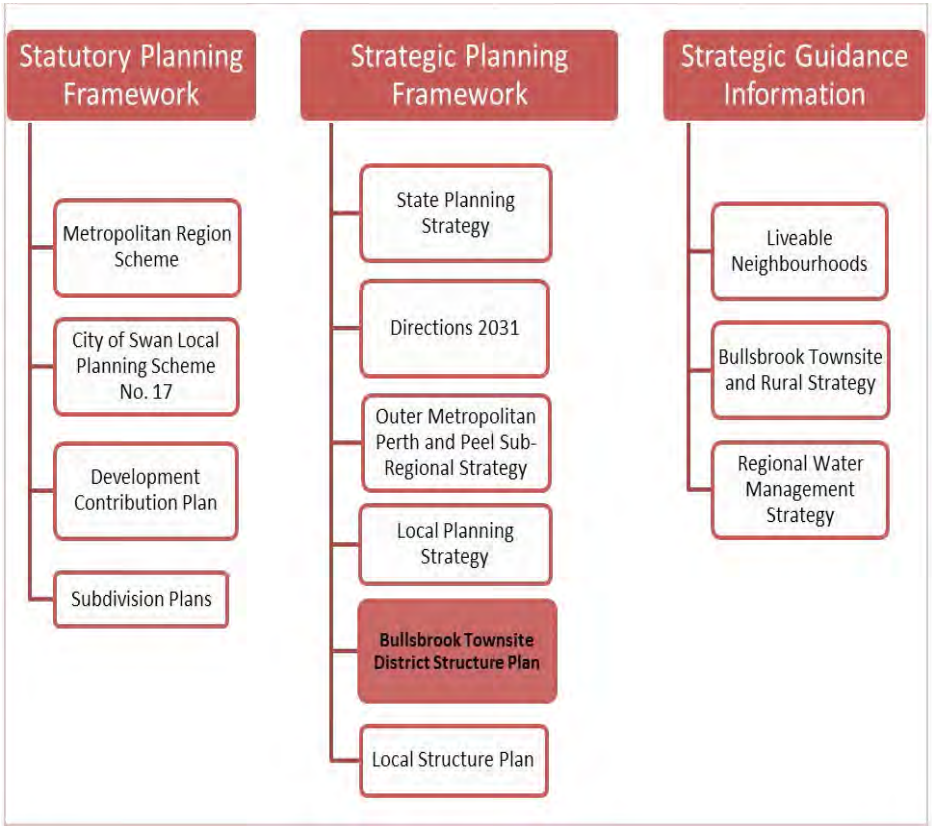


Figure 3. Bullsbrook Townsite District Structure Plan: Study Area—Aerial and Context Photo

The following diagram demonstrates the hierarchy of planning instruments that apply to the future urban development of the study area:



The BTRS anticipated that the necessary urban rezoning would not be required before 2020, unless employment and traffic growth, plus related statutory planning processes, occurred beforehand. However, the City of Swan is currently experiencing pressure for this planning work to commence and has received numerous structure plan proposals for various parcels of land within the study area. The WAPC has initiated MRS amendments to rezone the majority of the future residential area from Rural to Urban Deferred.

1.2 Land description

1.2.1 Location

The District Structure Plan study area is indicated in Figure 3. It comprises 1,583ha.

1.2.2 Land use

The study area contains existing urban development including residential, commercial, retail, light industrial, community and Public Open Space (POS) land use, as well as a wide variety of rural land uses.

The land use pattern is as follows and generally in terms of the zoning under LPS17 indicated in Figure 4:

Urban

A small tract of the Bullsbrook study area comprises land already zoned 'Urban' under the MRS. See Figure 6. This land is generally located around the existing commercial hub, to the south-west and north-east of the existing intersection of GNH and Chittering Road. To the north, the urban land is occupied mostly by lots used for residential purposes. Directly to the east of this is a small portion of land which is yet to be developed. To the south, the 'Urban' zoned land is occupied by a commercial and semi-industrial estate.

Residential

There is an existing residential community located within the study area. Located to the north of the existing commercial hub, along Chittering Road, the area occupies 82ha of the study area where there are currently approximately 782 dwellings. The area zoned 'Residential', under LPS17, is established (see Figure 4). The area zoned 'Residential Development', under LPS17 (a zone requiring endorsed structure plans), occupies approximately 91ha and has a mixture of developed and undeveloped land, some of which is in the process of structure planning.

Non-residential

There is an existing commercial hub within the study area, based around the intersection of Bullsbrook Road and GNH. It is known as the Bullsbrook town centre and comprises an area of approximately 15.5ha. It consists of a newsagent, supermarket, service station, butcher, hotel, chemist, a hairdresser, bank, real estate agencies and food outlets. Directly to the west of the commercial hub is a quasi-light industrial estate with some retail along the GNH.

The areas, currently used for commercial and quasi-light industrial purposes are located within LPS17 'Special Use Zone No. 2' and 'Special Use Zone No. 7'. All land in the study area zoned appropriately for commercial/retail purposes has been exhausted, with the exception of the remnant vacant block on the existing hotel site. Previous surveys have found that many

residents find the retail options in Bullsbrook to be inadequate and therefore travel to Midland and Joondalup for shopping.

Urban Deferred

Under the MRS, to the north-east and south-east of land zoned 'Urban' in the study area, portions of land are zoned 'Urban Deferred'. This land is predominantly zoned 'General Rural' under LPS17. However, there is a parcel of land in the north-east 'Urban Deferred' area which is zoned 'Residential Development' in LPS17. This appears to be an anomaly in LPS17 and the approval of any future structure plan would be based on demonstration that adequate services can be suitably provided to the area. Lifting of the urban deferment is likely to occur concurrently with such a structure plan.

Industrial

A recent MRS amendment rezoned a large area of land, located south-west of the existing commercial hub, from 'Rural' to 'Industry', and LPS17 was subsequently rezoned from 'General Rural' to 'Special Use No. 22'.Local structure plans have been approved over this industrial area.

Rural

The study area is predominantly zoned 'Rural' under the MRS. The 'Rural' land occupies an area of over 782ha and falls within the 'General Rural' and 'Landscape' zones of LPS17. It is located to the north and south of the existing 'Urban' zoned land and is dissected by creek lines. It is also impacted by two quarry sites referred to further on in this report.

1.2.3 Legal description and ownership

The study area can be largely divided into public and private ownership. The major public landowner is the Commonwealth Government of Australia (Department of Defence) which owns the RAAF Pearce Airbase and associated adjacent land. There are also several parcels of land owned by the State Government and the City of Swan which are reserved for conservation as well as POS.

The remaining area is generally privately owned, predominantly by four major land holders. There are of course other landholders in ownership of smaller land parcels. Figure 5 identifies those lots owned by major landholders within the District Structure Plan area.

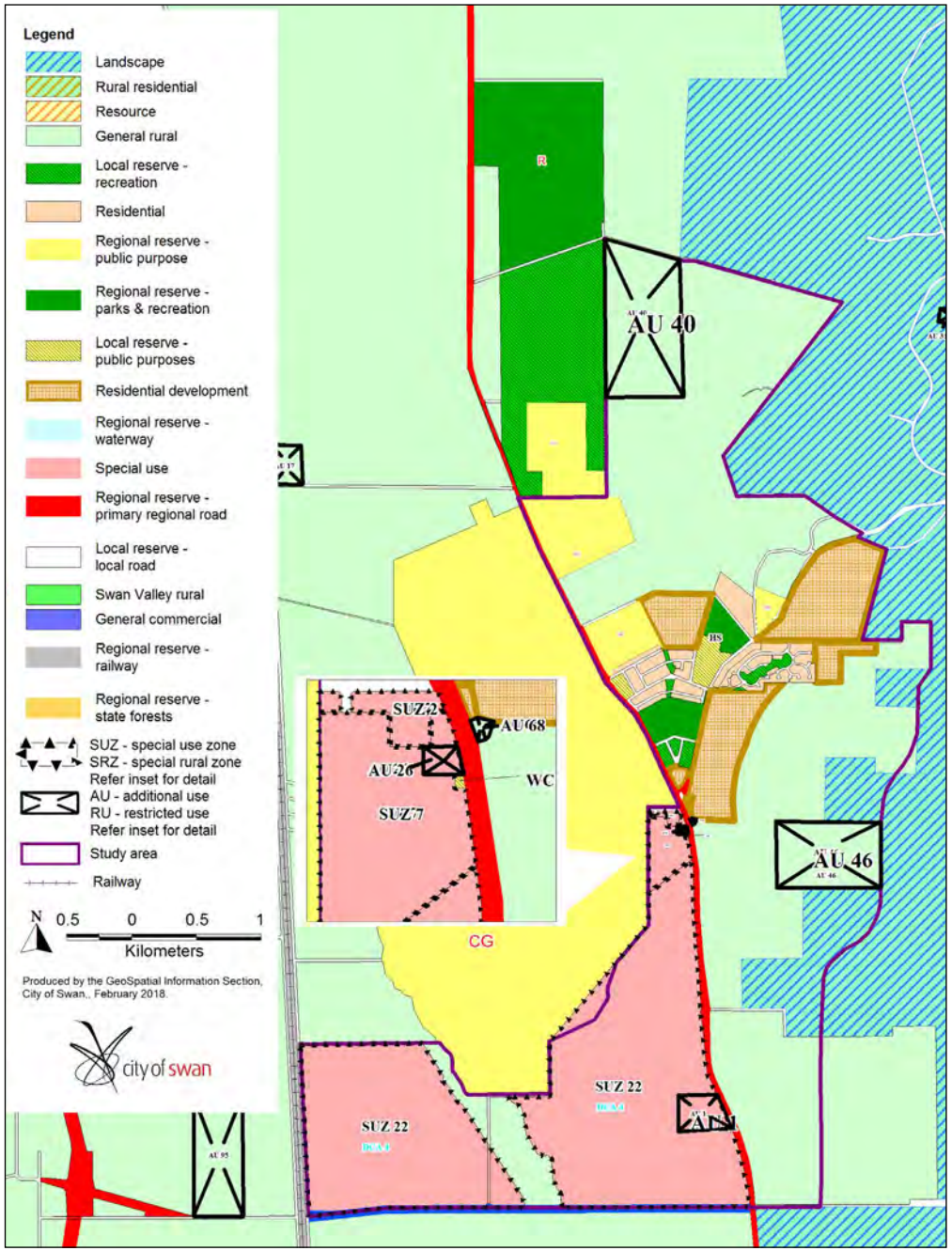


Figure 4. Bullsbrook Townsite District Structure Plan: City of Swan Local Planning Scheme No. 17

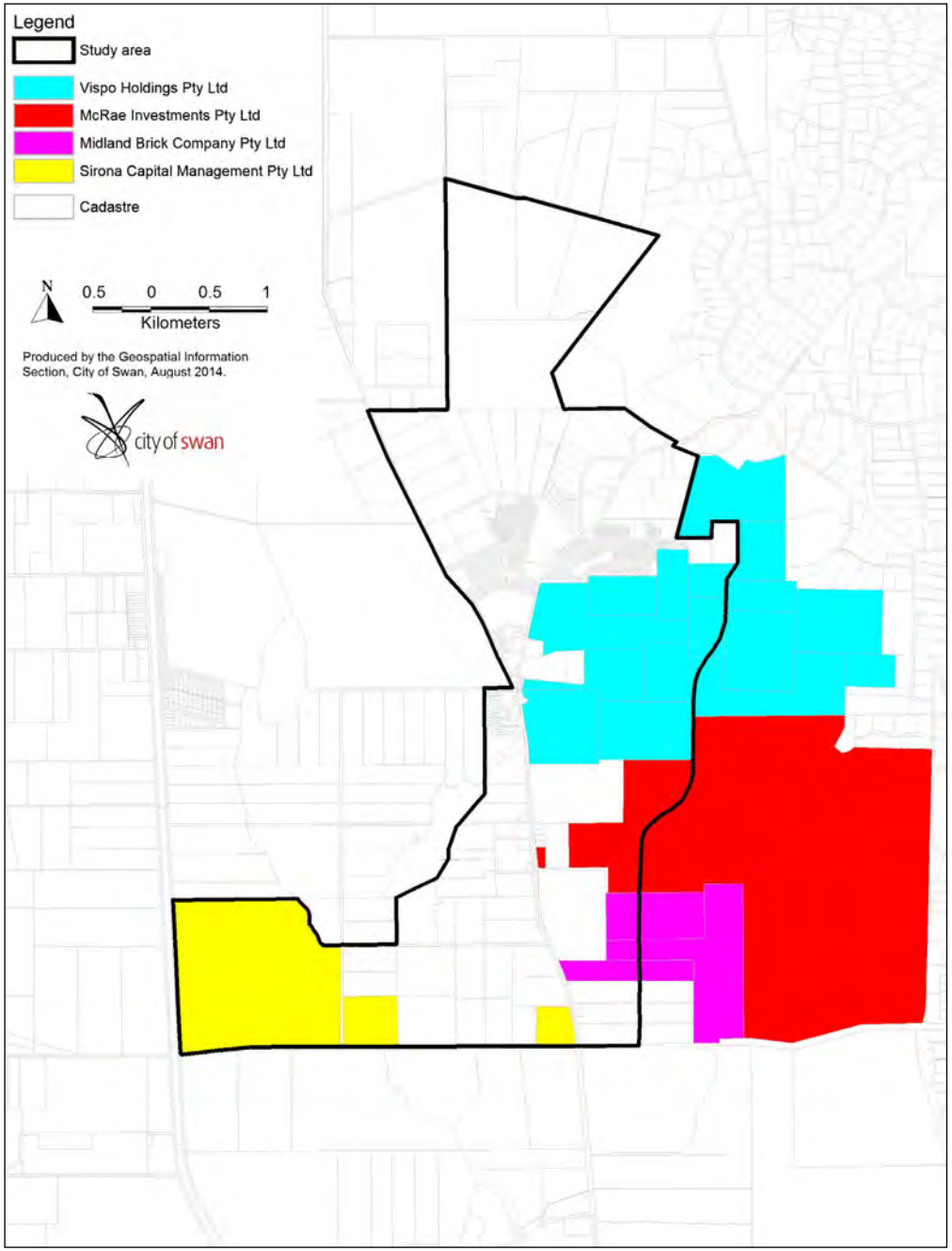


Figure 5. Bullsbrook Townsite Land Use Master Plan: Major Large Landholdings in the Master Plan

1.3 Planning framework

1.3.1 Zoning and reservations

Metropolitan Region Scheme (MRS)

The MRS is the regional land use planning scheme for the Perth metropolitan area. The MRS indicates the agreed strategic direction for land within the metropolitan region. It catalyses change to planning controls at the local level, when a specific reservation or rezoning occurs within it.

The study area is zoned, primarily; 'Rural' under the MRS. However some land has already been zoned 'Urban' and 'Urban Deferred'. A number of MRS reservations are also located within the study area including 'Public Purpose (Commonwealth Government)', 'Parks and Recreation' and 'Restricted Public Access'. The GNH, which divides the study area, is reserved as a 'Primary Regional Road' under the MRS. Figure 6 reflects the MRS mapping relevant to the study area.

City of Swan Local Planning Scheme No. 17 (LPS17)

LPS17 provides the statutory framework for any future development within the study area. The current zoning of the study area under LPS17 is indicated in Figure 4. The District Structure Plan and any subsequent structure plans will inform LPS17 on any rezonings required to facilitate the future expansion of the Bullsbrook townsite. The majority of the study area is zoned 'General Rural' under LPS17. Some lots are zoned 'Landscape' under LPS17 and others, already developed or flagged for development in the near future are zoned 'Residential Development'.

1.3.2 Regional and Sub-regional Structure Plans

Directions 2031 and Beyond—Metropolitan Planning beyond the Horizon

Directions 2031 and Beyond—Metropolitan Planning beyond the Horizon ('Directions 2031') is the State Government's high level spatial and strategic plan for WA's metropolitan region. The document establishes a vision for the future growth of the region, providing a framework of growth indicators to guide the detailed planning and delivery of housing, infrastructure and support services necessary to accommodate that growth. In relation to the District Structure Plan, it provides guidance to the City of Swan with reference to:

- Providing for a growing population in Bullsbrook in a sustainable manner, with consideration to available land, employment generation, water and energy resources;
- Providing the best possible integration of land use and transport infrastructure to suit the needs of the Bullsbrook community;
- Protecting the natural environment, including high quality natural resources; and
- Identifying infrastructure needs for the proposed future urban growth.

North-East Sub-Regional Structure Plan

The *North-East Sub-Regional Structure Plan* is currently being prepared by the State Government. The document aims to guide land use and infrastructure provision for the Swan, Kalamunda and Mundaring municipalities. As directed by 'Directions 2031' and the *Outer Metropolitan Perth and Peel Sub-Regional Strategy*, the Sub-Regional Structure Plan is required to address strategic issues by developing a long term spatial framework for the sub-region. Consequently, the Sub-Regional Structure Plan will identify any necessary MRS amendments, as well as funding, staging and implementation of future development.

'Providing for a growing population in Bullsbrook in a sustainable manner...'



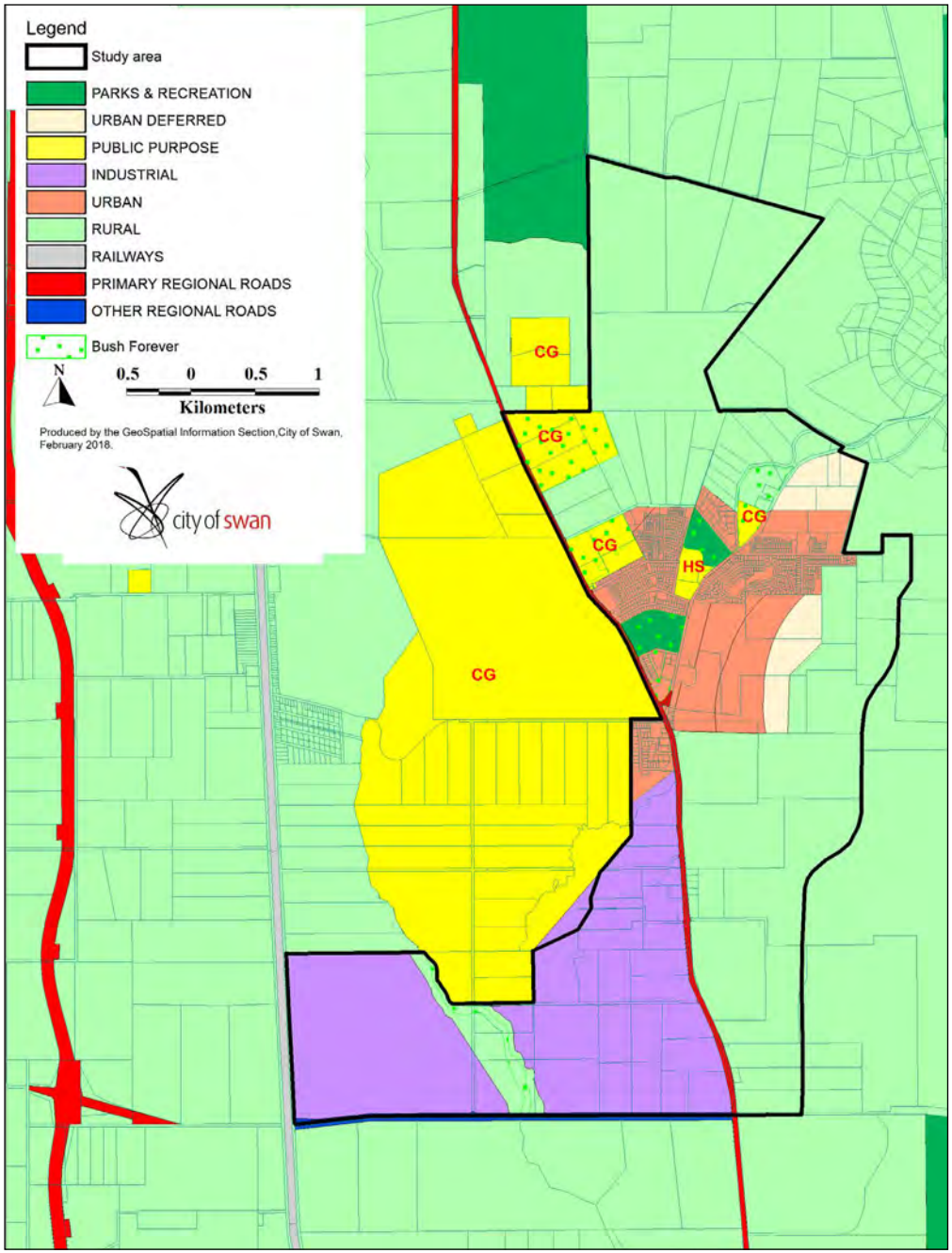


Figure 6. Bullsbrook Townsite District Structure Plan area: Current Metropolitan Region Scheme

1.3.3 Planning Strategies

A number of state and local planning strategies are relevant and have been considered in the preparation of the District Structure Plan. Accordingly, the plan is deemed to comply with the following:

State Planning Strategy

The State Government's *State Planning Strategy* sets a broad focus for land use planning in Western Australia (WA). The strategy recognises the need to accommodate population growth through the provision of residential land and to create value adding industries to areas of WA—including in Bullsbrook. The strategy specifically recognises the need to progress a structure plan for Bullsbrook as a priority action for the State.

Outer Metropolitan Perth and Peel Sub-Regional Strategy

The *Outer Metropolitan Perth and Peel Sub-Regional Strategy* provides a framework for delivering the objectives of 'Directions 2031'. The Strategy links State and Local Government strategic planning to inform the preparation and review of structure plans and local planning strategies. The Sub-Regional Strategy identifies Bullsbrook as requiring an urban expansion (2011–2015) of about 228ha. The additional dwellings to be provided are proposed to result from infill of existing 'Urban' and 'Urban Deferred' zoned land, combined with the development of land identified for urban expansion and investigation. The Sub-Regional Strategy identifies a growth in the number of dwelling units of over 4,100.

State Economic and Employment Land Strategy

The State Government has published the *State Economic and Employment Land Strategy* to guide future commercial and industrial growth in the Perth metropolitan and Peel regions. This is in response to the recognised shortage of industrial land supply. In particular, the strategy identifies the areas, type and locations of general and light industrial land required over the next 20 years. This includes land nominated in south Bullsbrook as a 'potential industrial—medium term' area (with a proposed intermodal facility), and land in north Bullsbrook nominated as a 'potential industrial—long term' area.

City of Swan Local Planning Strategy

The City is currently drafting the *City of Swan Local Planning Strategy*. The aim of this document is to:

- Provide strategic direction for land use planning and development over the next 10 years and beyond;
- Provide strategic direction for sustainable resource management and development in the context of state and regional planning;
- Provide rationale for the provision and zoning and reservation of land under LPS17, in relation to development control;
- Provide a strategic framework for assessment and decision-making in relation to any development, subdivision and/or proposed amendments to LPS17;
- Provide the context for coordinated planning and programming of physical and social infrastructure at a local level;
- Identify the need for further studies or investigation by the City to address longer-term strategic planning and development issues.

The draft Local Planning Strategy identifies the need for land use studies in the Bullsbrook area and provides general direction for these. As part of this, the District Structure Plan responds directly to key issues identified within the draft Local Planning Strategy.

City of Swan Local Rural Planning Strategy

The City is currently preparing the *City of Swan Local Rural Planning Strategy*. The Strategy will amalgamate the City's numerous existing rural strategies that apply to individual rural areas within the municipality. In respect of Bullsbrook, the Strategy will take into account the need to find a balance between urban expansion and protection of existing agricultural activities in the area. The City contains many examples of agricultural and non-rural land uses in the one location, which can often create conflict due to incompatibility. This is likely to be the case in Bullsbrook as urbanisation continues. Therefore, appropriate measures will need to be taken to minimise land use conflict.

City of Swan Urban Housing Strategy

The *City of Swan Urban Housing Strategy* was endorsed by Council on 13 June 2012. It sets out a strategy for meeting the future housing need and managing the character and amenity of existing residential areas.

The Strategy proposes to increase the area of land zoned 'Residential' under LPS17. It also introduces a 'Dual Residential Code' which provides the opportunity for landholders of identified 'Residential' properties to seek higher density development bonuses. Such bonuses will only be supported if an applicant can demonstrate compliance with a specific set of design criteria.

In line with the Strategy, the District Structure Plan proposes an increase in residential density within the brown field development sites located in the study area (as identified in Figure 20), and supports appropriate density codes for identified greenfield urban development sites, through future structure planning.

Amendment 92 of the Local Planning Scheme No. 17 was gazetted 23/10/2015 which rezoned the abovementioned land.

City of Swan Integrated Transport Strategy

The City is currently preparing the *City of Swan Integrated Transport Strategy* as a sub-strategy of the City's Local Planning Strategy. This Strategy, and subsequent Infrastructure Implementation Plan, aims to enable and create an innovative, balanced transport system within the City of Swan. Any recommendations from this draft Strategy, which relate to transport in Bullsbrook, will be required to be considered in future structure planning of the area.

Bullsbrook Townsite and Rural Strategy 2008

The City's *Bullsbrook Townsite & Rural Strategy* was produced in response to the State Government's 2003 publication of the North East Corridor Extension Strategy which aimed to facilitate effective and acceptable land use within areas north of Ellenbrook, including the townsites of Upper Swan, Bullsbrook and Muchea. In examining the opportunities and constraints within the existing Bullsbrook townsite and surrounding areas, the Strategy identified the future Bullsbrook townsite which forms the basis for the boundaries of the current District Structure Plan. Key findings and recommendations of the strategy have been considered in the preparation of the District Structure Plan.

1.3.4 Policies

A number of State Government policies are relevant to, and have been considered in the design of the District Structure Plan. Accordingly, the Plan is deemed to comply with the following:

Policy No.	Policy Name	Brief Summary
State Planning Policy (SPP)		
SPP 1	State Planning Framework Policy	• Overarching SPP which groups the existing state and regional policies and plans into a central State Planning Framework. • Provides context to land use and development decision making in WA. • Builds on the key principles of the State Planning Strategy by addressing the need for planning for sustainable land use and development.
SPP 2	Environment and Natural Resources	• Outlines key implications for planning in the promotion of sustainability and sustainable development. • Sets objectives for the consideration of the natural environment in broader land use planning and decision making.
SPP 2.4	Basic Raw Materials	Aims to: • protect the state's basic raw materials by identifying key extraction areas and priority resource locations; • ensure incompatible development cannot occur in such areas where it would potentially limit future exploitation; and • ensure that the use and development of land for the extraction of basic raw materials does not negatively impact on the environment or amenity in the locality of the operation during or after extraction.
SPP 2.5	Rural Planning	• Recognises that agricultural production from rural areas is a significant part of the WA economy. • Responds to various planning issues including the need to improve agricultural productivity whilst considering the impacts of agricultural activity on natural resources, and relocating inappropriately located and poorly planned rural-residential and hobby farm development which are constraining opportunities for required urban growth on the fringe of urban areas. • Considers potential conflict between incompatible land uses.
SPP 2.8	Bushland Policy for the Perth Metropolitan Region	• Applies to Bush Forever area and local bushland within the Perth Metropolitan Region. • Aims to ensure the protection of bushland and management issues are addressed and integrated with broader land use planning decision making.

Policy No.	Policy Name	Brief Summary
State Planning Policy (SPP) (continued)		
SPP 2.9	Water Resources	• Sits under SPP 2, providing additional guidance for the consideration of water resources in land use planning processes. • Aims to protect, conserve and enhance water resources, assist in ensuring availability of water resources as required by humans and other biological life and promote the sustainable use of water resources.
SPP 3	Urban Growth and Settlement	• Sets out the principles and considerations which apply to planning for urban growth and settlements in WA. • Aims to manage the growth of urban areas while promoting sustainable and well planned settlement patterns which provide for variety of housing, employment and economy building opportunities, recreation facilities and open space. • Sets objectives for State and Local Government to ensure the coordination of new development with the efficient, economical and timely provision of infrastructure and services in 'liveable neighbourhoods'.
SPP 3.4	Natural Hazards and Disasters	• Sets objectives for State and Local Government to include planning for natural disasters as a key element in the preparation of all statutory and non-statutory planning documents to minimise the adverse impacts of natural disasters on communities, the economy and the environment. • Establishes the need for the creation of the WAPC *Planning for Bushfire Protection* guidelines.
SPP 3.6	Development Contributions for Infrastructure	• Recognises the need for careful planning and coordination for the provision of fundamental infrastructure in new communities including roads, public transport, water supply, sewerage, electricity, gas, telecommunications, drainage, open space, schools, health services, as well as community and recreation facilities. • Aims to ensure that development contributions are actually necessary and relevant to the proposed development and to ensure that those benefiting from the infrastructure and facilities are charged consistently, with complete transparency and equity in the apportioning, collecting and spending of such development contributions.
SPP 4.1	State Industrial Buffer	• Sets out objectives to ensure that industrial emissions such as noise, dust, gas, odour, fumes and lighting overspill, which may not be compatible with other land uses, are managed through the provision of appropriate zonings and associated buffers. • Provides a consistent state-wide approach for the protection and long-term security of industrial zones, transport terminals (including ports), other utilities and special uses.

continued over...

Policy No.	Policy Name	Brief Summary
State Planning Policy (SPP) (continued)		
SPP 4.2	Activity Centres for Perth and Peel	• Triggers the need for Activity Centre Structure Plans. • Sets out to ensure that an even distribution of jobs, services and amenities are provided to communities in the Perth and Peel region. • Specifies broad planning requirements for the planning and development of new activity centres and the redevelopment and renewal of existing centres in the region. • Aims to ensure integration of activity centres with public transport and that activity centres contain a range of activities to promote community benefits.
SPP 5.4	Road and Rail Transport Noise and Freight Considerations in Land Use Planning	• Aims to promote a sustainable transport system which is compatible with surrounding land uses. • Sets out to minimise the adverse impact of transport noise, without placing excessive restrictions on noise-sensitive residential development, or unduly contributing to the cost of transport infrastructure.
Other Policies		
	Liveable Neighbourhoods	• State Government operational policy which acts as a neighbourhood design code and aims to facilitate the development of sustainable communities. • Seeks to provide an urban structure which is walkable and incorporates mixed uses for the purpose of reducing car dependency and providing a diverse range of living, employment and leisure opportunities. • Promotes interconnected street networks to make walking, cycling and driving pleasant and safe. • Strong focus on fostering a sense of community and local identity in neighbourhoods and towns.

1.3.5 Other approvals and decisions

The North-East Corridor Extension Strategy 2003

In order to address growing development pressures occurring to the north of Ellenbrook, the *North-East Corridor Extension Strategy* was completed by the State Government in 2003. The Strategy identifies the need to provide for the continued role of the Bullsbrook and Upper Swan townsites as urban areas while, at the same time, protecting the scarp of the Darling Range.

Bullsbrook Place Plan 2008

The City of Swan has divided its jurisdiction into five Place Management Areas. Each Place Management Area is then further divided into thirteen different communities across the City. These are referred to as Place Areas or Places. A Place Plan has been compiled for Bullsbrook Place (Figure 7 indicates the Bullsbrook Place boundary). A *Bullsbrook Local Area Plan* is proposed to replace the *Bullsbrook Place Plan* in the future.

Bullsbrook Place Plan recommends a range of broad priority actions pertaining to the social, economic, natural and developed environments of the area. One of the key recommendations is for the development of this District Structure Plan.

Economic and retail needs relating to Bullsbrook

In 2007, the City commissioned 'Quick Ideas' to produce the *State of the Bullsbrook Economy* report (funded through the 'Rapid Outer Swan Economic Spin-offs Program'). It put forward proposals towards viable, diverse and long-term economic activity to help create local employment opportunities and protect and strengthen the rural landscape and economy in Bullsbrook and Gidgegannup.[5]

The report provides an overview of a broad range of industry and business perspectives throughout the Bullsbrook area. It also assesses the dominant issues, opportunities and constraints within the Bullsbrook business community and sets a series of actions and recommendations for the future economic development of the Bullsbrook business community.

[5]Source: Quick Ideas 2007.

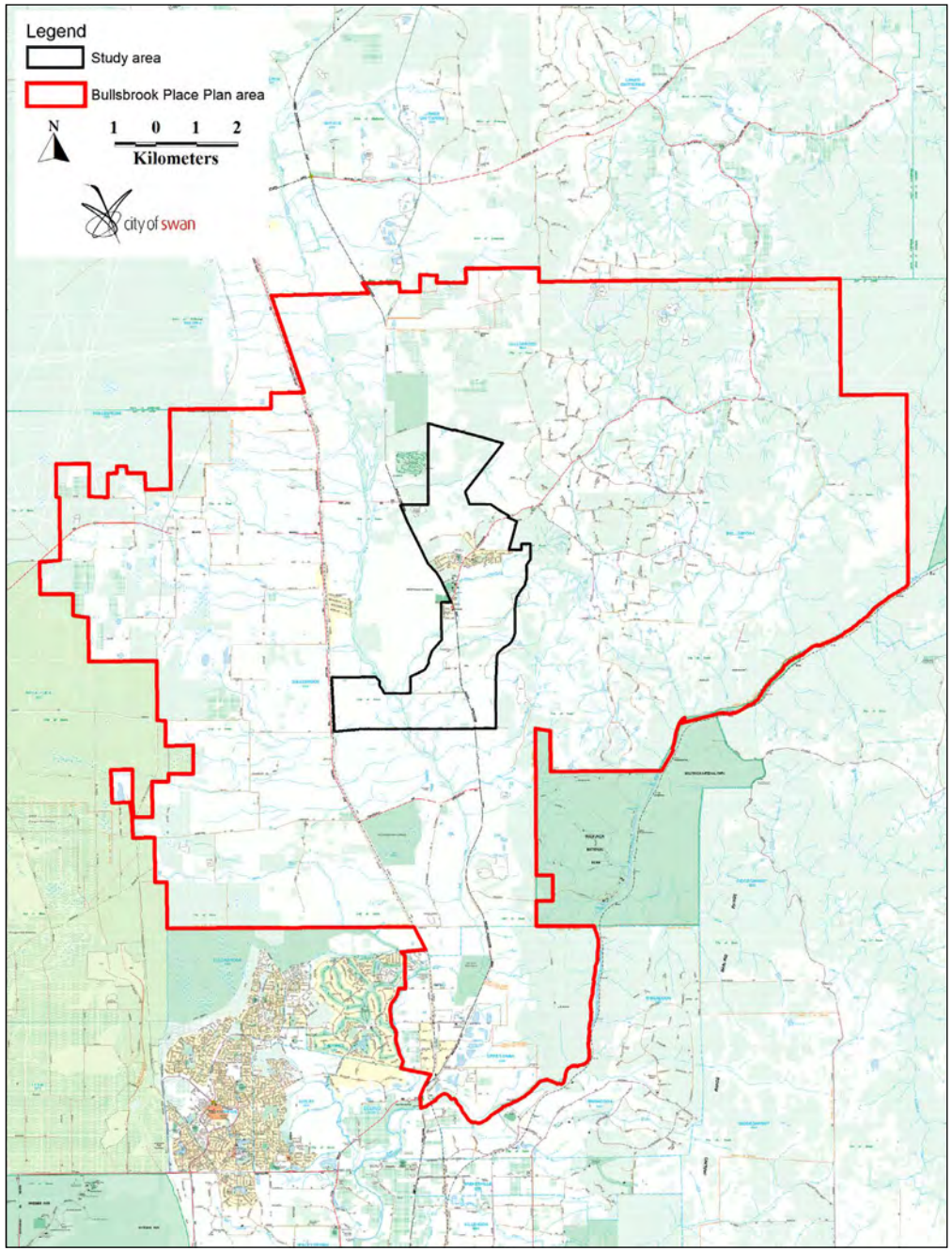


Figure 7. Bullsbrook Townsite District Structure Plan:
Bullsbrook Place Plan Boundary 2008 (shown in red)

Bush Forever sites reflect areas which have regionally significant bushland requiring retention and protection...'



2.0 Site Conditions and Constraints

2.1 Biodiversity and natural area assets

2.1.1 Vegetation

The natural vegetation in this area has been cleared extensively. Remaining vegetation is limited to a few sites protected under Bush Forever, and minor patches of riparian vegetation along the Ki-it Monger and Ellen Brooks. Remaining vegetation is dominated by the Guildford Vegetation Complex within the central portion of the study area, the Beermullah Vegetation Complex in the north; and the Reagan Vegetation Complex in the north-eastern portions (refer Figure 8)[6].

Bush Forever

Bush Forever sites have been identified by the State Government to reflect areas which have regionally significant bushland requiring retention and protection, in accordance with the Bushland Policy for the Perth Metropolitan Region SPP2.8 and 'Planning Bulletin No. 69'. There are seven separate areas within the Bullsbrook townsite area which are classified under Bush Forever and therefore subject to retention requirements. These are generally set aside for conservation, or outlined as Commonwealth land.

Threatened ecological communities

Threatened ecological communities are protected by the *Environmental Protection and Biodiversity Conservation Act 1999*. There are 14 listed threatened community sites, and associated buffer zones, which impact the study area. These sites can be categorised into the following communities:

- Shrublands and woodlands on Muchea limestone—endangered;
- *Eucalyptus calophylla—xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain—critically endangered;
- Forests and woodlands of deep seasonal wetlands of the Swan Coastal Plain—vulnerable; and
- Herb rich shrublands in clay pans—endangered.

2.1.2 Threatened and rare fauna

Threatened and rare fauna are species which are under threat from extinction and protected under the *Wildlife and Conservation Act 1950*. There are seven species, identified as priority fauna, which can be found in the Bullsbrook area. These are listed below:

- Schedule 1 (Fauna which is rare or likely to become extinct, in need of special protection)—**Chuditch** (*Dasyurus geoffroii*) and **Western Swamp Tortoise** (*Pseudemydura umbrina*);
- Schedule 4 (Declared to be fauna in need of special protection)—**Carpet Python** (*Morelia spilota imbricata*);
- Priority One (Taxa which are known from a small number of specimens or sighting and populate land which is under threat)—**Trapdoor Spider** (*Arbanitis inornatus*);
- Priority Three (Taxa which are known from few specimens or sightings and some populations are not habituating land under immediate threat)—**Bee** (*Leioproctus contraties*);
- Priority Four (Taxa which have sufficient knowledge available and are not under threat but need a particular level of monitoring)—**Carpet Python** (*Morelia spilota imbricata*).

The Regional Water Management Strategy (RWMS) undertaken noted that none of these have recently been encountered in the study area. However, through community consultation it was noted that the Chuditch has been regularly sighted and thus protection measures should be made in any future planning.

[6]Source: City of Swan 2008.

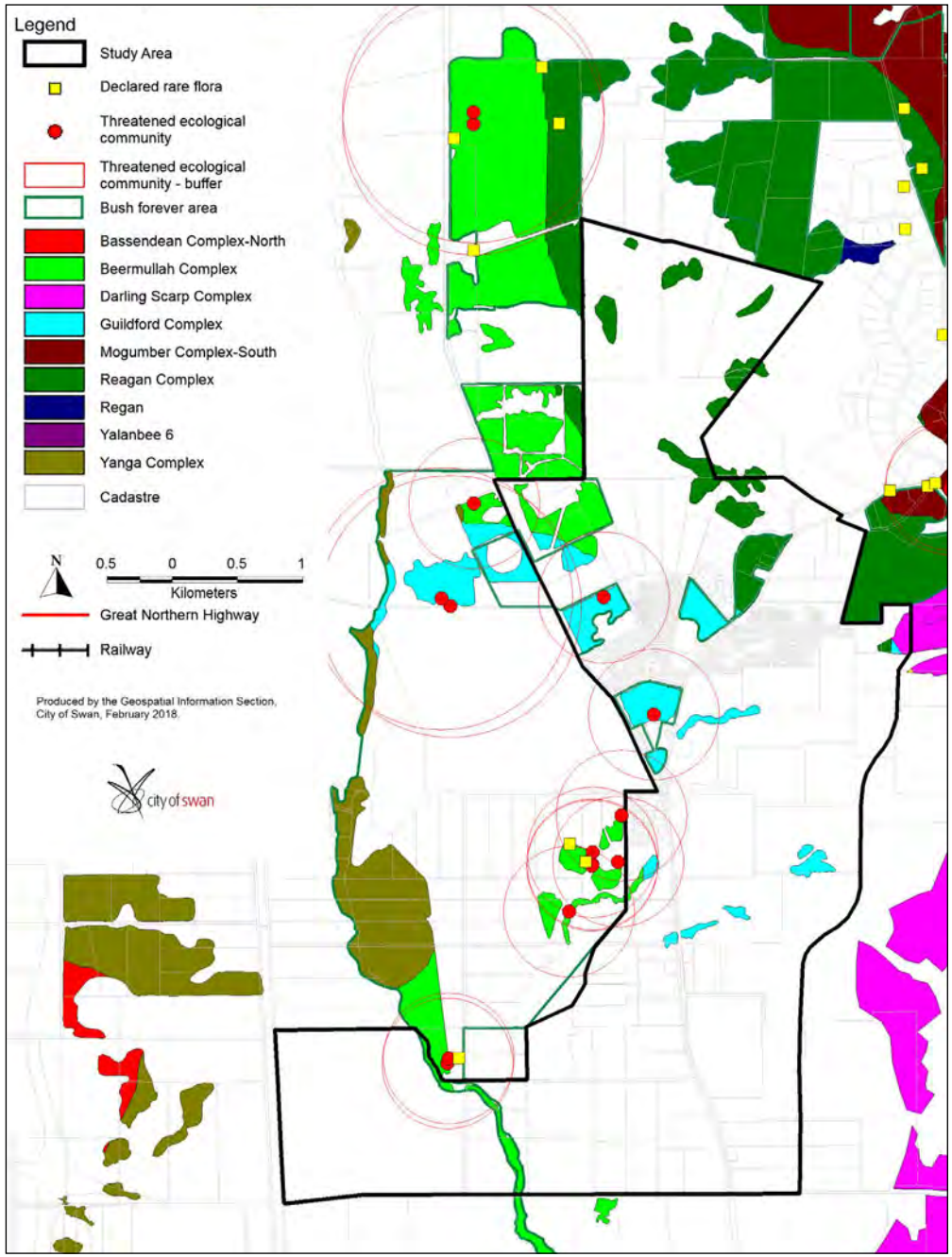


Figure 8. Bullsbrook Townsite District Structure Plan: Existing Vegetation

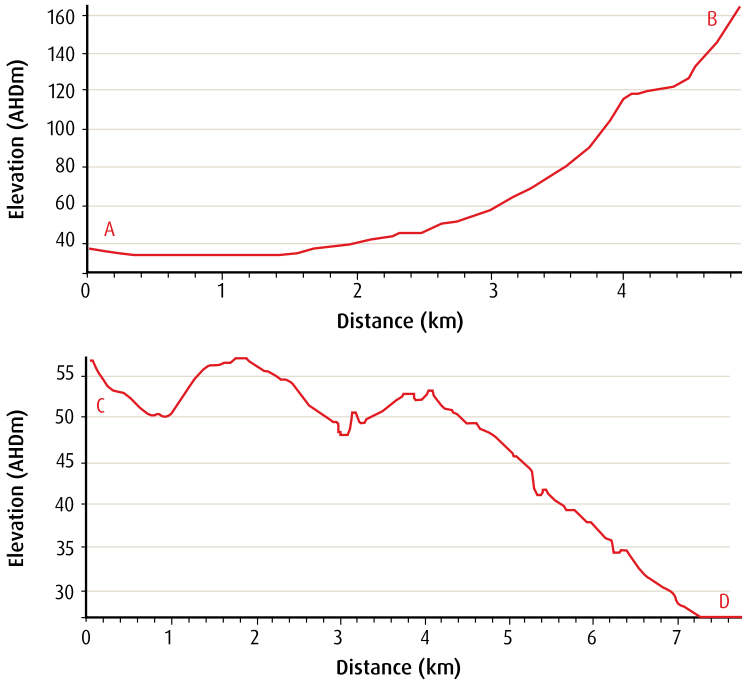
2.2 Landform and soils

2.2.1 Geomorphology

The geomorphology of the study area is characteristic of the larger regional Darling System. The Darling System mainly constitutes the Darling Plateau (undulating, dissecting land surfaces) but, in the Bullsbrook area, also includes the Dandaragan Plateau (gently undulating surfaces) and the Swan Coastal Plain (generally flat).

2.2.2 Topography

The study area lies at the base of the foothills to the immediate west of the Darling Scarp. The topography of the precinct is relatively low lying, and forms at the intersection of the Dandaragan Plateau, Darling Plateau and Swan Coastal Plain. The western part of the study area forms on the relatively flat fluviatile deposits of the Swan Coastal Plain and therefore is most appropriate for townsite development. The topography undulates slightly in the northern half of the study area.[7] The north-eastern section of the study area is slightly higher in elevation, located along the Dandaragan Plateau scarps.[8] Digital models of the area have found the study area topography ranges from 55 to 27m AHD north to south, and 36 to 158m AHD from west to east[9]—as indicated below, where A–B is west to east, and C–D is north to south.



2.2.3 Soils

Soil data indicates that sands and deep sands are dominant north of Chittering and Hurd Roads, which are likely to be well drained provided there is sufficient clearance to groundwater. To the south of Chittering and Hurd Roads shallower soils such as alluvials, shallow sands, sands subject to inundation and duplex soils are found. Shallow groundwater levels are usually associated with these soil types and, as such, these soils are generally moderate to poorly drained soils with low storage capacity.

2.2.4 Land degradation

A land degradation analysis indicates that the area is susceptible to salinity in the north-western sections and to phosphorous export throughout the majority of the precinct. In the western sections the land is susceptible to water logging, and in the north the land is highly susceptible to wind erosion.[10]

2.2.5 Acid sulphate soils and contaminated sites

The State Government has produced mapping which identifies Acid Sulphate Soils (ASS), either of high to moderate risk, or moderate to low risk, as well as Contaminated Sites. There are no 'high to moderate risk' ASS sites identified in the Bullsbrook study area. However, a small area of land associated with Ellen Brook, which runs through the south-west of the Bullsbrook study area, has been classified as 'moderate to low risk'. Consequently, the risk of ASS within the Bullsbrook Townsite area is considered to be low (refer Figure 9).

A number of sites within the study area have been identified on the Department of Environment and Conservation 'Contaminated Sites Register' as being either potentially contaminated (with further investigation required) or contaminated (and therefore restrictions on land use apply). In order to allow development, this classification will be required to be reversed through investigation or remediation. The total area that these potentially contaminated or contaminated sites occupy is 198ha (refer Figure 9).

[7] Source: GHD 2012.

[8] Source: City of Swan 2008.

[9] Source: GHD 2012.

[10] Source: City of Swan 2008.

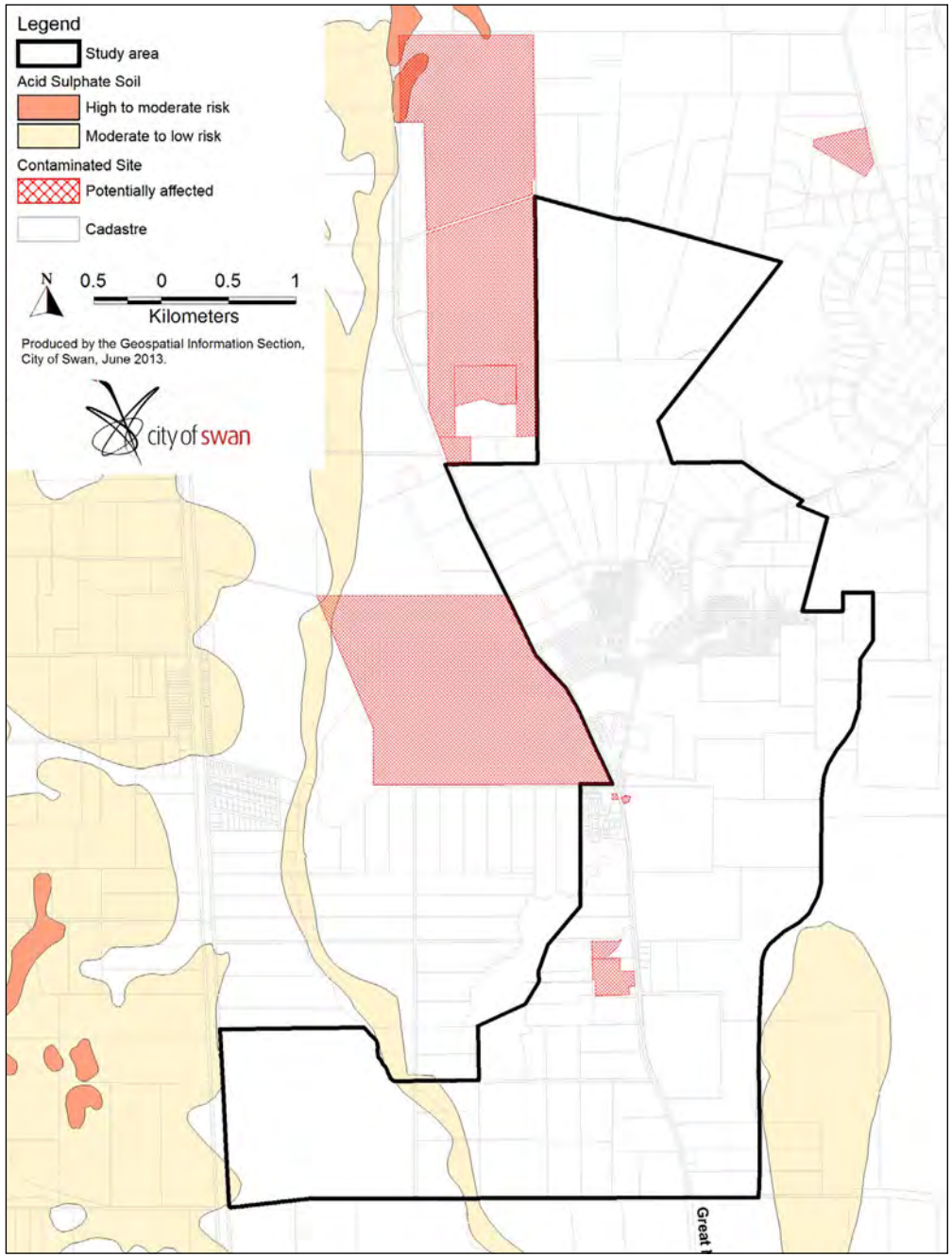


Figure 9. Bullsbrook Townsite District Structure Plan: Acid Sulphate Soils and Contaminated Sites

2.2.6 Basic raw materials

The Bullsbrook area contains several quarries which are classified as raw materials under the SPP2.4. In terms of the Policy, there are a number of 'Priority Resource Locations' and their buffers, in the Bullsbrook study area (refer Figure 10).

The 'Marlin Bullsbrook' Structure Plan (Local Structure Plan SP-011), for an area east of the south-eastern edge of the study area, was approved subject to conditions by the State Government in 2012 (these conditions were further modified in March 2014). Although it acknowledged the removal of the 'Hard Rock Quarry Priority Resource' site and associated buffer in the north of the structure planning area, the clay quarry is required to have a 500m buffer. It is understood that in the future this buffer may be reduced by agreement between all relevant parties. This buffer extends into the south-east corner of the Bullsbrook townsite study area.

Any application for development within a 500m buffer of this current operation must consider the potential impacts of the operation on proposed development. It will therefore be the responsibility of developers to investigate and prove that a development will not be impacted by an existing extractive industry, as per SPP2.4.

There are also two other existing extraction areas (not classified as Priority Resource Locations under SPP2.4) that affect the study area:

Lots 1288 and 2792 Taylor Road, Bullsbrook

The quarry located within Lots 1288 and 2792 Taylor Road, Bullsbrook was used for rock extraction. It is an expired tenement, which is currently undergoing rehabilitation/ revegetation. In recent considerations, the site has not been noted as an important resource area and therefore is not identified as a 'regionally significant basic raw materials area' under the policy.[11] The State Government is currently reviewing SPP2.4. It is likely that this site will be removed from the revised SPP2.4 mapping.

Lots 801 and 802 Morrissey Road

This site has a number of mineral and basic raw material constraints. Within the site is a 'strategic mineral resource protection area' (titanium–zircon mineralisation) and a 'regionally significant basic raw materials'–clay site, both requiring appropriate protection with a buffer of 500m. The protection of these raw materials will impact on the design of the District Structure Plan.

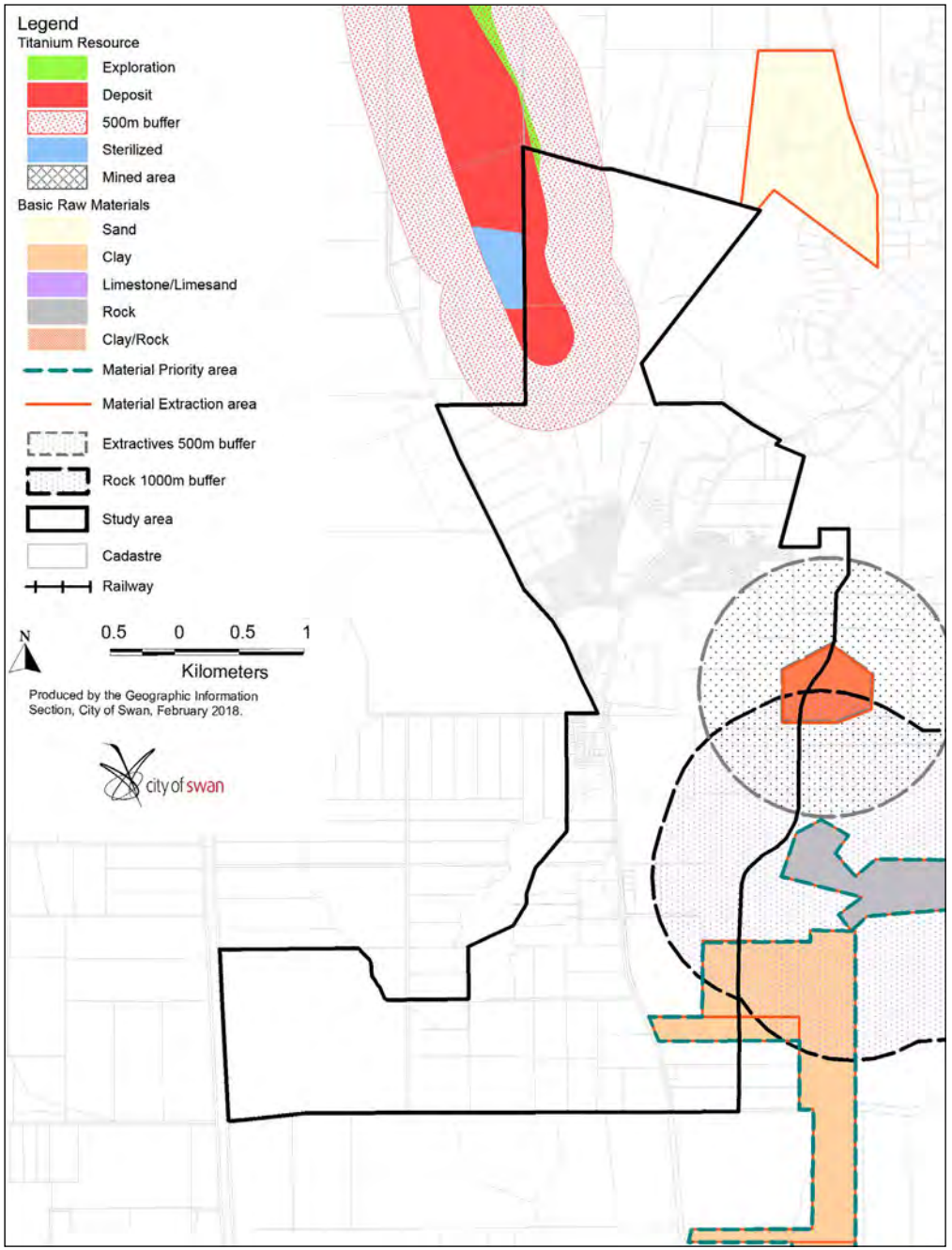


Figure 10. Bullsbrook Townsite District Structure Plan: SPP2.4—Basic Raw Materials—Bullsbrook Townsite and Surrounds

[11] Source: WAPC 2012.

2.3 Ground water and surface water

The study area contains a number of surface water features, including streams and creek lines, which generally flow south-west towards the Ellen Brook. The majority of the southern section of the precinct forms part of the 'Ellen Brook Sustainable/Multiple Use Wetland'. Figure 11 indicates the surface water features within the study area.[12]

2.3.1 Surface water

The primary drainage line for the study area is the Ellen Brook, crossing the area from north to south along the south-west of the Bullsbrook Townsite area. Some properties adjacent to the Ellen Brook are impacted by the 100 year flood plain. These sites, occupying about 15ha, will impact on the total yield of appropriate land for development. Other drainage lines run east to west through the study area and lead into the primary drainage channel.[13]

As indicated in Figure 11, there are some wetlands in the general Bullsbrook area. The Department of Water (DoW) has set wetland management categories based on the level of ecological attributes and functions of a wetland. These are known as 'Conservation', 'Resource Enhancement' and 'Multiple Use'. The majority of wetlands in Bullsbrook are outside the study area and listed within the highest management category ('Conservation C'). There are a small number of 'Resource Enhancement' and 'Multiple Use' category wetlands. There are also a number of other wetlands (not identified as having a management category) dispersed through the area.

In relation to the Ellen Brook catchment, identified as being the greatest contributor of total nitrogen and phosphorous loads to the Swan Canning estuary, the Bullsbrook townsite area does not discharge high concentrations of nutrients to the Ellen Brook.

Development adjacent to creek lines and wetlands require, as a general rule, buffers of at least 30m and 50m respectively. However final buffers to residential developments (envisaged to be taken up as foreshore reserves and to be separated from required 10% POS contributions), are to be determined at a more detailed structure planning stage upon detailed assessments of site specific biophysical factors.[14]

2.3.2 Groundwater levels and quality

The management of groundwater and its quality in planning for the Bullsbrook townsite area is of great significance, given the major role groundwater plays in transport of nutrients to the Ellen Brook and the Swan-Canning estuary.[15]

Based on the limited information currently available, it is not possible to generate accurate groundwater contours or make specific comments on the groundwater condition within the Bullsbrook Townsite area. Further work would be required at the structure planning stage; however, the City will also be required to support future monitoring by developers.[16]

From the limited data available about the groundwater quality within the study area, indications are that the water has Total Nitrogen (TN) and Total Phosphorous (TP) levels which are below the Swan River Trust's long term target of 1.0 and 0.1 mg/L respectively, with the exception of point source contamination. These are sites where elevated heavy metal concentrations, or contamination, occur and result in TN and TP levels which are at or slightly above the long term target.[17]

[12] Source: City of Swan 2008.

[13] Source: GHD 2012.

[14] ibid.

[15] ibid.

[16] ibid.

[17] ibid.



'The management of groundwater and its quality in planning for the Bullsbrook townsite area is of great significance...'

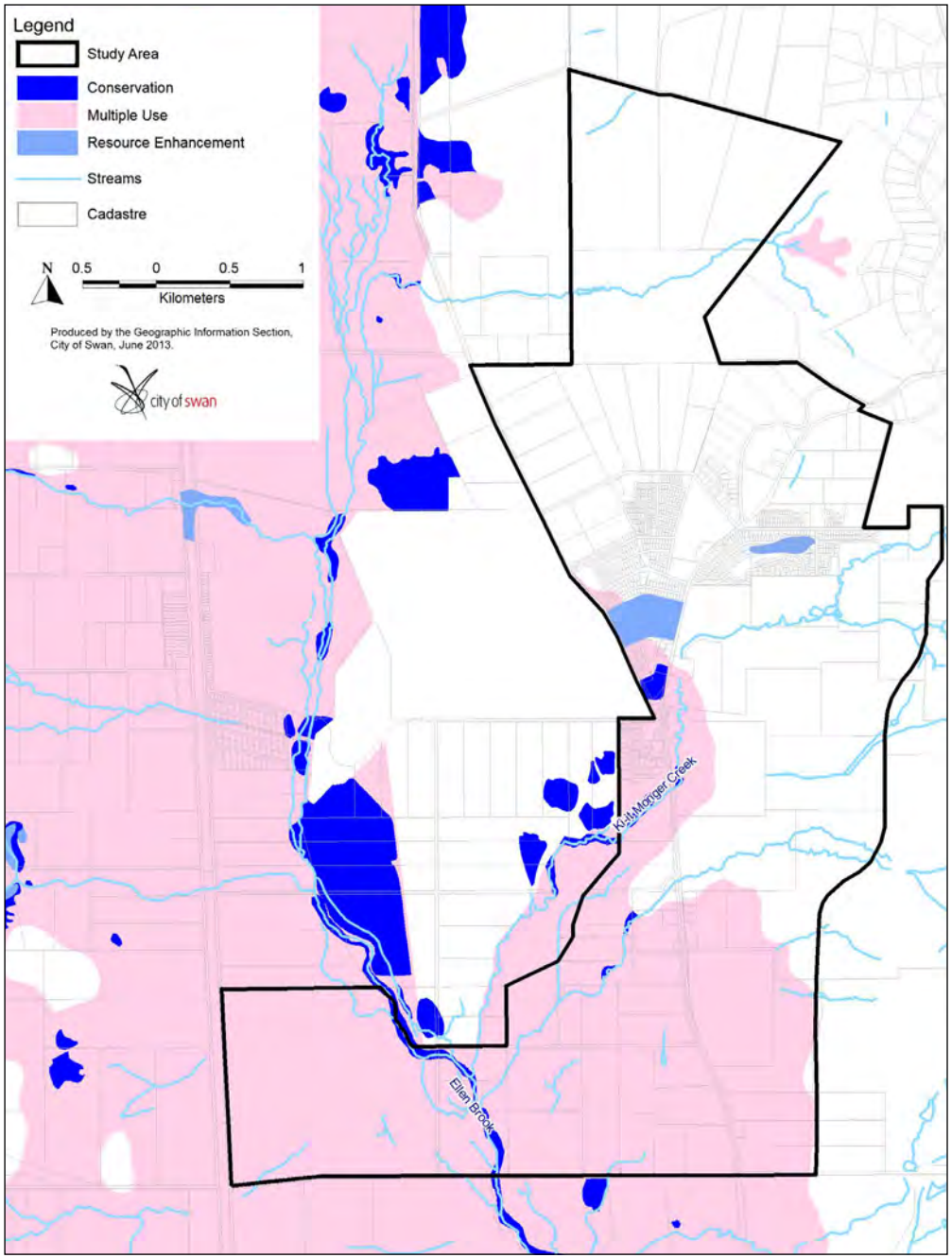


Figure 11. Bullsbrook Townsite District Structure Plan: Surface Water Features

2.4 Bushfire Hazard

Figure 12 identifies the bushfire hazard levels which have been mapped by the City of Swan for the Bullsbrook area. A large proportion of the study area is identified as being within 'extreme' and 'moderate' bushfire hazard areas, posing a real threat to lives if not managed appropriately. A fire Management Plan will be required at the local structure plan stage in accordance with the Guidelines for Planning in Bushfire Prone Areas.

All subdivision and development in Bushfire Prone areas will require a Bushfire Attack Level assessment and construction shall be in accordance with AS3959 as appropriate for the level of bush fire hazard applying to the land and any other relevant requirements of LPS17. Development of land within 'extreme' hazard levels must demonstrate acceptable permanent hazard reduction measures before approval will be granted.



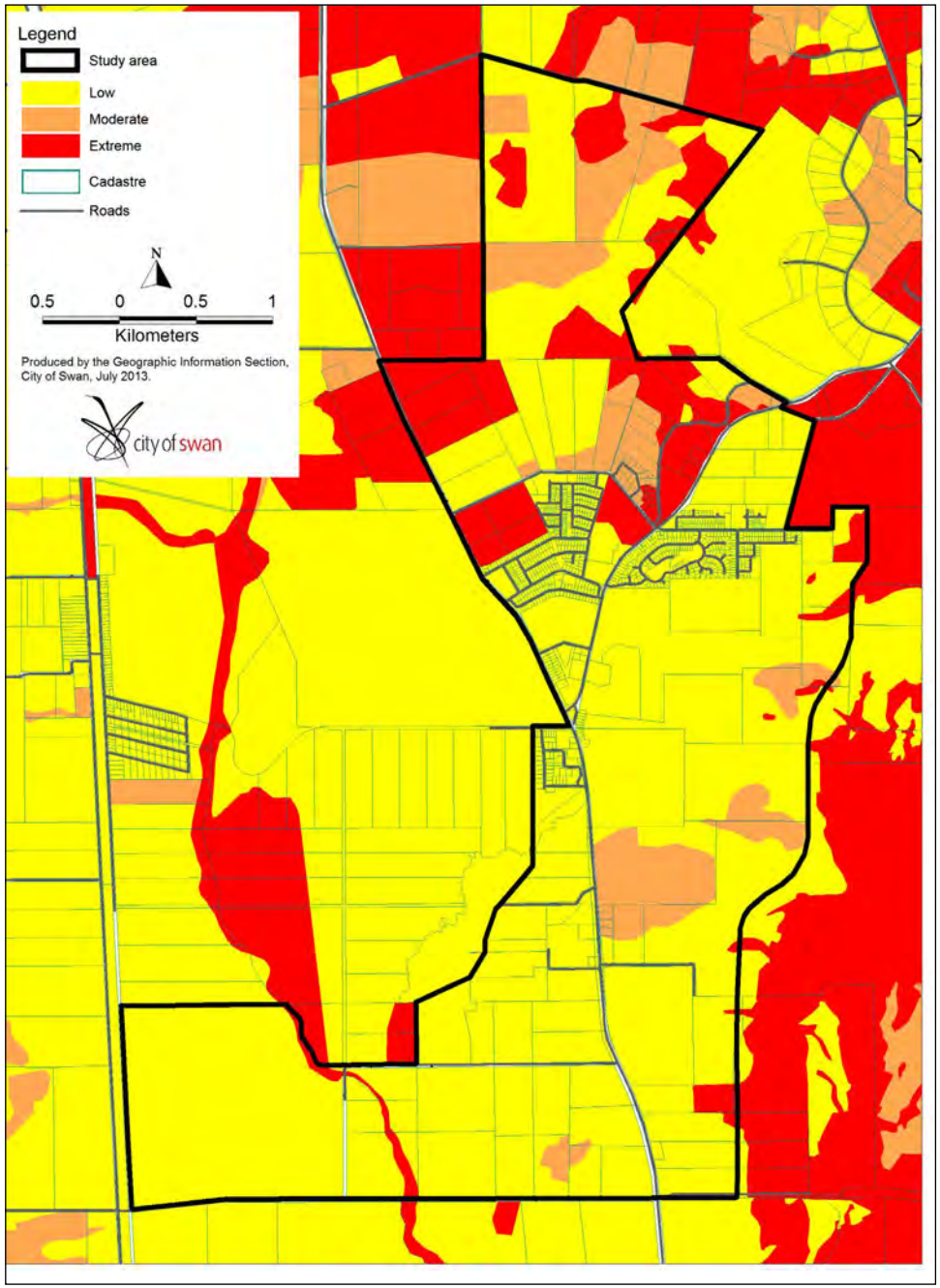


Figure 12. Bullsbrook Townsite District Structure Plan: Bushfire Hazard

2.5 Heritage

The *Aboriginal Heritage Act* introduced in WA in 1972, recognises the strong relationship that Indigenous people have with the land. It provides protection to places and objects in WA that are important to the culture of Indigenous people. There are currently five registered Aboriginal sites within the Bullsbrook townsite area (refer Figure 13), and these will need to be taken into account at structure planning stage
The sites are listed as:

- Ki-it Monger Brook 2: Ceremonial, Mythological, Modified Tree;
- Ki-it Monger Brook 1: Artefacts / Scatter;
- Sounness Drive Camp (GNHE#3): Historical;
- Ellen Brook: Upper Swan: Mythological (waterways and wetlands between Bullsbrook and Moore River);
- South Bullsbrook: Artefacts / Scatter.

There are no sites or buildings within or directly adjacent to the study area currently listed on the State Register of Heritage Places. However, the following buildings have been noted on the State Heritage Office website as having some heritage significance as identified through other surveys:

- Chequers Hotel (formerly known as the Bullsbrook Hotel): Lot 13, No. 2543 Great Northern Highway, Bullsbrook
- Royal Australian Air Force Base Pearce: Great Northern Highway, Bullsbrook

It is noted that many members of the community hold high regard and value to the rural activities synonymous with the area's history. It has become clear through dialogue with the community that whilst change and growth in the area is inevitable, future development should respect the area's historical rural character through its built form.

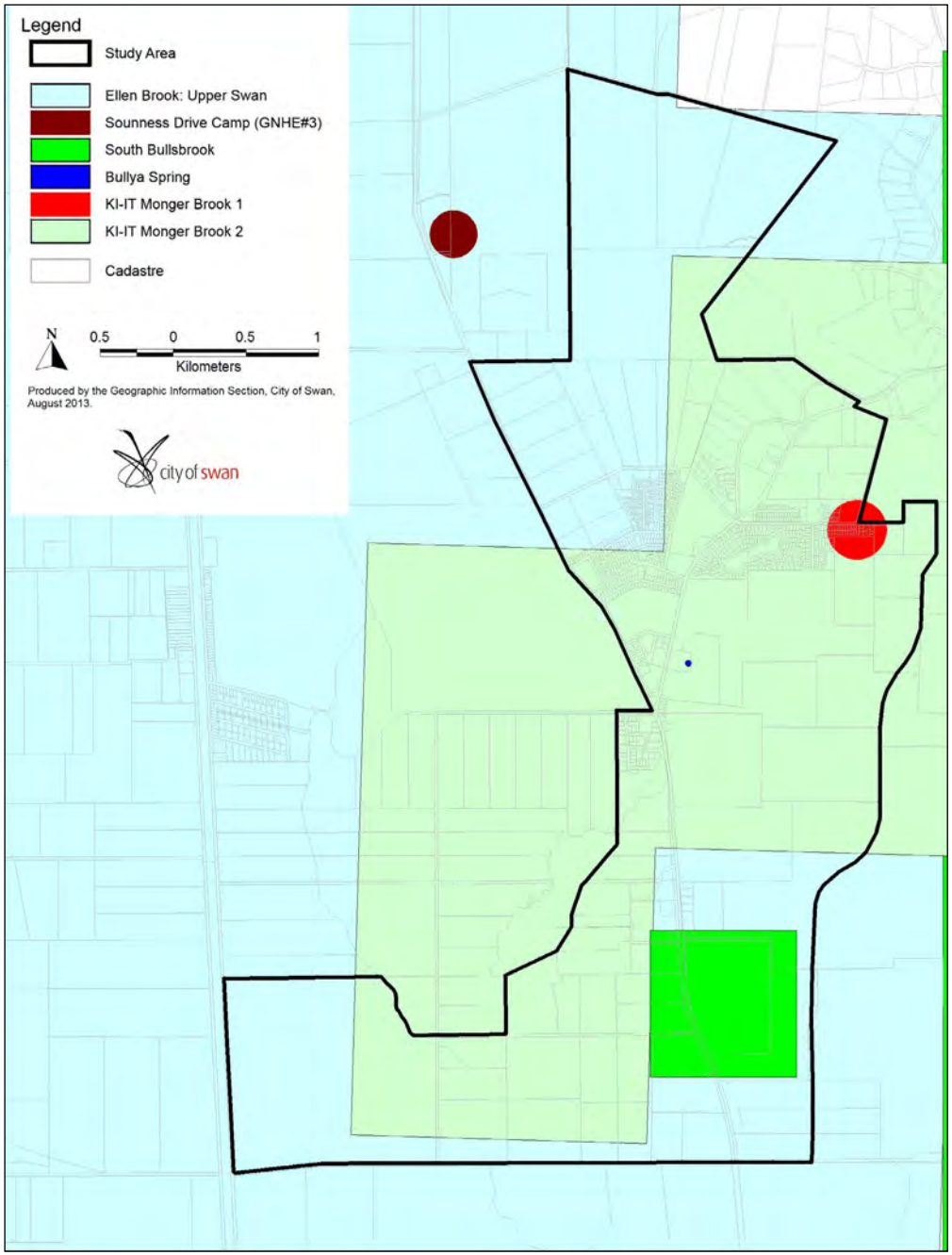


Figure 13. Bullsbrook Townsite District Structure Plan: Aboriginal Heritage Sites

2.6 Road Network

2.6.1 Regional road network

Great Northern Highway

The GNH is classified as a 'Primary Regional Road' under the State's MRS. It is a key trade and commercial link to and from Perth, servicing the road transport needs of the northern regions of WA and the Northern Territory. It forms part of the Perth-Darwin National Highway Auslink Network (PDNH).[18] It is also the key route for many parts of the Swan Valley, Muchea and Bullsbrook. It cuts right through the existing centre of Bullsbrook in a north–south direction providing a barrier of sorts between the east and west. The significance of this route is continuing to increase with demands for freight servicing the northern parts of WA expected to grow considerably in the near future.

'Directions 2031', identifies North Ellenbrook, Upper Swan, South Bullsbrook and east of Bullsbrook centre as future development locations. This has necessitated the development of an access strategy aimed at guiding future planning decisions to allow development of the area to proceed without compromising the function, safety and efficiency of GNH. The 'Great Northern Highway West Swan to Muchea Access Strategy' (GNH Access Strategy), produced by representatives from Main Roads WA, State Government, the Department of Transport and the City, details future access to the GNH between West Swan Road and Rutland Road, including the townsites of Upper Swan and Bullsbrook. The Strategy proposes technical provisions, such as appropriate spacing of access points, speed zoning and the treatment of intersections (refer Figure 14), and examines the state, regional and local planning framework as well as planned future land uses. The Strategy also considers the constraints and opportunities within the study area, providing recommendations relating to road access which will inform future planning decisions and facilitate the assessment of structure pans, subdivisions and development applications.[19]

Stock Road

Stock Road is classified as an 'Other Regional Road' under the State's MRS and provides access to the south-west section of the study area and the new south Bullsbrook industrial area, as identified by the State. It is also identified as a key connection route from GNH to the proposed PDNH to the west.

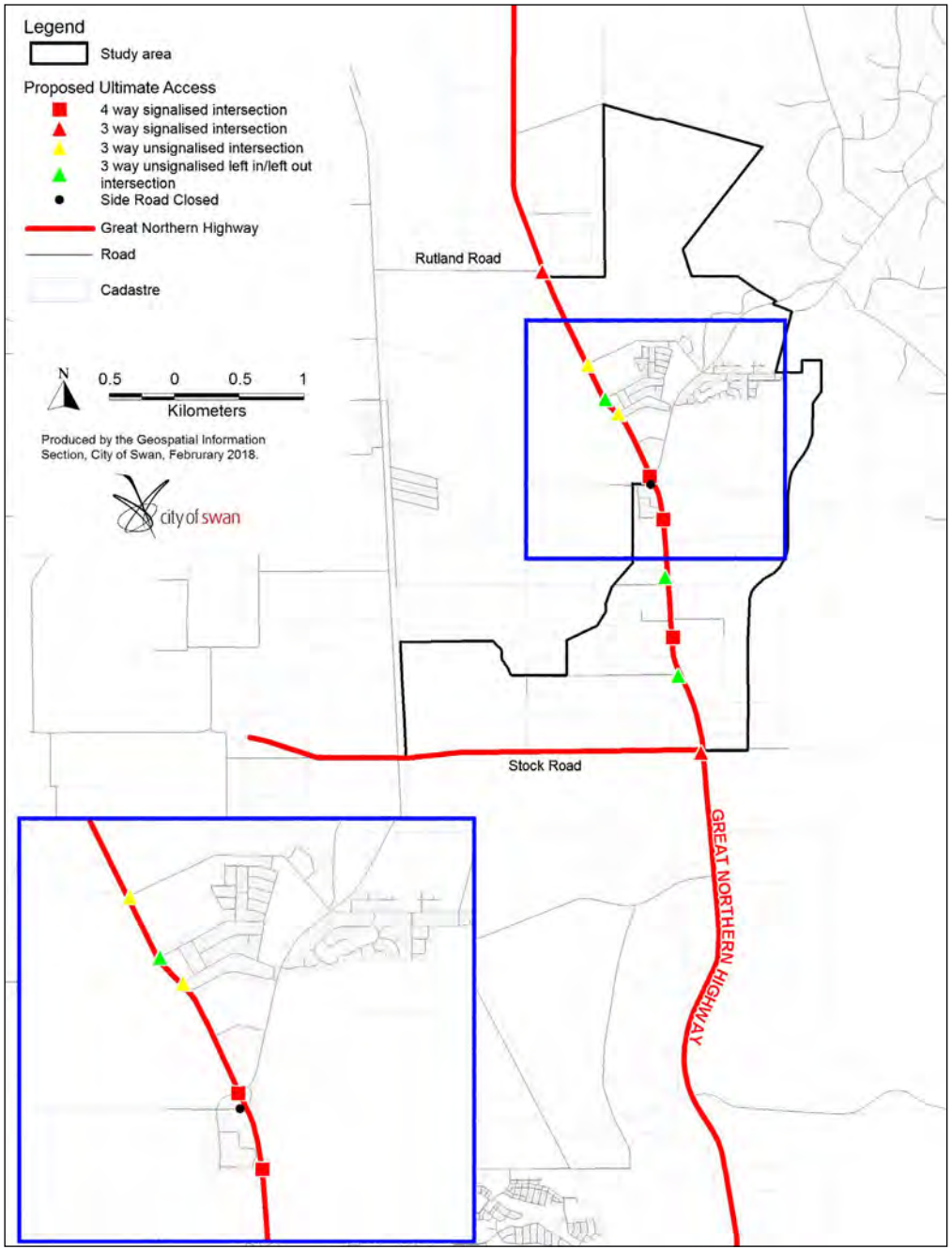


Figure 14. 'Great Northern Highway West Swan to Muchea Access Strategy': Main Roads WA: Proposed Ultimate Access

[18] Source: Department of Planning; City of Swan; Department of Transport & Main Roads WA 2011.

[19] Note: Following finalisation of the GNH Access Strategy, further information has come to light, warranting the need for some minor changes to the agreed access points. These changes are evident within the District Structure Plan.

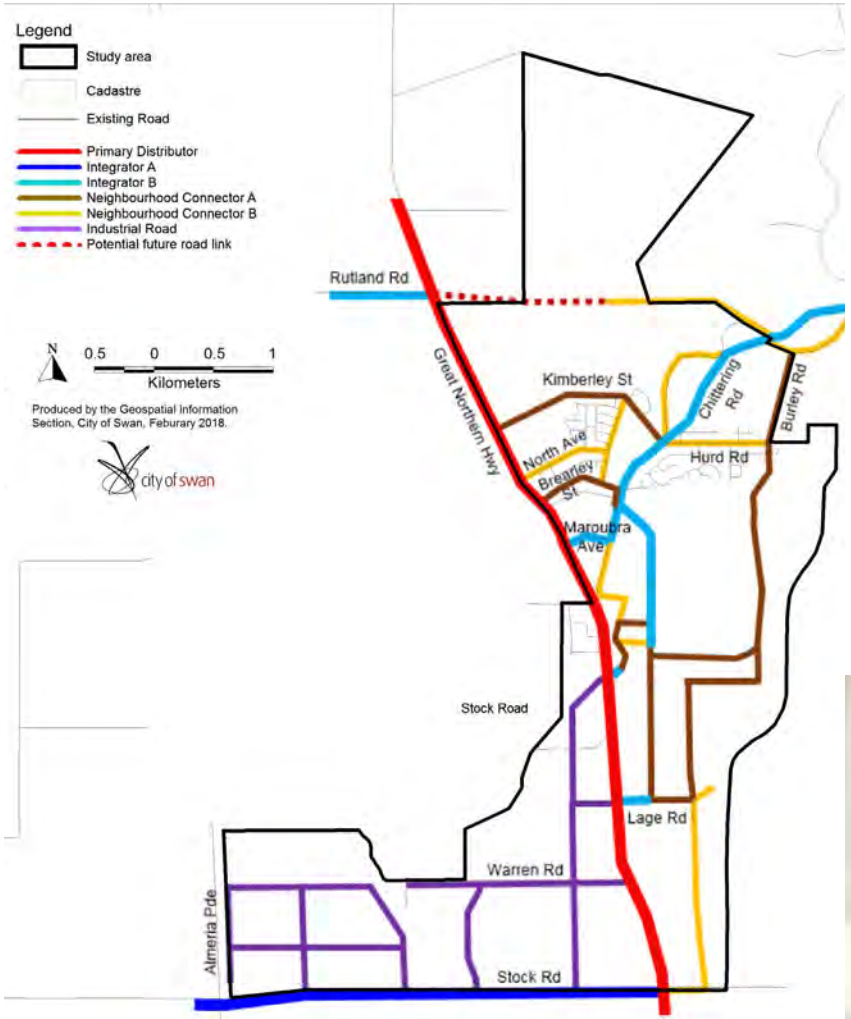


Figure 14A. Bullsbrook Townsite District Structure Plan: Road Heirarchy

The State Government has allocated funding to progress the planning and construction of the route of the Perth to Darwin National Highway between Reid Highway and Muchea.

Perth to Darwin National Highway

Planning for the alignment of the PDNH from Reid Highway to Maralla Road has been completed, and the reservation for the section of road located between Ellenbrook and Maralla Road included in the MRS (refer Figure 3). The State Government has allocated funding to progress the planning and construction of the route of the PDNH between Reid Highway and Muchea. This link will reduce a significant amount of demand for the GNH.[20]

2.6.2 Bullsbrook townsite area

There are a number of existing local roads which feed into the study area from GNH. From the east these include North Avenue, Brearley Street and Lage Road. From the west, the most significant is Rutland Road which links Railway Parade on the west, whilst others include Bullsbrook Road, Brigg Way, Butternab Road, Dewar Road and Warren Road.

2.6.3 Public transport

The study area is currently poorly served by public transport, with only one Transperth bus route serving it. The route leads directly to the Midland Train Station and provides two services per peak period and one mid-day during the week. This bus service is not directly connected to other major retail areas such as Joondalup.

2.6.4 Pedestrian and cycle network

The existing built-up residential area of Bullsbrook is well serviced by footpaths which offer good connectivity to the existing district school and to GNH. This connection becomes somewhat fragmented between the residential area and the town hub area.

In 2012, the City adopted its *Swan Cycle Connect Strategy* to guide future investment in dual use path infrastructure. Whilst no specific requirements are set out within the strategy for the Bullsbrook townsite, all future development will be required to comply with the guidelines within this Strategy.

[20] Source: Department of Planning; City of Swan; Department of Transport & Main Roads WA 2011.



2.7 Infrastructure and other land use constraints

2.7.1 Utilities

Water supply

The Water Corporation advises that existing public water supply infrastructure in the Bullsbrook area is restricted to servicing the Bullsbrook townsite and the Upper Swan area west of GNH. Scheme Water Service infrastructure is shown in Figure 15. In order to facilitate Scheme water supply for further residential, commercial and industrial development within the Bullsbrook townsite, significant upgrades to the current water infrastructure will be required. The short, medium and long term plans included in the Water Corporation's planning to date includes:

- Installation of a separate outlet from the current Bullsbrook service tank, and new distribution mains to serve the town. These will be dependent upon the availability of capital and actual growth in the area.
- Acquisition of land for a new Bullsbrook high level tank and construction of pump station for transfer from the current tank to the new high level tank. Timing will be based on demand in the area and availability of land for acquisition.

Wastewater treatment

A Water Corporation wastewater treatment plant (WWTP) is located in the north-west corner of the study area (refer Figure 16). Wastewater is treated to remove nutrients and pathogens, and then infiltrated into the ground via on-site infiltration basins. Buffer distances are applied to the plant on a case by case scenario. The buffer distance that is currently applied to the Bullsbrook plant is shown in Figure 16. This buffer as annotated on Water Corporation Plan 'DZ30-1-7c'.

The Water Corporation has carried out some long term planning for the area and has indicated that, in the future, it is likely that the plant will be decommissioned and waste water will be pumped through a pipeline to Ellenbrook which would then convey the raw wastewater into the existing metropolitan sewer network. Delivery of this infrastructure will be based on timing, availability of capital and actual growth in the area (likely to be post 2019).

The Water Corporation advises that all properties outside of the Bullsbrook townsite rely on individual or grouped septic tanks or on-site effluent treatment systems.

Power supply

Western Power currently supplies electricity to the Bullsbrook townsite area via two 22kV feeders that radiate from a 132/22kV zone substation at Muchea, which is connected to the South West Transmission Network via a 132kV transmission line.[21] These lines service the entire Bullsbrook area, as highlighted in the previous Bullsbrook Townsite and Rural Strategy. Refer to Figure 17. Expansion and extension to this infrastructure will be provided at the cost of developers.

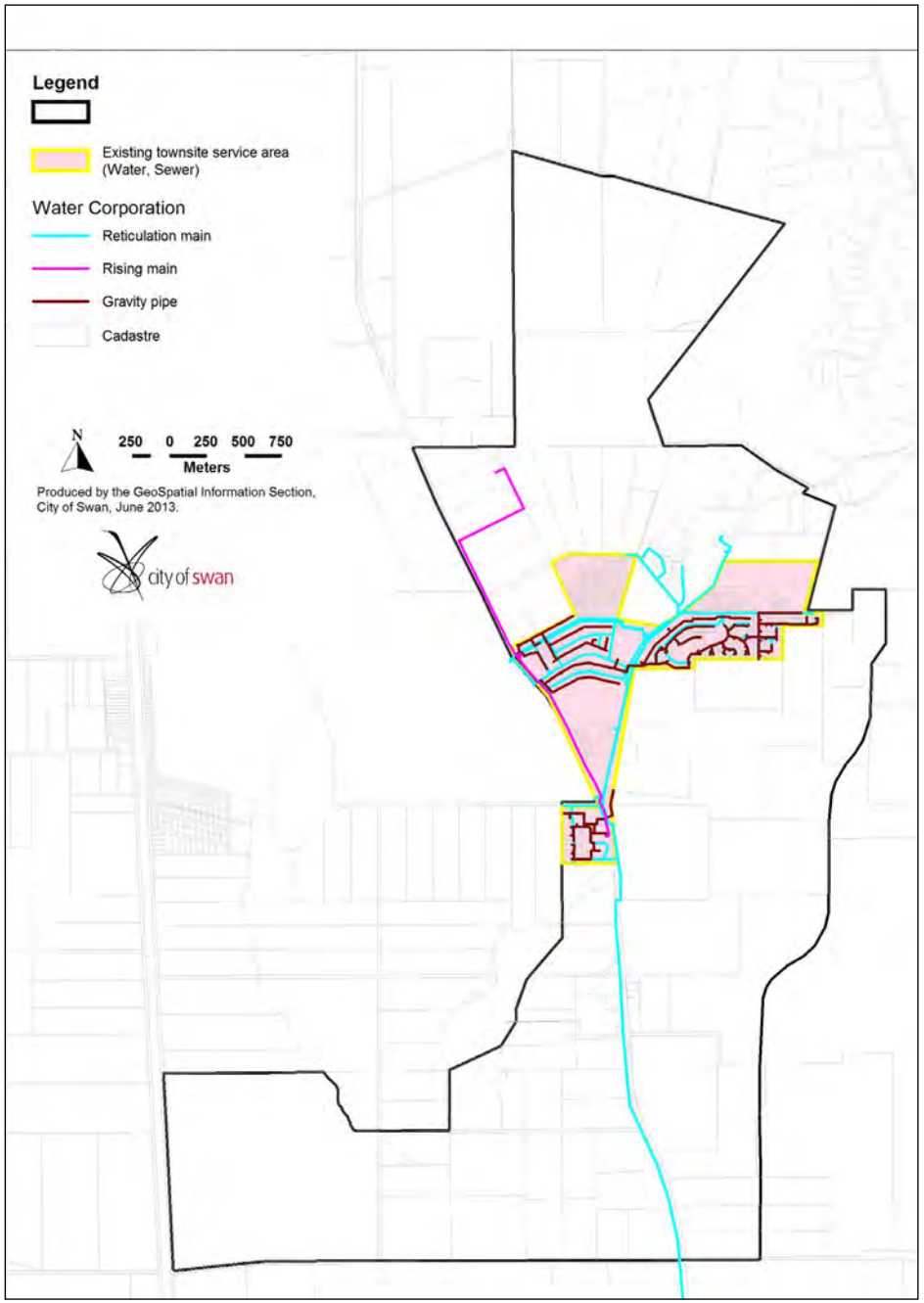


Figure 15. Bullsbrook Townsite District Structure Plan: Scheme Water Service Infrastructure

[21] Source: WAPC 1999.

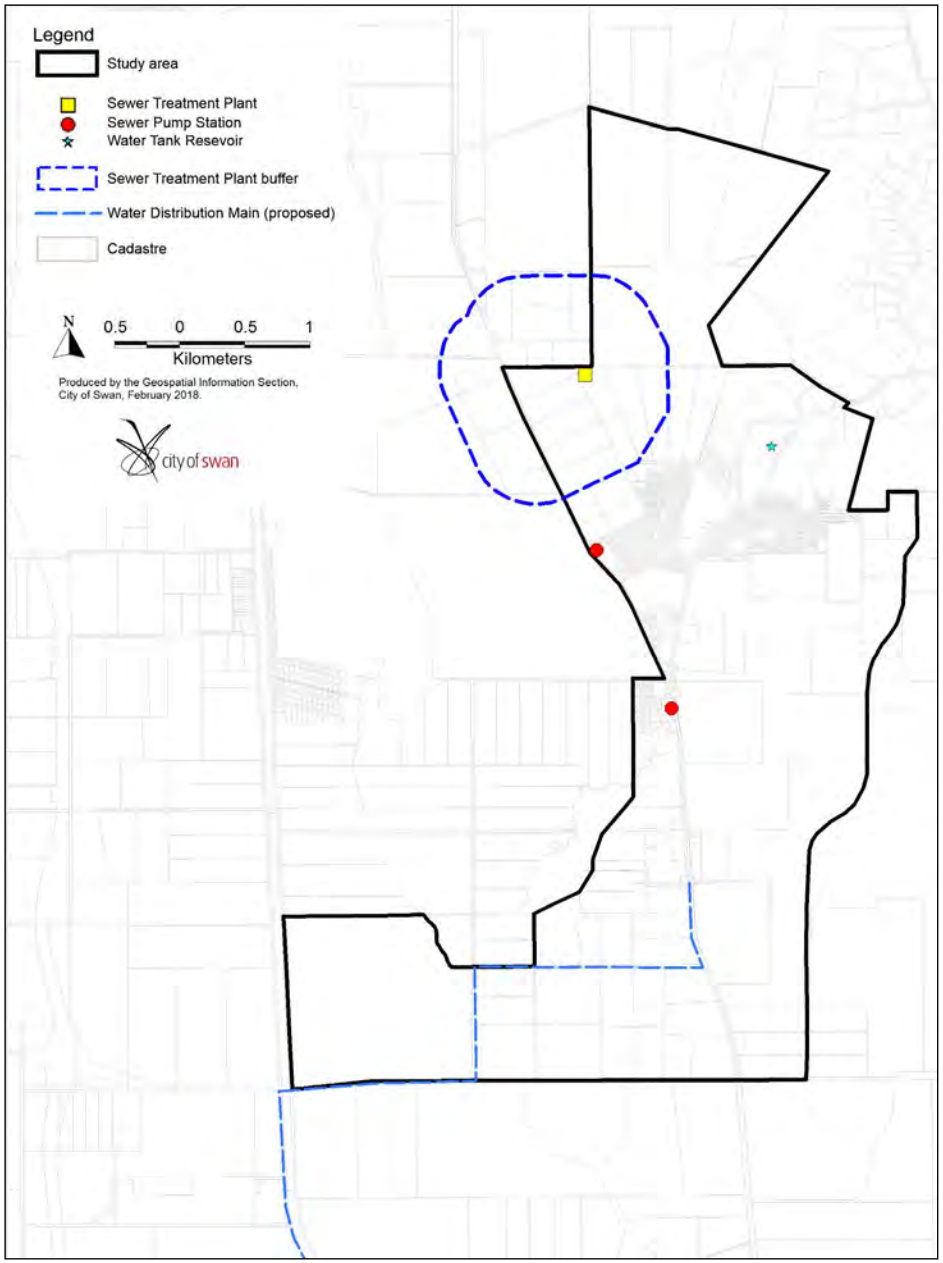


Figure 16. Bullsbrook Townsite District Structure Plan:
Water Corporation Waste Water Treatment Plant and Associated Buffer

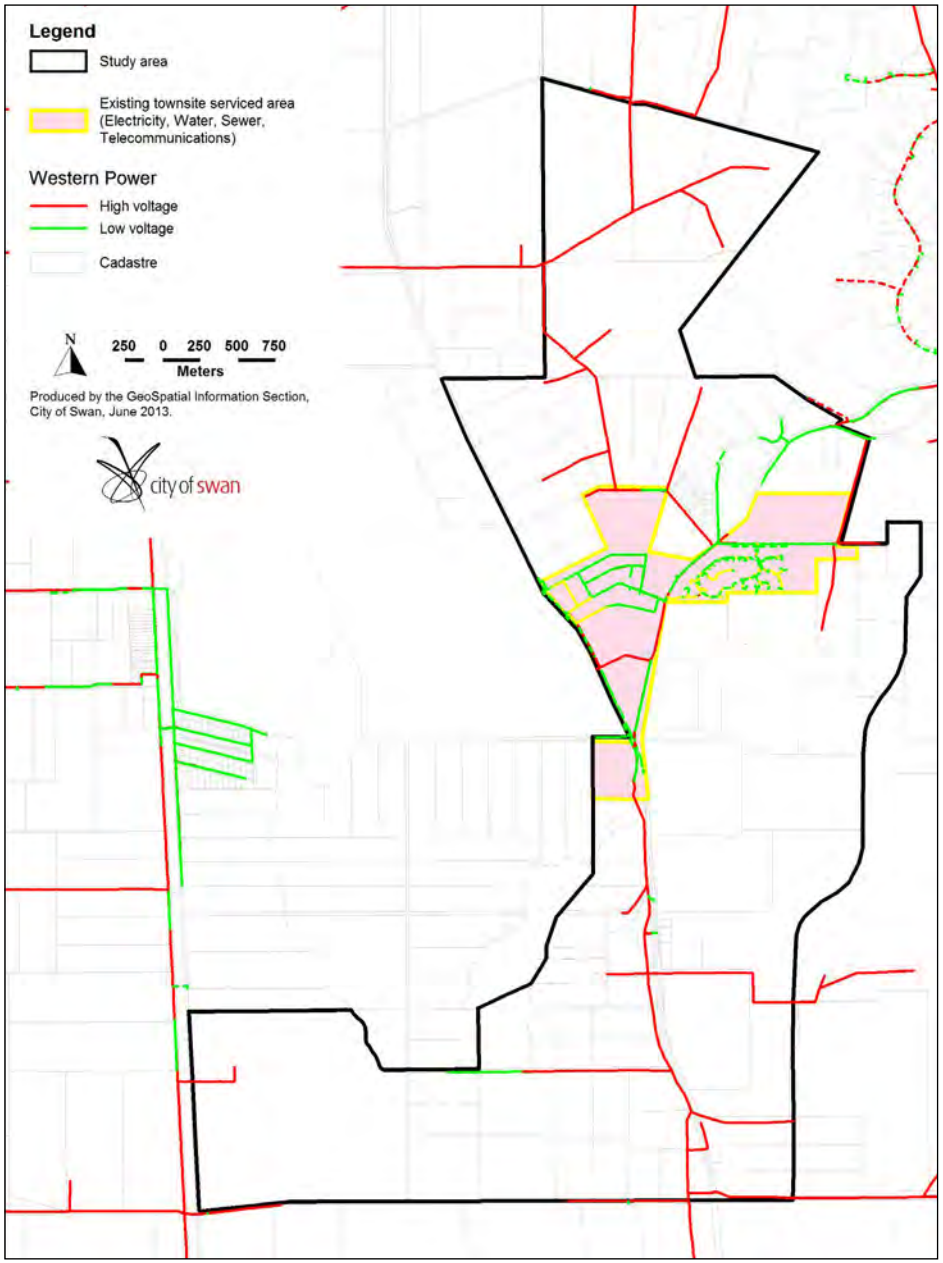


Figure 17. Bullsbrook Townsite District Structure Plan:
Power Supply

Gas supply

Alinta Gas advises that the Dampier–Bunbury Natural Gas Pipeline runs west of the western boundary of the study area, with a dedicated easement of 30m. This pipeline, along with the Parmelia Pipeline, provides natural gas to major industrial users and residential development in the south-west of the State, on the coastal plain from Perth to Busselton.[22]

Natural gas is currently drawn off the Pipeline at two points, and is a discretionary service which can be provided to new industrial, commercial and residential estates at the cost of the developer.[23]

2.7.2 Community facilities

Existing facilities

Bullsbrook is currently well serviced by a number of community facilities (not all within the townsite area) as summarised below:

Facility Type	Name
Community Buildings	Pickett Park Hall (Bullsbrook Community Hall) West Bullsbrook Hall Bullsbrook Neighbourhood Centre (youth facility, crèche and activity room) Bullsbrook Community Library Bullsbrook Child Health Care and Preschool Bullsbrook Sports Club
BMX and Skate Parks	Bullsbrook Skate Park and BMX track West Bullsbrook BMX track and play park
Sporting Facilities and Infrastructure	Pickett Park Oval Pickett Park basketball/netball courts and lawn bowls Lowery Park Pavilion and tennis courts District school (soccer field, gymnasium, dance studio and hard courts)
Parks and Reserves	Lowery Park Ballad Park Brearley Park Burley Park Wally Jones Park Wattlebark Park
Additional Facilities (private open space)	Various bushland areas Chequers Golf Club and bushland State Equestrian Centre Various bridle trails

[22] Source: City of Swan 2008.

[23] Source: WAPC 1999.

2.7.3 Royal Australian Air Force—Pearce Airbase

The RAAF Pearce Airbase is located along the western boundary of the study area (north of the industrial estate).

Aircraft noise contours (refer Figure 3) demonstrate that the townsite area is unaffected by aircraft noise, with the exception of the 'Special Use' zoned industrial area south of the RAAF Base (SUZ No. 22) and a small portion of a reserve east of GNH which belongs to RAAF. There may be some affect to future urban land directly north of Kimberley Street and detailed acoustic planning will be required to ensure this can be managed suitably.

Future developers will need to liaise with RAAF via the City to ensure that adequate measures are made to appropriately address pertinent matters associated with development in proximity to an airbase. These include:

- Bird strike;
- Defence (Areas Control) Regulations;
- Extraneous Lighting and Glare; and
- Explosive Ordnance Safeguarding.

The District Structure Plan will need to take these matters into account where relevant to the level of planning detail provided.



3.0 The District Structure Plan

Vision

As stated previously, the population forecast for Bullsbrook is 16,073 people by 2031, and 20,506 people by 2036[24], and the State has set an employment self-sufficiency target of 75% for the North-East Corridor.[25] The District Structure Plan provides a strategy for the growth of the townsite area to accommodate this population and to provide employment.

> The City's vision for the District Structure Plan is to promote the Bullsbrook townsite as the City of Swan's Northern Gateway and to accommodate this growing community in a liveable town which is sustainable, vibrant and prosperous.

Towards achieving this vision and, taking into account the site conditions and constraints referred to in the foregoing, the study area is considered capable of providing a consolidated urban area which can be well served by transport, essential utilities, community facilities, retail outlets and employment.



[24] Source: Forecast id 2018.

[25] 'Directions 2031', WAPC 2010.

Objectives

To this end, strategic objectives have been set for the District Structure Plan. These are:

To:

- provide a coordinated approach to future urban development and implementation of associated infrastructure for those areas in Bullsbrook identified for urban expansion, particularly in relation to land use;
- incorporate key transport routes throughout the District Structure Plan area;
- identify suitable community facilities, open space and employment generating sites that provide equitable access for existing and future residents.
- ensure that future urban development provides for environmentally sensitive design, protecting existing landscape and natural water features;
- ensure that future urban development minimises conflict with existing agricultural land uses that are significant to the supply of produce to the Perth metropolitan region and beyond;
- provide for diversity of housing stock by promoting a range of residential densities within the study area;
- provide for development which is consistent with 'Liveable Neighbourhoods' principles, incorporating walkable catchments and a well serviced public transport system;
- provide for a self-sustainable community by promoting a mix of residential and non-residential uses, including industrial, commercial, community-based uses and mixed-use development; and
- protect existing major land uses including the Pearce RAAF Base, various resource extraction operations and adjacent agricultural and horticultural activities.

Key design considerations

As highlighted within the site conditions and constraints section of this report, various existing natural and built form features affect the study area. These features have formed distinct parameters in the design of the townsite, which in turn have shaped the mix and location of land use within the District Structure Plan (refer Figure 18). In terms of this, and taking into account the above objectives, key considerations in the design of the District Structure Plan are discussed below:

District Centre

SPP4.2 stipulates a requirement for a District Centre to service populations over 20,000. In early planning stages of the District Structure Plan, the City recognised the need for an expanded retail/commercial centre in Bullsbrook and the limitations of the existing centre to allow expansion. Therefore, it is concluded that a new **District Centre** would need to be planned for. However, it also recognised that the existing central retail/commercial area should not be isolated from the new centre, particularly during the transition stage. As such, the City recognised that the new centre would need to be located as close as possible to the existing centre, to provide connection between the two.

With the RAAF Pearce base and an identified industrial estate directly south-west of GNH, it was apparent that future residential development would need to continue along the east side of GNH. Therefore, in accordance with orderly and proper planning, the new centre would need to be integrated with this residential expansion area, so that future commercial growth would not be dissected or interrupted by GNH. It was determined that the most appropriate location for the new District Centre would be directly east of the existing hub, across the GNH.

Related uses

With this proposed location of the District Centre and related land uses, it is deemed appropriate to co-locate essential district level community facilities and open space at Pickett Park (including proposed future upgrades).

It would be expected that denser residential opportunities would be made available along the identified **Activity Corridor**, which is the main north-south link through the townsite (Section 3.4.2).

As the townsite expands outwards from the District Centre, it is expected that residential expansion will occur to the south first and then to the north of the existing residential development. Three new primary schools and potentially one new high school site, in addition to the existing district school, as well as **Neighbourhood Centres** will be required as the townsite expands southwards. Indicative proposed school and neighbourhood centre sites are shown in the District Structure Plan.

The study area is enriched with natural water features and it is expected that much of the local open space will be distributed adjacent to these creek lines and wet areas. Other passive local open space opportunities will be required to be provided within individual walkable catchments. The majority of required active open space will be addressed through the provision of local playing fields and the proposed **District Open Space** (DOS) indicated in the District Structure Plan.

Industrial use

The land zoned 'Industry' within the MRS is zoned 'Special Use No. 22' under LPS17 and has approved local structure plans to provide for industrial development. DCPs are also currently being prepared to ensure the appropriate coordination of delivery and distribution of necessary infrastructure within the estate.

The State Government has also earmarked the area for the possible location of an intermodal freight terminal. The District Structure Plan recognises this **Industrial** area along the western edge of GNH, north of Stock Road, for the provision of key job opportunities to the future expanded community of Bullsbrook. Controlled intersections (signalised or round-a-bouts) with GNH are proposed at Stock Road and future Lage Road extension to facilitate easy and safe access (refer Section 3.4).

Land in the north and south-east of the study area is strictly constrained by various environmental buffers and currently quarantined from future development. These areas have been identified within the District Structure Plan as **Future Investigation Area** and **Clay Quarry Buffer Area**. Within the **Future Investigation Area** is a site identified by the State Government as having potential for non-heavy industrial use in the long term.

The vision, objectives and design considerations discussed above are an integral part of the District Structure Plan indicated below.

The following Sections 3.1 to 3.7 each discuss a key aspect of the District Structure Plan, particularly in relation to the most relevant of the stated objectives which are set out at the beginning of each section.

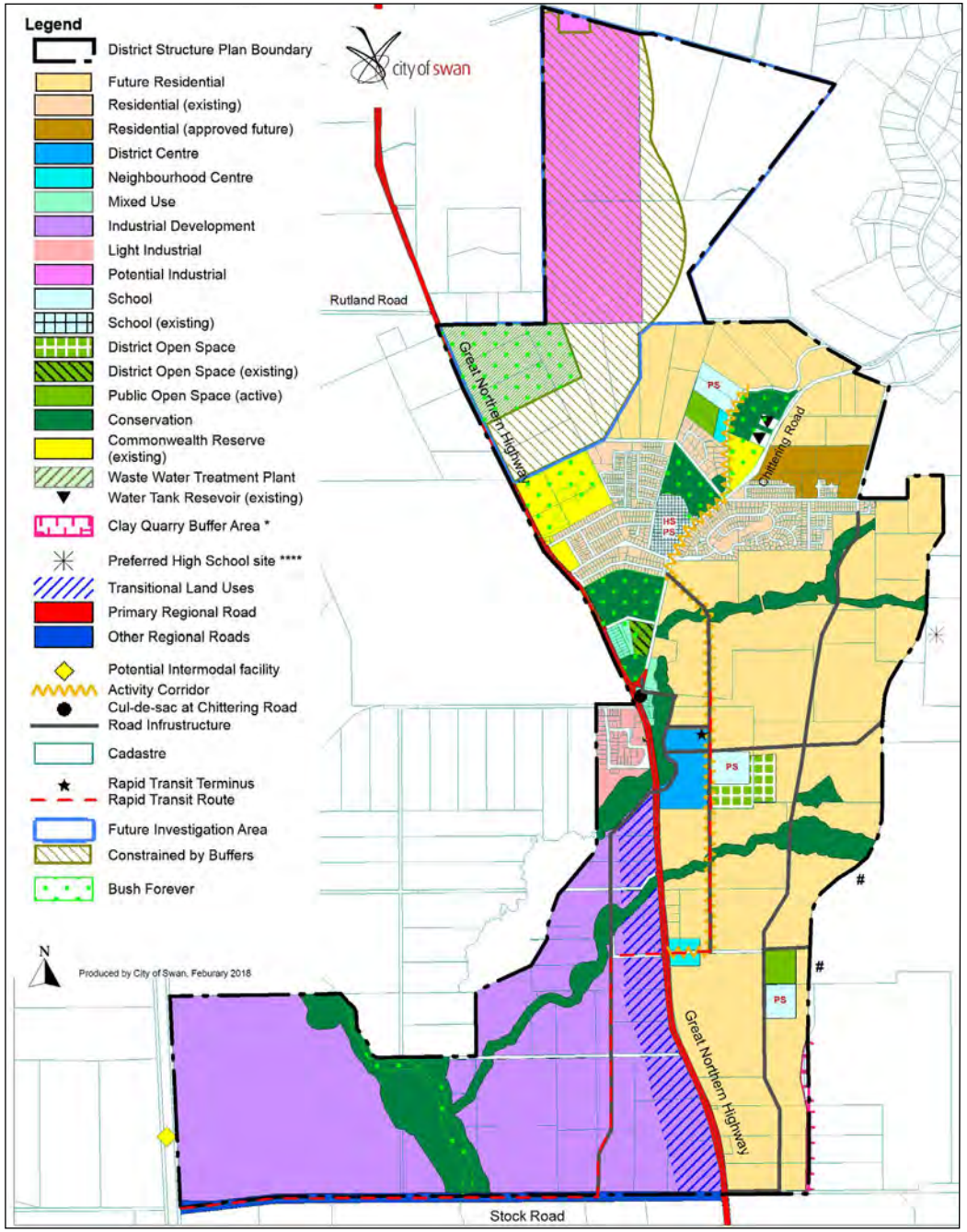


Figure 18. Bullsbrook Townsite District Structure Plan

* The existing 500 metre clay quarry buffer may be reduced in the future, upon agreement of all relevant parties. This buffer is subject to detailed mapping.

** Transitional land uses are required along the western edge of the Great Northern Highway (refer Section 3.1.2 of the Bullsbrook Townsite District Structure Plan report).

*** The location, design and size of the DOS is to be refined through the local structure planning stage.

**** In the event that an additional high school site is required, its siting and location should be determined prior to supporting the first major structure plan. Refer to Section 3.6.1 of the Bullsbrook Townsite District Structure Plan report.

\# It is noted that an existing approved rural local structure plan overlaps in this area. This issue needs to be adressed in future local structure plans.

3.1 Land use

Objectives

- Provide for diversity of housing stock by promoting a range of residential densities within the study area;
- Provide for a self-sustainable community by promoting a range of non-residential uses including industrial, commercial, community-based uses and mixed-use development; and
- Protect existing major land uses including the Pearce RAAF Base, various resource extraction operations and adjacent agricultural and horticultural activities;
- Ensure that future urban development minimises conflict with existing agricultural land uses that are significant to the supply of produce to the Perth metropolitan region and beyond.

A summary of key land uses and population to be provided for within the District Structure Plan is as follows:

Land Use and Population Yield	
Total area covered by the District Structure Plan	1,583ha
Area of each land use with District Structure Plan (gross) – Residential – Industrial – Commercial	 488ha (293ha net) 505ha (404ha net) 17.7ha
Estimated residential lot yield[26]	6,599 lots including 153 urban infill lots (plus 2,777 possible further lot potential from currently from the Future Investigation Area probably post 2031 [potential 34 lots within clay quarry buffer area])
Estimated population yield[27]	18,478 people (plus 7,776 people possible from the Future Investigation Area—probably post 2031)[28]
Number of high schools[29]	2 (1 existing)[30]
Number of primary schools	3
Estimated commercial floor space (for activity centre)	10,000m^2 net lettable area by 2031 (20,000m^2 probably post 2031)
Employment (Industry) Labour force[31]	11,000 jobs[32] 9,093 (probably post 2031)[33]
Provision of Public Open Space – Unrestricted – Restricted	 50.5ha 12.6ha

[26] At 22 lots per net site ha (15 dwellings per gross urban zoned ha) for 'Connected City', under the WAPC's *Outer Metropolitan Perth and Peel Sub-regional Strategy.*

[27] At 2.8 people per household—Forecast id: average for 2011.

[28] This figure does not include the existing population of 6,048.

[29] At 1/1,500 lots—'Liveable Neighbourhoods'—WAPC.

[30] The addition of a second high-school will be subject to a number of factors, described in detail within Section 3.1 of this report.

[31] Members of population working full time, part time or currently looking for work.

[32] This figure includes only employment generated within the industrial estate at 30 employees per ha (Macroplan Dimasi 2013). On top of this figure will include commercial, retail and community use employment.

[33] Based on 2.8 people per household (Forecast id average for 2006-2036), 1.29 employees per dwelling (City of Swan ID Forecast average 2011).

3.1.1 Residential

The residential component of the District Structure Plan is made up of:

- Existing residential;
- Approved structure plan areas;
- Existing 'Urban Deferred' zoned sites under the MRS; and
- Proposed future residential.

These are indicated in Figures 19 and 20.

The estimated future yield of the residential component is set out in the following table:

Component	Gross Site Area (ha)	Net Site Area (ha)[34]	Lots[35] (dwellings)	Population Yield[36]
Existing Residential[37]	–	–	153	428
Approved Structure Plans	17.5	10.5[38]	231	647
Urban Deferred[39]	45.2	27.1	596	1,669
Future Residential	416.8	250.1	5,501	15,405
Total Yield	479.5	287.7	6,328	17,721

This has been estimated by considering the net area of land available to be developed within the District Structure Plan study area (after land required for non-residential uses, streets, laneways, open space and community facilities has been deducted from the gross developable area) and then applying the State Government target of 22 dwellings per net site ha followed by a projected household size of 2.8 persons per dwelling.

Local structure planning for any new development within the area will need to make provision for the buffering of any heavy haulage noise associated with traffic from GNH. This matter will need to be appropriately addressed in accordance with SPP5.4 by a suitably qualified acoustic consultant.

Future investigation areas, including the clay quarry buffer area, are not included in the above forecast. These are considered in Sections 3.1.3 and 3.1.4.

[34] Total site yield, based on area after deducting required areas for DOS, Conservation, District Centre and three Primary Schools (43.3 ha) as well as 40% for roads, drainage, POS and allowance for steep terrain in local area.

[35] At 22 lots per net site ha (15 dwellings per gross urban zoned ha) for 'Connected City', under the WAPC's *Outer Metropolitan Perth and Peel Sub-regional Strategy*.

[36] At 2.8 people per household—Forecast id: average for 2011.

[37] Refers to potential for further growth (3% assumption based on Urban Housing Strategy).

[38] Refers to further growth available (where subdivision has not yet been approved) at time of calculation.

[39] Land zoned 'Urban Deferred' under the MRS.

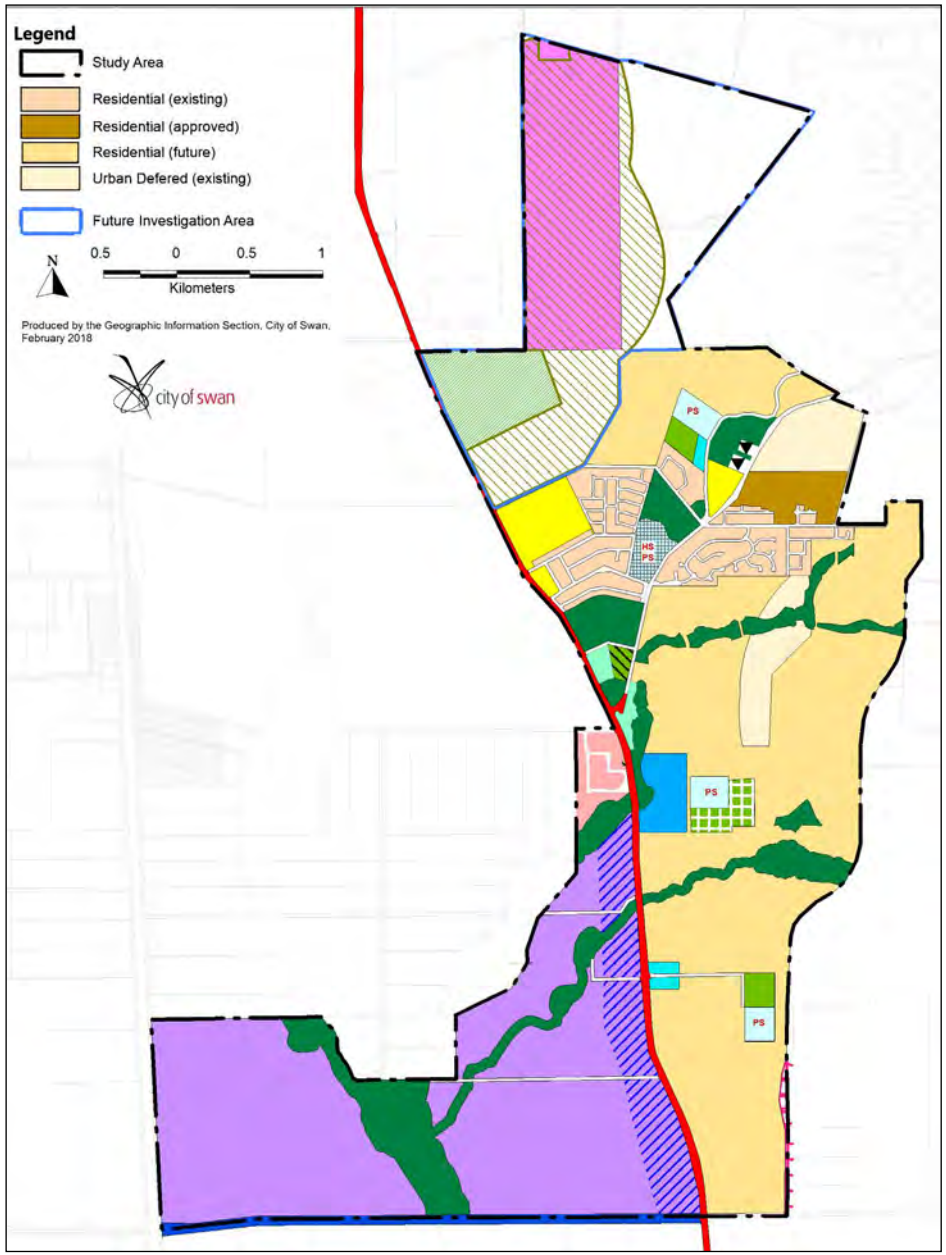
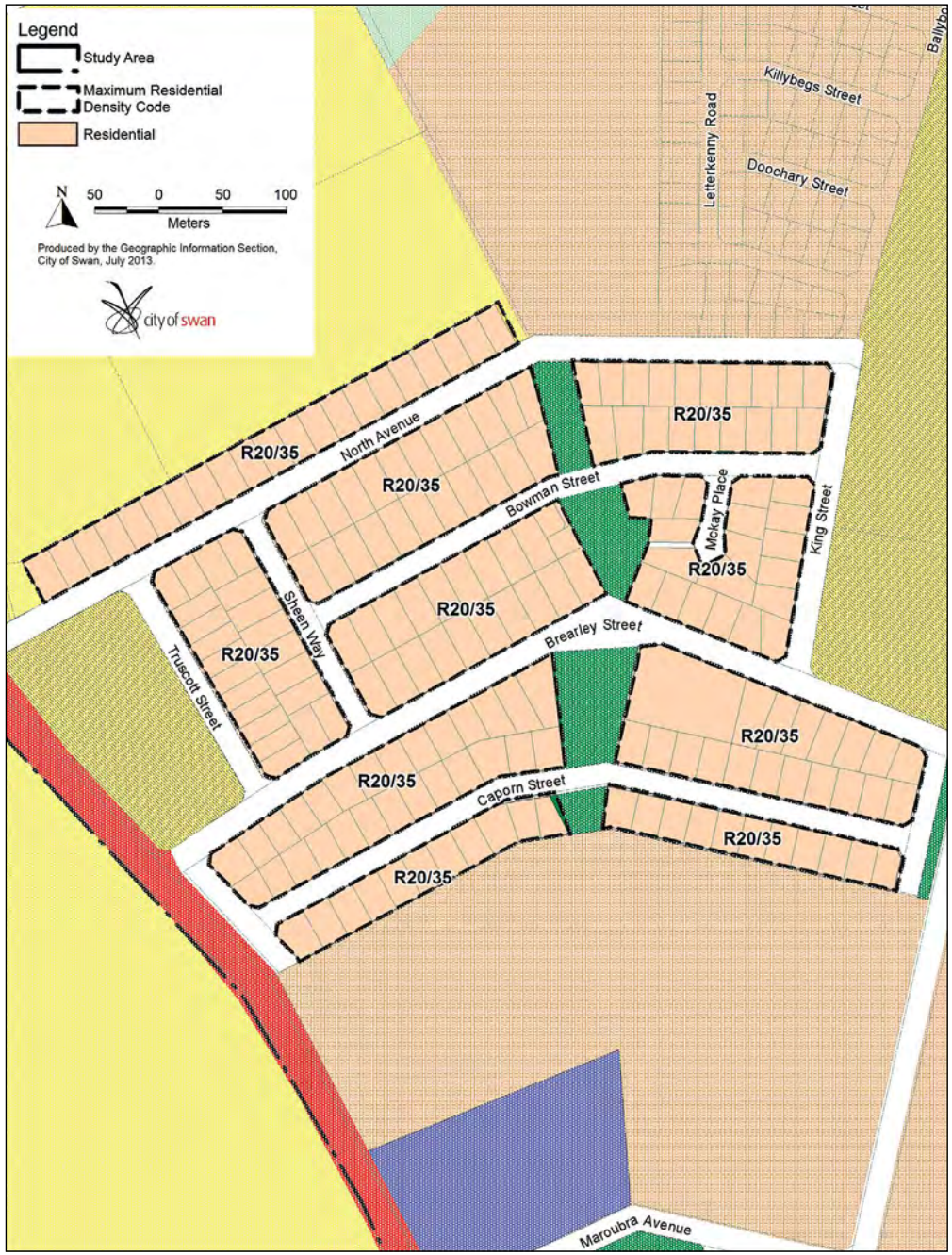


Figure 19. Bullsbrook Townsite District Structure Plan: Residential Component



Existing residential areas

The Existing Residential area which was up-coded as part of Local Planning Scheme Amendment No. 92 is expected to accomodate an additional 153 dwellings by 2031. This means that the existing housing stock in the area of 525 dwellings could be increased by 153 new dwellings. Figure 20 indicates the density codes within the existing residential area.

Approved Structure Plan areas

The Approved Future Development component of the District Structure Plan comprises three approved structure plans. These occupy several parcels of land, two being located between Kimberley and North Streets, and the third located to the north of Hurd Road. These structure plans facilitate the future development of approximately 231 lots which will accommodate over 647 residents.[40]

Existing Urban Deferred Sites

The Urban Deferred' sites occupy land located directly east of Chittering Road (in the north-east section of the study area) and a number of sites located to the south-east of Chittering Road (directly south of the existing residential area), as indicated in Figure 6.

The urban deferment of the north-east site appears to be an anomaly, as it is zoned 'Residential Development' within the City's LPS17. However, irrespective of this, the urban deferment would require lifting upon the endorsement of any structure plan for the site (refer Figure 21).

The south-east 'Urban Deferred' site is currently zoned 'General Rural' under LPS17 and is partley constrained by a landfill buffer (Figure 10).

As both existing 'Urban Deferred' sites are adjacent to the existing urban area, there is likely to be a relative ease of access to existing service connections. Therefore, it would be expected that first stages of new urban growth will emerge from these two sites (less so from the north-eastern site which is restricted by its topography), upon relevant amendments to the MRS and LPS. The component of existing 'Urban Deferred' sites occupies a net area of approximately 27.1ha which could accommodate up to 596 new lots.[41]

Figure 20. Bullsbrook Townsite District Structure Plan: City of Swan Urban Housing Strategy—Existing residential densities resulting from LPS amendment 92.

[40] At 2.8 persons per dwelling.

[41] At 22 lots per net site ha (15 dwellings per gross urban zoned ha) for 'Connected City', under the WAPC's *Outer Metropolitan Perth and Peel Sub-regional Strategy*.

Future residential

The townsite study area comprises a **Future Residential** component of just over 250.1ha, based on the area of land available for urban development (upon deduction of those areas required for non-residential uses and infrastructure, as well as parcels of land that will continue to be constrained by relevant environmental buffers in the immediate to long term future). This translates to the opportunity to provide approximately 5,501 additional lots within the townsite. In order for this land to be developed, landowners would need to prepare a Local Structure Plan to initiate an MRS amendment and subsequent LPS amendment, to rezone the land from 'Rural' to 'Urban' and 'General Rural' to 'Residential Development', respectively.

Future structure plans for the 'Urban Deferred' and Future Residential Precincts will be required to refine the identified boundaries and detail density distribution, to demonstrate how the State Government's 'Directions 2031', *Outer Metropolitan Perth and Peel Sub-regional Strategy* and 'Liveable Neighbourhoods' policy can be achieved. The diversity and quality of housing within these areas will need to demonstrate attractive, safe and liveable communities through best practice urban design and architecture. It could be expected that as a result of Bullsbrook's 'rural' location, there will be a greater demand for lots larger than those yielding 22 dwellings per net ha, especially in the earlier stages of development.

The overall estimated future yield of dwellings based on total build out (excluding yield from the Future Investigation Area and Clay Quarry Buffer Area) accommodates approximately 18,478 people (excluding the existing 2018 population of 6,048) which can accommodate the forecasted population of 16,073 by 2031 and will significantly address the forecasted population of 20,506 by 2036.

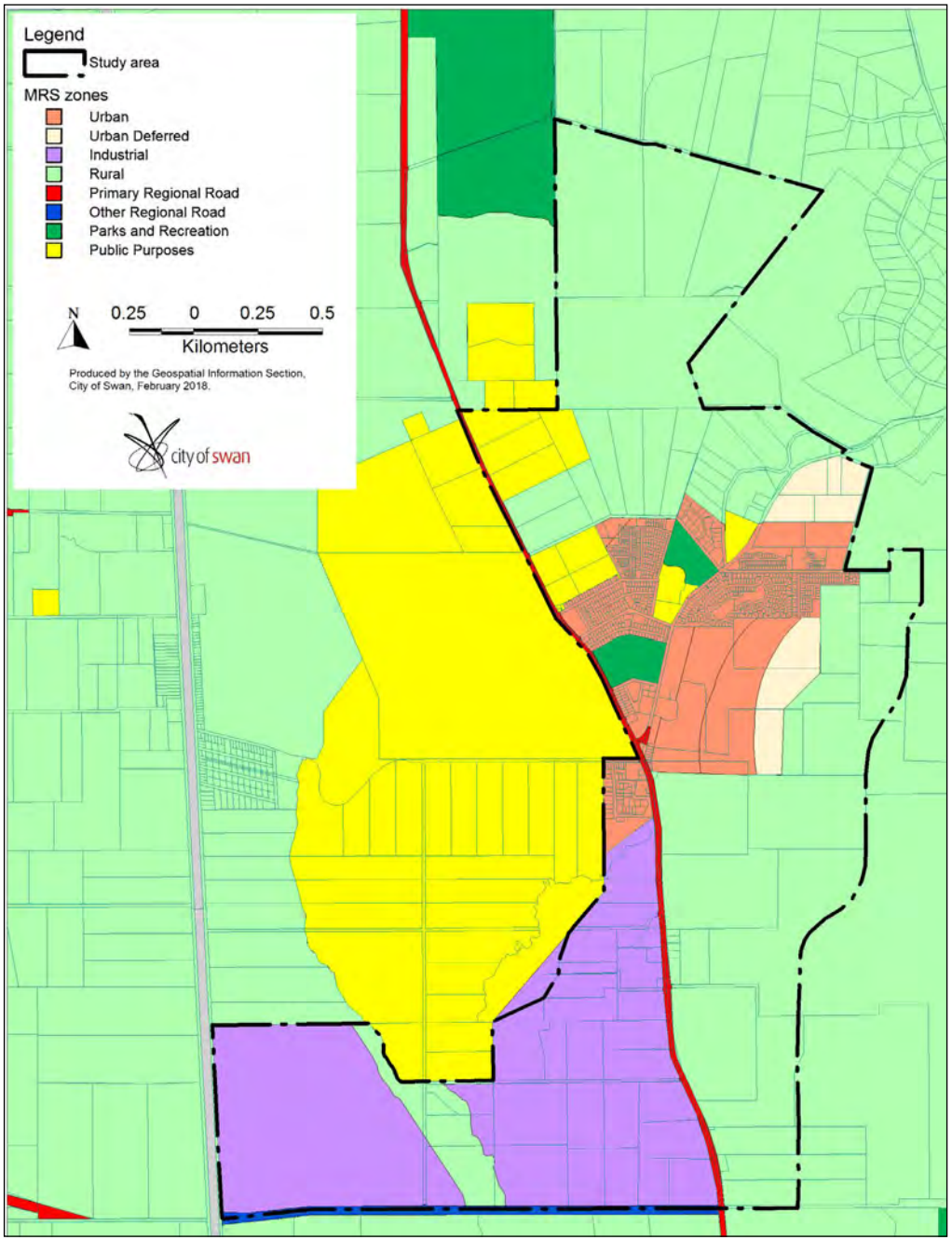


Figure 21. Bullsbrook Townsite District Structure Plan: MRS Zoning in Bullsbrook

3.1.2 Activity nodes and employment

Activity centres and an industrial area have been proposed within the District Structure Plan. This is in accordance with State Government planning guidance, in particular the EELS. These are discussed in the following:

Existing Commercial/Industrial hub

There is no further land available for retail expansion in Bullsbrook. The existing hub is small, occupying a total area of 1,900m^2 (including food and services), and is perceived as deficient by local residents. This area is noted as 'Light Industrial' within the District Structure Plan, reflecting the predominant land use within the immediate area. The envisaged change to the commercial/retail aspect of this area is further discussed below.

Future retail needs

The City carried out a retail needs assessment for the municipality in 2012. The assessment identified the need for a larger centre in Bullsbrook (with approximately 8,000–10,000m^2 of retail floor space) between 2021 and 2031, to grow to a District Centre (with up to 20,000m^2 retail floor space) beyond 2031. The District Centre would provide weekly grocery shopping facilities, convenience/service shops, a significant range of lower order comparison shops, cafes, restaurants and niche traders. Much of the work for the retail needs assessment was carried out prior to the publishing of State Government's EELS and the compilation of the District Structure Plan. Therefore further detailed investigation would be required, at future local structure planning stage, to determine whether a shopping facility of a district capacity would be required earlier.

The need for two future small Neighbourhood Centres has also been identified. The southern Neighbourhood Centre has been oriented along Lage Road with allowance for a main street style of development, having clear visibility and connection to the GNH and adjacent industrial estate.

The inclusion of the additional district and neighbourhood retail floor space will contribute positively to the recommended 75%[42] self-sufficiency target for the expected workforce population in the north-east.

Expansion of retail/commercial area

Previously, prior to the construction of the Perth coastal highway, Indian Ocean Drive, a large amount of tourists heading to the north of Perth would travel through Bullsbrook. This has already reduced substantially and will reduce even further when the PDNH is constructed, diverting most traffic away from the Bullsbrook townsite. Taking this into account, it is considered that expansion of commercial/retail use would be more appropriate on the east side of GNH (rather than in its existing location west of GNH which developed predominately to serve the Highway) where it can better serve residential development east of the Highway. Notwithstanding this, existing commercial traders located to the west of the Highway would be able to continue to enjoy existing use rights into the future. Connectivity between the commercial development west and east of GNH is encouraged through the proposed location of the new centre directly to the east (with clear visibility from the GNH), particularly through the transition stage.

[42] 'Directions 2031', WAPC 2010.



District Centre

The proposed **District Centre** is expected to commence expansion within its western edge to provide an early connection with the existing hub to the west, and to take advantage of the exposure to GNH. The proposed District Centre is located along a north–south distributor road close to proposed community facilities, DOS and the district school in order to create a vibrant and connected centre with a diverse range of activities.

In regard to GNH, whilst street parking is not encouraged along the Highway (which will remain as a high wide load route), a number of other traffic calming devices (such as a pedestrian crossing, street art and street trees) should be considered. As such, the Highway would help towards providing safety, amenity and definition for the Centre, whilst connecting it to growth areas.

An Activity Centre Structure Plan would be required for the District Centre, in accordance with SPP4.2 to ensure it conforms with the model framework provided in the policy.

The initial stage of development is likely to provide for food services, smaller scale weekly grocery needs and other convenience shops, mixed with some residential opportunities. At subdivision stage, structure plans would be required to promote good quality urban design and 'Liveable Neighbourhoods—Main Street' principles.

Expansion of the Centre would occur eastwards, where appropriate siting would need to be considered to ensure the extent of the District Centre can be accommodated.

If pressure occurs for further Mixed Use opportunities, in addition to those on the western edge of the new Centre, this could be accommodated on the western side of Pickett Park. In this event, an alternate, appropriately sized and located site would need to be identified for a replacement playing field (most likely in the north of the District Structure Plan).

Aged Care

The District Structure Plan recognises the need to cater for **Aged Care** in the future. In accordance with 'Liveable Neighbourhoods' principles, Aged Care Accommodation is best located within the activity centre. It is envisaged that this would be provided adjacent to the District Centre, which offers the advantage of providing nearby shopping, medical, public transport services and other commercial facilities.

Neighbourhood Centres

Two new small **Neighbourhood Centres** are proposed to complement the District Centre. A Neighbourhood Centre is proposed to be located in the southern part of the study area to provide amenity and convenience to this future structure planning area, and to also serve the needs of the large industrial employment node located opposite (on the west side of GNH). Located close to a proposed future four-way controlled intersection (signalised or round-a-bout) of GNH with Dewar Road–Lage Street, patrons travelling from the industrial estate will have the advantage of not needing to enter the Highway. The Neighbourhood Centre will provide catchment support to the District Centre and improve walkable catchment within the surrounding urban village.

The need for the second Neighbourhood Centre is only likely to arise when the northern section of the study area experiences development pressure. The proposed site, located close to a Primary School, centrally within the neighbourhood, will provide a similar level of service as the other Neighbourhood Centre serving the southern residential area.

Both Neighbourhood Centres are located along the proposed Activity Corridor (Section 3.4.2), which will ensure good exposure and good public transport access to each site.

All District and Neighbourhood Centre buildings are required to be designed using 'Liveable Neighbourhoods—Main Street' principles, addressing and fronting adjacent streets. These Centres will provide a mix of commercial, residential and community uses.

Industrial Node

The Industrial node has been added to the west of the townsite study area, though not previously identified within the 'Bullsbrook Townsite Rural Strategy'. As previously discussed, this node has been recognised within EELS for future industrial development. An amendment to the MRS was recently approved by the State Government to rezone land identified in the node (331ha net[43]) from 'Rural' to 'Industrial'. At full build out, this node is estimated to trigger at least 11,000 jobs.[44]

The node, bounded by Stock Road, GNH, the Ellen Brook and Railway Parade, is suitably located along the expected connection point to the future PDNH–Stock Road. An intermodal freight facility is expected to be constructed to the west of this node, expanding the need for complementary transport related industries. The node is well located to serve WA's growing industrial sector in terms of its strategic location on the State's major route north (especially in respect of the oil and gas and mining industry), and its substantial separation from key bushfire-prone areas.

[43] Net industrial area, excluding 20% of gross industrial land for road and drainage infrastructure.

[44] Macroplan Dimasi 2013.

The land has several constraints, including being dissected by Ellen Brook and 100 year flood plain. An existing poultry farm is located in this area and the land is affected by noise generated by the flight paths of planes utilising the Pierce RAAF base air strip.

The GNH forms a key transport corridor through the City, offering a window into Swan seen by many passers-by on a daily basis. The future townsite development presents an opportunity to improve the built form along the highway and to ensure an appropriate interface between non-residential and residential development. The eastern section of the industrial precinct will need to address the sensitive land uses proposed for the land located directly to the east of the GNH. An indicative 'Transitional Land Uses' precinct is identified along this side of the precinct and shall be required to be noted within any future structure plan and associated local development plan (where relevant). Development within this area will need to address the Environmental Protection Authority (EPA) 'Guidance for the Assessment of Environmental Factors Western Australia (in accordance with the *Environmental Protection Act 1986*): Separation Distances between Industrial and Sensitive Land Uses'[45] to ensure noise, dust and odour is appropriately managed. Furthermore, development within 'Transitional Uses' zone will need to respect the preferred built form character of the local community, ensuring an enhanced aesthetic appearance along the highway.

Job yield identified in the District Structure Plan will strongly support the north-east corridor self-sufficiency target of 75%.

3.1.3 Future investigation area

The **Future Investigation Area** (refer Figure 18) is currently mostly quarantined, as it is constrained by several environmental buffers. These include creek line buffers, Bush Forever sites, the Water Corporation WWTP buffer and buffers likely to be required by the Department of Mining and Petroleum for the purpose of protecting the Titanium Zircon resource partially located along the northern boundary of the study area. However, the Wastewater Plant buffer is likely to be lifted upon the decommissioning of the plant in future years.

The north-east section of the study, located outside these buffers, is located within an extreme bushfire risk area and currently has only one main access/egress point. Therefore, it may be difficult for development of this area to achieve compliance with the State Government's *Planning for Bushfire Protection* policy and with the City's LPS17 requirements.

Through the preparation of EELS, the Department of Planning have also identified a long term potential non-heavy industrial site within this area.

Were all the constraints of the Future Investigation Area to be satisfactorily addressed, it has the ability to potentially accommodate 2,777 additional lots or 7,776 people.[46] It is recommended that this area not be considered for urban development until all the constraints have been removed.

3.1.4 Clay quarry buffer area

The **Clay Quarry Buffer Area** has been identified as a result of the buffer required to the existing Midland Brick quarry site located to the south-east of the study area. The buffer is calculated from the identified extraction areas, and Midland Brick has also identified that this work will be likely carried out in stages from north to south. Furthermore, the existing 500m buffer may be reduced further in the future, upon agreement of all relevant parties. Therefore there may be potential, in the future, for this area to become available for urban. The Clay Quarry precinct has the ability to accommodate approximately 34 lots or 96 people.

Together with the estimated yield from the proposed residential components of the District Structure Plan of 6,599 dwellings (Section 3.1.1) plus the estimated potential yield from the currently constrained 'Future Investigation Area' and 'Clay Quarry Buffer Area' of 2,811 dwellings (Section 3.1.3), would result in a total estimated build out yield of 9,410 dwellings which could accommodate approximately 26,348 people (excluding the existing 2018 population of 6,048).

This alligns with the State Government's target to accommodate Bullsbrook's forecast population of 26,483 people by 2036.



[45] Environmental Protection Authority Guidance Statement No. 3 (June 2005).

[46] This figure excludes the identified long term industrial site as well as Conservation and Bush Forever Sites.

3.2 Public Open Space

The future urban expansion of the study area will accommodate a variety of open space types in order to support the quality of life to future residents and people working within the area, taking advantage of and respecting the remnant bushland and natural water features which enrich this area.

The POS provision includes DOS with a district wide catchment, playing fields with an emphasis on active recreation, foreshore reserves with an emphasis on conservation and passive recreation, as well as local parks. The table below provides a schedule of existing and proposed POS within the study area.

Whilst it is beyond the scope of the District Structure Plan to specify in detail the location and exact amount of all future POS, the following table provides some guidance towards planning for the proposed residential components of the District Structure Plan in the medium term. Proposed DOS and active playing fields are in accordance with the City's draft Bullsbrook Community Infrastructure Plan (BCIP).

Local Structure Plans will be required to address requirements of the State's 'Liveable Neighbourhoods' policy by demonstrating how planned POS sites are of appropriate location and size and are well connected and designed from a usability, safety and surveillance perspective. A detailed schedule will be required to include the amount, distribution and staging of the POS delivery for each Local Structure Plan. The types of open space provided will need to meet the needs of all users and age groups. Developers will generally be required to design and construct all local open space in consultation with the City. Establishment/ maintenance programs are to be set up and agreed upon at Local Structure Plan stage in accordance with the City's current policy in this regard.

All Bush Forever sites are to be treated in accordance with SPP2.8 and are therefore not included in the consideration of open space.

Calculation of Subdivisible Area and Public Open Space Requirement

		Hectares
Study area	1,583	
Deductions		
Future Investigation Area (includes waste treatment site)		321.2
Clay Quarry Buffer Area		2.6
Conservation Sites		35.2
Foreshore reserves to be ceded		103.1
Public Purpose Sites (Commonwealth Reserves)		24.6
Total deductions		486.7
Net site area		1,096.3
Deductions		
Primary school sites		15.0
Town centres and commercial[47]		30.6
Industrial land[48]		403.0
Regional Roads (GNH & Chittering Road)		16.6
Total deductions		465.2
Net Subdivisible area		631.1
Public Open Space requirement at minimum of 10% of net subdivisible area[49]		63.1
Minimum unrestricted Public Open Space requirement (80%)[50]	50.5	
Less existing unrestricted Public Open Space sites		
Existing local parks:		
Wally Jones Park	0.24	
Existing neighbourhood parks:		
Ballad Park	0.74	
Brearley Park	0.63	
Existing district park		
Pickett Park	8	
Lowery Park Pavilion and Tennis Courts	2.84	
Total existing unrestricted Public Open Space		12.5
Proposed District Open Space (DOS)	9.3	
Other proposed POS adjacent to primary schools	7.7	
Total unrestricted Public Open Space (including DOS)		17

continued over...

Calculation of Subdivisible Area and Public Open Space Requirement			
		Hectares	
Maximum Restricted Public Open Space requirement (20%)[51]	12.6		
Less existing restricted use Public Open Space sites			
Existing restricted use sites:			
Ballad Park Drainage Basin	0.15		
Future restricted use sites[52]:			
128 North Ave Bullsbrook	0.77		
9002 North Ave Bullsbrook	0.2		
Chittering/Hurd/Burley Rd Bullsbrook Structure Plan	1.12		
Total existing restricted use Public Open Space		2.2	
Minimum unrestricted Public Open Space to be provided (ha)		21.0[54]	
Maximum restricted Public Open Space to be provided (ha)		10.4	
Total minimum Public Open Space to be provided (ha)			31.4[53]

3.2.1 Active open space

The majority of required active open space will be addressed through the provision of the DOS identified within the District Structure Plan, in addition to the existing Pickett Park oval site.

A fourth playing field site may need to be identified in the north of the study area, at Local Structure Planning stage, at the point in time that this area begins to experience development pressure.

Sites identified by the City for active open space are to be relinquished to the City by the developer. These will generally be constructed by the City unless otherwise agreed with a developer. Cost sharing arrangements associated with such development are described further on in this report.

[47] 3ha allowed for non-residential uses within the Mixed Use precincts.

[48] Includes existing commercial/industrial centre which is proposed for Light Industrial uses.

[49] Minimum under the State's *Development Control Policy No. 2.3: Public Open Space in Residential Areas* (DC2.3). However the City is likely to request at least 13% to compensate for the area of POS used for drainage.

[50] DC2.3.

[51] ibid.

[52] Based on previously approved structure plans.

[53] Minimum under DC2.3—required in addition to the proposed DOS and school oval sites. However the City is likely to request at least 13% to compensate for the area of POS used for drainage.

[54] Based on 'Liveable Neighbourhoods'—required in addition to the proposed DOS and school oval sites.

3.2.2 Passive open space

This is required to be evenly distributed throughout the residential components of the District Structure Plan within walkable catchments. The study area is enriched with natural water features and it is expected that much of the local open space will be distributed adjacent to these creek lines and wet areas. Some open space credits (at a maximum of 2%) may be attributed to these natural areas, in addition to urban water management/drainage areas and natural wetlands, where the developer can demonstrate appropriate design and treatment in consultation with the City.

Minimum creek line buffers of 30m (subject to further investigation on a case by case basis at the Local Structure Planning stage) will be required to form foreshore reserves where applicable. The City will also require the provision of a hard edge separation of creek line and bushland areas to other development via roads. A developer may be able to demonstrate appropriate separation through shared path networks. This is provided adequate surveillance and fire separation can be provided without the need for clearing of remnant bushland/vegetation as identified for protection within the City's Local Biodiversity Strategy.

3.2.3 District open space

The City has identified the need for a DOS containing four possible additional ovals.

The area of 8.6ha indicatively set aside east of the town centre would accommodate:

- 4 rectangle pitches/2 cricket ovals;
- 5 cricket practice nets;
- 8 hard courts;
- supporting community building, inclusive of change rooms and amenity block;
- 249 (approximately) on-site parking bays.

Development of the DOS will be required to commence once 50% of residential lots are created in the catchment area. This is likely to occur between 2021 and 2026 when the population has reached 10,000–12,000 people.

Beyond this, additional ovals will be provided adjacent to the proposed new primary schools.

The DOS is indicatively identified on the District Structure Plan (Figure 18). It will form part of an area to be identified as a Development Contribution Area (DCA) in LPS17. A Development Contribution Plan (DCP) will need to be prepared that includes the DOS as a contribution item.

The City of Swan will only accept the vesting of the land in the indicatively identified location as DOS to the satisfaction of the EPA and City of Swan.



3.3 Community facilities

District Community Centre

With an expected population growth in Bullsbrook, the District Community Centre will be required to provide essential meeting, service and program space. The building will be constructed in two stages as the population gradually increases. The newly constructed first stage building includes a relocated library, Place Office, meeting rooms, function room, youth and child care facilities and, eventually, Home and Community Care services. The multi-use District Community Centre will be located at Pickett Park and will form part of the Community Hub. With close proximity to future town centre and sporting facilities, and separation from the district school, the site is considered most suitable. It already has a sense of identity and connection for existing residents, who currently patronise the adjacent sporting facilities; community hall and skate park.

The District Community Centre is primarily to cater for the needs of the Bullsbrook community, with the first stage proposed to be constructed in 2015 to replace a number of existing facilities in Bullsbrook. Further expansion of the facility will occur in response to population growth as a result of residential development, with the trigger for design and construction of the district level facilities being 50% of lots created in the study area. This is likely to occur between 2021 and 2026.

These facilities are proposed in accordance with the City's draft BCIP.

Local facilities

The district school has expressed an interest in relocating the local child health care clinic to the school site. This is supported and would be funded by the State Government.

Existing playgrounds are to be maintained or replaced in accordance with the City's existing 'Playspace Strategy'. These should be identified in individual Local Structure Plans where relevant.

The draft BCIP identifies that the public library will need to be relocated, preferably to the district community centre, and will require approximately 800m^2 in area.

The City has also recognised, through the draft BCIP, the need for a local community centre in the north-east area of Bullsbrook, in the event the currently constrained area was to be built out. Given the preference for facilities to be located on vested land, the flagged district school site could be an appropriate location for a future local community centre and should be considered in the design of the school site.

3.4 Movement network

Objectives

- Incorporate key transport routes throughout the District Structure Plan study area; and
- Provide for development which is consistent with 'Liveable Neighbourhoods' principles, incorporating walkable catchments and a well serviced public transport system.

The Bullsbrook District Structure Plan recognises the need to ensure that movement networks within the study area provide connectivity and amenity, achieving a safe, efficient, attractive and environmentally sensitive intermodal transport grid.

3.4.1 Regional road network

Main Roads WA's GNH Access Strategy recognises that, in time, the PDNH will relieve the regional freight function currently fulfilled solely by the GNH. Heavy vehicle traffic will be generally encouraged to use this route. Notwithstanding this, GNH will remain a high-wide load route and will therefore still accommodate a significant number of freight vehicles. Stock Road will serve as a major connector between the PDNH and GNH. The GNH Access Strategy recognises that the large number of property accesses along portions of this section of GNH reduce the safety and efficiency of the route. The strategy therefore recommends that new property accesses should not be supported, unless there is no reasonable alternative. As such the District Structure Plan proposes a road network that facilitates future development, but is consistent with the GNH Access Strategy, by attempting to reduce any further demand on GNH (refer Figure 22).

3.4.2 Local road network

The District Structure Plan's proposed movement network has been developed at an arterial and neighbourhood connector level, with input from the City's appointed traffic and transportation consultants and with regard to Main Roads WA's GNH Access Strategy referred to above.

The network was developed through analysis, modelling and assessment and represents the best and safest outcome in terms of both traffic flow around the proposed new town centre and connection to GNH.

The movement network is indicated in Figure 22.

The local network generally comprises the following for which the staging and funding mechanisms should be addressed in structure plans:

East of Great Northern Highway

- A proposed north south arterial route through the townsite between existing Chittering Road to the north and existing Lage Road to the south.[55]
- A proposed north south arterial route through the townsite, connecting existing Chittering Road to Stock Road via Burley Road and Alto Way.[56]
- Existing Maroubra Avenue to the north to be linked to GNH via a new 3 way un-signalised intersection.
- Existing Chittering Road to be converted to a cul-de-sac just prior to its existing intersection with GNH.
- Existing Brearley Street to the north to be linked to GNH via a new 3 way un-signalised intersection.
- Existing Lage Road to the south to be linked to GNH via a new 4 way signalised intersection.
- A new east west link to GNH from the existing unsealed Taylor Road linking southward via the arterial connector to a future 4 way signalised intersection.
- North of Brearley Street, existing North Avenue to link to GNH via a new 3 way un-signalised left-in left-out intersection.
- North of existing North Avenue, existing Kimberley Street to link to GNH via a new 3 way un-signalised intersection.
- A new road from existing Rutland Road linking eastward across GNH via a future 4 way signalised intersection, continuing eastwards to meet Chittering Road via Crocker Road.
- Existing Lage Road to be extended to the north-east, eventually linking to Clarkson Road, east of the study area.[57]

[55] Refer 'Activity Corridor and Public Transport'.

[56] The traffic volume expected on this road will increase substantially from just south of existing Nocturne Rise (as new development occurs). This road is likely to reflect a 'District Distributor' road as classified within the Main Roads WA Road Hierarchy for Western Australia. During initial stages of development, it is likely that this route will carry much of the heavy vehicle traffic through from Chittering Road to GNH via Stock Road. Once the proposed Rutland Road extension is constructed, heavy vehicle traffic will be encouraged to use this route to access GNH and PDNH via Rutland/Neaves Road. Confirmation of and details relating to the District Distributor classification will be determined via detailed traffic modelling provided in association with future structure plans for the area.

[57] This road connection is required as part of the adjacent approved 'Marlin Bullsbrook Structure Plan'—SP-011, approved subject to conditions in 2012, with subsequent modifications in March 2014).

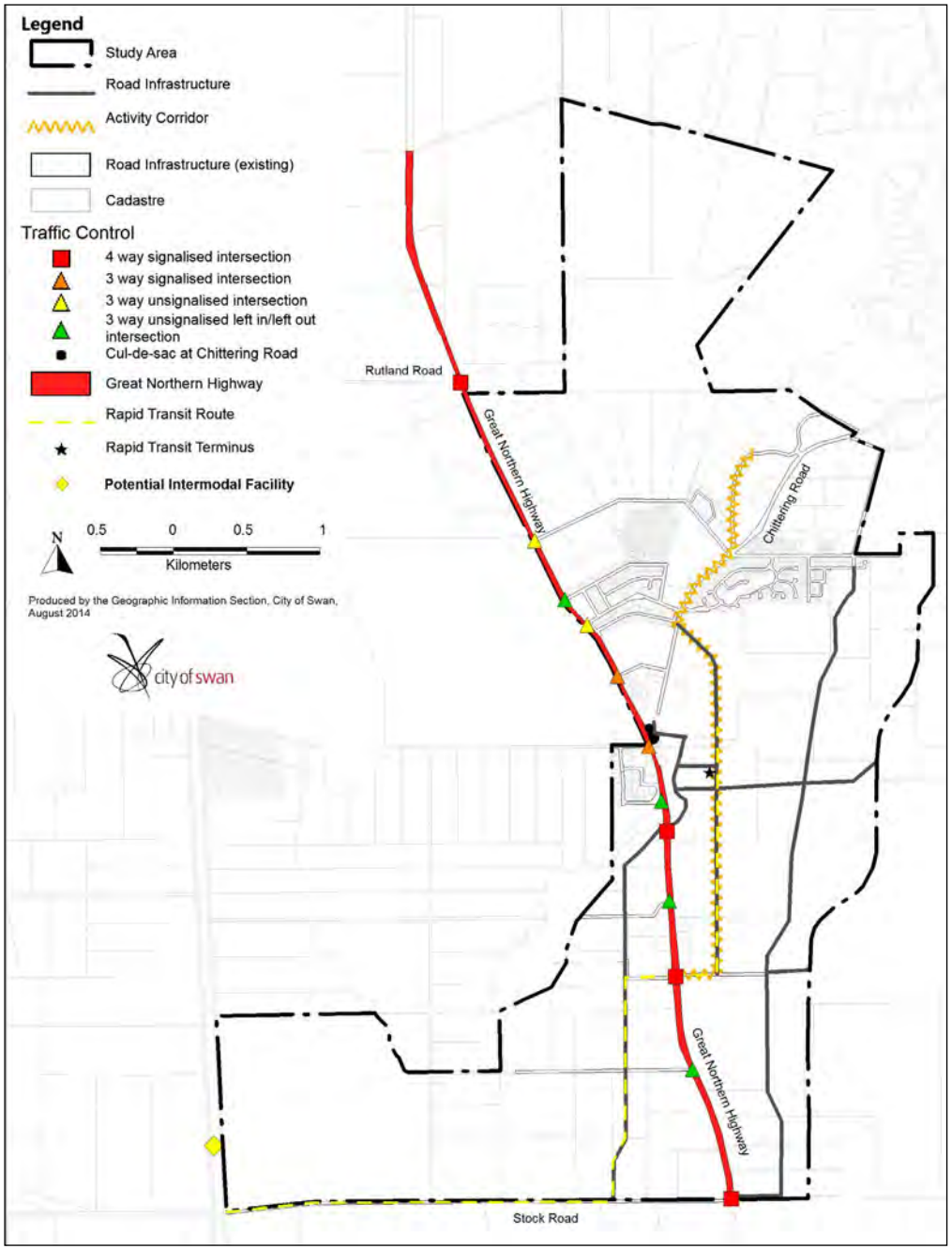


Figure 22. Bullsbrook Townsite District Structure Plan: Traffic Movement Network

West of Great Northern Highway

- Existing Stock Road to link to GNH via a new 4 way signalised intersection.
- Existing Warren Road to link to GNH via a 3 way un-signalised left-in left-out intersection.
- Existing Lage Street to link across GNH into existing Dewar Road via a new 4 way signalised intersection linking southwards to Stock Road.
- Existing Butternab Road to link to GNH via a new 3 way un-signalised left-in left-out intersection.
- A proposed new road extending south of Ki-It Monger Brook, to link across GNH to Taylor Road via a new 4 way signalised intersection, extending southwards to Warren Road.
- Existing Brig Way to link to GNH via a new 3 way un-signalised left-in left-out intersection.
- Existing Bullsbrook Road to link to GNH via a 3 way signalised intersection.

Activity Corridor and Public Transport

The Activity Corridor will be along the proposed arterial connector road from Lage Road to Chittering Road. The corridor will provide a central spine for movement and activity within the townsite. It will link the south Bullsbrook industrial area, shopping centres, schools and community facilities for residents and visitors. The Activity Corridor will accommodate the future public transport route, whilst also accommodating footpaths, cycling lanes and a focus point for medium/high density residential development.

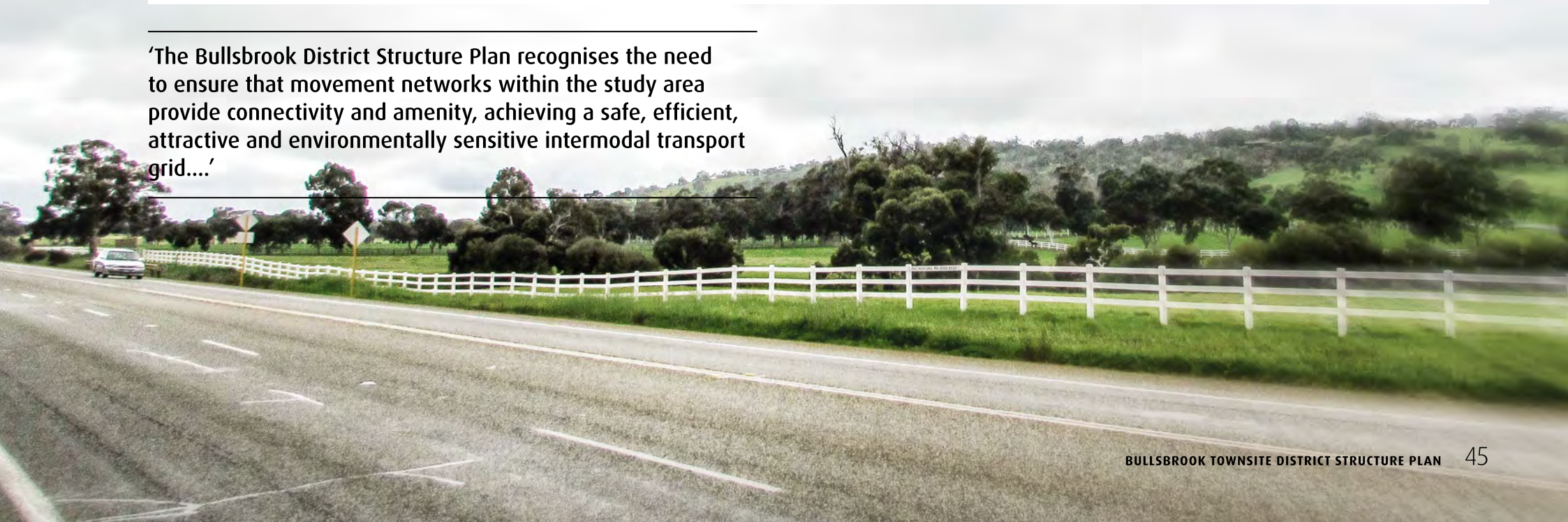
The District Structure Plan identifies a public transport link to Bullsbrook via a possible future Rapid Transit Service extension to the line which is intended to service the Swan Urban Growth Corridor and Ellenbrook. Details are to be discussed and explored with the Public Transport Authority and the Department of Transport at the detailed planing stages.

The public transport link is proposed to follow the PDNH route to the north of Ellenbrook and then service the proposed south Bullsbrook Industrial area via Stock Road and Bullsbrook town centre via the District Structure Plan Activity Corridor. The intention of the Rapid Transit Route is to identify the long term need for the proposed Bullsbrook town centre to be linked to the regional public transport network. Whilst the reference of a 'Rapid Transit Route' may be interpreted in different ways, the projected population of Bullsbrook is considered to be of a size that will only support a bus system (bus route that may in the long term, at best, include priority interchanges). A rapid transit terminus is proposed on the edge of the District Centre, along the Activity Corridor, to serve as a central passenger collection and distribution point. Additional bus services would also be provided within the new residential areas, connecting into the Activity Corridor.

3.4.3 Neighbourhood network

Neighbourhood networks will be designed and developed by developers through Local Structure Planning to the satisfaction of the City of Swan and will be required to conform to the standards and requirements of 'Liveable Neighbourhoods' by providing connective, amenable and integrated street networks which are safe, efficient, attractive and encourage walkability within individual catchments. Refer to Figure 14A.

'The Bullsbrook District Structure Plan recognises the need to ensure that movement networks within the study area provide connectivity and amenity, achieving a safe, efficient, attractive and environmentally sensitive intermodal transport grid....'



3.5 Environmental and water management

Objective

- Ensure that future development provides for environmentally sensitive design, protecting existing landscape and natural water features whilst ensuring safety for future communities.

3.5.1 Management of water

An RWMS has been prepared for the study area by GHD on behalf of the City of Swan. This is attached at Appendix 1.

The RWMS has been prepared in accordance with the Better Urban Water Management Strategy with enough detail so that a District Water Management Strategy is not required. However, future structure plan proposals will be required to be accompanied by a Local Water Management Strategy and relevant district and local level water monitoring.

The RWMS demonstrates how water resources can be considered in land use planning and proposes a range of recommendations which will need to be taken into account at structure planning stage to conserve water supply in Bullsbrook and to meet the requirements of:

- *State Water Plan 2007*;
- *State Planning Strategy 1997*;
- *Liveable Neighbourhoods 2007*;
- *State Planning Policy 2.9 Water Resources 2006*;
- *Better Urban Water Management Strategy*.

Wetland and creek line buffers

The RWMS outlines a range of environmental asset management criteria, including the maintenance of minimum wetland and creek line buffers at 50m and 30m respectively (subject to further investigation on a case by case basis at the Local Structure Planning stage). It proposes the maintenance of creek buffer lines as foreshore reserves in accordance with State requirements, as well as the encouragement of passive recreation such as walking, rowing and canoeing along waterways. The RWMS also recommends passive bank stabilisation techniques, such as revegetation, prevention of stock access and Foreshore Condition Assessments along river banks, to prevent and remediate foreshore erosion.

Water conservation

The recommendations of the RWMS refer to utilising water conservation techniques such as fit-for-purpose water; rainwater tanks; urban run-off (stormwater) for irrigation; treating domestic grey water and treating wastewater.

The RWMS notes that there will be limited groundwater made available by the DoW for the irrigation of POS. A range of techniques is outlined in order to conserve the limited ground water available for irrigation of future POS. This includes Xeriscaping, Hydrozoning, incorporation of rain gardens/swales, and sourcing of alternative water supplies (e.g. water recycling) and ground surfaces. Further detailed studies are being carried out by the City to determine the most appropriate option in order to facilitate future urban development.

3.5.2 Vegetation protection

Much of the area within the townsite has already been cleared for past agricultural uses. However, a number of key sites have been identified which contain vegetation considered to have significance.

Threatened ecological community

The District Structure Plan design attempts to avoid development within or near to any known Threatened Ecological Communities (TECs). However, in the event that a TEC is identified in a more detailed Local Structure Plan investigation, it is generally accepted that it is the proponent's responsibility to prove the TEC is not within the development area, or else provide some form of natural corridor to ensure its sustainability (GHD, 2011).

Planning for bushfire protection

The District Structure Plan design attempts to avoid any known areas of extreme bushfire risk. Whilst most developable land within the study area is relatively cleared, the close proximity of the Darling Scarp and associated National Park with its bushfire risks, poses a serious threat to lives. Significant consideration must be given to this at structure planning stage. All subdivisions will be required to comply with the State Government's *Planning for Bushfire Protection* policy and the City's LPS17, in particular with regard to the need for fire management plans and construction of buildings in accordance with Australian Standards AS3959.

3.6 Education and cultural considerations

Objective

- Identify suitable community facilities, open space and employment generating sites that provide equitable access for existing and future residents.

3.6.1 Education

Based on the number of new lots which can be accommodated within the study area, a total of three new primary schools are likely to be required. An additional high school may also be required if the developable land area of the existing district high school level facilities on the existing Bullsbrook College site cannot be expanded and upgraded, due to existing natural environmental constraints, to meet the demand of the future community needs for secondary education service delivery (for Year 7 to Year 12 students).

The City has identified the need for three senior ovals in the study area (in addition to the DOS and the existing Pickett Park oval). These can be co-located and thus shared with the primary schools where appropriate and should be distributed across the study area. The City requires each senior oval to comprise a minimum gross area of approximately 3.6ha (dimensions 165m x 135m) with the playing field wholly located on City land. These would be considered as neighbourhood playing fields and are identified as POS within the District Structure Plan.

If a new high school site is required, its location will need to be confirmed through future investigatory studies and confirmation on whether a new high school site is required should be determined prior to supporting the first major local structure plan.

However, the preferred approximate location is identified in Figure 18, to the east of the study area. Given that the potential school site would serve a district function, the suggested location is considered appropriate.

Further investigation will be required into the exact location of the school (taking into consideration topography, water bodies, bushfire risk, agricultural land capability and the need to preserve visual amenity along the scarp line). If such matters cannot be resolved, an alternative appropriate site will need to be identified.

Normally provided at a rate of one stand-alone 4.0 hectare primary school for every 1,500 lots and one stand-alone 10.0 hectare high school for every 6,500–7,000 lots, the provision of shared use of playing field facilities co-located with schools will potentially allow a reduction in the size of a primary school site (3.5ha) and the high school site (9.0ha), following consultation with the Department of Education (DoE).

3.6.2 Aboriginal heritage

There are five Aboriginal Heritage sites located within the study area (refer Figure 13). In relation to these, and the assessment of future Local Structure Plans or individual site developments, applicants may be required to:

- Consult with relevant Aboriginal people about the proposal in general, or areas that may be subject to physical alteration;
- Undertake an Aboriginal Heritage survey or investigation;
- Develop a full inventory of heritage values;
- Reference Cultural Heritage Due Diligence Guidelines;
- Satisfy the requirements of the Department of Aboriginal Heritage.

3.6.3 Rural character

Future development should provide interpretations of the historical rural character of the area. This can be achieved through the encouragement of a diversity in lot types and residential design guidelines which support distinct built form and design elements that can reflect the area's rural past.



3.7 Infrastructure coordination, servicing and staging

Objective

- Provide a coordinated approach to the future urban development and implementation of associated infrastructure for those areas in Bullsbrook identified for urban expansion.

3.7.1 Servicing

Water supply

As outlined earlier, the Water Corporation has plans to acquire private land on which a new high level tank can be constructed to allow adequate water pressure to supply the expanded townsite. This site is likely to be located outside the study area (in order to be located in a suitably high position). The tank is likely to have sufficient capacity to feed the majority of the proposed future lots. However, if required, the Water Corporation will investigate an additional lower level tank in the future.

Headworks will be required to be funded via cost-sharing arrangements directly with the Water Corporation, in the event that future structure plans encompass land owned by multiple parties.

Wastewater management

The Water Corporation advises that the Bullsbrook Wastewater Treatment Plan (WWTP) will be decommissioned within the next few years and future service to the area will be linked to the WWTP in North Ellenbrook. No further upgrades are planned for the Bullsbrook WWTP. In the interim, development directly adjacent to the Bullsbrook WWTP will be impacted by existing buffers.

Future urban waste water will be pumped through a pipeline to Ellenbrook which would then convey the raw wastewater into the existing metropolitan sewer network. Delivery of this infrastructure will be based on timing, availability of capital and actual growth in the area (likely to be post 2017).

The Water Corporation advises that all properties outside of the Bullsbrook townsite will continue to rely on individual or grouped septic tanks or on-site effluent treatment systems.

Electricity

To support any major residential and industrial development within the Bullsbrook area, the construction of a new electricity zone substation between Maralla Road and Neaves Road (outside study area), supported by a network of distribution feeders, would be required.[58]

Gas supply

The potential expansion of residential and industrial uses in the study area could be supplied by natural gas through the MLV117 connection (south of Neaves Road), though this is a discretionary service and would be subject to economic viability.[59]

3.7.2 Developer contribution arrangements

As part of the future urban development, road infrastructure, utility headworks, POS and community facilities will need to be implemented via cost-sharing mechanisms. Individual developers will need to outline the method of cost-sharing for hard infrastructure items within their respective structure plans. The exception, however, will be cost sharing of community facilities and possible district level roads and stormwater infrastructure.

Given that the City has conducted pre-planning for the required facilities and their locations, the City will require an amendment to LPS17 to include the entire study area as a DCA. A subsequent DCP will need to be compiled to ensure that future developers contribute towards the costs of land provision and development of the necessary community facilities and possibly district level roads and drainage infrastructure.

Cost contributions will be levied on a full cost recovery basis. The need for shared infrastructure items included will be generated by development within Bullsbrook. The City will seek, where applicable and feasible, contributions from third parties (e.g. DoE and Department of Sport and Recreation) towards various infrastructure items, including the DOS, active POS and community facilities.

Any proposed DCPs will be prepared in accordance with the *Planning and Development Act 2005* (and associated amendments), SPP3.6 and the LPS17.

The DCPs will be based on the City's *Local Planning Policy Pol-TP-138 Swan Urban Growth Corridor—Infrastructure Strategy for Development Contributions*, while taking into consideration the more refined outcomes of relevant structure plans.

As per SPP3.6, DCPs shall contain the following information:

- The DCA to which the DCP applies;
- Schedules and mapping of the shared infrastructure items for development area;
- Infrastructure cost schedules detailing the cost of each item;
- The method of calculating the cost contribution;
- The method of cost apportionment;
- The process for review of cost contributions;
- Additional infrastructure which could be added.

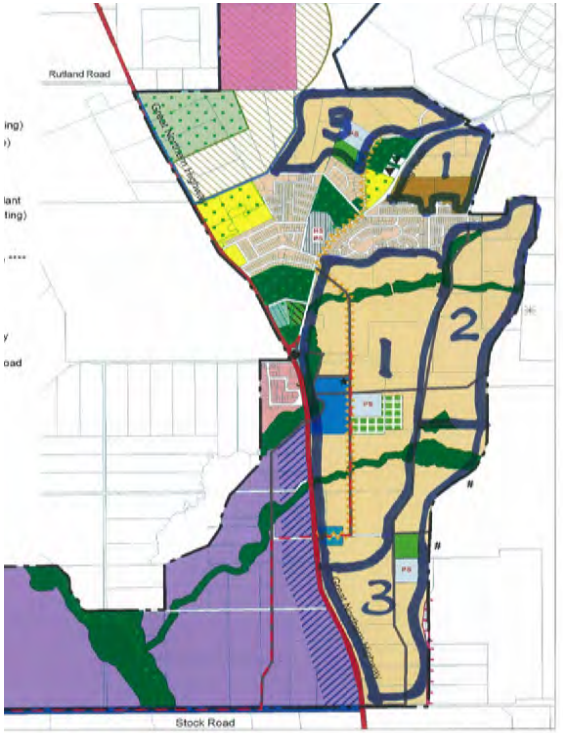


Figure 23. Bullsbrook Townsite District Structure Plan: Indicative Staging Plan

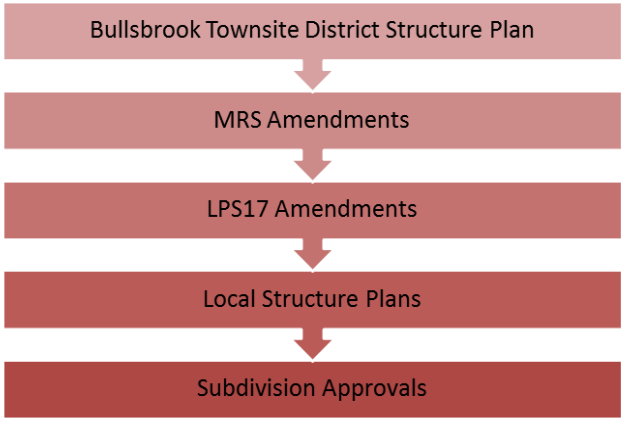
[58] Source: City of Swan 2008.

[59] Source: Ministry for Planning 1999.

3.8 Other requirements

The intention of this District Structure Plan is to highlight appropriate locations for key land uses, particularly those that will require cost sharing arrangements between future developers. In order for further urban development to commence within the study area, developers will be required to progress relevant MRS and LPS17 amendments and to gain approval for local structure plans for respective landholdings.

The process for this is indicated in the diagram below and discussed in the following.



3.8.1 Metropolitan Region Scheme amendments

For the District Structure Plan to be realised, the MRS will need to be amended, through the State Government. This shall include (though not necessarily limited to) appropriate rezoning of land, in accordance with the District Structure Plan, from:

- 'Urban Deferred' to 'Urban';
- 'Rural' to 'Urban';
- 'Rural' to 'Parks and Recreation'.

Such amendments could be progressed by landholders seeking to develop their land.

3.8.2 Local planning framework

Amendments

For the District Structure Plan to be realised, amendments to the City of Swan LPS17 is envisaged to be initiated by the City, and processed through State Government, including (but not necessarily limited to):

- Rezoning of land from 'General Rural' to 'Residential Development'; and 'Special Use'
- Creation of a 'DCA'.

Such amendments could be progressed by landholders seeking to develop their land. The purpose of rezoning land to 'Residential Development' or 'Special Use', is to ensure that development occurs only under careful structure planning for the area, which would allow the vision of the District Structure Plan to be achieved.

Local Structure Plans

As areas are rezoned to 'Residential Development' and 'Special Use' under LPS17, structure plans will be required to be lodged with the City to coordinate the proposed development.

Structure plans will need to address design (in accordance with 'Liveable Neighbourhoods' State policy principles) together with residential densities, employment and retail opportunities, services, community facilities, POS, environmental issues, as well as provision of a range of infrastructure services and its cost sharing arrangements.

Once Local Structure Plans have been approved by the City and the WAPC, development can proceed.



4.0 Conclusion

The foregoing demonstrates that this District Structure Plan for Bullsbrook townsite meets the objectives of the strategy, satisfies the targets of 'Directions 2031' and goes towards meeting the City's vision for the District Structure Plan which is to accommodate the future community in a liveable town which is sustainable, vibrant and prosperous.

Accordingly, it is recommended that this District Structure Plan be used as the basis for future development of the Bullsbrook Townsite.

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This document can be made available in alternative formats on request.

COS01447

APPENDIX 2

Bushfire Management Plan and
Bushfire Hazard Level Assessment



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Thursday, 23 April 2026

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Name:	Andrew Cook	Project No.:	A25.063
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Email:	Andrew.Cook@dplh.wa.gov.au		

Bushfire Management Plan Addendum: Amendment No. 1 - Bullsbrook North District Structure Plan

Background

This Bushfire Management Plan (BMP) addendum has been prepared to address the outstanding bushfire matters in relation to Amendment No. 1 of the Bullsbrook North District Structure Plan (the DSP), as shown in Figure 1 and Figure 2. The DSP was accompanied by a BMP (Lushfire & Planning, 2023) given the subject site is designated as Bushfire Prone Area 2 on the Western Australian Map of Bushfire Prone Areas (DFES, 2024; Figure 3).

The City of Swan (the City) have recommended approval of the DSP to the Western Australian Planning Commission (WAPC) subject to the BMP being approved by the Department of Fire and Emergency Services (DFES). While *State Planning Policy 3.7 – Bushfire* (SPP 3.7; WAPC, 2024a) and the *Planning for Bushfire Guidelines* (the Guidelines; WAPC, 2024b) no longer requires DFES to approve or endorse BMPs, there are several comments that remain unresolved. These are unable to be addressed through updates to the existing BMP given the author has recently retired, and subsequently Western Environmental Approvals Pty Ltd (WEPL) was engaged to address the unresolved comments through preparation of this BMP addendum.

Purpose

Considering the above and in consultation with the Department of Planning, Lands and Heritage (DPLH), this BMP addendum seeks to:

- Address the outstanding DFES comments relevant to the strategic planning stage.
- Validate the bushfire assessment prepared by the previous bushfire consultant.
- Validate the assessment against the bushfire protection criteria of the *Guidelines for Planning in Bushfire Prone Areas - Version 1*.4 (WAPC; 2021).
- Identify any differences between the acceptable solutions in the *Guidelines for Planning in Bushfire Prone Areas v1.4* (WAPC; 2021) and the *Planning for Bushfire Guidelines* (WAPC; 2024b) and outline how subsequent planning stages can satisfy the current bushfire planning framework.

This addendum is to be read in conjunction with the existing BMP (Lushfire & Planning, 2023).

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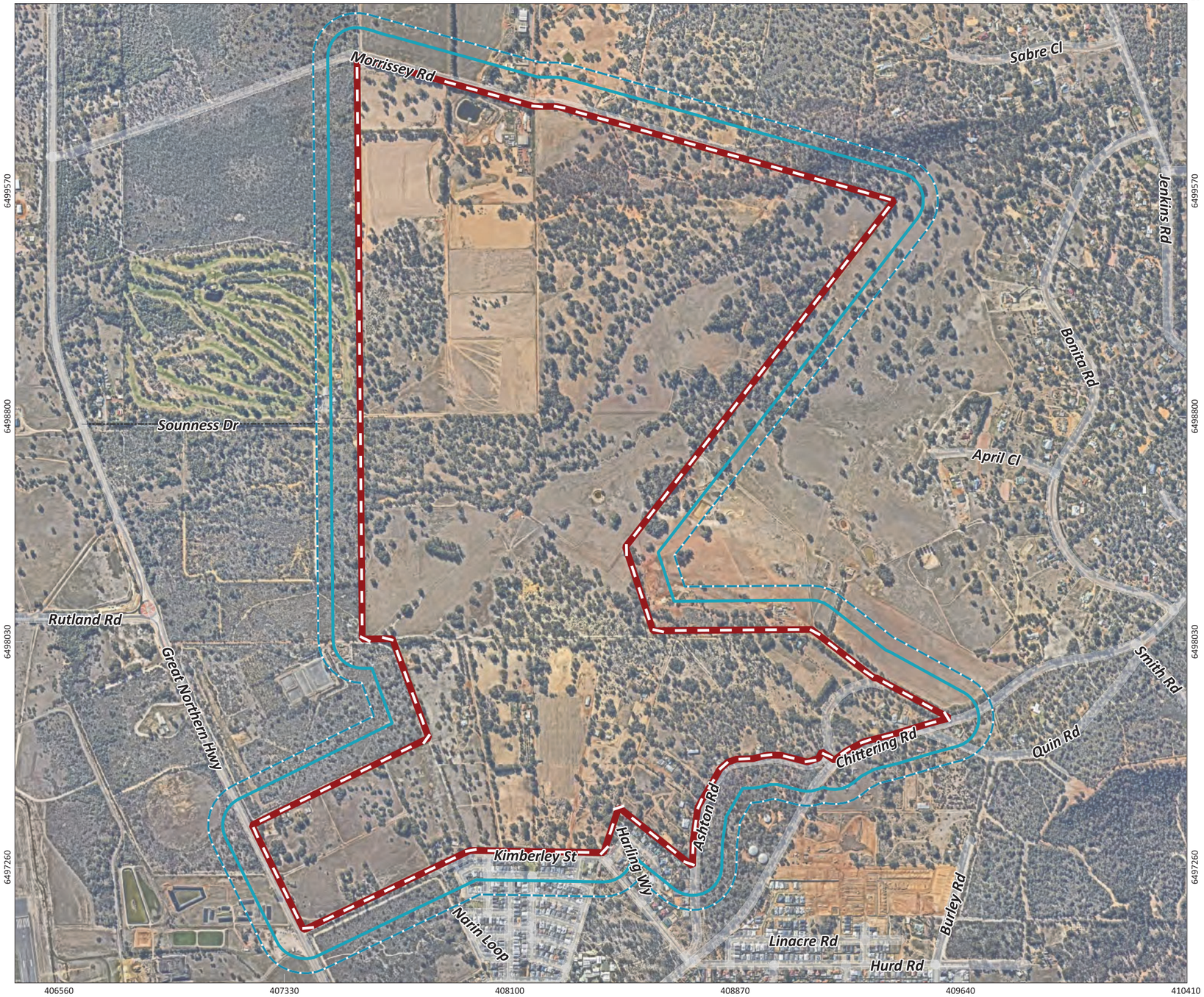





Figure 1: Site Overview

N

0 200 400 600 800 m

PROJECT/REPORT NAME	Bushfire Management Plan Addendum Bullsbrook North District Structure Plan
SCALE	1:15,400
SHEET SIZE	A3 COLOUR
CLIENT	Bullsbrook North Landowner Group
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.063
VERSION	0
DATA SOURCE	Nearmap (11th May 2025)
DRAWN BY / REVIEWED BY	SM/DW
DATE	23/1/2026

Legend

- Subject Site
- Buffer 100m
- Buffer 150m
- Buffer 2km

No	Description	Drawn	Approved	Date
A	Original issue	SM	DW	23/1/2026

NOTES:

Cadastral boundary (LGATE-002). Base map ESRI Topo. Townsites (LGATE-248).

WESTERN ENVIRONMENTAL

Western Environmental Pty Ltd
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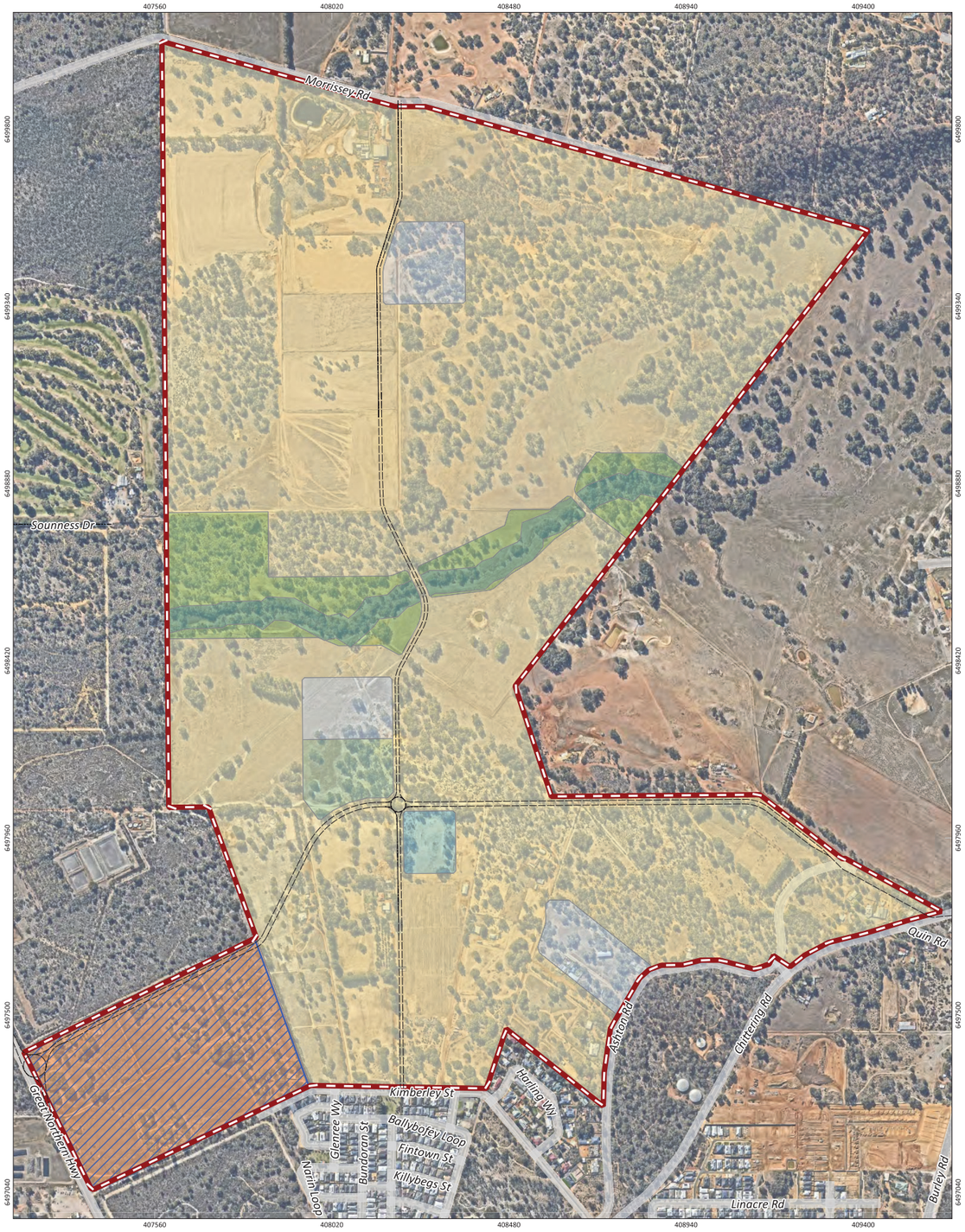

Figure 2: Site Plan

N 0 80 160 240 320 m

PROJECT/REPORT NAME	Bushfire Management Plan Addendum Bullsbrook North District Structure Plan
SCALE	1:9,200
SHEET SIZE	A3 COLOUR
CLIENT	Bullsbrook North Landowner Group
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.063
VERSION	0
DATA SOURCE	Nearmap (11th May 2025)
DRAWN BY / REVIEWED BY	SM/DW
DATE	23/1/2026

Legend

- Subject Site
- Conservation
- Public Open Space
- Playing Fields
- Neighbourhood Centre
- Primary School
- Future Residential
- Investigation Area
- Future Road

No	Description	Drawn	Approved	Date
A	Original issue	SM	DW	23/1/2026

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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Figure 3: Bushfire Prone Areas

N 0 90 180 270 360 m

PROJECT/REPORT NAME	Bushfire Management Plan Addendum Bullsbrook North District Structure Plan
SCALE	1:10,400
SHEET SIZE	A3 COLOUR
CLIENT	Bullsbrook North Landowner Group
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.063
VERSION	0
DATA SOURCE	Nearmap (11th May 2025)
DRAWN BY / REVIEWED BY	SM/DW
DATE	23/1/2026

Legend

- Subject Site
- Buffer 100m
- Buffer 150m

Bush Fire Prone Area Planning (OBRM-023)

- Bushfire Prone Area 2

No	Description	Drawn	Approved	Date
A	Original issue	SM	DW	23/1/2026

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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DFES Comments

The BMP has previously been referred to DFES as part of the planning assessment for the Metropolitan Region Scheme (MRS) amendment and the DSP. WEPL understand that DFES have raised similar concerns through both referrals which include:

- The vegetation assessment and bushfire hazard level (BHL) assessment have not been prepared in accordance with the Guidelines and is unable to be validated.
- Several assumptions have been made regarding changes to classified vegetation, including the caravan park and the conservation reserve which are unable to be validated.
- Encroachments of BAL-40 or BAL-FZ into the setback areas of future residential lots.
- Details required on how access can be provided to all areas of the DSP.
- Details required on how reticulated water supply can be provided.
- Future stages and landscaping will need to consider the requirements for perimeter roads and/or fire service access routes.

WEPL have addressed the relevant DFES comments through the preparation of this BMP addendum. A separate response letter has been prepared outlining how the DFES comments have been addressed and/or can be addressed at subsequent planning stages. WEPL recommends that the DSP is progressed without referral of this BMP addendum to DFES given subsequent BMPs prepared at the local structure planning stage will be referred to DFES for further comment. At this time, many of the DFES comments are likely to be addressed given additional details will be provided as part of the local structure plan.

Bushfire Assessment

WEPL have undertaken a site assessment to validate the vegetation classifications in the BMP and identify any changes that may have occurred since the assessment was undertaken in 2022. In addition, given the size of the assessment area and the strategic nature of the proposal, WEPL have conservatively reclassified areas of vegetation to align with DFES expectations. It is anticipated that these vegetation classifications will be refined at subsequent planning stages when a more detailed analysis is undertaken to prepare the more detailed Bushfire Attack Level (BAL) Contour assessments.

Photographs relating to each individual vegetation plot identified on Figure 4 are included in Attachment A. The vegetation classifications vary from the previous assessment, as follows:

- Areas of vegetation throughout the assessment area that are contiguous with adjacent vegetation and comprise less than 10% of the plot area have been reclassified based on the predominant vegetation type. This relates to:
    - Areas of Class D Scrub within the subject site being reclassified to Class A Forest.
    - Areas of Class C Shrubland within the subject site and adjacent to the western boundary being reclassified to Class A Forest.
    - Areas of Class A Forest adjacent to the western boundary being reclassified to Class D Scrub.
- An area of Class D Scrub has been reclassified as Class G Grassland given it has been cleared. This relates to an area of Lucerne within the subject site along the western boundary.

The above has resulted in no changes to the existing BHL assessment given:

- The changes to vegetation classifications on the subject site will have a post development BHL of LOW given the majority of the site will be cleared to facilitate future development, as shown in Figure 5.
- The changes to vegetation classifications outside of the subject site have the same hazard level (for example, Forest and Scrub both have an extreme BHL).

A revised BHL assessment (Figure 6) has been prepared in accordance with the Guidelines which is based on the post development vegetation classifications (Figure 5) and the concept master plan in Attachment B. The BHL is based on the following post development assumptions:

- Areas identified for future development (i.e. residential, commercial, primary schools and investigation areas) have been excluded on the basis that they will be cleared, with any retained vegetation to meet the definition of low threat vegetation in accordance with Clause 2.2.3.2 (f) of AS 3959: 2018.
- Road reserves have been excluded on the basis that they will be cleared, with any retained vegetation within the verges to meet the definition of low threat vegetation in accordance with Clause 2.2.3.2 (f) of AS 3959: 2018.
- Areas of unrestricted POS excluded on the basis that they will be managed as public parkland, with any retained trees to meet the definition of low threat vegetation in accordance with Clause 2.2.3.2 (f) of AS 3959: 2018.
- Areas of restricted POS (conservation reserve) classified as Class A Forest on the basis that vegetation will be retained, with the potential for revegetation within the associated 30m buffer.

Assessment Against the Bushfire Protection Criteria (v1.4 of the Guidelines)

The DSP has been assessed against the Bushfire Protection Criteria (BPC) of the now superseded v1.4 of the Guidelines (Table 1). As the DSP was assessed under v1.4 of the Guidelines, reassessment of the DSP under the recently adopted 2024 Guidelines may result in incompatibilities. As such, assessment of the DSP against v1.4 of the Guidelines is considered appropriate.

Notwithstanding, WEPL have also considered the BPC in the 2024 Guidelines to identify any incompatibilities that may arise at subsequent planning stages. This is discussed below, in the section following Table 1.

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Table 1: Assessment against the Bushfire Protection Criteria

Bushfire Protection Criteria	AS	PS	N/A	Assessment
Element 1: Location				
A1.1 Development location	✓	☐	☐	Post development, the majority of the subject site will have a moderate or low BHL. Lots will be separate from bushfire hazards through the use of public roads, asset protection zones (APZs) and/or low threat POS to ensure future habitable buildings are subject to a radiant heat exposure not exceeding 29kW/m^2 (BAL-29).
Element 2: Siting and design of development				
A2.1 Asset Protection Zone (APZ)	✓	☐	☐	The subject site will enable suitably sized APZ to be provided around future habitable buildings to ensure the radiant heat exposure does not exceed 29kW/m^2 (BAL-29). Upon completion of the subdivision works, future habitable buildings are likely to be subject to a radiant heat exposure not exceeding 29kW/m^2 (BAL-29). Accordingly, APZs are unlikely to be required unless bushfire hazards are retained within the subject site due to the staging of subdivision.
Element 3: Vehicular access				
A3.1 Public Roads	✓	☐	☐	Public roads will be designed in accordance with the relevant technical specifications applicable to the class of road as specified in the IPWEA Subdivision Guidelines, Liveable Neighbourhoods, Austroads Standards and/or any applicable standard in the local government area.
A3.2a Multiple access routes	✓	☐	☐	Multiple access routes from the subject site to more than two suitable destinations will be available via the public road network, following the delivery of the east-west road connection to Great Northern Highway and/or additional connections to the existing public road network. This includes direct access to the Bullsbrook townsite (suitable destination) and Tonkin Highway which provides access to multiple suitable destinations. In addition, the DSP will likely result in the creation of additional suitable destinations within the subject site.
A3.2b Emergency access way	☐	☐	✓	Emergency access ways are not required given compliance with A3.2a has been achieved. There is insufficient detail at DSP stage to determine whether emergency access ways will be required as part of the internal road layout. However, emergency access ways are unlikely to be required based on the concept master plan (Attachment B).
A3.3 Through roads	✓	☐	☐	The majority of existing public roads providing access to the subject site are through roads, with the exception of Morrissey Road. The concept master plan (Attachment B) indicates internal access roads connecting to Morrissey Road, reducing the extent of the no-through road to less than 200m and improving access and egress for existing properties along Morrissey Road. If Morrissey Road remains a no-through road, it will need to be upgraded to include a turnaround area (i.e. cul-de-sac) for a Type 3.4 fire appliance vehicle. While Kimberley Road is a no-through road, access to the subject site will not be from the no-through road portion, as shown on the concept master plan (Attachment B). There is insufficient detail at DSP stage to determine whether no through roads are required as part of the internal road layout. Compliance will be confirmed at subsequent planning stages however all public roads are planned to be through roads based on the concept master plan (Attachment B).
A3.4a Perimeter roads	☐	☐	✓	There is insufficient detail at DSP stage given the internal road layout is yet to be determined. Compliance will be confirmed at subsequent planning stages. This is discussed further below.
A3.4b Fire services access route	☐	☐	✓	There is insufficient detail at DSP stage given the internal road layout is yet to be determined. Compliance will be confirmed at subsequent planning stages. This is discussed further below.
Element 4: Water				
A4.1 Identification of future water supply	✓	☐	☐	Future development will need to be serviced by a reticulated water supply, with hydrants to be provided in accordance with Water Corporation technical specifications. While investigations are ongoing, all stakeholders and agencies acknowledge that additional water infrastructure will be required to service future development.

Note: AS - Acceptable solution, PS - Performance solution, N/A - Not applicable.

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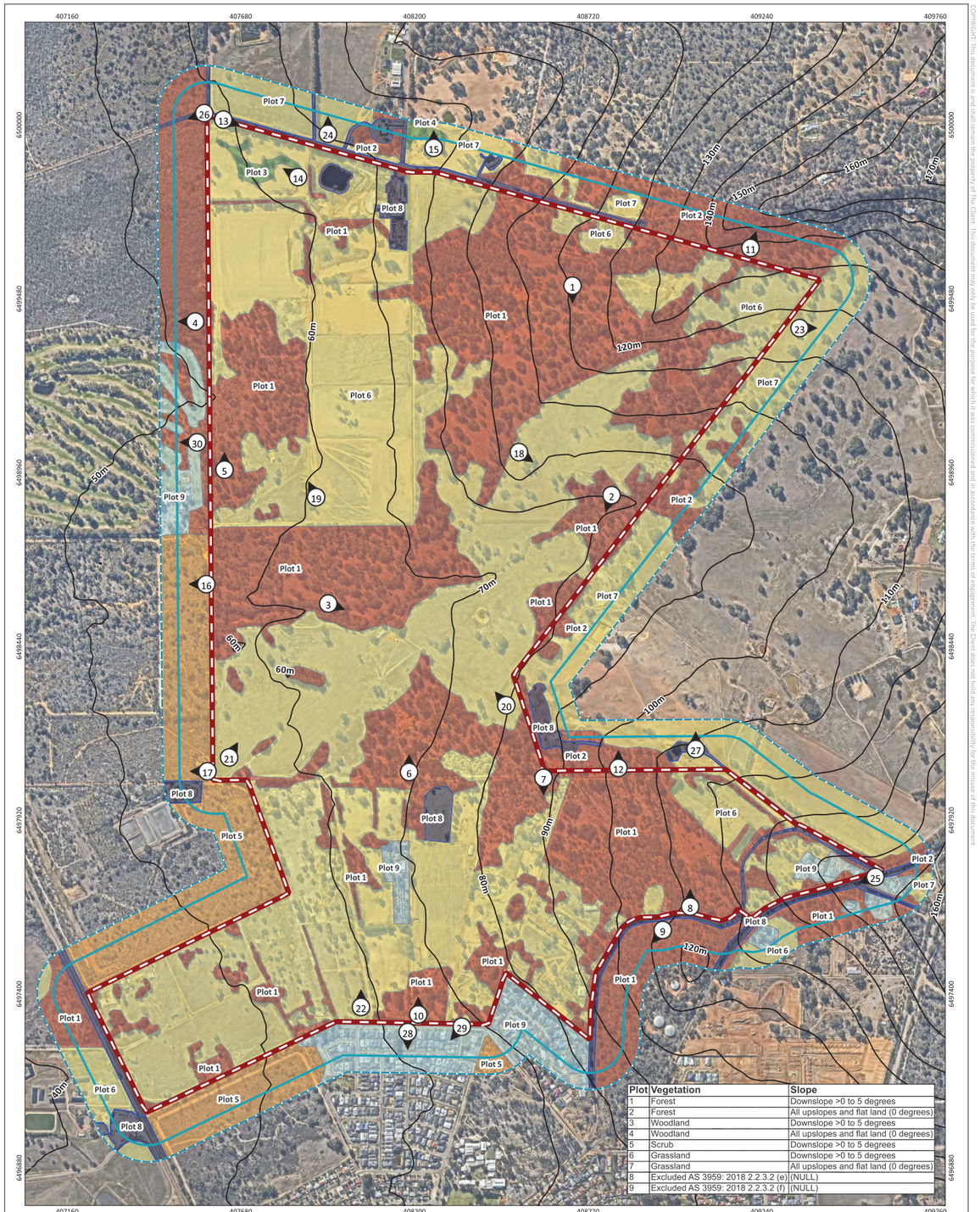

Plot	Vegetation	Slope
1	Forest	Downslope >0 to 5 degrees
2	Forest	All upslopes and flat land (0 degrees)
3	Woodland	Downslope >0 to 5 degrees
4	Woodland	All upslopes and flat land (0 degrees)
5	Scrub	Downslope >0 to 5 degrees
6	Grassland	Downslope >0 to 5 degrees
7	Grassland	All upslopes and flat land (0 degrees)
8	Excluded AS 3959: 2018 2.2.3.2 (e)	(NULL)
9	Excluded AS 3959: 2018 2.2.3.2 (f)	(NULL)

Figure 4: Pre-Development Vegetation Classification

N 0 90 180 270 360 m

PROJECT/REPORT NAME: Bushfire Management Plan Addendum Bullsbrook North District Structure Plan

SCALE: 1:10,400 | SHEET SIZE: A3 COLOUR | CLIENT: Bullsbrook North Landowner Group

COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50 | PROJECT NUMBER: A25.063 | VERSION: 0

DATA SOURCE: Nearmap (11th May 2025) | DRAWN BY / REVIEWED BY: SM/DW | DATE: 23/1/2026

Legend
- Subject Site
- Buffer 100m
- Buffer 150m
- Photos
- 10 metre contours (DPIRD-073)

Vegetation Classification
- Class A - Forest
- Class B - Woodland
- Class D - Scrub
- Class G - Grassland
- Excluded AS 3959: 2018 2.2.3.2 (e)
- Excluded AS 3959: 2018 2.2.3.2 (f)

No	Description	Drawn	Approved	Date
A	Original issue	SM	DW	23/1/2026

NOTES: Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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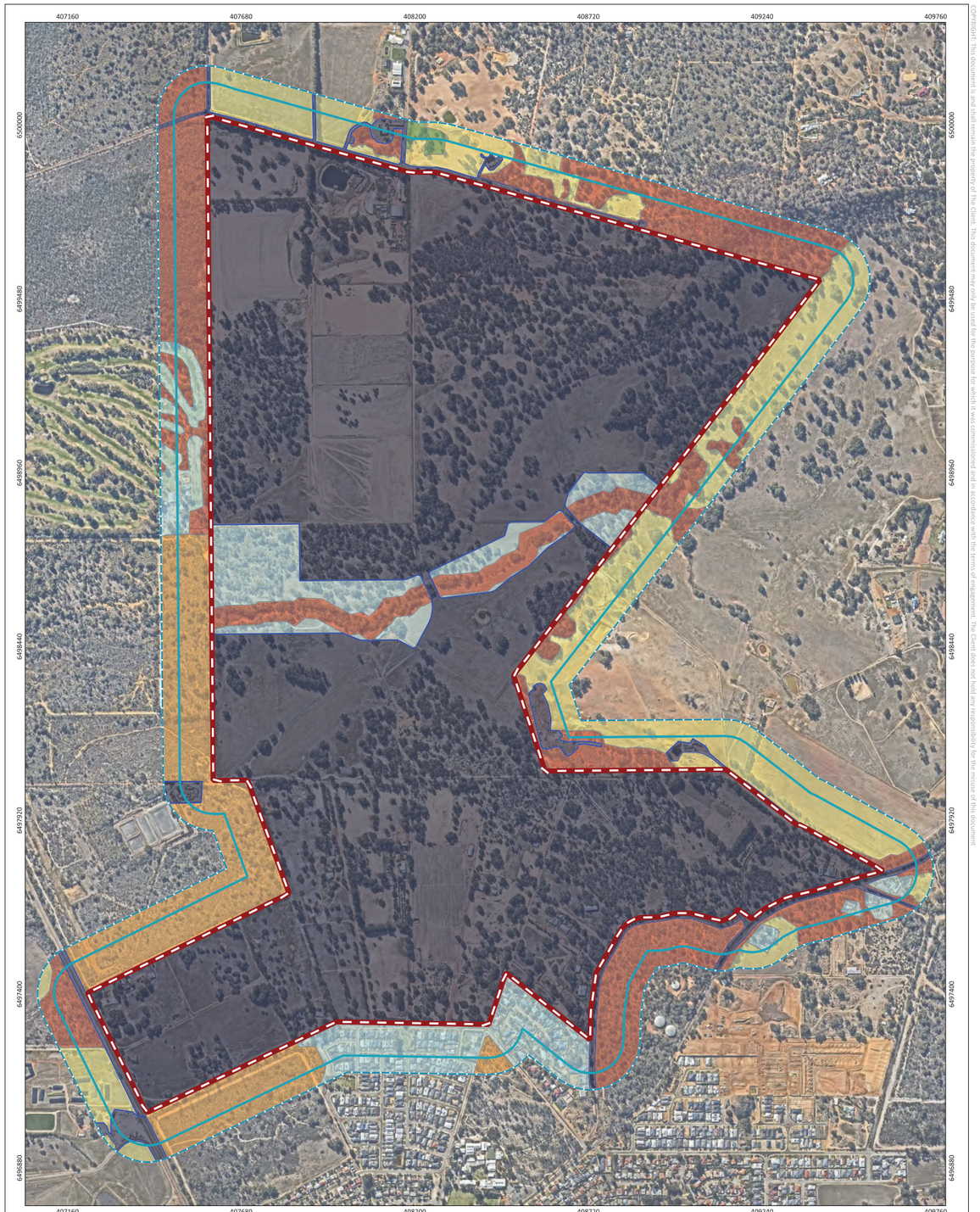

Figure 5: Post-Development Vegetation Classification

N 0 90 180 270 360 m

PROJECT/REPORT NAME: Bushfire Management Plan Addendum Bullsbrook North District Structure Plan

SCALE: 1:10,400 | SHEET SIZE: A3 COLOUR | CLIENT: Bullsbrook North Landowner Group

COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50 | PROJECT NUMBER: A25.063 | VERSION: 0

DATA SOURCE: Nearmap (11th May 2025) | DRAWN BY / REVIEWED BY: SM/DW | DATE: 23/1/2026

Legend
- Subject Site
- Buffer 100m
- Buffer 150m

Vegetation Classification
- Class A - Forest
- Class B - Woodland
- Class D - Scrub
- Class G - Grassland
- Excluded AS 3959: 2018 2.2.3.2 (e)
- Excluded AS 3959: 2018 2.2.3.2 (f)

No	Description	Drawn	Approved	Date
A	Original issue	SM	DW	23/1/2026

NOTES: Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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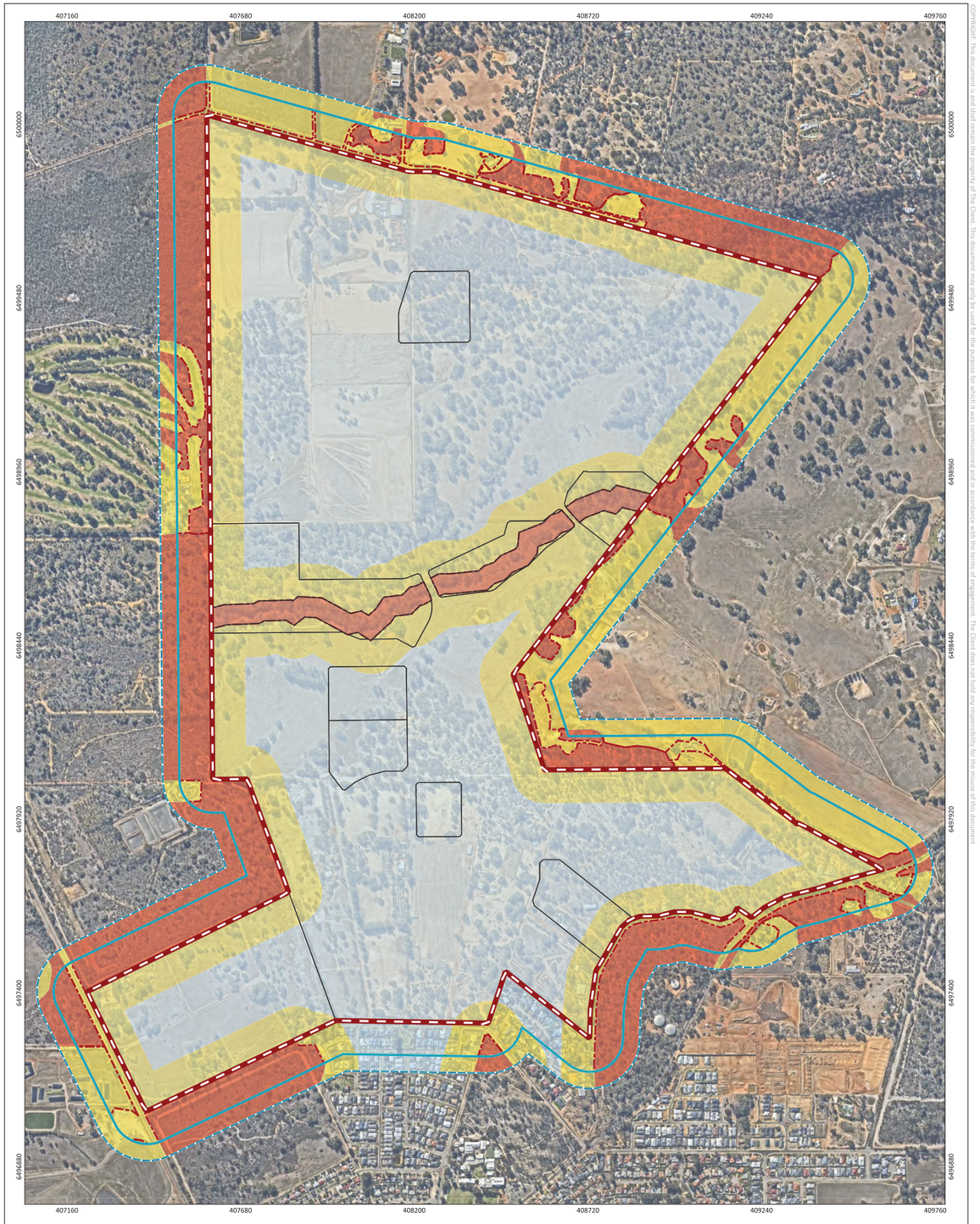

Figure 6: Bushfire Hazard Level (BHL)

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Updated Bushfire Policy Framework

The new SPP 3.7 and the Guidelines were adopted on 18 November 2024, after formal lodgment of the DSP. While the new SPP 3.7 and the Guidelines are not intended to be applied to planning proposals that have been lodged prior to the 18 November 2024, WEPL have undertaken an assessment to ensure subsequent planning stages meet the new policy requirements. Accordingly, the DSP has been assessed against BPC 4: Strategic Planning of the Guidelines with Table 7 of the previous BMP updated to demonstrate that subsequent planning stages are capable of achieving compliance with the updated bushfire policy framework (refer Attachment C).

Element 1: Location

The subject site is designated as Bushfire Prone Area 2 on the *Western Australian Map of Bushfire Prone Areas* (DFES, 2024). Strategic planning proposals in Bushfire Prone Area 2 are now required to determine the Broader Landscape Type in accordance with Appendix A.1 of the Guidelines. The strategic planning proposal satisfies the acceptable solution for Element 1 if it is located in Broader Landscape Type A.

A Broader Landscape Assessment (BLA; WEPL, 2025) in Attachment D has been prepared in accordance with the Guidelines to determine whether the DSP complies with Element 1 of the Guidelines. The BLA determines that the subject site is Broader Landscape Type A and therefore meets the acceptable solution for Element 1.

Element 2: Siting and Design

Areas identified for future development shall achieve a pre- or post-development BHL of moderate or low which is consistent with the previous version of the Guidelines. As demonstrated in the BHL assessment (Figure 6), the areas identified for future development are subject to a moderate or low BHL.

The Guidelines have introduced a requirement for strategic planning proposals to avoid, or where unavoidable, minimise the clearing of native vegetation. WEPL assumes that environmental impacts have been assessed and that areas of native vegetation with environmental value will be retained throughout the subject site, with specific tree retention to be confirmed at detailed design stage.

Element 3: Vehicular Access

Strategic planning proposals are now only required to assess the following vehicular access requirements:

- Public roads, including perimeter roads, should meet the technical requirements applicable to the class of road as specified in the IPWEA Subdivision Guidelines, Liveable Neighbourhoods, Austroads Standards and/or any applicable standard in the local government area.
- Public access routes should be provided in two different directions, to two different suitable destinations; and with an all-weather surface.

- If public road access is via a no-through road which cannot be avoided due to demonstratable site constraints, the public road access is to be a maximum 200m from the boundary of the subject site to an intersection where two-way access is provided.
- If public access is via a no-through road, it shall comply with public road specifications and include a turnaround area for a Type 3.4 fire appliance (i.e. cul-de-sac).

The above vehicular access requirements are generally consistent with the previous version of the Guidelines. However, it should be noted that emergency access ways, perimeter roads and fire service access routes are no longer applicable to a strategic planning proposal under the new Guidelines. WEPL understands that these have been deferred to subsequent planning stages when greater details are available on the proposed road layout.

Element 4: Water Supply

The Guidelines require evidence to be provided that a sufficient and accessible reticulated water supply for bushfire firefighting can be provided at the subdivision and/or development application stage, in accordance with the specifications of the relevant water supply authority. This is consistent with the previous version of the Guidelines.

While investigations are ongoing, all stakeholders and agencies acknowledge that additional water infrastructure will be required to service future development within the DSP. As such, this should be considered sufficient to address the acceptable solution at this stage, with servicing arrangements to be outlined in the BMP at subdivision stage.

Additional Considerations

The concept master plan in Attachment B has been used to inform the assessment in this BMP addendum. As part of this assessment, the following matters have been identified as needing to be addressed at subsequent planning stages:

- The future Local Structure Plan and associated BMP for land within the Bullsbrook North Local Structure Plan Area No. 1: Kimberley Street North will need to address the delivery of the east-west road connection to Great Northern Highway to ensure the availability of suitable public vehicle access at an appropriate stage of development.
- The unrestricted POS will need to be designed to a public parkland specification to meet the definition of low threat vegetation under Clause 2.2.3.2 (f) of AS 3959: 2018. If vegetation within the unrestricted POS is unable to be modified to low threat, these areas will need to be classified in accordance with AS 3959: 2018, resulting in potential changes to the master plan layout.
- All subdivision stages will need to demonstrate that each lot has access to two different access routes providing access in different directions to two different suitable destinations. The key considerations for achieving this requirement include:
    - The construction of two (2) creek line crossings prior to any land being developed north of the creek line.
    - The east-west road connection being extended through to Great Northern Highway.
- The internal public road network will need to be modified to provide perimeter roads, as follows:
    - Along the northern boundary from the end of Morrissey Road through to the eastern boundary. The perimeter road is required to provide hazard separation to the Class A Forest to the north.
    - Along the western boundary from Morrissey Road through to the POS along the creek line. The perimeter road is required to provide hazard separation to the Class A Forest to the west. Fire service access routes in lieu of a perimeter road can potentially be used if there are site constraints along the western boundary adjacent, provided they connect back to the public road network every 500 m.
    - Along sections of the eastern boundary to provide hazard separation to areas of Class A Forest to the east. Perimeter roads are not required along sections of the eastern boundary which are adjacent areas of Class G Grassland.
- Evidence that a reticulated water supply can be provided to service the subject site and future development.

Conclusion

In the professional opinion of the author, the DSP satisfies the intent, aim and objectives of SPP 3.7 and the Guidelines and should therefore be approved by the WAPC.

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Attachment A:
Classified Vegetation Photos

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Plot 1	Class A Forest
Photo 1 Trees reaching up to 30 m in height with canopy cover exceeding 30%. The understorey structure is multi-tiered. The slope under this vegetation was assessed to be downslope > 0 - 5 degrees.	

Plot 1	Class A Forest
Photo 2 Trees reaching up to 30 m in height with canopy cover exceeding 30%. The understorey structure is multi-tiered. The slope under this vegetation was assessed to be downslope > 0 - 5 degrees.	

Plot 1	Class A Forest
Photo 3 (Background) Trees reaching up to 30 m in height with canopy cover exceeding 30%. The understorey structure is multi-tiered. The slope under this vegetation was assessed to be downslope > 0 - 5 degrees.	

Plot 1	Class A Forest
Photo 4 Trees reaching up to 30 m in height with canopy cover exceeding 30%. The understorey structure is multi-tiered. The slope under this vegetation was assessed to be downslope > 0 - 5 degrees.	

Plot 1	Class A Forest
Photo 5 Trees reaching up to 30 m in height with canopy cover exceeding 30%. The understorey structure is multi-tiered. The slope under this vegetation was assessed to be downslope > 0 - 5 degrees.	

Plot 1	Class A Forest
Photo 6 Trees reaching up to 30 m in height with canopy cover exceeding 30%. The understorey structure is multi-tiered. The slope under this vegetation was assessed to be downslope > 0 - 5 degrees.	

Plot 1	Class A Forest
Photo 7 Trees reaching up to 30 m in height with canopy cover exceeding 30%. The understorey structure is multi-tiered. The slope under this vegetation was assessed to be downslope > 0 - 5 degrees.	

Plot 1	Class A Forest
Photo 8 Trees reaching up to 30 m in height with canopy cover exceeding 30%. The understorey structure is multi-tiered. The slope under this vegetation was assessed to be downslope > 0 - 5 degrees.	

Plot 1	Class A Forest
Photo 9 Trees reaching up to 30 m in height with canopy cover exceeding 30%. The understorey structure is multi-tiered. The slope under this vegetation was assessed to be downslope > 0 - 5 degrees.	

Plot 1	Class A Forest
Photo 10 Trees reaching up to 30 m in height with canopy cover exceeding 30%. The understorey structure is multi-tiered. The slope under this vegetation was assessed to be downslope > 0 - 5 degrees.	

Plot 2	Class A Forest
Photo 11 Trees reaching up to 30 m in height with canopy cover exceeding 30%. The understorey structure is multi-tiered. The slope under this vegetation was assessed to be flat/upslope.	

Plot 2	Class A Forest
Photo 12 Trees reaching up to 30 m in height with canopy cover exceeding 30%. The understorey structure is multi-tiered. The slope under this vegetation was assessed to be flat/upslope.	

Plot 2	Class A Forest
Photo 13 Trees reaching up to 30 m in height with canopy cover exceeding 30%. The understorey structure is multi-tiered. The slope under this vegetation was assessed to be flat/upslope.	

Plot 3	Class B Woodland
Photo 14 Trees reaching up to 30 m in height with canopy cover less than 30% and grassy understorey. The slope under this vegetation was assessed to be downslope > 0 - 5 degrees.	

Plot 3	Class B Woodland
Photo 15 Trees reaching up to 30 m in height with canopy cover less than 30% and grassy understorey. The slope under this vegetation was assessed to be downslope > 0 - 5 degrees.	

Plot 4	Class D Scrub
Photo 16 Shrubs greater than 2m in height with foliage cover greater than 30%. The slope under this vegetation was assessed to be downslope > 0 - 5 degrees.	

Plot 4	Class D Scrub
Photo 17 Shrubs greater than 2m in height with foliage cover greater than 30%. The slope under this vegetation was assessed to be downslope > 0 - 5 degrees.	

Plot 5	Class G Grassland
Photo 18 Paddocks containing unmanaged grasses with an average height greater than 100mm. The overstorey vegetation comprises of less than 10% of the canopy cover. The slope under this vegetation was assessed to be downslope > 0 - 5 degrees.	

Plot 5	Class G Grassland
Photo 19 Paddocks containing unmanaged grasses with an average height greater than 100mm. The overstorey vegetation comprises of less than 10% of the canopy cover. The slope under this vegetation was assessed to be downslope > 0 - 5 degrees.	

Plot 5	Class G Grassland
Photo 20 Paddocks containing unmanaged grasses with an average height greater than 100mm. The overstorey vegetation comprises of less than 10% of the canopy cover. The slope under this vegetation was assessed to be downslope > 0 - 5 degrees.	

Plot 5	Class G Grassland
Photo 21 Paddocks containing unmanaged grasses with an average height greater than 100mm. The overstorey vegetation comprises of less than 10% of the canopy cover. The slope under this vegetation was assessed to be downslope > 0 - 5 degrees.	

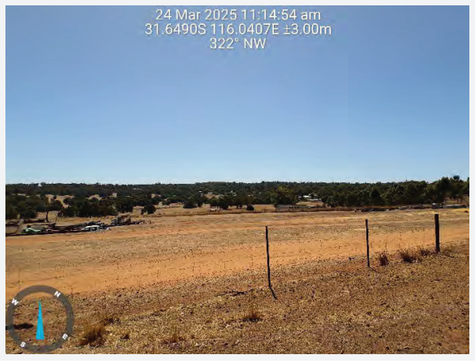
Plot 5	Class G Grassland
Photo 22 Paddocks containing unmanaged grasses with an average height greater than 100mm. The overstorey vegetation comprises of less than 10% of the canopy cover. The slope under this vegetation was assessed to be downslope > 0 - 5 degrees.	

Plot 5	Class G Grassland
Photo 23 Paddocks containing unmanaged grasses with an average height greater than 100mm. The overstorey vegetation comprises of less than 10% of the canopy cover. The slope under this vegetation was assessed to be downslope > 0 - 5 degrees.	

Plot 6	Class G Grassland
Photo 24 Paddocks containing unmanaged grasses with an average height greater than 100mm. The overstorey vegetation comprises of less than 10% of the canopy cover. The slope under this vegetation was assessed to be flat/upslope.	

Plot 7	Excluded - clause 2.2.3.2 (e)
Photo 25 Non-vegetated public roads.	

Plot 7	Excluded - clause 2.2.3.2 (e)
Photo 26 Non-vegetated public roads.	

Plot 7	Excluded - clause 2.2.3.2 (e)
Photo 27 Non-vegetated gravel driveways and cleared areas.	

Plot 8	Excluded - clause 2.2.3.2 (f)
Photo 28 Public parkland containing low threat vegetation.	

Plot 8	Excluded - clause 2.2.3.2 (f)
Photo 29 Residential development containing low threat vegetation.	

Plot 8	Excluded - clause 2.2.3.2 (f)
Photo 30 Golf course with low threat fairways.	

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Attachment B:

Concept Master Plan

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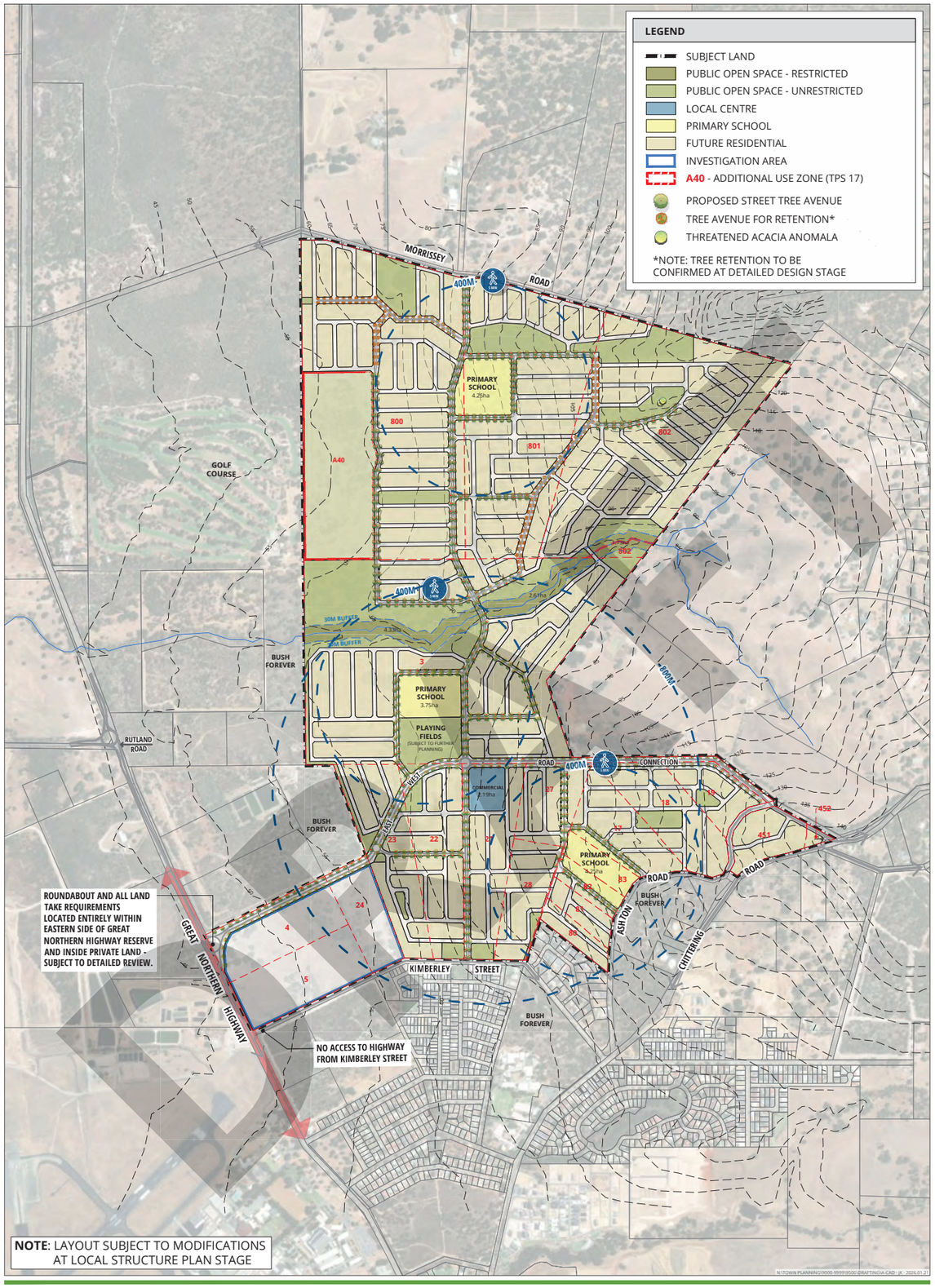

BULLSBROOK TOWNSITE NORTHERN PRECINCT MASTER PLAN CONCEPT

BULLSBROOK

N

0 300 m

SCALE @ A3: 1:12,500

9506-CON-07-E

DRAWN: WC
DATE CREATED: 2026.01.21
PROJECTION: MGA50 GDA94
CADASTRE: LANDGATE
AERIAL: BING 2020

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Attachment C:
BPC Compliance

Table 2: Bushfire Protection Criteria (2024) Compliance Assessment (Updated Table 7 from the previous BMP)

BPC	MRS Amendment	Local Planning Scheme Amendment	Local Structure Plan	Subdivision Application	Development Application
Element 1: Location					
Location	The subject site achieves Broader Landscape Type A and is therefore considered suitable for land use intensification, subject to suitable arrangements being in place for the timely delivery of the east-west connection to Great Northern Highway.	The subject site achieves Broader Landscape Type A and is therefore considered suitable for land use intensification, subject to suitable arrangements being in place for the timely delivery of the east-west connection to Great Northern Highway.	The subject site achieves Broader Landscape Type A and is therefore considered suitable for land use intensification, subject to suitable arrangements being in place for the timely delivery of the east-west connection to Great Northern Highway.	The subject site achieves Broader Landscape Type A and is therefore considered suitable for land use intensification.	Not applicable to the development application stage.
Element 2: Siting and Design					
Siting and Design	Areas identified for future development will be subject to a moderate or low BHL.	Areas identified for future development will be subject to a moderate or low BHL.	Local structure plans will need to demonstrate that areas identified for future development achieve BAL-29 or below with particular focus on the north-west and north-east interfaces. The BMP is to include high-level assessment of the POS	Subdivision applications will need to demonstrate that each lot provides a sufficient development site that achieves BAL-29 or below. The BMP is to include a refined assessment of the POS reserves taking into consideration vegetation	Development applications will need to demonstrate that all habitable buildings achieve BAL-29 or below.

BPC	MRS Amendment	Local Planning Scheme Amendment	Local Structure Plan	Subdivision Application	Development Application
			reserves taking into consideration vegetation retention, revegetation and landscape design.	retention, revegetation and landscape design.	
Asset Protection Zones (APZs)	Not applicable to strategic planning stage.	Not applicable to strategic planning stage.	Local structure plans will need to ensure there is a suitable setback between bushfire hazards and development areas for the provision of APZs (if required).	The subdivision design will need to ensure there is a suitable setback between bushfire hazards and development areas for the provision of APZs (if required).	Following completion of subdivisional works, it is unlikely that APZs will be required around future habitable buildings. If they are required due to bushfire hazards being retained on lots, the APZ shall be established to a width that enable BAL-29 or below to be maintained in perpetuity.
Clearing of native vegetation	The extent of clearing to be determined at subsequent planning stages.	The extent of clearing to be determined at subsequent planning stages.	Local structure plans will need to demonstrate how the proposal avoids or where unavoidable minimises the clearing of native vegetation in accordance with SPP 3.7, especially the identification and protection of significant habitat trees.	Subdivision applications will need to demonstrate how the proposal avoids or where unavoidable minimises the clearing of native vegetation in accordance with SPP 3.7, especially the identification and protection of significant habitat trees.	Development will need avoid, or where unavoidable, minimize the clearing of native vegetation.

BPC	MRS Amendment	Local Planning Scheme Amendment	Local Structure Plan	Subdivision Application	Development Application
			The BMP will need to consider areas identified for retention and/or revegetation.	The BMP will need to consider areas identified for retention and/or revegetation.	
Element 3: Vehicular Access					
Public roads	The subject site is currently accessed via multiple public roads. It is acknowledged that existing roads may require upgrading as part of the subdivisional works for various stages.	The subject site is currently accessed via multiple public roads. It is acknowledged that existing roads may require upgrading as part of the subdivisional works for various stages.	Public roads within the subject site shall be designed in accordance with the Guidelines and the relevant standards for the class of road (i.e. Liveable Neighborhoods).	Public roads within the subject site shall be designed in accordance with the Guidelines and the relevant standards for the class of road (i.e. Liveable Neighborhoods).	Not applicable to development application stage.
Access routes	Multiple access routes from the subject site to more than two suitable destinations will be available following the delivery of the east-west road connections to Great Northern Highway.	Multiple access routes from the subject site to more than two suitable destinations will be available following the delivery of the east-west road connections to Great Northern Highway.	Local structure plans for each stage will need to ensure the east-west road connection is available at an appropriate stage of development and demonstrate two-way access for each development area.	Subdivision applications for each stage will need to demonstrate two-way access for each lot. A staging plan shall be prepared to demonstrate when key access routes are required, including the east-west road connections to Great Northern Highway and the two creek line crossings.	Not applicable to development application stage.

BPC	MRS Amendment	Local Planning Scheme Amendment	Local Structure Plan	Subdivision Application	Development Application
No-through roads	Morrisey Road has been identified as an existing no-through road which does not currently comply with the Guidelines. If Morrisey Road remains a no-through road, this will need to be addressed at subsequent planning stages, with the local structure plan and subdivision layout designed to ensure the no-through road complies with SPP 3.7 and the Guidelines.	Morrisey Road has been identified as an existing no-through road which does not currently comply with the Guidelines. If Morrisey Road remains a no-through road, this will need to be addressed at subsequent planning stages, with the local structure plan and subdivision layout designed to ensure the no-through road complies with SPP 3.7 and the Guidelines.	Location structure plans should avoid the use of no-through roads. Where unavoidable due to demonstratable site constraints, the no-through road shall be provided in accordance with the Guidelines. In addition, if Morrisey Road remains a no-through road, a road connection must be established to reduce the extent of the no-through road to less than 200m, in accordance with the Guidelines.	Subdivision applications should avoid the use of no-through roads. Where unavoidable due to demonstratable site constraints, the no-through road shall be provided in accordance with the Guidelines. Subdivision stages may require the use of temporary no-through roads which can only be considered where compliance with the Guidelines is achieved.	Not applicable to development application stage.
No-through road requirements	Upgrades to Morrisey Road, including the construction of a complaint turnaround area will be undertaken during the subdivisional works.	Upgrades to Morrisey Road, including the construction of a complaint turnaround area will be undertaken during the subdivisional works.	If compliant no-through roads are required due to site constraints, a turnaround area for a Type 3.4 fire appliance vehicle must be provided.	If compliant no-through roads are required due to site constraints, a turnaround area for a Type 3.4 fire appliance vehicle must be provided.	Not applicable to development application stage.
Emergency access ways	Not applicable to strategic planning stage.	Not applicable to strategic planning stage.	Local structure plans should provide two-way public road access to multiple suitable	The subdivision design should provide two-way access to multiple suitable destinations	Not applicable to development application stage.

BPC	MRS Amendment	Local Planning Scheme Amendment	Local Structure Plan	Subdivision Application	Development Application
			destinations without the need for an emergency access way.	without the need for an emergency access way. Subdivision stages may require the use of temporary emergency access ways to facilitate interim access. If required, emergency access ways shall be provided in accordance with the Guidelines.	
Perimeter roads	Not applicable to strategic planning stage.	Not applicable to strategic planning stage.	Local structure plans shall include perimeter roads in accordance with SPP 3.7 and the Guidelines. Where perimeter roads are unable to be provided due to demonstratable site constraints, fire services access routes shall be provided in accordance with the Guidelines.	The subdivision design shall include perimeter roads in accordance with SPP 3.7 and the Guidelines. Where perimeter roads are unable to be provided due to demonstratable site constraints, fire services access routes shall be provided in accordance with the Guidelines.	Not applicable to development application stage.
Fire service access routes	Not applicable to strategic planning stage.	Not applicable to strategic planning stage.	Fire service access routes shall only be used where perimeter roads are unable to be	Fire service access routes shall only be used where perimeter roads are unable to be	Not applicable to development application stage.

BPC	MRS Amendment	Local Planning Scheme Amendment	Local Structure Plan	Subdivision Application	Development Application
			provided due to site constraints. Local structure plans will need to justify the use of fire service access routes where perimeter access is unable to be achieved.	provided due to site constraints. Subdivision applications will need to justify the use of fire service access routes where perimeter access is unable to be achieved.	
Battle-axe access legs	Not applicable to strategic planning stage.	Not applicable to strategic planning stage.	Lot layout will be determined at subsequent planning stages.	Subdivision applications should avoid the use of battle-axe lots. If proposed, subdivision applications will need to justify the use of battle-axe lots.	Not applicable to development application stage.
Element 4: Water Supply					
Water supply	Confirmation that a reticulated water supply can be provided at the subdivision stage.	Confirmation that a reticulated water supply can be provided at the subdivision stage.	Confirmation that a reticulated water supply can be provided at the subdivision stage.	Subdivision applications will need to demonstrate that reticulated water can be provided, with hydrants to be provided in accordance with Water Corporation technical specifications.	Reticulated water supply and hydrant connections are expected to be available.

Attachment D:

Broader Landscape Assessment

WESTERN ENVIRONMENTAL

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Broader Landscape Assessment

Proposal details
Proposal: Amendment 1 – North Bullsbrook District Structure Plan
Local Government: City of Swan
Decision Maker: Western Australian Planning Commission

Report details			
Report date	5/06/2025	**Report version**	A
Author	Dylan Wray (L2 BPAD 44656)	**Review**	Daniel Panickar (L3 BPAD 37802)

Purpose and Project Details

This Broader Landscape Assessment (BLA) has been prepared as part of the Bushfire Management Plan (BMP) addendum and relates to Amendment No. 1 to the Bullsbrook North District Structure Plan (the DSP), as presented in Figure 1. The DSP area (the subject site) is bound by Morrissey Road to the north, rural-residential land to the east, Bullsbrook townsite to the south and a bush forever site and a golf course to the west.

Strategic planning proposals identified within Bushfire Prone Area 2 on the *Western Australian Map of Bush Fire Prone Areas* (DFES, 2024) require an assessment of the broader landscape in accordance with *State Planning Policy 3.7 Bushfire* (SPP 3.7; WAPC, 2024a). This BLA has been prepared to demonstrate compliance with Element 1: Location of the *Planning for Bushfire Guidelines* (the Guidelines; WAPC, 2024b).

Assessment Details

A desktop analysis has been completed to understand the bushfire hazards, broader road network, proximity to townsites, urban areas and suitable destination to quantify the potential for a landscape scale bushfire in the broader landscape in accordance with the methodology outlined in Appendix A in the Guidelines.

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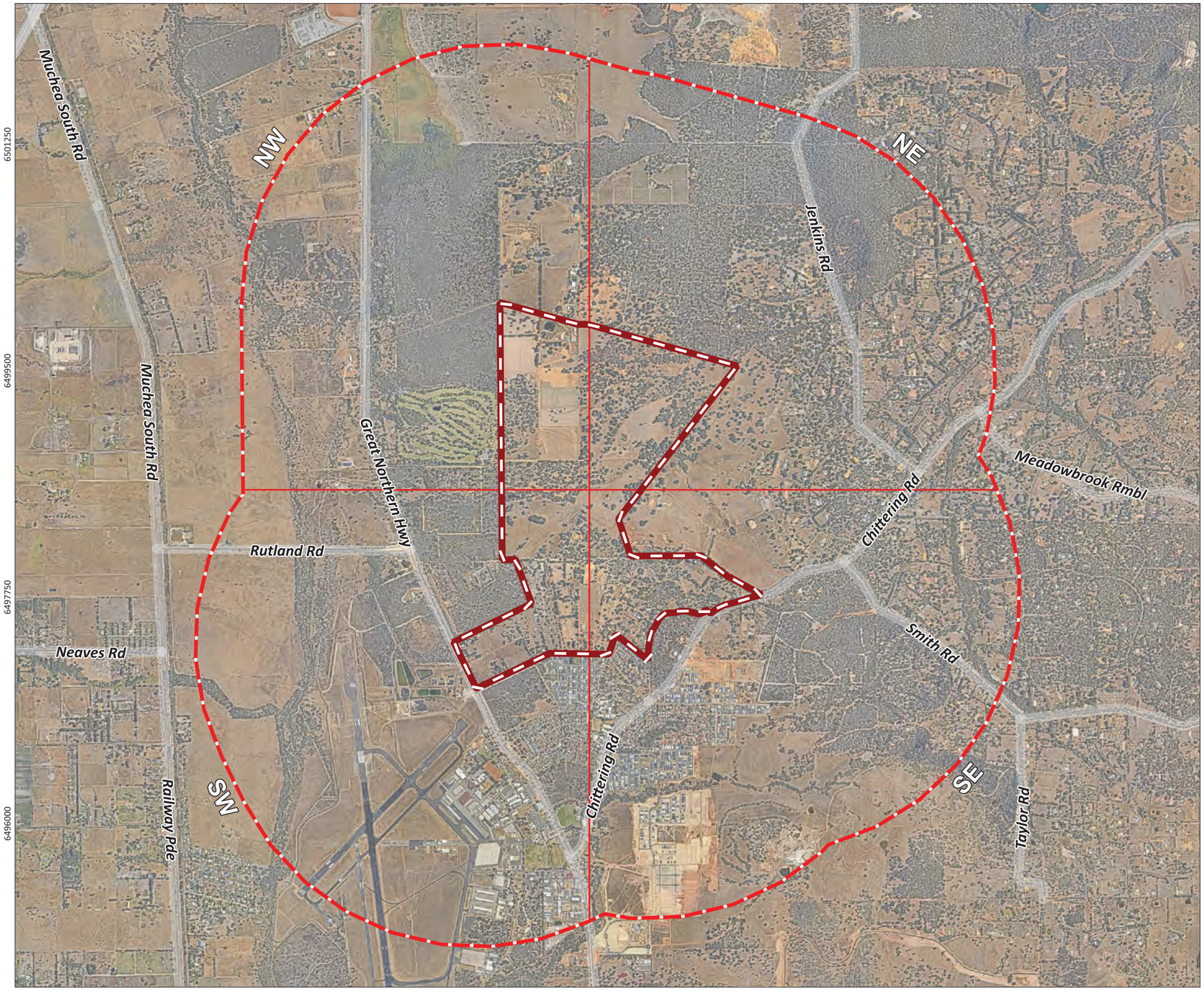

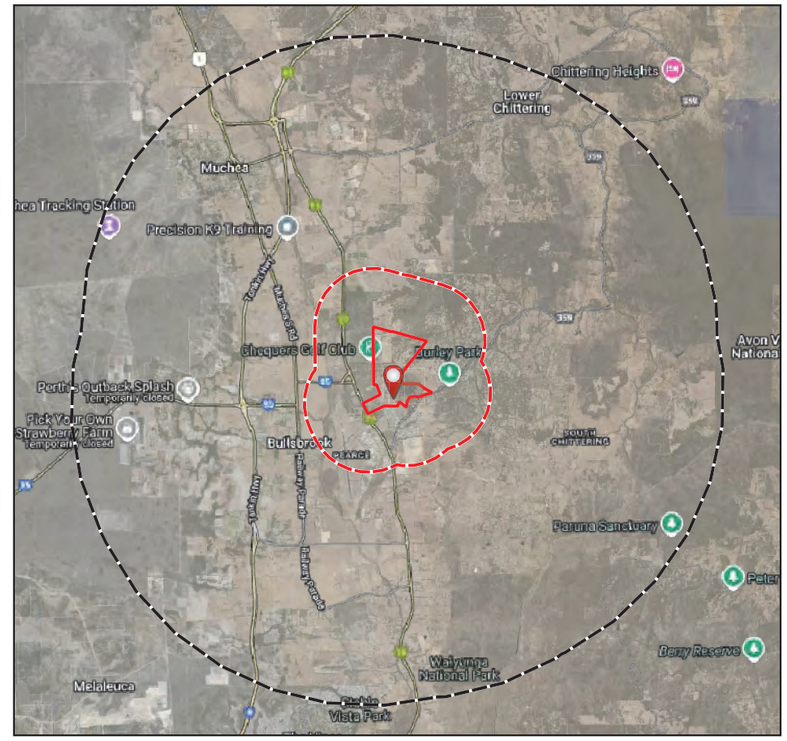



Figure 1: Site Overview

0 500 1,000 1,500 2,000 m

N

PROJECT/REPORT NAME: Bushfire Management Plan Addendum Bullsbrook North District Structure Plan			
SCALE: 1:35,000	SHEET SIZE: A3 COLOUR	CLIENT: Bullsbrook North Landowner Group	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A25.063	VERSION: 0
DATA SOURCE: Nearmap (1st February 2025)		DRAWN BY / REVIEWED BY: SM/DW	DATE: 5/6/2025

Legend

- Subject Site
- Buffer 2km
- Buffer 10km

No	Description	Drawn	Approved	Date
A	Original issue	SM	DW	5/6/2025

NOTES:

Cadastral boundary (LGATE-002). Base map ESRI Topo. Townsites (LGATE-248).

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1: Determination of the BLA Area

For the purposes of this desktop assessment, all areas within 2 km of the DSP area have been included in the BLA area (Figure 1).

2: Assessment and Mapping of the Broader Landscape

2.1: Assessment and Mapping of Vegetation

Using up to date aerial imagery, the structure of vegetation within the BLA area were assessed and categorised. The categories align with classified vegetation and exclusions under *Australia Standard (AS) 3959: Construction in Bushfire Prone Areas* (AS 3959; SA, 2018) and comprise:

- Areas of low-threat vegetation and non-vegetated areas.
- Areas of unmanaged grassland (Class G Grassland).
- Areas of all other types of classified vegetation (i.e. Class A – Class F vegetation).

Consideration has been given to any known revegetation and areas of environmental, biodiversity or conservational value in assigning categories to vegetation within the BLA area.

2.2: Assessment and Mapping of Aspects

The broader landscape area has been broken down into four quadrants depending on their aspect in relation to the subject site (Figure 1). The exposure of the proposed development to identified bushfire hazards has been assessed in relation to each of these aspects (Table 1).

Table 1: Description of vegetation within each of the mapped quadrants

Aspect	Bushfire hazard description
Northeast	• This quadrant contains rural residential properties and regional reserves. • Vegetation throughout the quadrant largely comprises of dense trees and shrubs (all other types of vegetation) with some smaller areas of open paddocks (unmanaged grassland). • There are areas of low threat vegetation / non-vegetated areas associated with the public road network and vineyards on private properties. • Due to the connectedness of large portions of classified vegetation and proximity to the subject site boundary, this quadrant is considered to be able to support a landscape scale bushfire which may threaten the subject site.
Southeast	• This quadrant contains residential development associated with the Bullsbrook townsite and rural residential properties. • Vegetation throughout the quadrant comprises of dense trees and shrubs (all other types of vegetation), open paddocks (unmanaged grassland) and existing developed areas (low threat vegetation / non-vegetated areas). • Due to the connectedness of large portions of classified vegetation and proximity to the subject site boundary, this quadrant is considered to be able to support a landscape scale bushfire which may threaten the subject site.
Southwest	• This quadrant contains residential development associated with the Bullsbrook townsite, existing development associated with the Pearce airbase and rural properties. • Vegetation throughout the quadrant largely comprises of low threat vegetation associated with existing development. • There are smaller areas of dense vegetation (all other types of vegetation) and open paddocks (unmanaged vegetation) associated with rural properties and regional reserves. • Given the fragmentation of fuels in this quadrant and the extent of developed areas and unmanaged grassland, this aspect is not expected to support a landscape scale bushfire.
Northwest	• This quadrant contains rural properties and regional reserves. • Vegetation throughout the quadrant largely comprises of dense trees and shrubs (all other types of vegetation) with some smaller areas of open paddocks (unmanaged grassland). • There are areas of low threat vegetation / non-vegetated areas associated with the public road network, the golf course and existing development on private properties. • Due to the connectedness of large portions of classified vegetation and proximity to the subject site boundary, this quadrant is considered to be able to support a landscape scale bushfire which may threaten the subject site.

2.3: Assessment and Mapping of the Predominant Vegetation Pattern

Using the vegetation assessment undertaken in Step 2.1, the predominant vegetation pattern was determined based on the following three categories:

- Cleared vegetation (e.g. residential or urban zoned and developed land);
- Mosaic pattern of vegetation (including Class G Grassland and vegetation within rural living precincts); or,
- Large tracts of classified vegetation (e.g. contiguous vegetation within reserves or national parks which facilitates fire runs at least 1 km long and 100 m wide).

The predominant vegetation pattern within the BLA is mosaic. The following breakdown of the vegetation patterns have been mapped in Figure 3 and described in Table 2.

- Mosaic: 63.6%
- Large tracts: 18.6%
- Cleared / low threat vegetation: 17.8%

Table 2: Description of predominant vegetation pattern within each of the map quadrants

Aspect	Vegetation pattern description
Northeast	This aspect consists predominantly of mosaic vegetation on rural residential properties with some large tracts of vegetation.
Southeast	This aspect consists predominantly of mosaic vegetation on rural residential properties with some cleared / low threat vegetation associated with existing development.
Southwest	This aspect consists predominantly of cleared / low threat vegetation associated with existing development, with some large tracts and mosaic vegetation.
Northwest	This aspect consists predominantly of large tracts of vegetation associated with the regional reserves, with some areas of mosaic vegetation on rural properties.

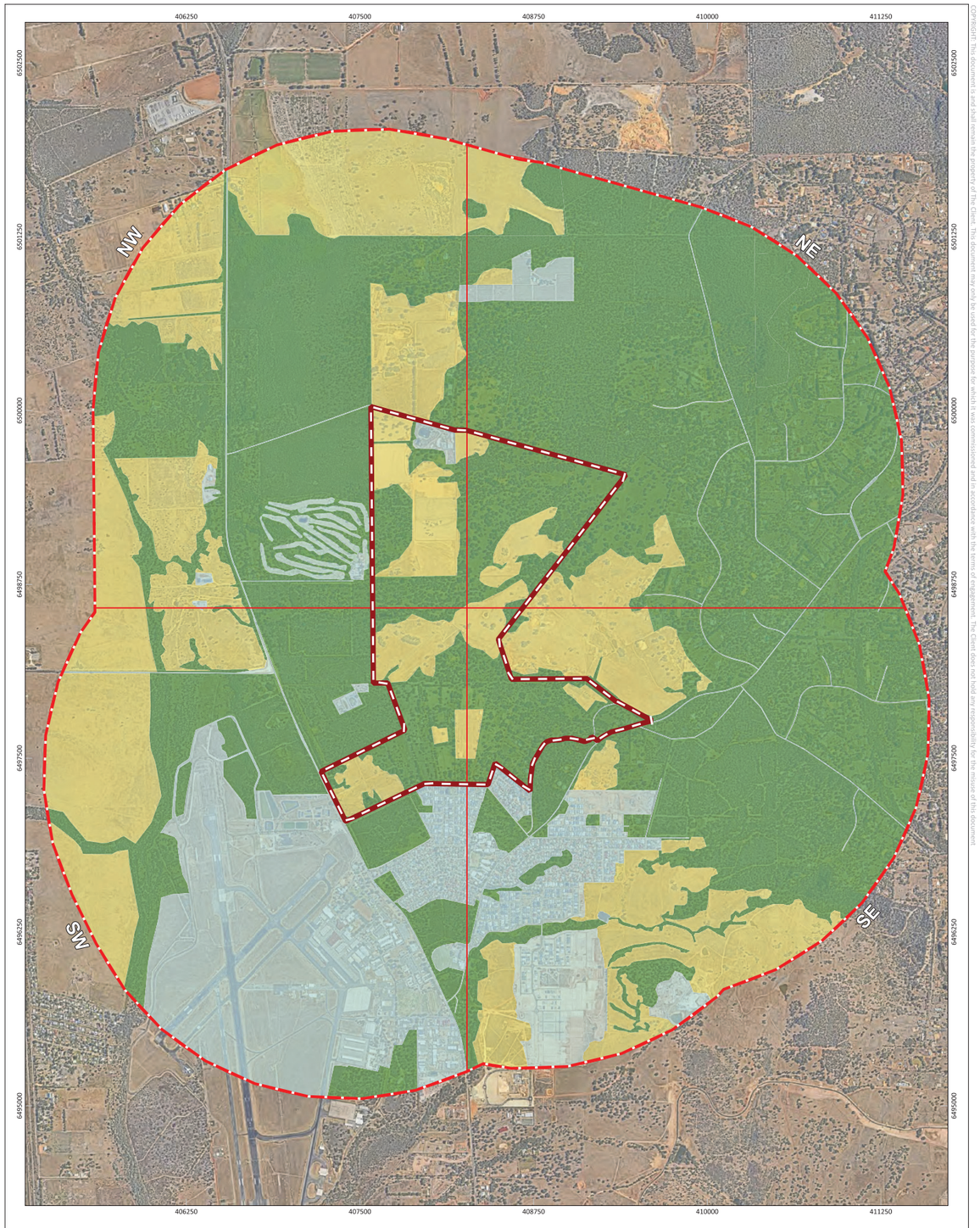

Figure 2: Mapped Vegetation Aspect

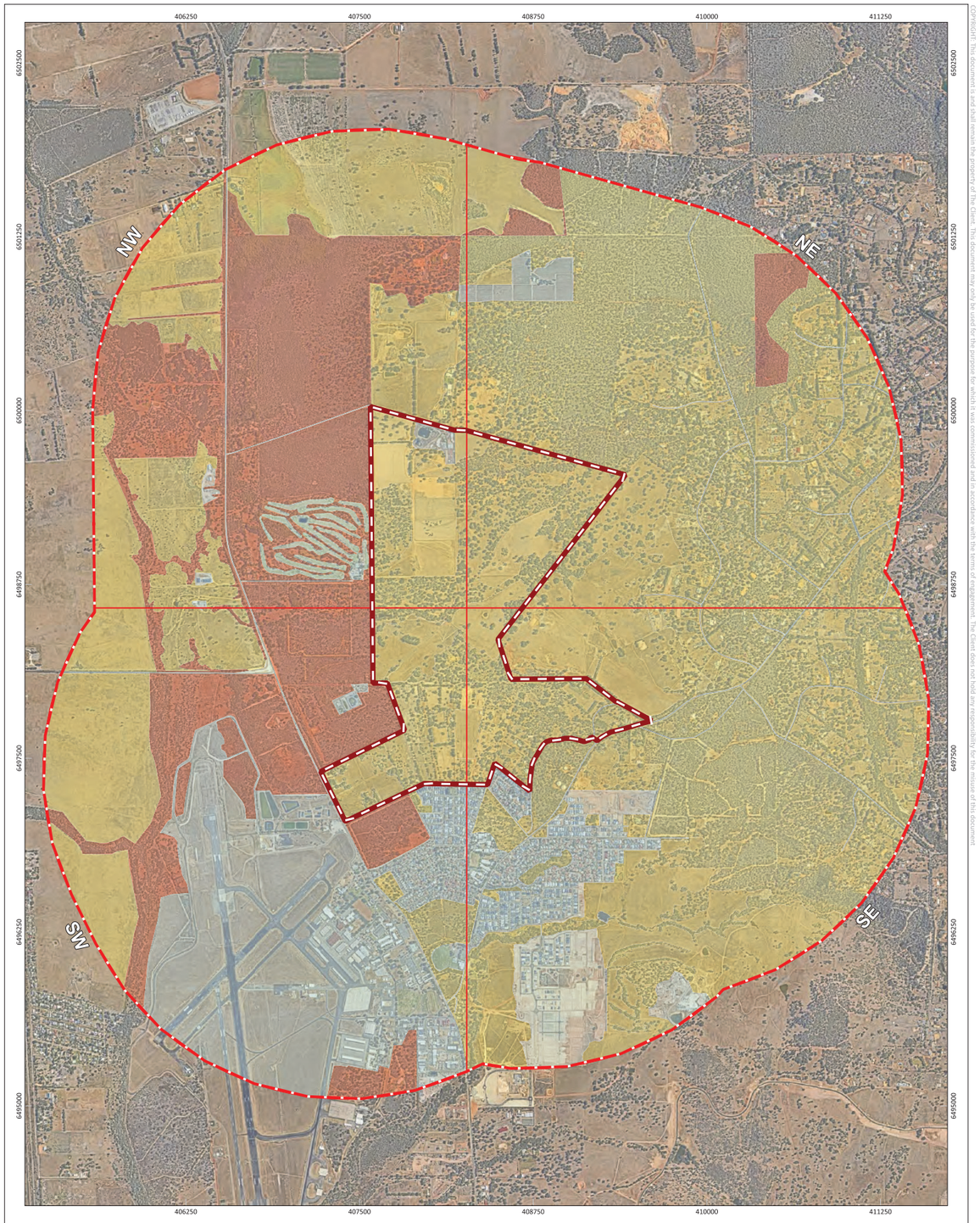

Figure 3: Predominant Vegetation Pattern

0 200 400 600 800 m
N

PROJECT/REPORT NAME: Bushfire Management Plan Addendum Bullsbrook North District Structure Plan		
SCALE: 1:25,000	SHEET SIZE: A3 COLOUR	CLIENT: Bullsbrook North Landowner Group
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A25.063	VERSION: 0
DATA SOURCE: Nearmap (1st February 2025)	DRAWN BY / REVIEWED BY: SM/DW	DATE: 5/6/2025

Legend

- Subject Site
- Buffer 2km

Vegetation Pattern

- Low threat/non vegetated
- Mosaic pattern
- Large tracts of classified vegetation

No	Description	Drawn	Approved	Date
A	Original issue	SM	DW	5/6/2025

NOTES:
Cadastral boundary (cGATE-002). Label corresponds to the vegetation association number.

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2.4: Assessment and Mapping of the Road Pattern and Suitable Destination(s)

The public road network surrounding the subject site was mapped and assessed to establish the level of vehicular access to the proposed DSP area. Potential escape routes to suitable destinations have been mapped and highlighted within Figure 4. In order to assess the complexity of these escape routes, the following details have been assessed and displayed:

- Main Roads WA road hierarchy;
- The location of intersections along each of the escape routes;
- Any cul-de-sacs exceeding 100 m in length which are within 500 metres of the escape routes; and
- The length of each of the escape routes to a suitable destination.

The analysis resulting in the outputs in Figure 4 is briefly detailed below.

Escape routes, road intersections and cul-de-sacs were generated from Main Roads WA - Road Hierarchy (MRWA 2024), a polyline dataset representing road centrelines spatially.

Escape routes used the geometry of the polylines to connect subject site access points to suitable destinations using the most efficient trafficable paths. Road intersections were points derived from the intersection of any polyline features within the dataset and cul-de-sacs were points derived from polyline end nodes not connected to other polyline features.

Significant intersections were defined as intersections on the escape route where:

- There is change in road name of roads on the escape route (e.g. Road Name A leading to Road Name B, both on the escape route);
- There is change in road category of roads on the escape route (Primary Distributor Road leading to Local Distributor Road, both on the escape route);
- There is road of a higher category leading off the escape route (e.g. Primary Distributor Road leading off the escape route connected to Local Distributor Road on the escape route); or
- There is a traffic signal present at the intersection on the escape route.

Significant cul-de-sacs were defined as cul-de-sacs in the vicinity of the escape route which are:

- Longer than 100 m in length (i.e. greater 100 m driving distance to any road interaction); and
- Less than 1 km driving distance from the end of the cul-de-sac to the nearest intersection on the escape route.

A short and direct route from the subject site to Bullsbrook townsite (suitable destination) is available via Kimberley Street, Great Northern Highway and Chittering Road. The subject site is less than 1 km to Bullsbrook via the existing and proposed public road network.

It should also be noted that post development, a number of large areas within the subject site will have a Bushfire Hazard Level (BHL) of Low. These areas will facilitate refuge as suitable destinations in the event of a landscape scale bushfire and require shorter distances of travel avoiding the need to travel past bushfire hazards.

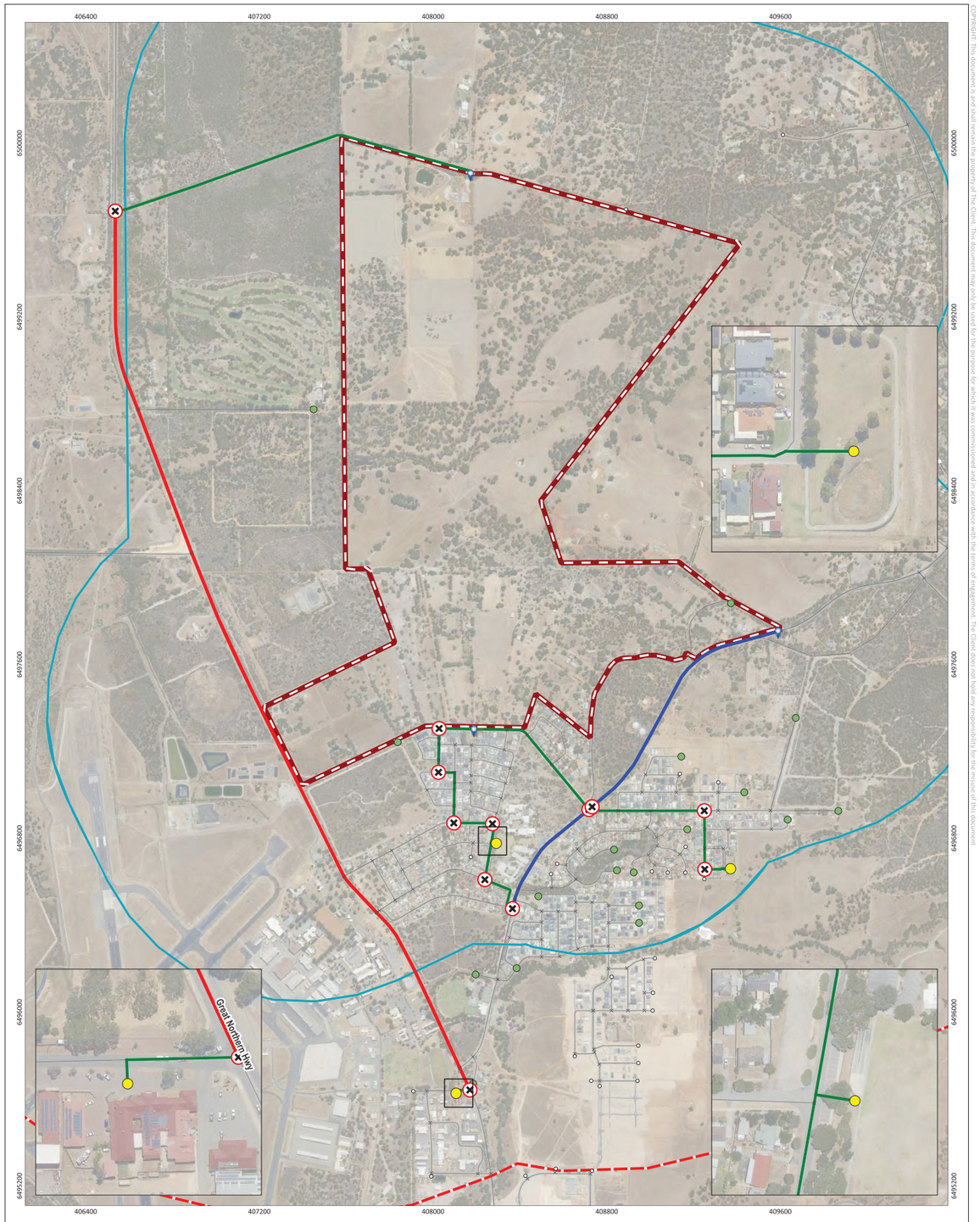

Figure 4: Road patterns and suitable destinations

N

0 100 200 300 400 m

PROJECT/REPORT NAME: Bushfire Management Plan Addendum Bullsbrook North District Structure Plan

SCALE: 1:16,000

SHEET SIZE: A3 COLOUR

CLIENT: Bullsbrook North Landowner Group

COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50

PROJECT NUMBER: A25.063

VERSION: 0

DATA SOURCE: Nearmap (1st February 2025)

DRAWN BY / REVIEWED BY: SM/DW

DATE: 5/6/2025

Legend

- Subject Site
- Buffer 1km
- Buffer 2km
- Access point
- Suitable Destination
- Road Hierarchy (MRWA)

Escape Route

- Primary Distributor
- District Distributor
- Access Road
- Road intersection
- Significant intersection along the escape route
- Cul de Sac
- Cul de Sac (longer than 100m within a 1km drive distance of the escape route)

No	Description	Drawn	Approved	Date
A	Original issue	SM	DW	5/6/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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3: Establishing the Broader Landscape Type

Using the information gathered throughout Steps 1 and 2, the Broader Landscape Type has been determined using a points-based system for the subject site in Table 3.

Table 3: Determination of the broader landscape type

Criteria	5 Points	2 Points	1 Point	Points
Proximity of the planning proposal to a suitable destination is:	☐ >10 km	☐ 1 – 10 km	✓ <1 km	1
The road pattern from the planning proposal to a suitable destination is:	☐ Complex and indirect (cul-de-sacs, and/or multiple intersections)	☐ Mixed road patterns	✓ Simple and/or direct (limited intersections)	1
The predominant vegetation pattern is:	☐ Large tracts of vegetation (contiguous vegetation)	✓ A mosaic pattern of vegetation (e.g. vegetation within rural living precincts)	☐ Cleared vegetation (e.g. clearing for residential zoned urban lots)	2
Exposure of the planning proposal to an identified external bushfire hazard (excluding Class G Grassland) is from:	✓ Three or four aspects	☐ Two aspects	☐ From nil or one aspect only	5
Assessment				
Total points		**Broader Landscape Type**		**9**
0-11 points		Broader Landscape Type A		✓
12-20 points		Broader Landscape Type B		☐

As per the above analysis, the subject site is determined to be Broader Landscape Type A which complies with the acceptable outcome of Element 1: Location of the Guidelines.

References

Department of Fire and Emergency Services (DFES). (2024). *Map of Bush Fire Prone Areas*. Retrieved on 19/04/2025 from: https://maps.slip.wa.gov.au/landgate/bushfireprone/

Standards Australia (SA). (2018). *Construction of buildings in bushfire-prone areas* (AS 3959: 2018).

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Statement of Limitations

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WEPL disclaims any and all liability with respect to any use of or reliance upon this report for any other purpose whatsoever.

In particular, it should be noted that this report is based on a scope of services defined by the Client, and is limited by budgetary and time constraints, the information supplied by the Client (and its agents) and, in some circumstances, access and/or site disturbance constraints.

The scope of services did not include any assessment of the title to or ownership of the properties, buildings and structures referred to in this report, or the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.

Reliance on Data

In preparing this report, WEPL has relied on data, surveys, analyses, designs, plans and other information provided by the Client (or its agents), other individuals and organisations ("the data").

Except as otherwise stated in this report, WEPL has not verified the accuracy or completeness of the data. WEPL does not represent or warrant that the data is true or accurate, and disclaims any and all responsibility or liability with respect to the use of the data.

To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in this report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data.

WEPL does not accept any responsibility or liability for any incorrect or inaccurate conclusions should any data be incorrect, inaccurate or incomplete or have been concealed, withheld, misrepresented or otherwise not fully disclosed to WEPL.

The conclusions must also be considered in light of the agreed scope of services (including any constraints or limitation therein) and the methods used to carry out those services, both of which are as stated or referred to in this report.

Bushfire Protection

The bushfire management measures and risk treatments proposed in this document do not guarantee that buildings or infrastructure will not be damaged in a bushfire, nor that there will be no injuries or fatalities either on the site or offsite while evacuating. Primarily, this is due to the unpredictable nature and behaviour of fire and fire weather conditions. In addition, implementation of the required bushfire management measures (including construction standards, maintenance etc.) and any other required or recommended measures, will depend upon, among other things, the ongoing actions of landowners and/or operators over which WEPL has no control.

Report for Benefit of Client

This report is confidential. Neither the whole nor any part of this report, or any copy or extract thereof, may be disclosed or otherwise made available to any third party without the prior written approval of WEPL.

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Other Limitations

This report is intended to be read in its entirety, and sections or parts of this report should therefore not be read and relied on out of context.

WEPL will not be liable to update or revise this report to take into account any events or circumstances or facts becoming apparent after the date of this report.

Bushfire Management Plan
(Bushfire Hazard Level Assessment)

Kimberley St, Morrissey Rd
Bullsbrook North

Ref 22-015
Ver B
May 2023

LUSHFIRE & PLANNING
3 Paterson Rd
Pinjarra WA 6208
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BPAD Bushfire Planning & Design

Bushfire Management Plan Coversheet

This Coversheet and accompanying Bushfire Management Plan has been prepared and issued by a person accredited by Fire Protection Association Australia under the Bushfire Planning and Design (BPAD) Accreditation Scheme.

Bushfire Management Plan and Site Details					
Site Address / Plan Reference:	Kimberley Street, Morrissey and Ashton Roads				
Suburb:	Bullsbrook	**State**:	WA	**P/code:**	6084
Local government area:	Swan				
Description of the planning proposal:	Planning Scheme Amendment, Structure Plan modification				
BMP Plan / Reference Number:	22-015	**Version:**	B	**Date of Issue:**	4/05/2023
Client / Business Name:	WPG Landholdings No 5 Pty Ltd and Bullsbrook Investment Company				

Reason for referral to DFES	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?	☐	☒
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the BPC elements)?	☐	☒
Is the proposal any of the following special development types (see SPP 3.7 for definitions)?		
Unavoidable development (in BAL-40 or BAL-FZ)	☐	☒
Strategic planning proposal (including rezoning applications)	☒	☒
Minor development (in BAL-40 or BAL-FZ)	☐	☒
High risk land-use	☐	☒
Vulnerable land-use	☐	☒

If the development is a special development as listed above, explain why the proposal is considered to be one of the above listed classifications (E.g. considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

Note: The decision maker (e.g. the local government or the WAPC) should only refer the proposal to DFES for comment if one (or more) of the above answers are ticked "Yes".

BPAD Accredited Practitioner Details and Declaration			
Name	**Accreditation Level**	**Accreditation No.**	**Accreditation Expiry**
Geoffrey Lush	Level 2	BPAD 27682	28/02/2024
Company		**Contact No.**	
Lush Fire & Planning		0418 954 873	

I declare that the information provided in this bushfire management plan is to the best of my knowledge true and correct.

Signature of Practitioner  **Date** 4/05/2023

This Bushfire Management Plan is a strategic bushfire hazard assessment for land adjacent to the northern boundary of the Bullsbrook Townsite.

The subject land is comprised of twenty-one properties with a combined area of 354 hectares. It is situated between Kimberley Street and Morrissey Road, extending from the Great Northern Highway to Ashton and Chittering Roads to the east.

The proposal has two components being:

- A modification to the Bullsbrook Townsite District Structure Plan, and
- An amendment to the Metropolitan Region Scheme to include the site in the Urban and Urban Deferred zones.

The objectives of this report are to:

a) Demonstrate that the final development will have a moderate or low hazard level.

b) Identify any bushfire management and spatial issues which should be considered; in the preparation of any local structure plan; subdivision or development applications.

c) Demonstrate that development will comply with State Planning Policy SPP3.7 Planning in Bushfire Prone Areas; the associated Guidelines and Bushfire Protection Criteria now and/or in subsequent planning stages.

The site is currently used for a range of rural land uses, including cropping, and grazing in addition to rural-residential uses. The site is a patchwork of cleared land with areas of remnant vegetation. To the west of the site is the Bullsbrook Nature Reserve, Chequer's Golf Club, a Waste Water Treatment Plant and Pearce Airbase. East of the site there is a mixture of rural and rural residential developments, while the land to the north contains rural lots. South of the site is urban development associated with the Bullsbrook townsite.

A large portion of the site is designated as being bushfire prone land.

It is proposed to develop the subject land for urban purposes, with fully serviced residential lots, two primary schools and a local centre, with potentially 4,480 dwellings.

The proposed Amendment to the Metropolitan Region Scheme will include the south eastern portion of the site in the Urban zone (Area 1) and the balance of the site in the Urban Deferred zone (Area 2). The Bullsbrook Townsite District Structure Plan, will also be amended to reflect the revised land use classifications.

The subdivision and development of the site for urban and residential purposes will require the general clearing of the proposed development areas. This is a function of both the proposed lots sizes and the bulk earth working that is required due to the slopes on the site.

A 30m wide revegetation buffer will be provided along each side the central drainage line, with other areas of high quality vegetation being retained as POS.

All vegetation within 150m of the site / proposed development was classified in accordance with AS3959. Given the size of the site and the generalised nature of the assessment, a conservative approach has been taken with the vegetation classifications. A bushfire hazard level assessment has been prepared for the existing undeveloped site of which approximately 40% has an extreme bushfire hazard level and the remaining 60% has a moderate bushfire hazard level.

A bushfire hazard level assessment has also been prepared for the proposed final development where:

- 5% of the site (17 hectares) will have an extreme bushfire hazard level;
- 34% of the site (122 hectares) will have a moderate bushfire hazard level; and
- 61% of the site (215 hectares) will have a low bushfire hazard level.

Kimberley, Morrissey Roads, Bullsbrook North
Summary

In relation to the subject land the main vegetation hazards are the Bush Forever Sites surrounding the site, which vary in size setback and vegetation types.

The developed site will have district access in multiple directions connecting to primary regional roads, which will allow for the evacuation of residents in an emergency with:

- Morrissey Road providing access to the Great Northern Highway from the north western corner of the site;
- Rutland Road extending east through the site connecting to Chittering Road; and
- Kimberly Street being extended west to the Great Northern Highway.

The most likely suitable destination in the event of any evacuation will be Bullsbrook town centre. A suitable destination does not mean does not necessarily mean an evacuation centre. It can be any land that is more than 100m from classifiable vegetation which would then have a BAL – Low rating. Also given the physical size of the site and the large number of dwellings located in areas with a low hazard rating, it is unlikely that the whole population would be evacuated in the event of a bushfire. Rather, any evacuation would focus on those residents closest to boundary of the fire front.

An assessment of the compliance with the Bushfire Protection Criteria has been provided demonstrating how the Criteria are expected to be complied with at the various planning stages. As there is no detailed subdivision design, many of the issues will be subject to confirmation at the subdivision stage.

The proposal complies with the objectives of State Planning Policy 3.7 as:

1. It avoids any increase in the threat of bushfire to people, property and infrastructure.

   This site is considered suitable for land use intensification as the proposed development areas will have a either a Low or Moderate Bushfire Hazard Rating.

2. It reduces vulnerability to bushfire through the identification and consideration of bushfire risks in the design of the development and the decision-making process.

   The bushfire hazard and risks have been identified and assessed in this report at the strategic level and demonstrates how the hazard level will be managed for the life of the development in the subsequent subdivision and development stages.

3. The design of the subdivision and the development takes into account bushfire protection requirements and includes specific bushfire protection measures.

   The proposed development complies with the Bushfire Protection Criteria and:

   - ❖ The intention of Element 1 Location is achieved as while there are major areas of vegetation with an extreme hazard level on the surrounding land, this is not continuous for the full length of any one boundary and for three boundaries it is highly fragmented.
   - ❖ The intention of Element 2 Siting and Design will be achieved in the design of the development which responds to the surrounding bushfire issues and incorporates appropriate asset protection zones, defendable spaces and management of the development/vegetation hazard interface.
   - ❖ The intention of Element 3 Vehicular Access is achieved as the proposed road network is designed in accordance with Liveable Neighbourhood requirements and has multiple access routes which will allow residents to evacuate to a suitable destination before a bushfire arrives at the site.
   - ❖ The intention of Element 4 Water is achieved as the development will have a reticulated water supply and hydrants which will enable people, property and infrastructure to be defended from bushfire.

4. **A**chieves an appropriate balance between bushfire risk management measures and biodiversity, conservation values, and environmental protection.

   The vegetation on the site which is to be cleared for development has been assessed for environmental values and is generally in a degraded condition. Areas of high value vegetation are being retained and the buffers to the central drainage line will be revegetated.

Document Control

Street No	Lot No	Plan	Street Name		
	Various		Kimberley Street, Morrissey, and Ashton Roads		
Locality	Bullsbrook		State WA	Postcode	6084
Local Government Area	Swan				
Project Description	Planning Scheme Amendment, Structure Plan modification				
Prepared for	WPG Landholdings No 5 Pty Ltd and Bullsbrook Investment Company				

Ref No	Revision	Date	Purpose
22-015	Draft	11 November 2022	Draft for Review
	A	5 April 2023	Final
	B	4 May 2023	Client modifications

Name	Geoffrey Lush	Company	Lushfire & Planning
BPAD	Level 2 Practitioner	Accreditation No Expiry	27682 February 2024

Disclaimer

The measures contained in this report do not guarantee that a building will not be damaged in a bushfire. The ultimate level of protection will be dependent upon the design and construction of the dwelling and the level of fire preparedness and maintenance under taken by the landowner. The severity of a bushfire will depend upon the vegetation fuel loadings; the prevailing weather conditions and the implementation of appropriate fire management measures.

All information and recommendations made in this report are made in good faith based on information and accepted methodology used at that time. All plans are subject to survey and are not to be used for calculations. Notwithstanding anything contained therein, Lushfire & Planning will not, except as the law may require, be liable for any loss claim, damage, loss or injury to any property and any person caused by fire or by errors or omissions in this report.

Geoffrey Lush
4 May 2023
geoffrey@lushfire.com.au

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Kimberley St, Morrissey Rd, Bullsbrook North

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Kimberley St, Morrissey Rd, Bullsbrook North

1.0 Proposal Details

1.1 Introduction

This bushfire management plan is a strategic bushfire hazard assessment for land adjacent to the northern boundary of the Bullsbrook Townsite. The site is situated between Kimberley Street and Morrissey Road, extending from the Great Northern Highway to Ashton and Chittering Roads to the east as shown in Figure 1.

The proposal is described in detail in Section 1.6 and has two components being:

- An amendment to the Metropolitan Region Scheme to include the site in the Urban and Urban Deferred zones; and
- A modification to the Bullsbrook Townsite District Structure Plan.

The objectives of this report are to:

a) Confirm the suitability of the proposed zones and reserves having regard to the objectives of State Planning Policy SPP3.7 Planning in Bushfire Prone Areas.

b) Identify any bushfire management and spatial issues which should be considered; in the preparation of any local structure plan; subdivision or development applications.

c) Demonstrate that development will comply with State Planning Policy SPP3.7 Planning in Bushfire Prone Areas; the associated Guidelines and Bushfire Protection Criteria now and/or in subsequent planning stages.

State Planning Policy SPP3.7 Planning in Bushfire Prone Areas seeks to reduce vulnerability to bushfire through the identification and consideration of bushfire risks in decision-making at all stages of the planning and development process.

A Bushfire Management Plan (BMP) is required to accompany any strategic planning proposal in bushfire prone areas. The BMP should be prepared as early as possible in the planning process and progressively refined or reviewed as the level of detail increases. The level of detail provided within a BMP should be commensurate with the applicable planning stage and scale of the proposal or application.

Appendix 5 of the Guidelines for Planning Bushfire Prone Areas (2021) contains a checklist for the preparation of Bushfire Management Plans. This includes the bushfire assessment, identification of the bushfire hazard issues arising from the relevant assessment and a clear demonstration that compliance with the bushfire protection criteria contained within Appendix 4 of these Guidelines, can be achieved in the subsequent planning stages.

In relation to Scheme Amendments the BMP checklist provides the option of either a Bushfire Attack Level (BAL) Contour Map or a Bushfire Hazard Level assessment as shown in Table 1 over the page. If future lot layout has been determined, a BAL contour map showing the BAL ratings for each lot should be prepared instead of a BHL assessment.

Given the strategic nature of this report and the size of the subject land, the bushfire assessment is in the form of a Bushfire Hazard Level assessment. A Bushfire Hazard Level assessment provides a 'broad brush' means of determining the potential intensity of a bushfire for a particular area.

Table 1 Bushfire Management Plan Checklist

SECTIONS	Planning Strategies	Scheme Amendments	Structure Plans	Subdivision	Development Approval
Coversheet	Yes	Yes	Yes	Yes	Yes
Executive Summary	Optional	Optional	Optional	Optional	Optional
1.0 Proposal details	Yes	Yes	Yes	Yes	Yes
2.0 Environmental considerations	Yes	Yes	Yes	Yes	Yes
3.0 Bushfire assessment results					
3.1 Assessment inputs	Yes	Yes	Yes	Yes	Yes
3.2 Assessment outputs					
BHL assessment	Yes	**Yes**	**Yes**		
		or	or		
BAL contour map		Yes	Yes	Yes	
				or	
BAL assessment				Yes	Yes
4.0 Bushfire hazard issues	Yes	Yes	Yes	Yes	Yes
5.0 Assessment against Bushfire Protection Criteria	Yes	Yes	Yes	Yes	Yes
6.0 Implementation	Yes	Yes	Yes	Yes	Yes

1.2 Existing Conditions

The existing conditions for the site and the surrounding area are shown in Figure 1.

The subject land is comprised of twenty-one properties with a combined area of 354 hectares as documented in Table 2 and shown in Figure 2. The southern portion of the site contains smaller semi-rural lots with areas between 2 to 10 hectares. The northern portion contains larger rural lots from 40 to 80 hectares in size.

The site is currently used for a range of rural land uses, including cropping, and grazing in addition to rural-residential uses. The site is a patchwork of cleared land with areas of remnant vegetation. This vegetation varies in its structure and quality with many areas being parkland cleared with minimal understorey due to grazing.

To the west of the site is the Bullsbrook Nature Reserve, Chequer's Golf Club and a Waste Water Treatment Plant. To the south west is the Pearce Airbase. East of the site there is a mixture of rural and rural residential developments, while the land to the north contains rural lots. South of the site is urban development associated with the Bullsbrook townsite. This includes the Bullsbrook College, residential and community developments. The Water Corporation has water supply tanks located to the south east adjacent to Chittering Road.

There are multiple Bush Forever Sites in the area around the subject land.

The Great Northern Highway is located approximately 700m west of the site and is a 'Primary Regional Road'. Chittering Road is located to the south east of the site and is a district access road. Access to the southern portion of the site is from Kimberly Street and Ashton Road. Access to the northern portion of the site is from Morrissey Road.

The elevation of the site ranges from 44m AHD in the south west to 143m AHD in the east. The contour levels for the site are shown in Figure 3 and the gradients vary from 1.5 degrees to 7 degrees.

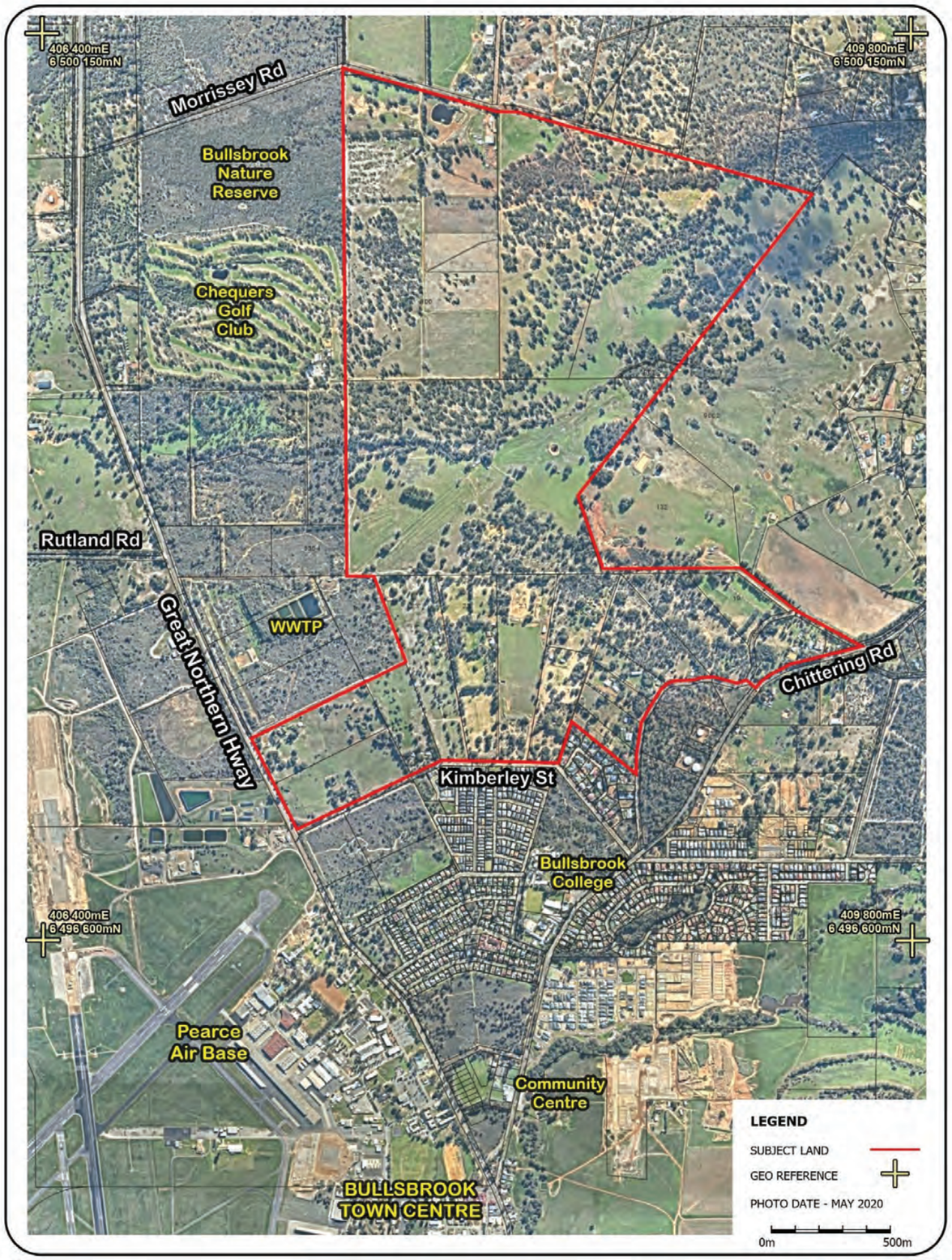

FIGURE 1
LOCATION & EXISTING CONDITIONS

Job No 22-015

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A	Preliminary	20/10/2022

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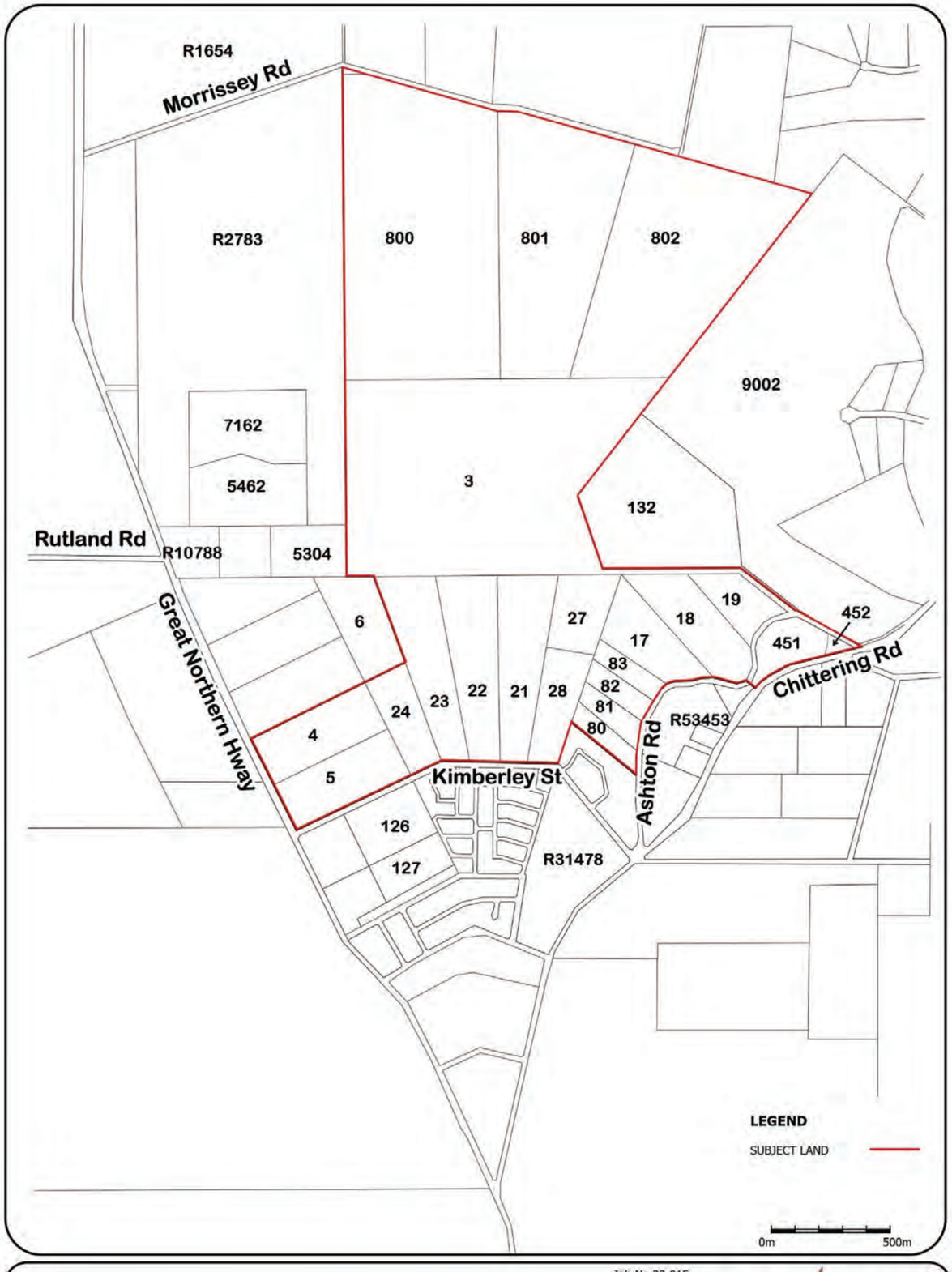

FIGURE 2
CADASTRAL PLAN

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A	Preliminary	20/10/2022

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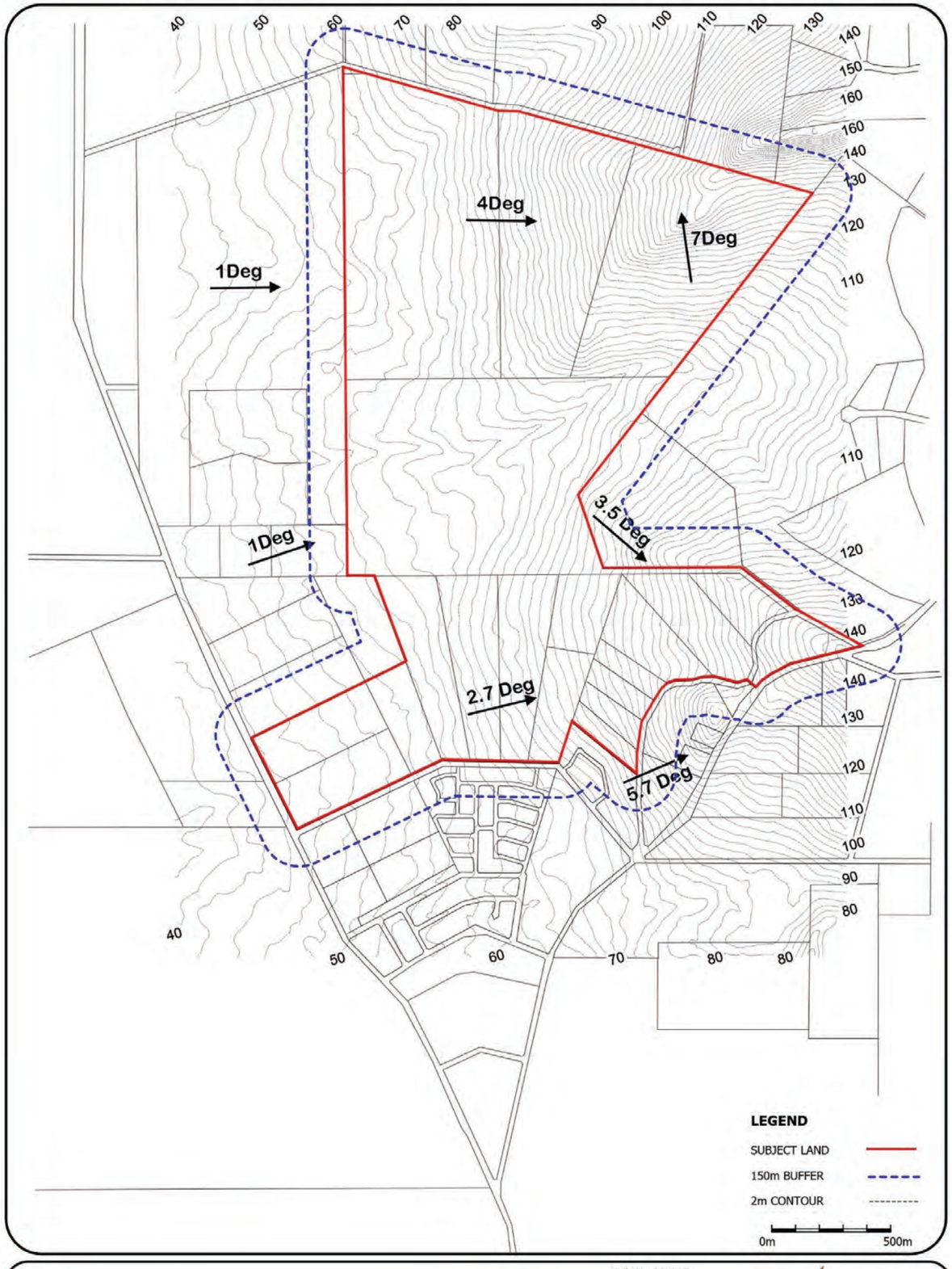

FIGURE 3
CONTOUR PLAN

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Job No 22-015

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A	Preliminary	20/10/2022

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Table 2 Property Details

Lot	Plan	Address	Area (ha)
800	43493	168 Morrissey Road	68.527
801	49675	Lot 801 Morrissey Road	41.002
802	49675	Lot 802 Morrisey Road	48.246
3	32225	135 Ashton Road	80.558
4	4911	2748 Great Northern Highway	10.016
5	4911	2710 Great Northern Highway	10.036
24	4911	94 Kimberley Street	6.252
23	4911	82 Kimberley Street	12.687
22	4911	72 Kimberley Street	12.983
21	4911	68 Kimberley Street	12.834
27	54352	48 Kimberley Street	6.781
28	54352	58 Kimberley Street	6.781
80	99697	49 Ashton Road	2.289
81	99697	59 Ashton Road	2.525
82	27363	69 Ashton Road	2.502
83	27363	71 Ashton Road	2.665
17	4911	81 Ashton Road	8.203
18	4911	93 Ashton Road	9.758
19	4911	131 Ashton Road	4.909
451	66577	247 Chittering Road	4.604
452	66577	261 Chittering Road	0.486
Total			354.644

1.3 Bushfire Prone Land

Most of the site is designated as being bushfire prone land as shown in Figure 4 and this trigger:

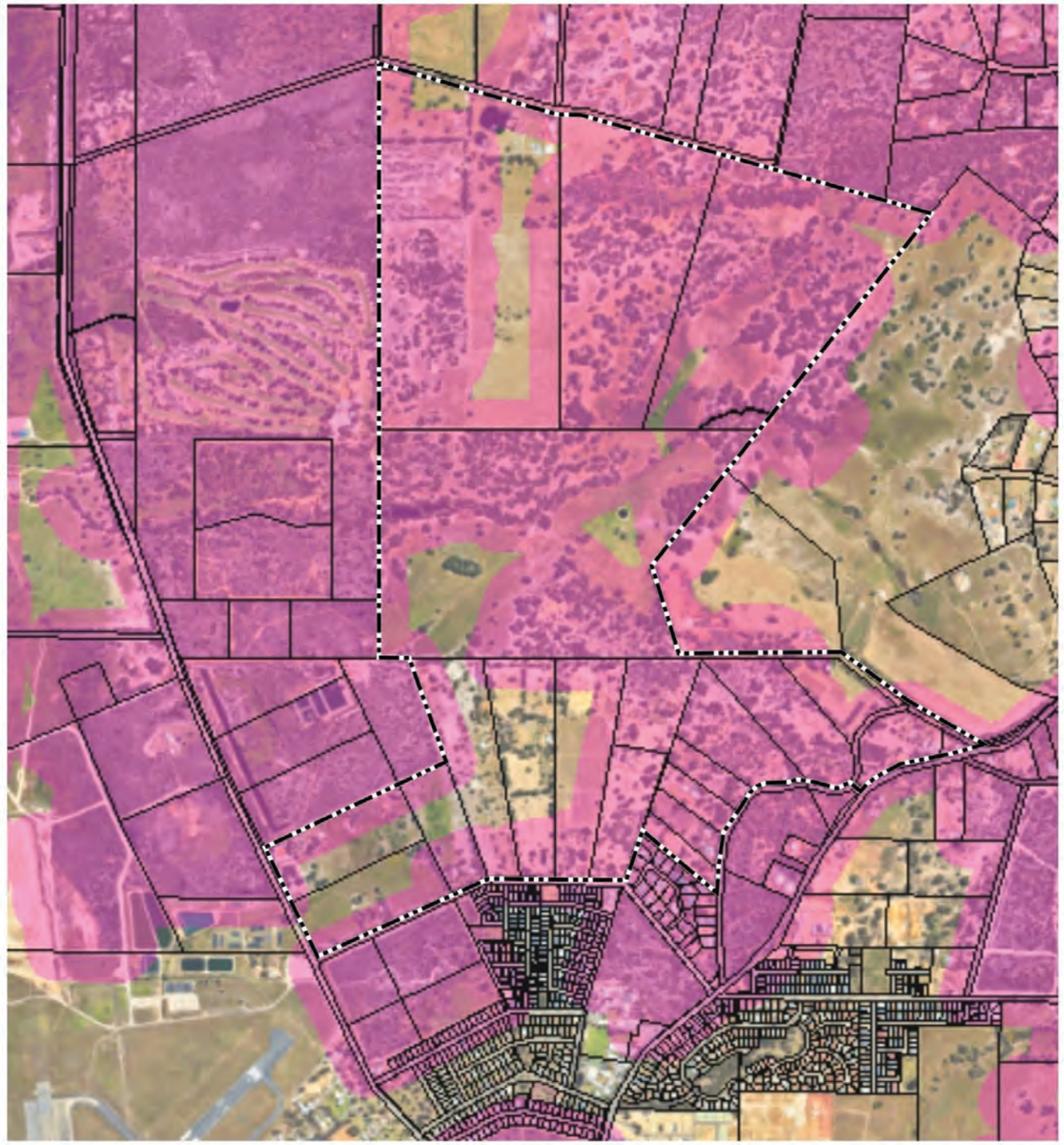
- The application of the bushfire construction provisions in the National Construction Code;
- The provisions of the Planning and Development (Local Planning Schemes) Regulations 2015; and
- The application of State Planning Policy SPP3.7 Planning in Bushfire Prone Areas.

State Planning Policy SPP3.7 Planning in Bushfire Prone Areas provides in Clause 6.2 that any strategic planning proposal, that has or will, on completion, have a moderate BHL and/or where BAL-12.5 to BAL-29 applies, may be considered for approval where it can be undertaken in accordance with the following policy measures.

a) the results of a bushfire hazard level assessment determining the applicable hazard level(s) across the subject land, in accordance with the methodology set out in the Guidelines.

b) the identification of any bushfire hazard issues arising from the assessment; and

c) clear demonstration that compliance with the bushfire protection criteria in the Guidelines can be achieved in subsequent planning stages.



1.4 Town Planning Framework

1.4.1 Regional Planning

The town planning framework is comprised of both strategic and statutory documents which are described in detail in the Amendment report. In broad terms this consists of:

- State Planning Strategy;
- Directions 2031 and Beyond;
- Perth and Peel @ 3.5 Million;
- Perth and Peel Green Growth Plan for 3.5 Million; and
- North East Sub Regional Planning Framework;

The subject site is currently zoned 'Rural' under the Metropolitan Region Scheme (see Figure 6). The land south of Kimberley Street is zoned 'Urban'. Portions of the land between the site and the Great Northern Highway are reserved for Public Purposes (Commonwealth Government) and Parks & Recreation (Restricted Access). Adjoining the site are Bush Forever sites 89, 291, 292, 294, and 296.

1.4.2 Local Planning

Under the City of Swan Local Planning Scheme, No 17, the subject site is zoned 'General Rural' with Lot 800 being included in Additional Use Zone 40 (Caravan Park and Transport Depot).

The land to the north east and east of the site extending to Chittering Road is included in the 'Landscape' and 'Rural Residential' zones. Portions of the land between the site and the Great Northern Highway are reserved for 'Public Recreation,' 'Recreation' and 'Public Purposes.' The land to the south of the site is zoned for 'Residential Development' and 'Residential.'

The Bullsbrook Townsite District Structure Plan was endorsed by the WAPC on April 2018 and is shown in Figure 5. The Structure Plan aims for a self-sufficient townsite, which provides for diverse land uses and basic infrastructure needs, whilst considering the natural environment and existing major land uses including the Pearce RAAF Base, various resource extraction operations and adjacent agricultural and horticultural activities.

The Structure Plan notes that there are seven separate areas within the Bullsbrook townsite area which are classified under Bush Forever and therefore subject to retention requirements. These are generally set aside for conservation, or outlined as Commonwealth land.

The bushfire hazard is referenced in Section 2.4 with Figure 12 (of the District Structure Plan) showing that a large proportion of the structure plan area was identified as being within 'extreme' and 'moderate' bushfire hazard areas, posing a threat to lives if not managed appropriately.

It recommends that a bushfire management plan will be required at the local structure plan stage in accordance with the Guidelines for Planning in Bushfire Prone Areas.

Section 3.5.2 Vegetation Protection further highlights bushfire protection and states that:

> The District Structure Plan design attempts to avoid any known areas of extreme bushfire risk. Whilst most developable land within the study area is relatively cleared, the close proximity of the Darling Scarp and associated National Park with its bushfire risks, poses a serious threat to lives. Significant consideration must be given to this at structure planning stage. All subdivisions will be required to comply with the State Government's Planning for Bushfire Protection policy and the City's LPS17, in particular with regard to the need for fire management plans and construction of buildings in accordance with Australian Standards AS3959.

The Structure Plan also shows the extension of Rutland Road, east through the subject land, connecting to the Chittering Road.

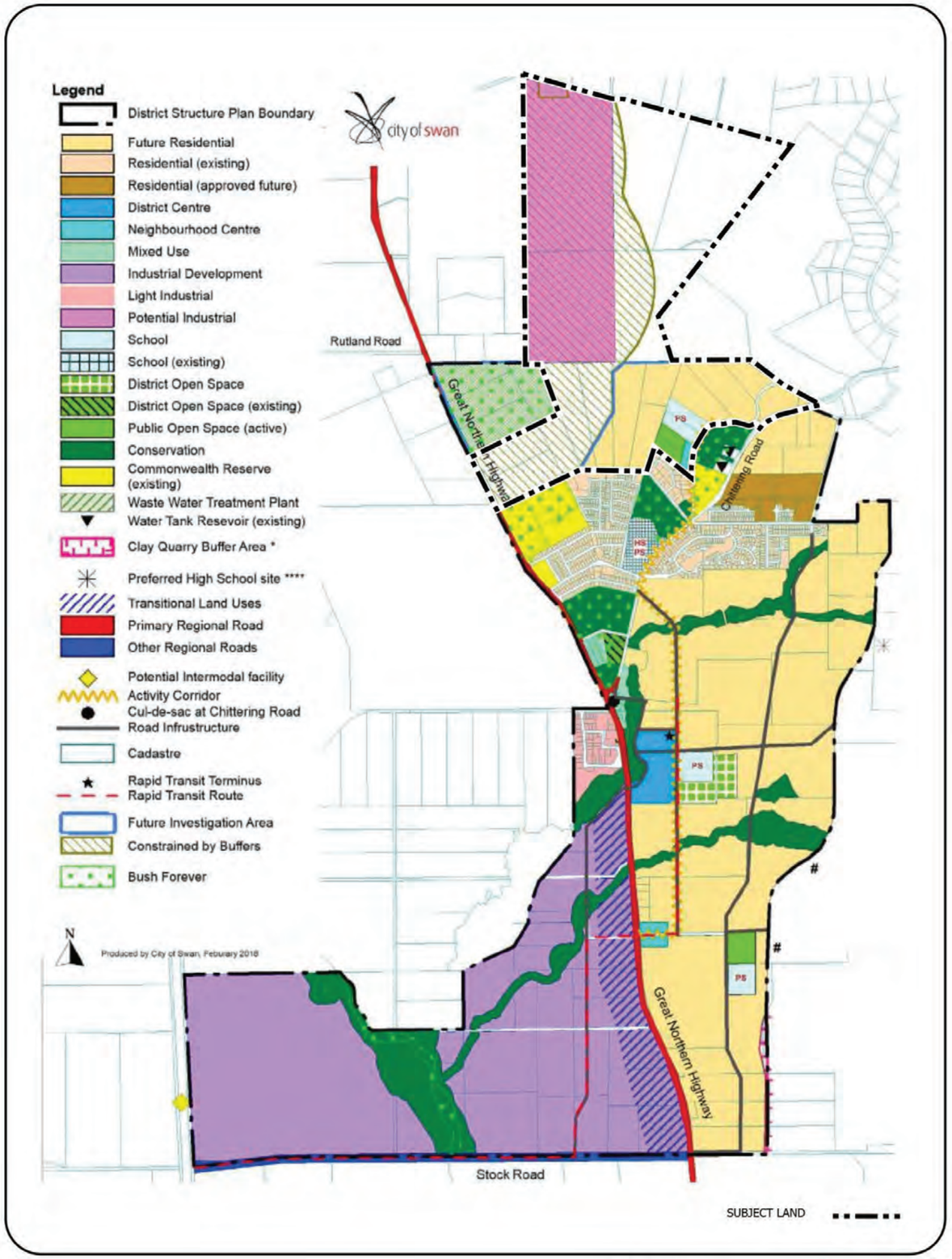


FIGURE 5
DISTRICT STRUCTURE PLAN

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A	Preliminary	20/10/2022

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1.5 Fire Season Guide

The City's 2022 – 2023 Fire Season Guide contains the following provisions:

For land less than 0.5 hectares
- Install and maintain an asset protection zone.
- Maintain all grass to or under 10cm high.
- If your land predominantly consists of dense native vegetation, firebreaks or additional understory maintenance may be required.
- Native vegetation should be maintained at or below 8 tonnes per hectare.

For land between 0.5 and 2.5 hectares
- Install and maintain an asset protection zone.
- Install firebreaks immediately inside and adjacent to all external property boundaries. Firebreaks need to be 3 metres wide with a 4 metre vertical (height) clearance free from flammable materials and overhanging branches.
- Maintain all grass to a height of no greater than 10cm. If the land is stocked, the grass must be reduced and maintained to a height of no greater than 10cm by the 1st of December.
- Natural vegetation within 100 metres of buildings including attached and adjacent structures and essential infrastructure shall be maintained at or below 8 tonnes per hectare.
- Where a property is affected by an approved bushfire management plan, property owners must still comply with all requirements in this notice and with any additional requirements outlined within that plan.

For land with an area greater than 2.5 hectares
- Install and maintain an asset protection zone.
- Install firebreaks immediately inside and adjacent to all external property boundaries. Firebreaks need to be 3 metres wide with a 4 metre vertical (height) clearance free from flammable materials and overhanging branches.
- Properties over 100 hectares require additional firebreaks to divide the land into areas not exceeding 100 hectares.
- Maintain all grass immediately adjacent to one side of any firebreak to a height of no greater than 10cm and a minimum width of 3 metres. If the land is stocked, this grass must be reduced and maintained to a height of no greater than 10cm by the 1st day of December.
- Natural vegetation within 100 metres of buildings including attached and adjacent structures and essential infrastructure shall be maintained at or below 8 tonnes per hectare.
- Where a property is affected by an approved bushfire management plan, property owners must still comply with all requirements in this notice and with any additional requirements within that plan.

The requirements for an asset protection zone include:
- Maintaining fuel loads at 2 tonnes per hectare or lower; and
- Maintaining grass at 10cm or under.

1.6 Proposed Development

It is proposed to develop the subject land for urban purposes, with fully serviced residential lots, two primary schools and a local centre. The land analysis is documented in Table 3 and there could potentially be 4,480 dwellings.

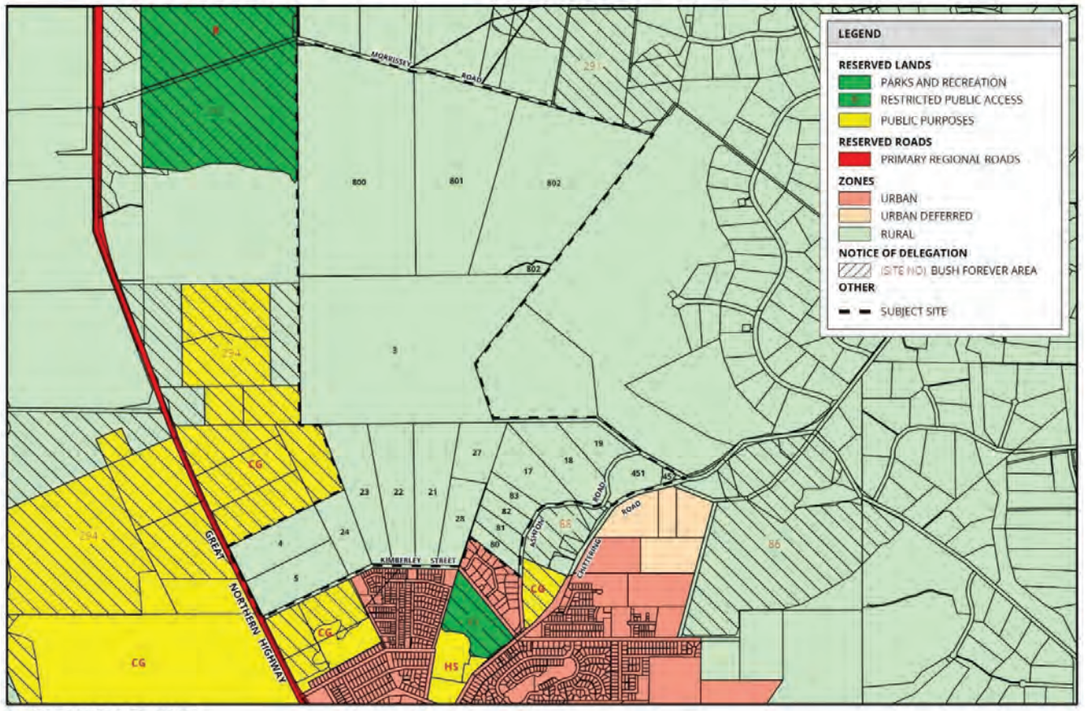
In order to develop the land for urban purposes it will be necessary to first amend the Metropolitan Region Scheme, the Bullsbrook Townsite District Structure Plan and then the City's Local Planning Scheme.

The proposed Amendment to the Metropolitan Region Scheme is shown in Figure 6 and will include the south eastern portion of the site in the Urban zone (Area 1) and the balance of the site in the Urban Deferred zone (Area 2).

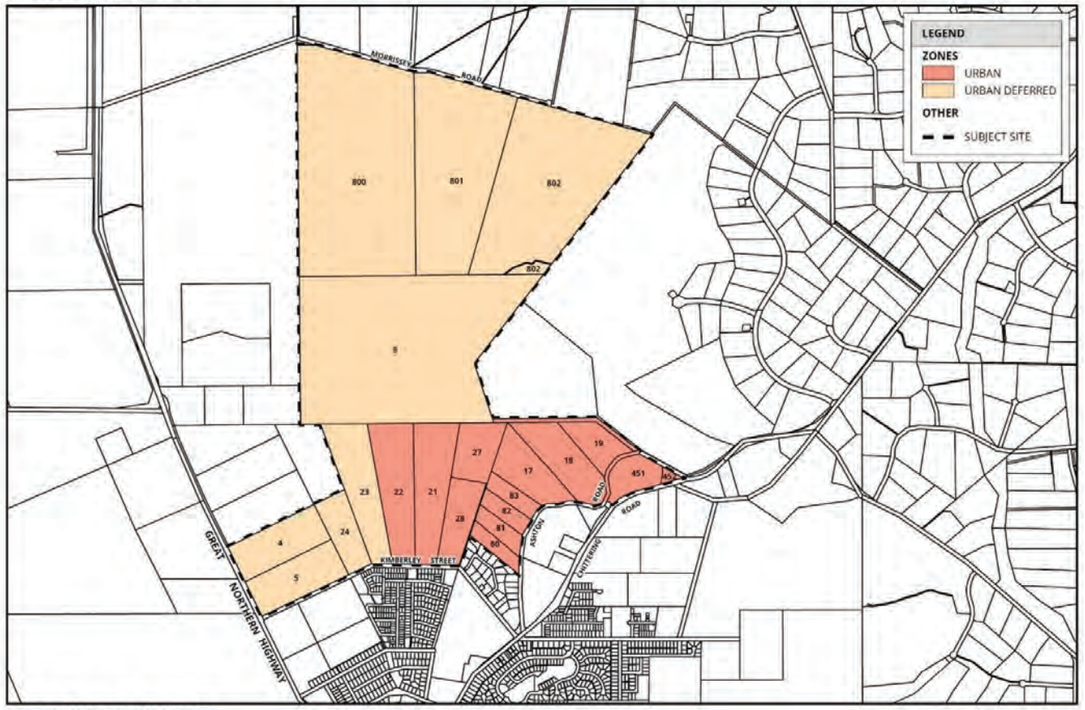
The modified Bullsbrook Townsite District Structure Plan is shown in Figure 7 and the Northern Precinct – Bullsbrook Townsite DSP (As amended) is shown in Figure 8.

Table 3 Land Analysis

	Bullsbrook North	**Stage 1**	**Stage 2**
Site Area (ha)	354.64400	77.32000	277.32400
Exclusions			
* Schools	7.14000	3.50000	3.64000
* E-W road	6.12000	3.20000	2.92000
* Local Centre	1.97000		1.97000
Gross Residential Area (ha)	339.41400	70.62000	268.79400
Less			
* 40% (Roads, POS, Drainage)	135.76560	28.24800	107.51760
Net Residential Area (ha)	**203.64840**	**42.37200**	**169.80640**
Yield Calc (No. Dwellings)	**4480.26480**	**932.18400**	**3735.74080**



EXISTING ZONING



PROPOSED ZONING

FIGURE 6
PROPOSED MRS ZONING

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Job No 22-015

Rev	Description	Date
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LEGEND

- Subject Site
- District Structure Plan Boundary
- Future Residential
- Residential (existing)
- Residential (approved future)
- District Centre
- Neighbourhood Centre
- Mixed Use
- Industrial Development
- Light Industrial
- School
- School (existing)
- District Open Space
- District Open Space (existing)
- Public Open Space (active)
- Conservation
- Commonwealth Reserve (existing)
- Waste Water Treatment Plant
- Water Tank Resevoir (existing)
- Clay Quarry Buffer Area *
- Preferred High School site ****
- Transitional Land Uses
- Primary Regional Road
- Other Regional Roads
- Potential Intermodal facility
- Activity Corridor
- Cul-de-sac at Chittering Road
- Road Infrustructure
- Cadastre
- Rapid Transit Terminus
- Rapid Transit Route
- Bush Forever
- Local Centre

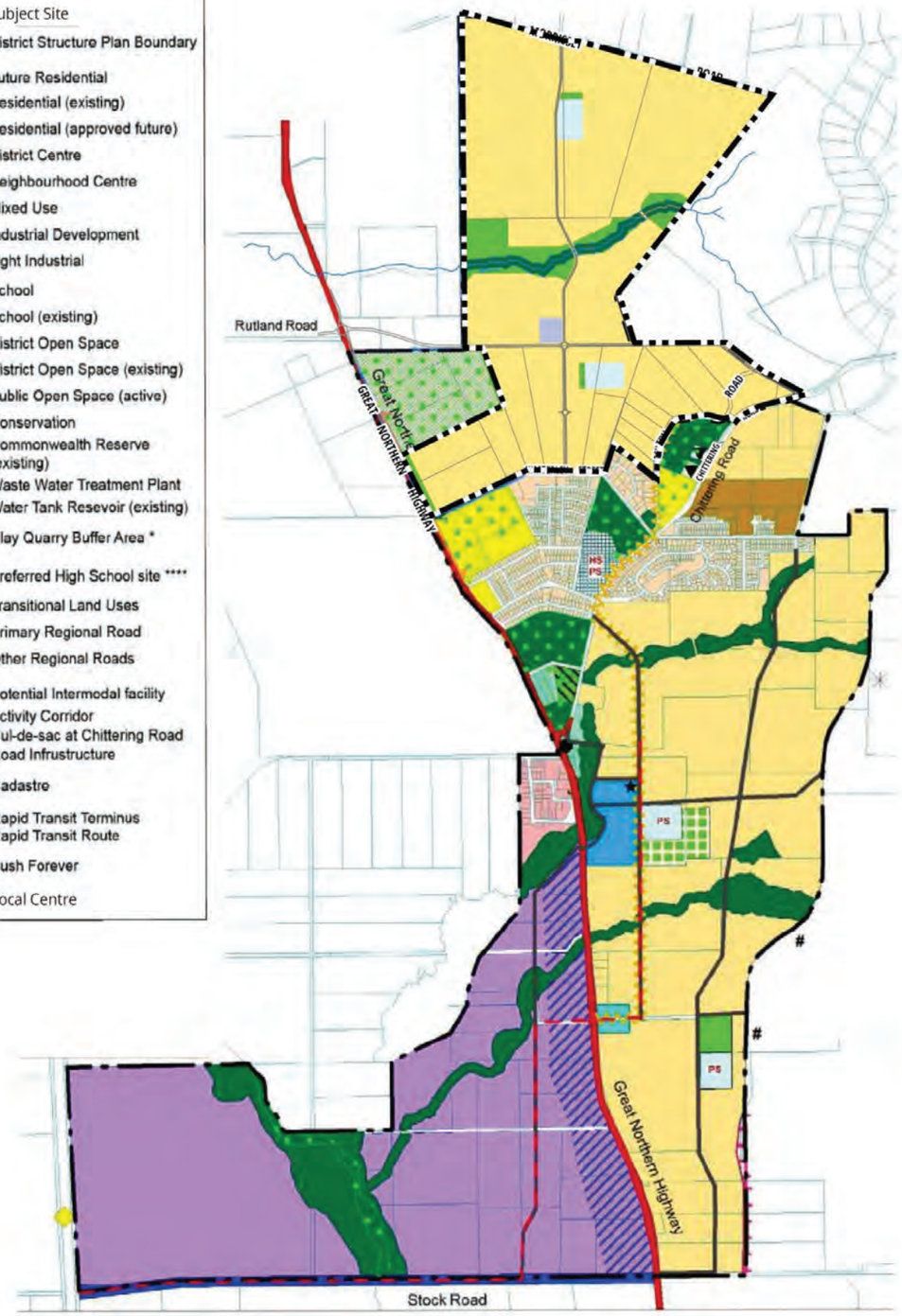

FIGURE 7
DISTRICT STRUCTURE PLAN
PROPOSED AMENDMENT

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Job No 22-015

Rev	Description	Date
A	Preliminary	20/03/2023

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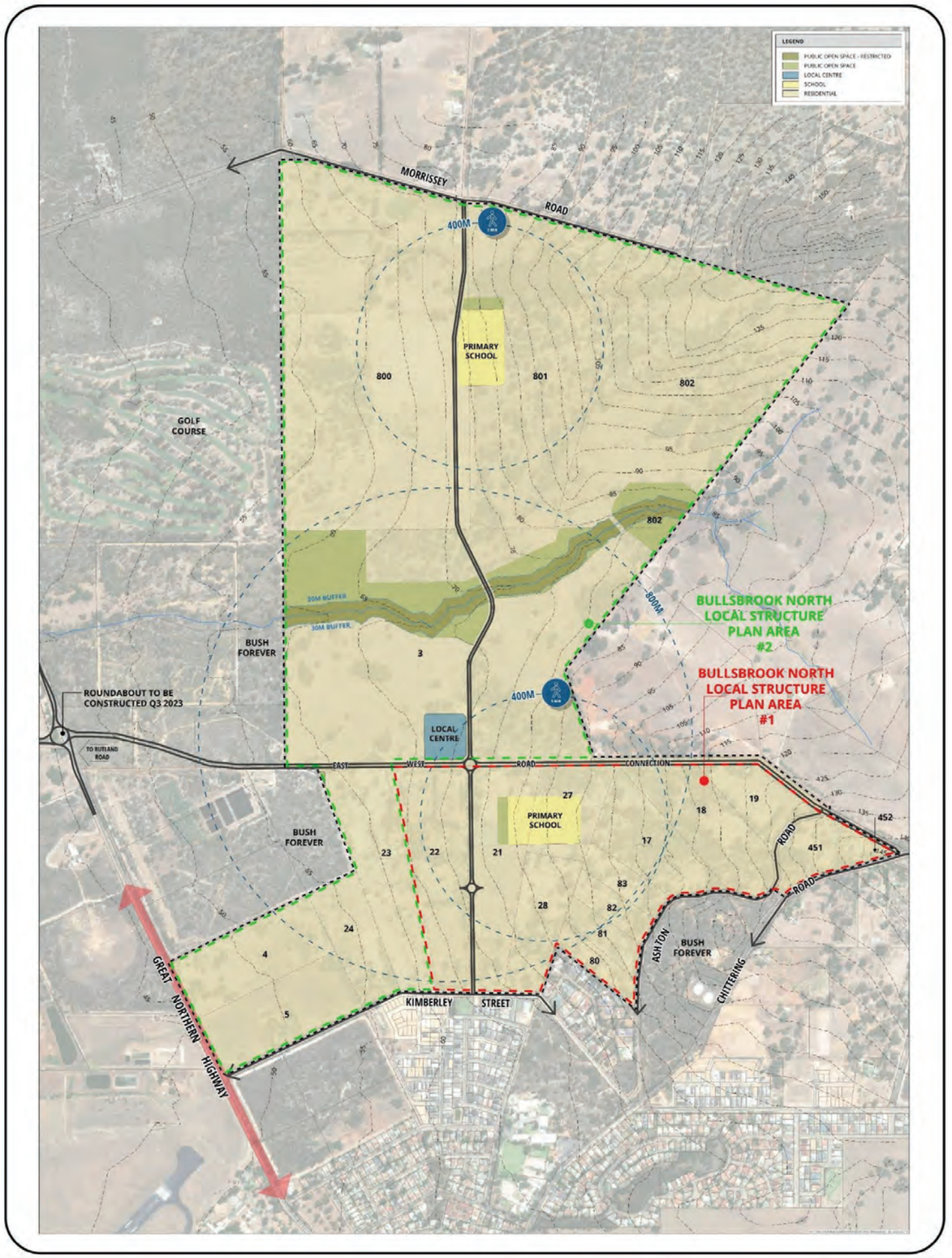

FIGURE 8
DISTRICT STRUCTURE PLAN
NORTHERN PRECINCT MODIFICATION

Job No 22-015
Rev A Description Preliminary Date 20/03/2023

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2.0 Environmental Considerations

2.1 General

State Planning Policy 3.7 (SPP3.7) policy objective 5.4 recognises the need to consider bushfire risk management measures alongside environmental, biodiversity and conservation values.

The relevant environmental issues are summarised in Table 4 and shown in Figure 9.

Table 4 Environmental Factors

Environmental Factor	Comment
Wetlands	Not applicable
Waterways	Not applicable, there are no waterways within the subject land.
RAMSAR wetlands	Not applicable.
Public Drinking Water Source Areas (PDWSAs)	Not applicable.
Threatened Ecological Communities (TECs)	None within the site, but are located in the adjoining areas.
Threatened and priority fauna	The site contains foraging habitat for the two Black Cockatoo species as well as potential breeding and roosting habitat trees.
Bush Forever areas	Adjoining or near the subject land are Bush Forever sites 89, 291, 292, 294, and 296.
Clearing regulations – Environmentally Sensitive Areas (ESAs)	Yes, the majority of the site is an ESA.
Aboriginal heritage	There are no listed Aboriginal Heritage Sites on the site while sites Site ID 3525 Ellen Brook and Site 3583 are nearby.
Non-indigenous heritage	Not applicable.

2.2 Clearing, Revegetation and Landscaping

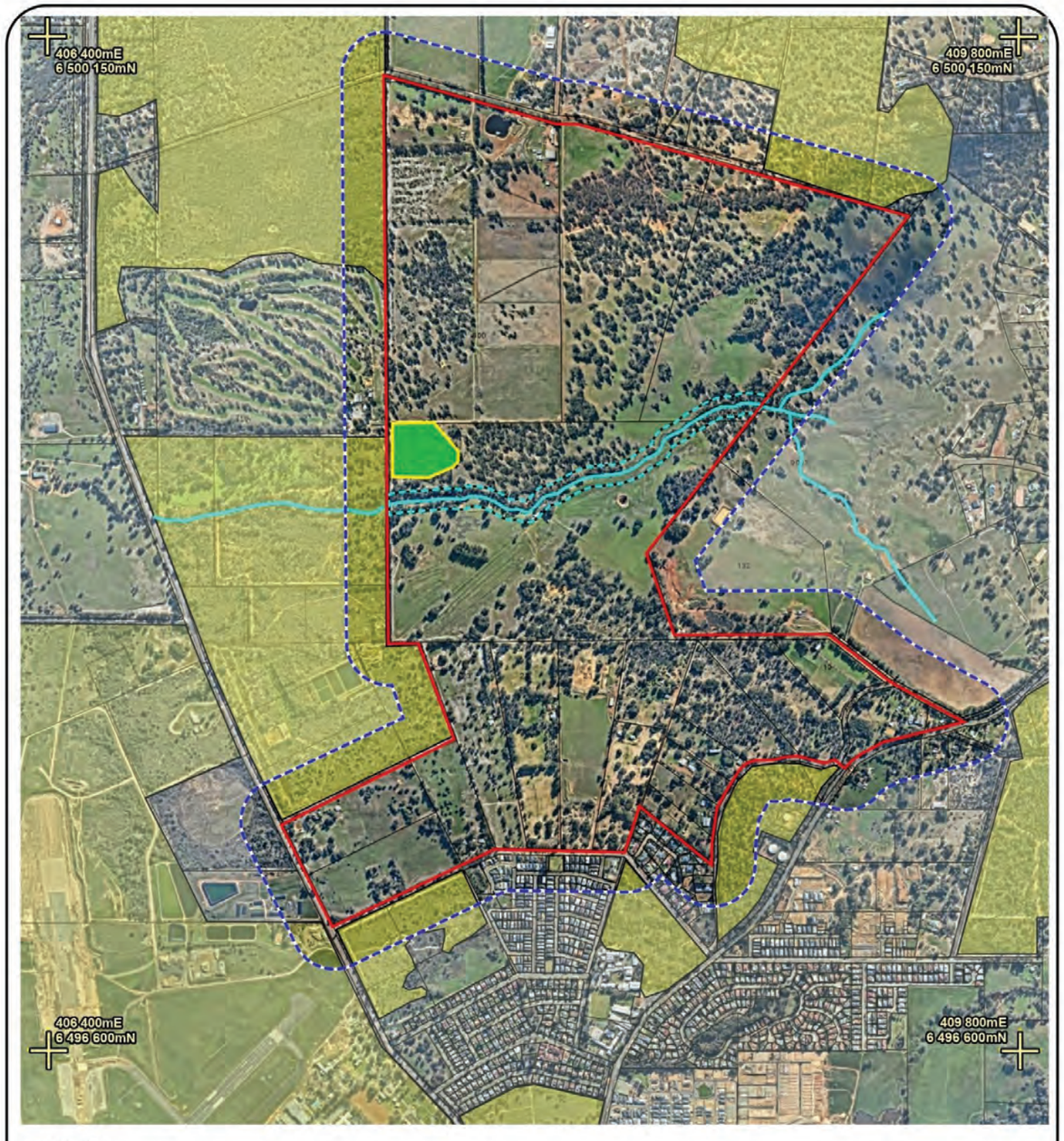
A Landscape Concept Plan will be prepared for the proposed development by LD Total and this will provide an overall guide to the proposed functions, amenities and landscape treatment within the subject land.

The proposed Landscape Strategy will identify both restricted and unrestricted public Open Space. Areas of existing vegetation will be either:

- Retained as bushland and be classified vegetation under AS3959; or
- Be modified and developed as highly managed parkland with clumps or belts of trees with selected understorey plants, with irrigated lawn, open spaces, pathways and may include playgrounds.

A 30m wide revegetation buffer will be provided along each side the central drainage line, with other areas of high quality vegetation being retained as POS.

The subdivision and development of the site for urban and residential purposes will require the general clearing of the proposed development areas as shown in Figure 10.



LEGEND

- SUBJECT LAND
- VEGETATION ASSESSMENT AREA (150m from the external boundary of the subject land)
- BUSH FOREVER SITE
- CREEK LINE
- 30m REVEGETATION BUFFER
- HIGH QUALITY VEGETATION

FIGURE 9
ENVIRONMENTAL FEATURES

Job No 22-015

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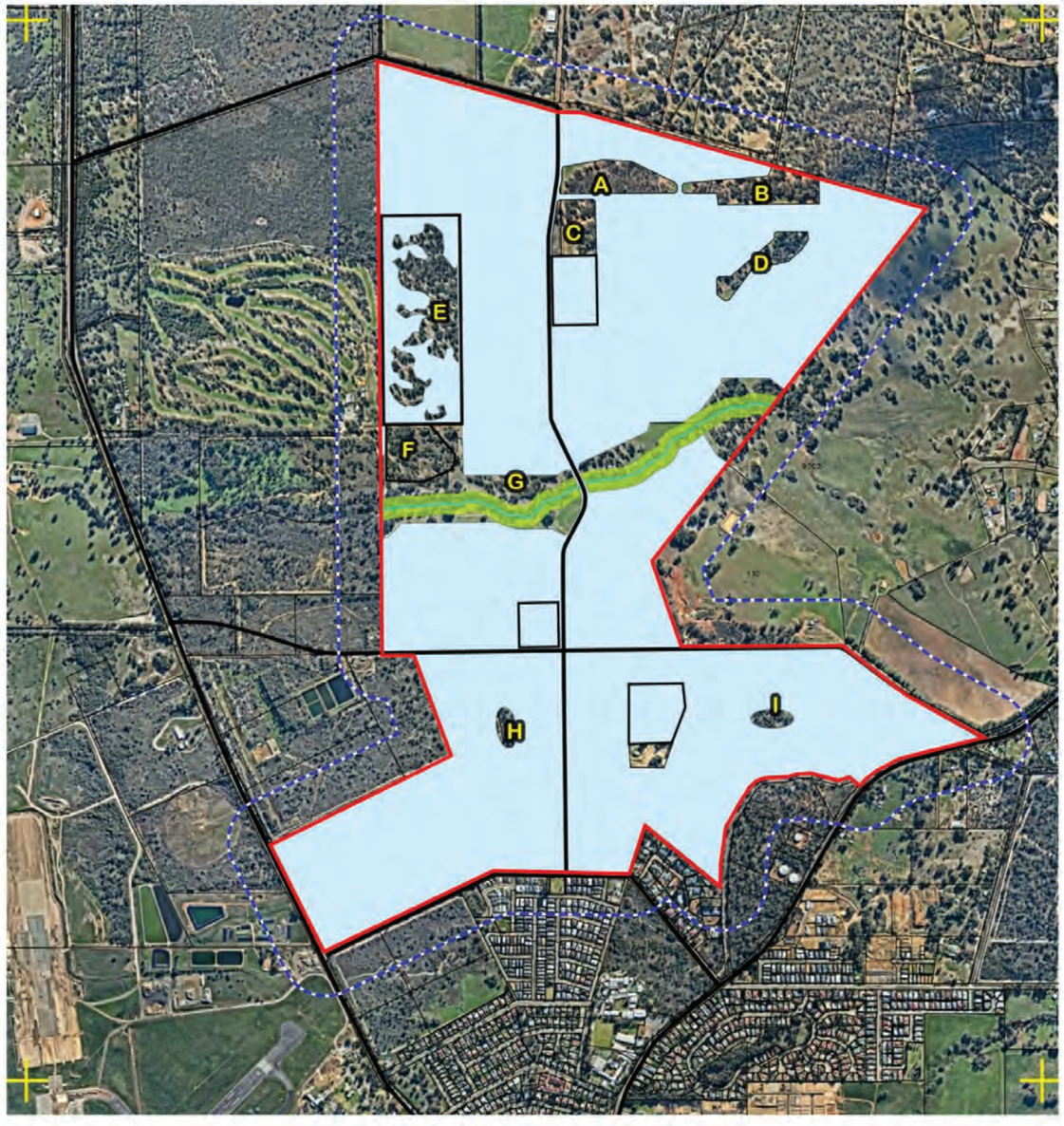

LEGEND

- SUBJECT LAND
- VEGETATION ASSESSMENT AREA (150m from the external boundary of the subject land)
- VEGETATION TO BE MODIFIED TO LOW FUEL STATE
- REVEGETATION 30m EITHER SIDE OF CREEK

VEGETATION AREAS
(Estimate of existing vegetation in each area)

- A - 2.8ha
- B - 3.8ha
- C - 1.7ha
- D - 1.9ha
- E - 7.0ha
- F - 3.7ha
- H - 0.6ha
- I - 0.5ha

FIGURE 10
VEGETATION MODIFICATION

Job No 22-015

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A	Preliminary	20/03/2023
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3.0 Bushfire Assessment Results

3.1 Assessment Inputs - Vegetation Classification

All vegetation within 150m of the site / proposed development was classified in accordance with:

- Clause 2.2.3 of Australian Standard AS3959 Construction of Buildings in Bushfire Prone Areas;
- The Visual Guide for Bushfire Risk Assessment in Western Australia; and
- Applicable Fire Protection Australia BPAD Practice Notes.

Given the size of the site and the generalised nature of the assessment, a conservative approach has been taken with the vegetation classifications. This means that where the vegetation classification may not be clear then:

- The vegetation classifications are based on the predominant vegetation within an area, which may incorporate smaller areas of vegetation which would otherwise be included in a separate Class;
- Class A Forest classification is used in preference to Class B Woodland; and
- Class D Scrub classification is used in preference to Class C Shrubland.

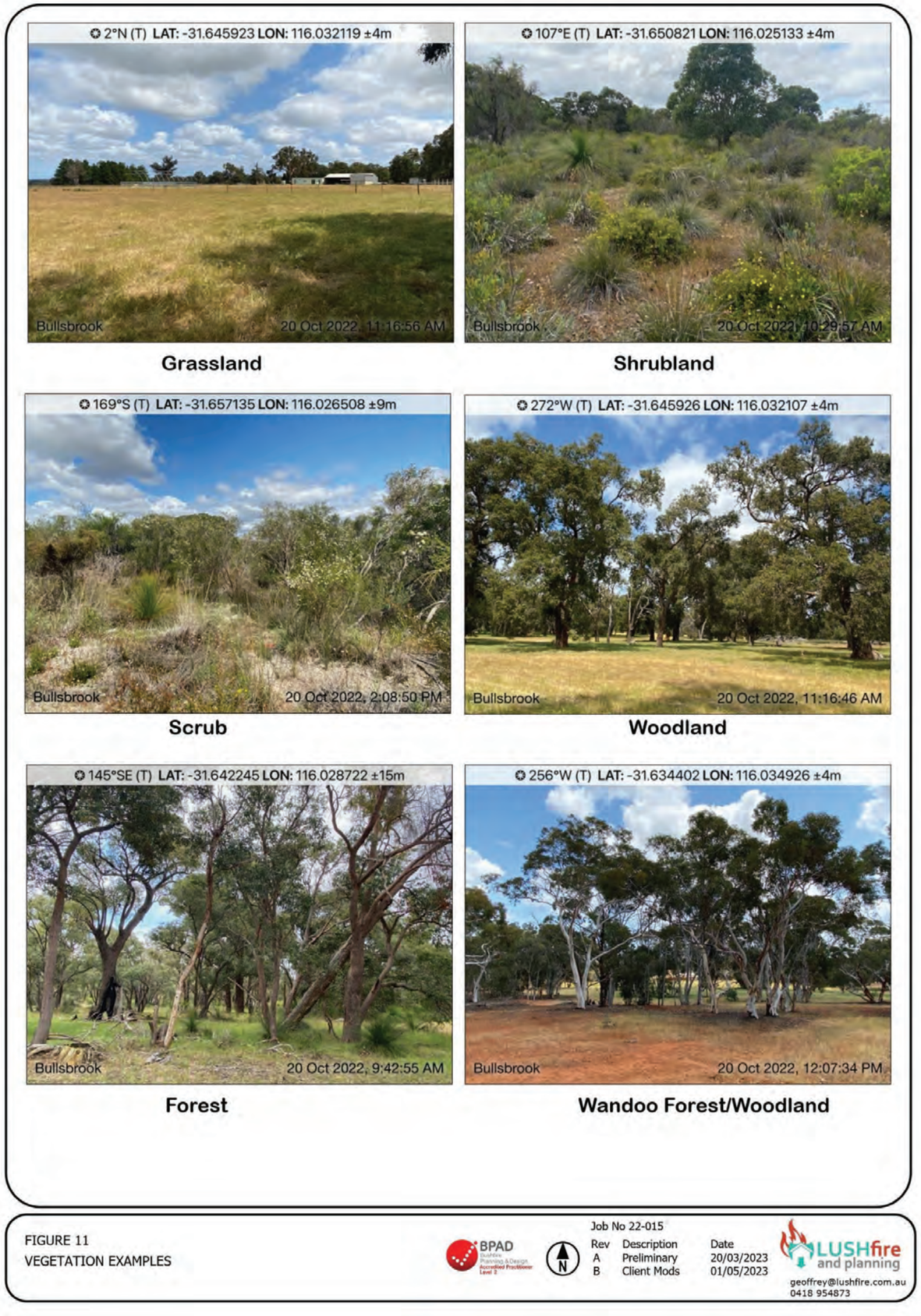
It is also noted that the vegetation classifications under AS3959 Construction of Buildings in Bushfire Prone Areas appear to be similar to widely used classifications used for environmental assessments. However, two notable differences being:

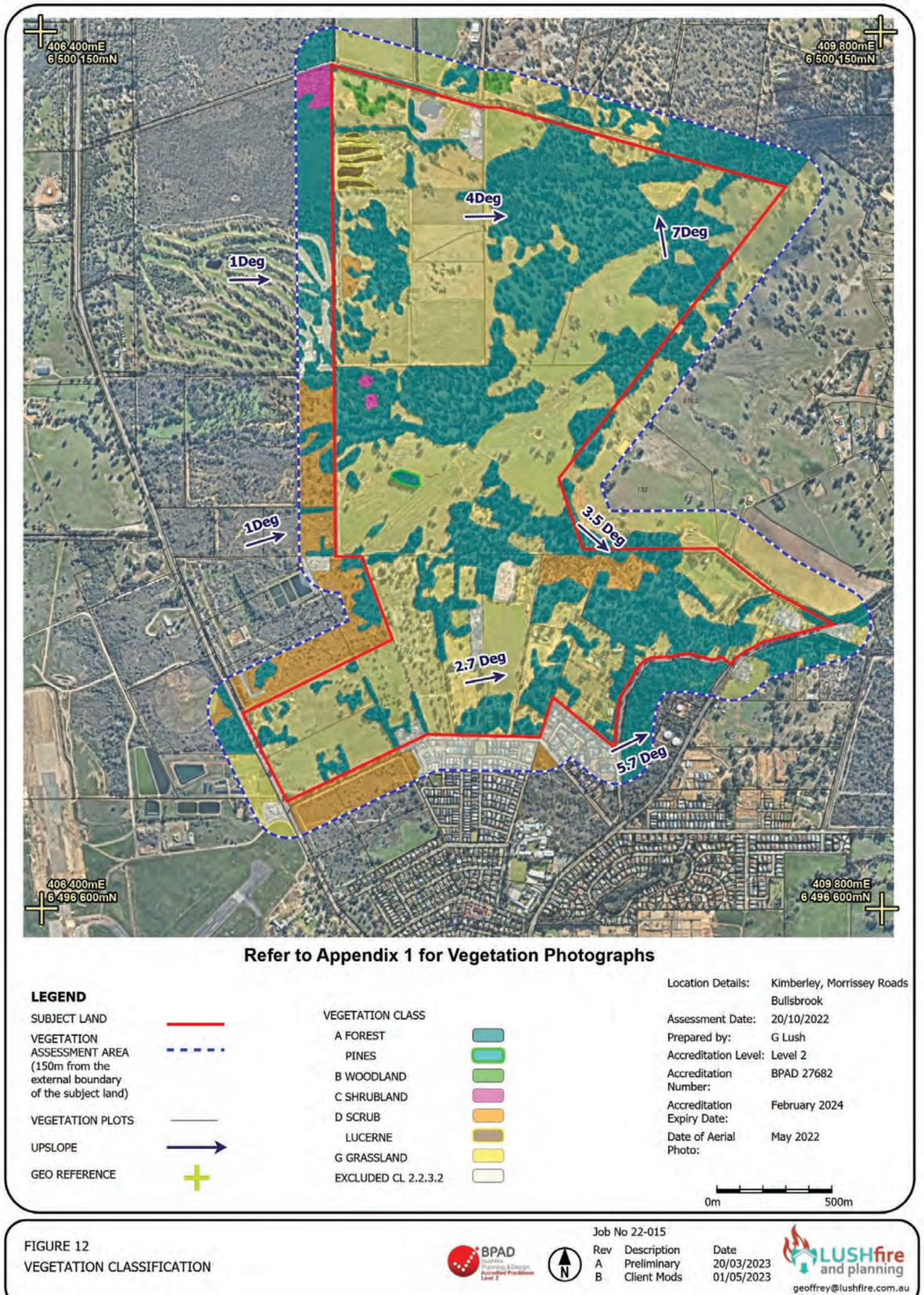
- The AS3959 classification of Woodland vegetation stipulates that it is to be over a grassland understorey that may have occasional shrubs; and
- There is no minimum height for Forest vegetation.

The primary vegetation types are documented in Table 5 with examples shown in Figure 11. The overall vegetation classification for the site and adjacent land is shown in Figure 12. More detailed vegetation photographs are shown in Appendix 1.

Table 5 Vegetation Descriptions

Classification	Description
Class G Grassland	This is generally pasture within the subject land and the surrounding rural properties which is being used for grazing.
Class C Shrubland	Shrubland areas are generally combined with other more prominent vegetation and in many cases with open scrub, especially in the Bullsbrook Nature Reserve, Bush Forever Sites 292 and 294. It has only been classified by itself in a few instances.
Class D Scrub	The areas if scrub vegetation occur predominantly in the Bush Forever sites on the lower sandy areas to the west of the site.
Class B Woodland	These are areas of Marri/Jarrah located in main portion of the property that have a pasture understorey. They are often on the edge of other forest plots where the canopy coverage diminishes as a transition to a more open area.
Class A - Forest	The forest areas are generally Marri/Jarrah with some areas of Flooded Gums. The areas predominantly have a grassland understorey, but with more than 30% canopy coverage. Several smaller areas, especially along the drainage line, have well developed mixed shrubland understorey with increased near surface fuel loads.
Class A - Forest	Wandoo / White Gum areas are found on the gravel ridge line in the higher north eastern portion of the site. Some areas could be potentially be classified as woodland as there is minimal understorey vegetation.





3.2 Assessment Outputs

3.2.1 Bushfire Hazard Level – Undeveloped Land

The bushfire hazard primarily relates to the vegetation on the site, the type and extent (area) of vegetation and its characteristics. The methodology for determining the bushfire hazard level is contained in the Guidelines for Planning in Bushfire Prone Areas (Section 4.1 and Appendix 2).

The classifications are as follows:

Extreme Hazard	• Class A Forest • Class B Woodland (05) • Class D Scrub • Any classified vegetation with a greater than 10 degree slope
Moderate Hazard	• Class B Open Woodland (06), Low Woodland (07) Low Open Woodland (08) Open Shrubland (09) * • Class C Shrubland • Class E Mallee/Mulga • Class G Grassland including sown pasture and crops • Vegetation that has a low hazard level but is within 100 metres of vegetation of vegetation classified as a moderate or extreme hazard.
Low Hazard	• Low threat vegetation, may include the following: areas of maintained lawns, gold courses, public recreation reserves and parklands, vineyards, orchards; cultivated gardens, commercial nurseries, nature strips and windbreaks. • Managed grassland in a minimal fuel condition meaning that there is insufficient fuel available to significantly increase the severity of the bushfire attack, for example short cropped grass to a nominal height of 100mm. • Non vegetated areas including waterways; roads; footpaths; buildings or rock outcrops.

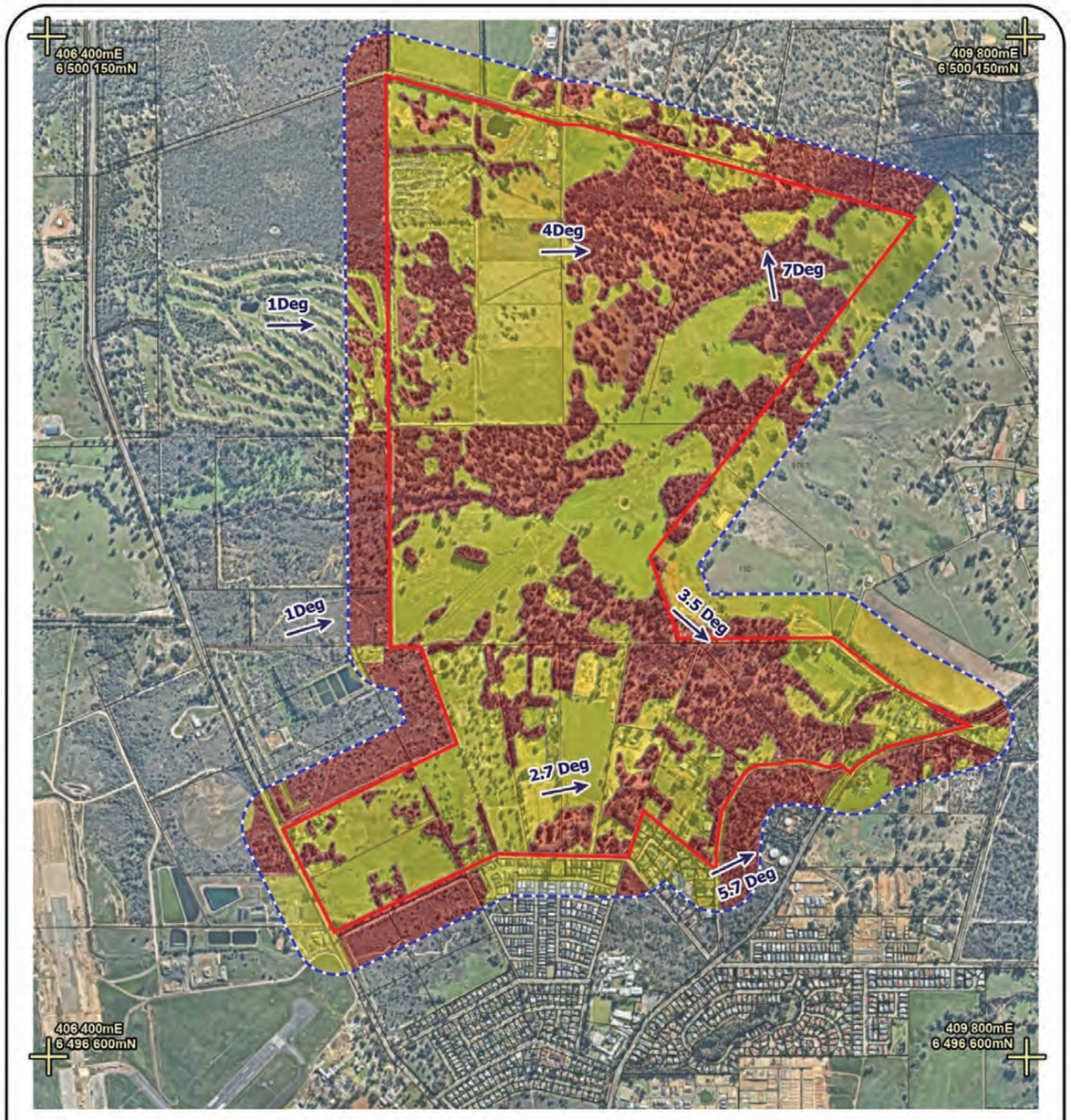
The bushfire hazard level assessment for the existing undeveloped land is shown in Figure 13. As expected, given the extent of vegetation, a large portion of the site has an extreme bushfire hazard level while the remainder of the site has a moderate level.

3.2.2 Bushfire Hazard Level – Developed Land

The classifications for the modified vegetation for the developed site are shown in Figure 14. These are based upon the assumptions in Section 2.2 regarding clearing and revegetation. The bushfire hazard assessment levels are shown in Figure 15.

When the site is fully developed it is expected that:

- 5% of the site (17 hectares) will have an extreme bushfire hazard level;
- 34% of the site (122 hectares) will have a moderate bushfire hazard level; and
- 61% of the site (215 hectares) will have a low bushfire hazard level.



LEGEND

SUBJECT LAND

ASSESSMENT AREA
(150m from the external boundary of the subject site)

BUSHFIRE HAZARD LEVEL

EXTREME

MODERATE

LOW

Location Details:	Kimberley, Morrissey Roads Bullsbrook
Assessment Date:	20/10/2022
Prepared by:	G Lush
Accreditation Level:	Level 2
Accreditation Number:	BPAD 27682
Accreditation Expiry Date:	February 2024
Date of Aerial Photo:	May 2022

0m 500m

FIGURE 13
BUSHFIRE HAZARD LEVEL ASSESSMENT
UNDEVELOPED LAND

BPAD Bushfire Planning & Design Accredited Practitioner Level 2

N

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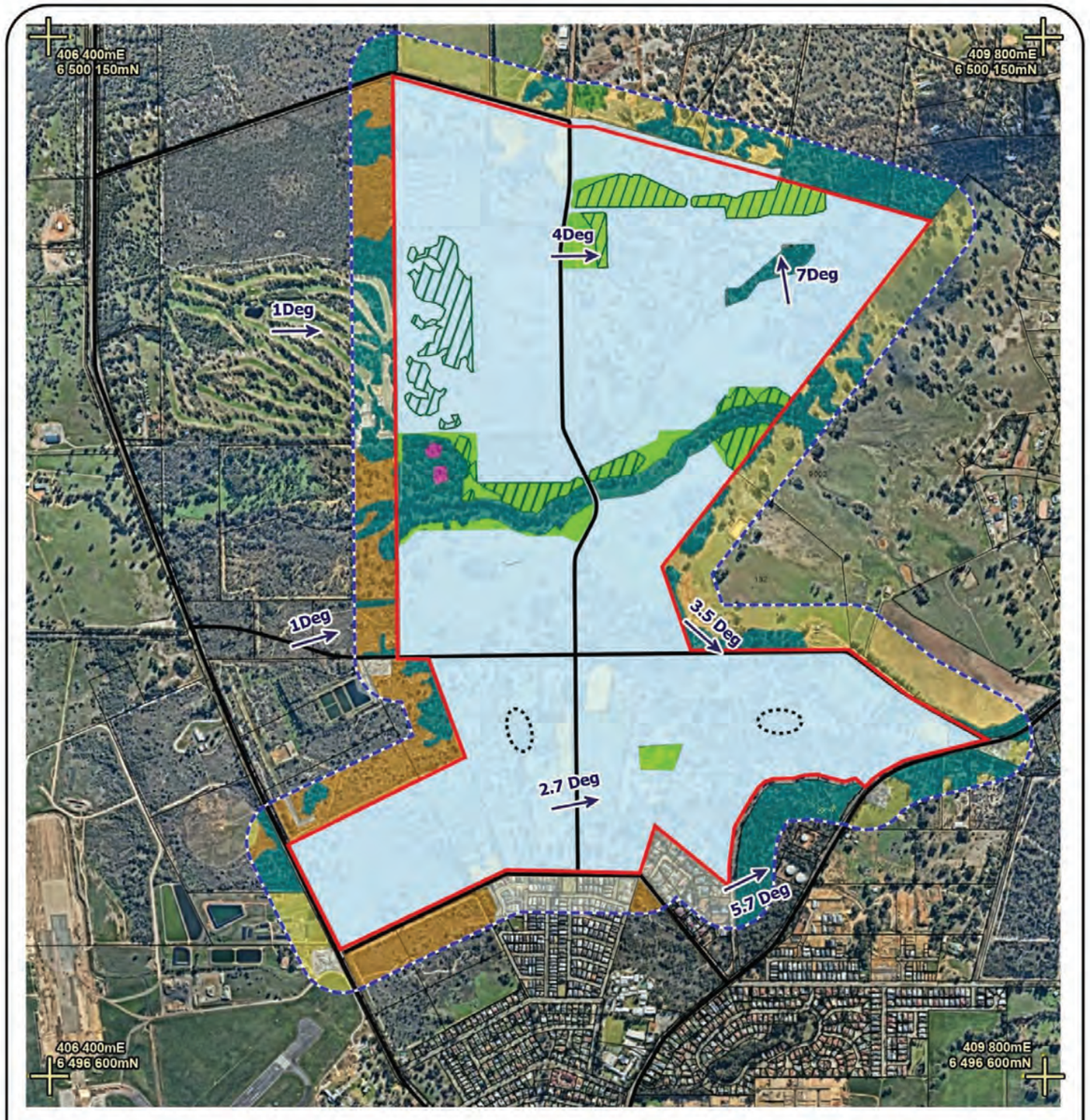

LEGEND

SUBJECT LAND

VEGETATION ASSESSMENT AREA
(150m from the external boundary of the subject land)

VEGETATION PLOTS

UPSLOPE

GEO REFERENCE

VEGETATION CLASS

A FOREST

B WOODLAND

C SHRUBLAND

D SCRUB

G GRASSLAND

EXCLUDED CL 2.2.3.2

MODIFIED TO LOW FUEL STATE

MANAGED POS

EXISTING BUSHLAND MODIFIED AND MANAGED WITH REDUCED FUEL LOADS

POTENTIALLY EXCLUDED CL 2.2.3.2(b) LESS THAN 1HA AND MORE THAN 100m FROM OTHER VEGETATION

Location Details:	Kimberley, Morrissey Roads Bullsbrook
Assessment Date:	20/10/2022
Prepared by:	G Lush
Accreditation Level:	Level 2
Accreditation Number:	BPAD 27682
Accreditation Expiry Date:	February 2024
Date of Aerial Photo:	May 2022

0m 500m

FIGURE 14
MODIFIED VEGETATION CLASSIFICATION

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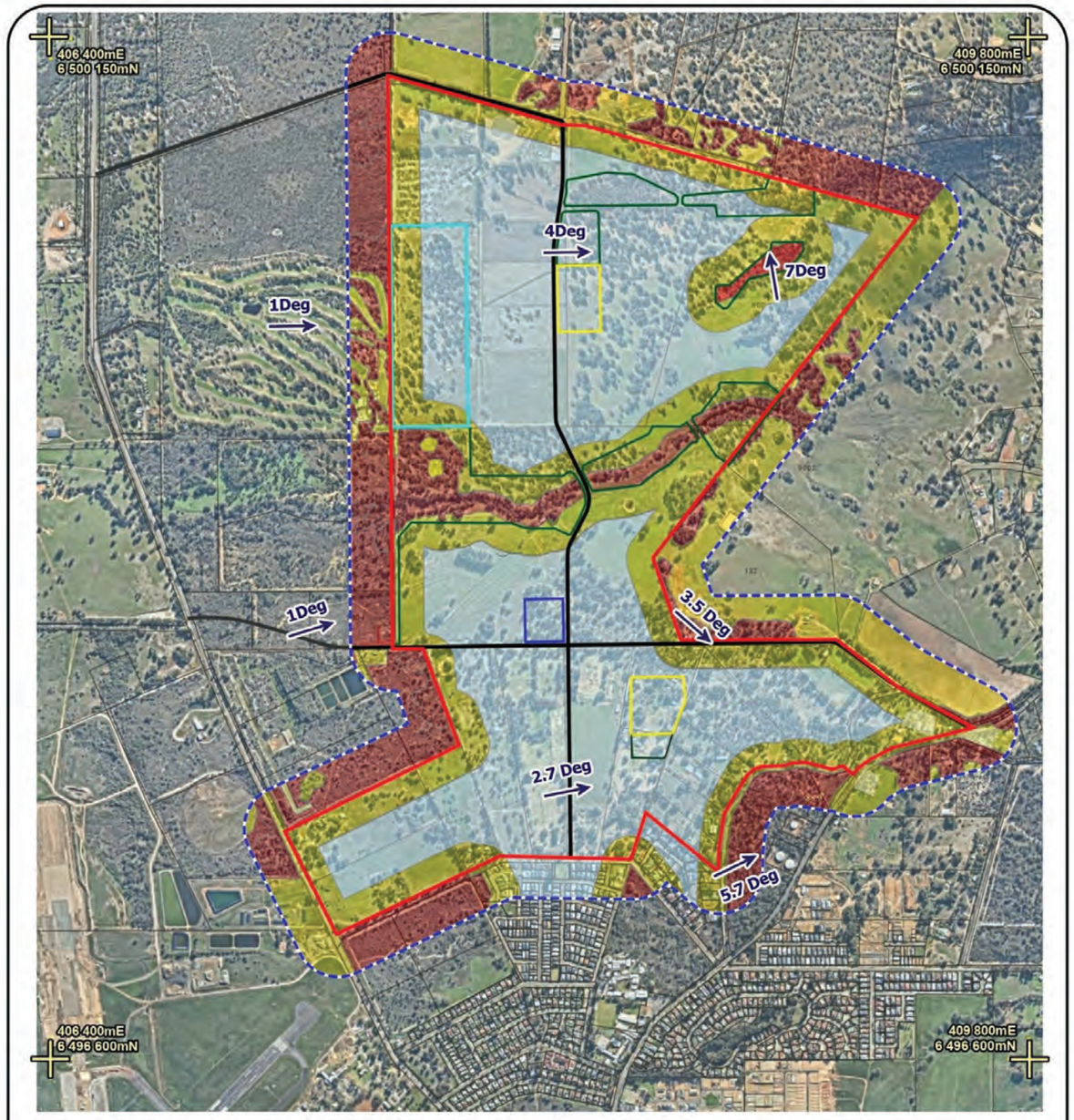

LEGEND

SUBJECT LAND

ASSESSMENT AREA (150m from the external boundary of the subject site)

BUSHFIRE HAZARD LEVEL

EXTREME

MODERATE

LOW

ACCESS ROAD

POS

PRIMARY SCHOOL

LOCAL CENTRE

CARAVAN PARK

Location Details:	Kimberley, Morrissey Roads Bullsbrook
Assessment Date:	20/10/2022
Prepared by:	G Lush
Accreditation Level:	Level 2
Accreditation Number:	BPAD 27682
Accreditation Expiry Date:	February 2024
Date of Aerial Photo:	May 2022

0m 500m

FIGURE 15
BUSHFIRE HAZARD LEVEL ASSESSMENT
DEVELOPED LAND

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4.0 Identification of Bushfire Hazard Issues

4.1 District Context

The relationship of the subject land to the surrounding district is shown in Figure 16.

A bushfire can have several ignition sources which can originate from either natural or human causes such as:

- Lighting strikes;
- Unattended camp fire;
- Discarded match or cigarette;
- Dry grass in contact with vehicle exhausts;
- Sparks from grinders, slashing or other mechanical operations;
- Backyard rubbish burning;
- Hazard reduction burns;
- Powerlines sparking in strong winds or falling;
- Pole top fires; and
- Deliberate arson.

The consideration of the bushfire hazard issues also relates to the type of bushfire event being:

- A large scale “landscape” fire which extends for over a kilometre and is likely to occur over lengthy period which could be several days; or
- A local or neighbourhood fire with a relatively smaller fire run, noting that the models used to quantify bushfire behaviour in Australian Standard AS3959 are based on observations of fire behaviour burning in contiguous vegetation over distances that exceed 100m.

A bushfire can impact the site from any direction and its intensity is a function of the weather conditions, slope, and vegetation. The bushfire season generally occurs from November until the end of April. The January and February 2022 Daily Weather Observations at the Pearce Weather Station (9053) are shown in Table 6 below.

Table 6 Weather Summary

2022	9:00 am Max Temp	9:00 am Max Wind Speed	Direction	3:00 pm Max Temp	3:00 pm Max Wind Speed	Direction
January	33.7 C	33 km/h	ENE	41.4 C	33 km/h	SW
February	35.5 C	39 km/h	ESE	42 C	35 km/h	WSW

In relation to the subject land the main vegetation hazards are:

- To the north east of the subject land is bush forever site 291 which is more than 300 hectares in area and extends for more than 2kms from the site. Further away to the north east are additional bush forever sites.
- To the south east is bush forever site 86 which has an area of more than 60 hectares, extending for approximately 800m. Bush forever site 88 also adjoins the south eastern portion of the site along Ashton Road.
- To the south west is bush situated between the subject land and the Great Northern Highway. This includes a portion forever site 294 and other reserves and freehold lots.
- To the north west is bush forever site 292 being approximately 200 hectares and extending for more than 1.5 kms.

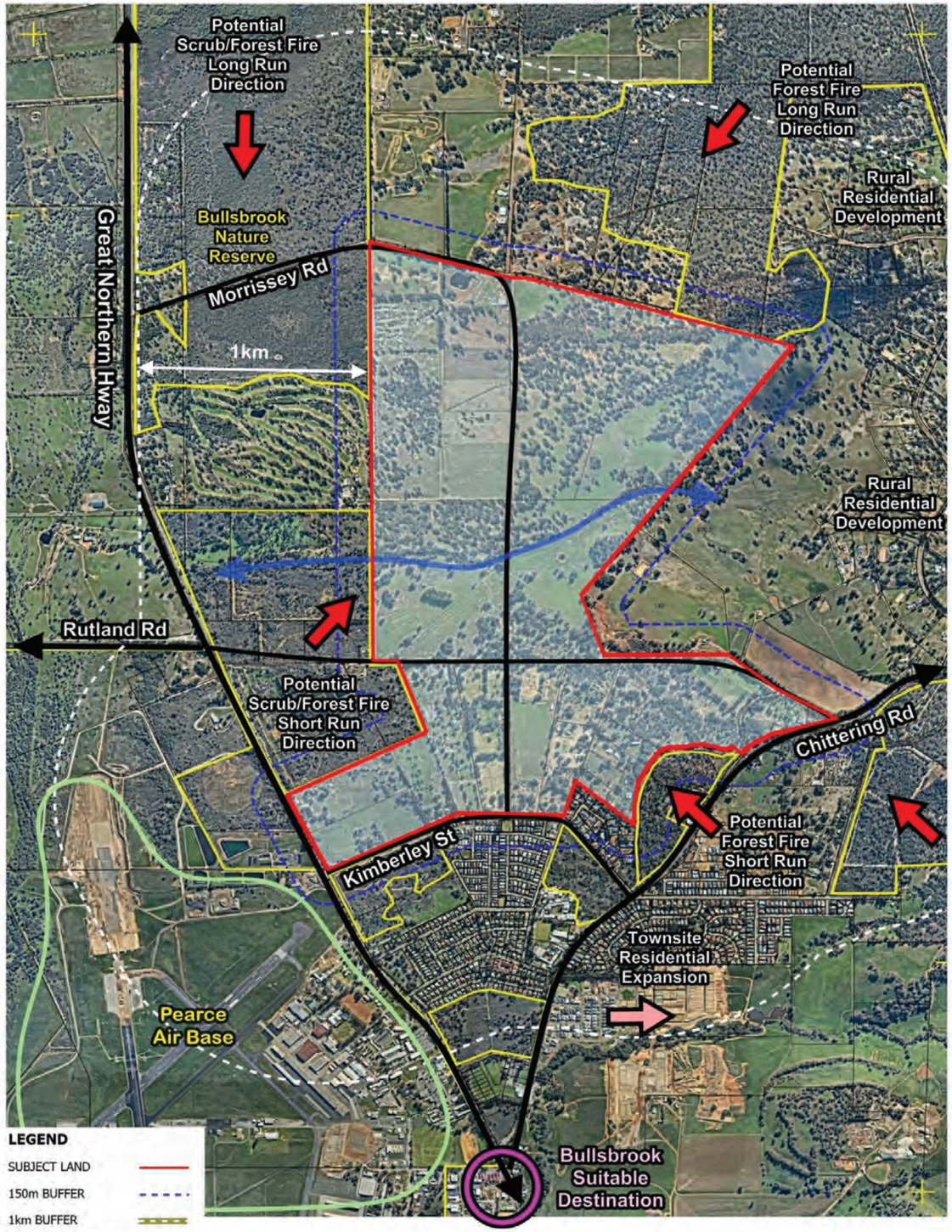

FIGURE 16
DISTRICT CONTEXT

Job No 22-015

Rev	Description	Date
A	Preliminary	20/03/2023
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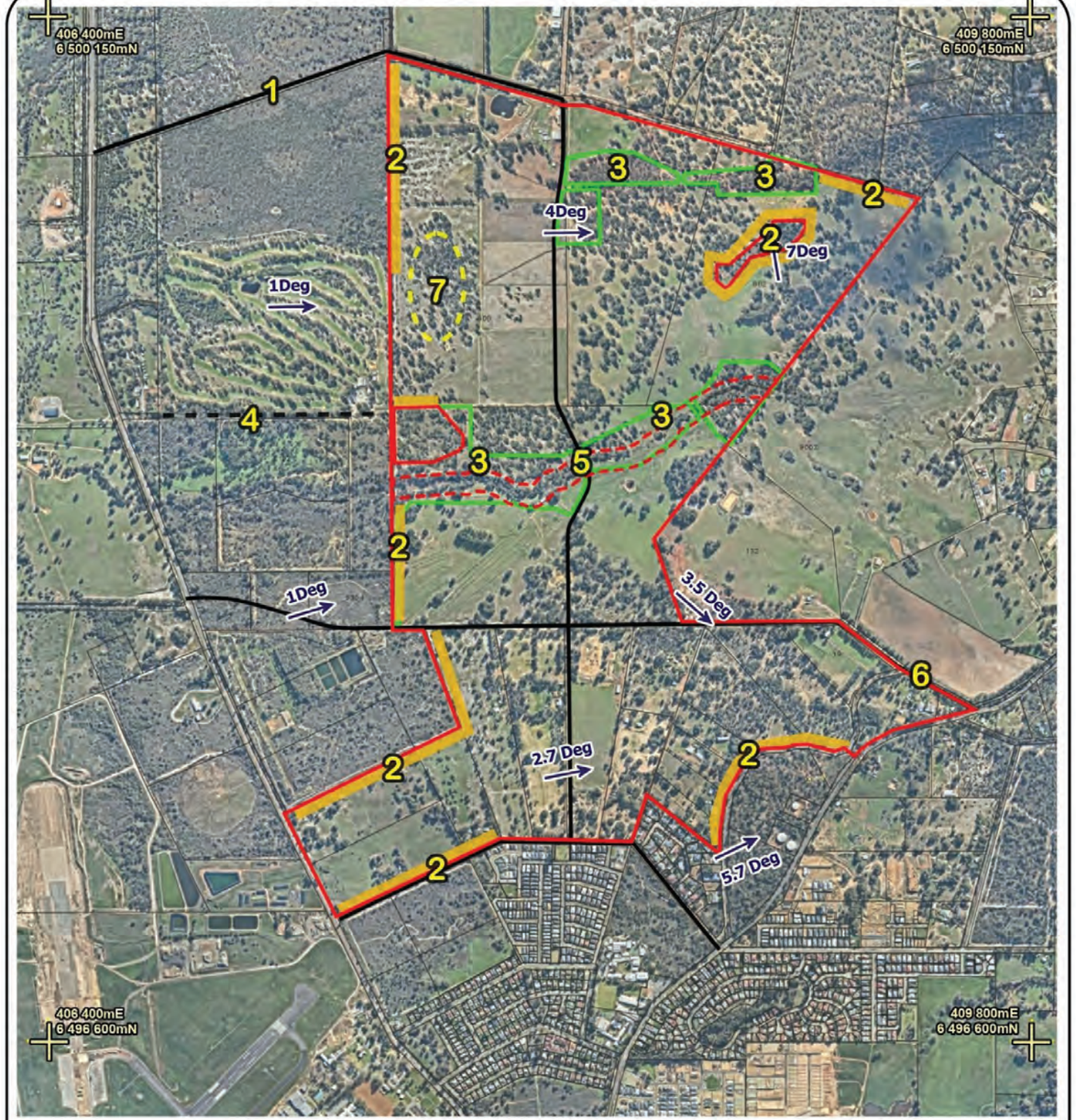

FIGURE 17
SITE ISSUES

Job No 22-015

Rev	Description	Date
A	Preliminary	20/03/2023
B	Client Mods	01/05/2023

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The developed site will have district access in multiple directions connecting to primary regional roads, which will allow for the evacuation of residents in an emergency. Acceptable Solution A3.2a refers to multiple access routes to two different "suitable destinations." The Guidelines define a "suitable destination" as an area that can provide shelter during a bushfire event and is either:

- not classified as bushfire prone on the Map of Bushfire Prone Areas; or
- greater than 100m from classifiable vegetation

The most likely suitable destination will be Bullsbrook town centre. A suitable destination does not mean does not necessarily mean an evacuation centre. It can be any land that is more than 100m from classifiable vegetation which would then have a BAL – Low rating. However, there must be a suitable "space" for people and in a developed area this would most likely be an area of public open space, or a large car park.

The developed site may potentially have up to 4,500 dwellings and the majority of the site is expected to have a BAL – Low rating. The site is between 1 and 2kms wide and nearly 3kms long. Where there is an external bushfire approaching the site, it is not expected that the whole population would be evacuated. Rather, any evacuation would focus on those residents closest to boundary of the fire front. The area of evacuation may extend for more than 100m from the site boundary and would depend upon operational considerations.

4.2 Local - Site Issues

The principal site issues are shown in Figure 17 and these will be addressed through the subdivision design and proposed management measures.

1. Upgrading of Morrissey Road

Morrisey Road provides the main access connection to the northern portion of the site from the Great Northern Highway. It is a 20m wide road reserve with a 6m sealed carriageway. The subject land is 1km distance from the highway with 850m having vegetation with an extreme hazard rating on both sides of the road, being associated with Bush Forever Site 292. This vegetation also extends on to the road verge as shown below.

Morrissey Road may potentially require widening of the shoulders. Management of the vegetation of the road verges may also be required to provide services and improve the safety of the road.



Morrissey Road looking south west towards the Great Northern Highway

2. Hazard Interface/ Separation

At the local level the major bushfire management issue is the interface with the bushland areas both within and external to the site. The most efficient and cost effective fire management measure is to separate development from hazard areas. The greater the separation distance the lower the hazard or BAL rating for the development.

Acceptable Solution A3.4a requires that a perimeter road be provided between residential areas and vegetation classified under AS3959 (except for grassland) as shown in Figure 19. The development setback must then be maintained as low threat vegetation in accordance with AS3959 Clause 2.2.3.2.

The functions and benefits of a perimeter road include:

- Allowing for passive surveillance of the bushland hazard;
- Providing a defendable space for firefighting and emergency management purposes;
- Reducing the potential radiant heat that may impact a habitable building in a bushfire event;
- Reducing the need for battle-axe lots; and
- Providing unconstrained public access/egress for the community in the event of a bushfire.

It is noted that in many instances the BAL-29 setback to the lot boundary may exceed the width of the perimeter road reserve. As shown in Figure 19, this would be 21m for Class A Forest on flat land and the setback increases with any downslope. In such cases the perimeter road reserve may have to be widening to accommodate the required setback.

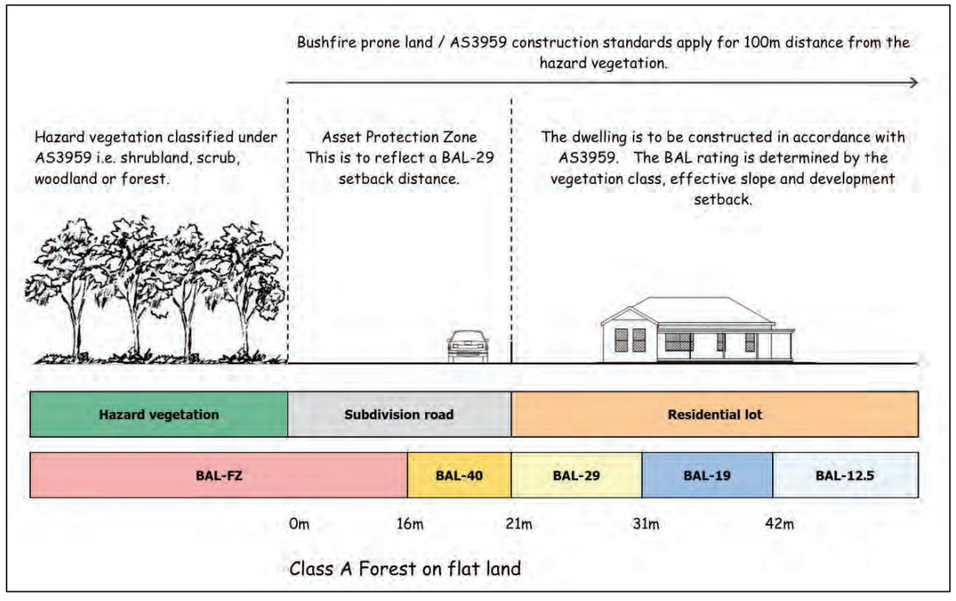


Figure 18 Hazard Interface

3. Modification of Bushland in POS Areas

As shown in Figures 9 and 13, it is proposed to retain multiple areas of vegetation as Public Open Space reserves. It is recognised that as there is a desire for people to live in closer contact with natural landscape particularly on the urban fringe, and that the provision of Public Open Space areas which are devoid of trees may not be acceptable. The landscaping design of public areas is expected to enhance and protect the distinctive landscape character of the site.

While the risk of a bushfire in an urban environment might be low, if the land is defined as being bushfire prone then the characteristics of the vegetation in public areas will affect the subsequent BAL ratings. Well managed, designed and publicly accessible landscape areas are likely to have a lower bushfire hazard and this has implications for the adjoining development and subdivision design.

The Public Open Space areas will cater for active and passive (restricted) uses. The landscaping principles for these could include:

a) Trees located closer to the central drainage areas with grassed areas on the periphery;
b) Little or no middle storey vegetation apart from drainage areas;
c) Open tree canopy to provide filtered sunlight;
d) Turfed areas will be irrigated and remain “green” and subject to regular mowing and maintenance;
e) Perimeter subdivision roads to ensure that the POS does not abut residential properties;
f) Maintaining near surface fuel loads to less than 4 tonnes per hectare; and
g) Ensuring a high degree of public surveillance by incorporating the design principles in the WAPC (2006) Designing Out Crime Guidelines / Safer Places by Design.

Evidence to support the exclusion of POS areas as established and managed to low threat in accordance with AS 3959 is required. If unsubstantiated, the vegetation classification will need to be revised to consider the vegetation classification or the resultant bushfire hazard level (BHL) assessment ratings may be inaccurate.

The key method for doing this is the preparation of a management plan for the proposed POS areas. The landscaping of any public open space areas is normally subject to a landscaping plan approved by Council with the landscaping established by the developer and maintained for two years as prescribed by Model subdivision condition R4 which states that:

> Arrangements being made for the proposed public open space to be developed by the landowner/ applicant to a minimum standard and maintained for two summers through the implementation of an approved landscape plan providing for the development and maintenance of the proposed public open space in accordance with the requirements of Liveable Neighbourhoods and to the specifications of the local government. (Local Government).

This is further reinforced in Section 6.3.3.2 of the Local Government Guidelines for Subdivisional Development which set out the standard requirements for the development of public open space including:

a) The preparation of a management plan;
b) A long-term maintenance agreement based on the management plan being entered into by the developer with the Local Government as part of the approval.
c) A landscape maintenance and watering period of at least two summer periods to ensure full establishment, which includes a maintenance bond.

4. Sounness Drive

Sounness Drive provides access from the Great Northern Highway to the Chequers Golf Club adjacent to western boundary of the site. The formal road reserve only extends 130m to the boundary of R27583, with the balance of the road effectively being a private access.

From the entrance to the Chequers Golf Club carpark to the boundary of the subject land is 140m.

Sounness Drive is not suitable as an additional public road access. It may, subject to the City’s agreement, be connected to the site as an emergency access way.



Sounness Drive within Reserve 27583

5. Single Internal Access Over Drainage Line

The modifications to the Structure Plan show a single distributor road within the site extending from Kimberley Street north over the drainage line connecting to Morrissey Road.

This will potentially be a 25m wide road reserve with a dual carriageway.

While noting the previous comments regarding the potential evacuation of part of the development in a fire emergency, it is necessary to show that this road has the capacity for the expected traffic volumes.

6. Aston Road Connection

The modifications to the Structure Plan show Ashton Road connecting to Chittering Road along the boundary of the subject land. This is a critical direct connection that provides access to the east of the site, whereas Ashton Road at present has a more circular route back to Chittering Road.

7. Caravan Park

The proposed caravan park site is already zoned under the Local Planning Scheme. This is a ‘vulnerable land use’ as defined in SPP3.7 Planning in Bushfire Prone Areas and will require a separate bushfire assessment as outlined in Section 4.4

4.3 High Risk Land Uses

High risk land uses are those uses which may lead to the potential ignition, prolonged duration and/or increased intensity of a bushfire. Such uses may also expose the community, fire fighters and the surrounding environment to dangerous, uncontrolled substances during a bushfire event. Examples of high risk land uses include service stations, landfill sites, bulk storage of hazardous materials, fuel depots.

Depending upon the specific land use provisions, it may be possible that high risk land uses are permissible within the service commercial area.

SPP 3.7 requires that a development application for any high risk land use is to be accompanied by a Bushfire Management Plan jointly endorsed by the local government and the Department of Fire and Emergency Services. This may include a risk management plan that addresses bushfire risk management measures for any flammable on-site hazards.

These provisions only apply when the development site is designated as being bushfire prone and has a rating of between BAL-12.5 and BAL-29.

4.4 Vulnerable Land Uses

Vulnerable land uses are uses where it is considered that occupants have a lesser capacity to respond in the event of a bushfire, and which may present evacuation challenges. These are generally associated with hospitals, nursing homes and retirement villages. However, they also include any form of tourist accommodation, places of assembly, family day care centres, schools etc.

It is expected that the residential components of the development may include various vulnerable land uses.

SPP 3.7 requires that a development application for a vulnerable land use is to be accompanied by a Bushfire Management Plan jointly endorsed by the local government and the Department of Fire and Emergency Services. This is also to have a Bushfire Emergency Evacuation Plan prepared for the proposal.

These provisions only apply when the development site is designated as being bushfire prone and has a rating of between BAL-12.5 and BAL-29.

5.0 Assessment Against the Bushfire Protection Criteria

A summary of the compliance with the Bushfire Protection Criteria as contained in Version 1.4 (Dec 2021) of the Guidelines for Planning in Bushfire Prone Areas is documented in Table 6. This demonstrates how the Criteria are expected to be complied with at the various planning stages being:

- The amendment to the Metropolitan Planning Scheme;
- The modifications to the District Structure Plan;
- An amendment to the Local Planning Scheme;
- A subdivision application; and
- A development application.

Version 1.4 of the Guidelines applies the Acceptable Solutions based upon the following planning stages:

SP – Strategic planning proposal and structure plan where the lot layout is not known

Sb – Structure plan where the lot layout is known and subdivision application

Dd – Development application for a single dwelling, ancillary dwelling or minor development

Do – Development application for any other development

It is also acknowledged that the subdivision design / concept plan is likely to be refined and evolve at the subsequent planning stages.

Table 7 BPC Compliance

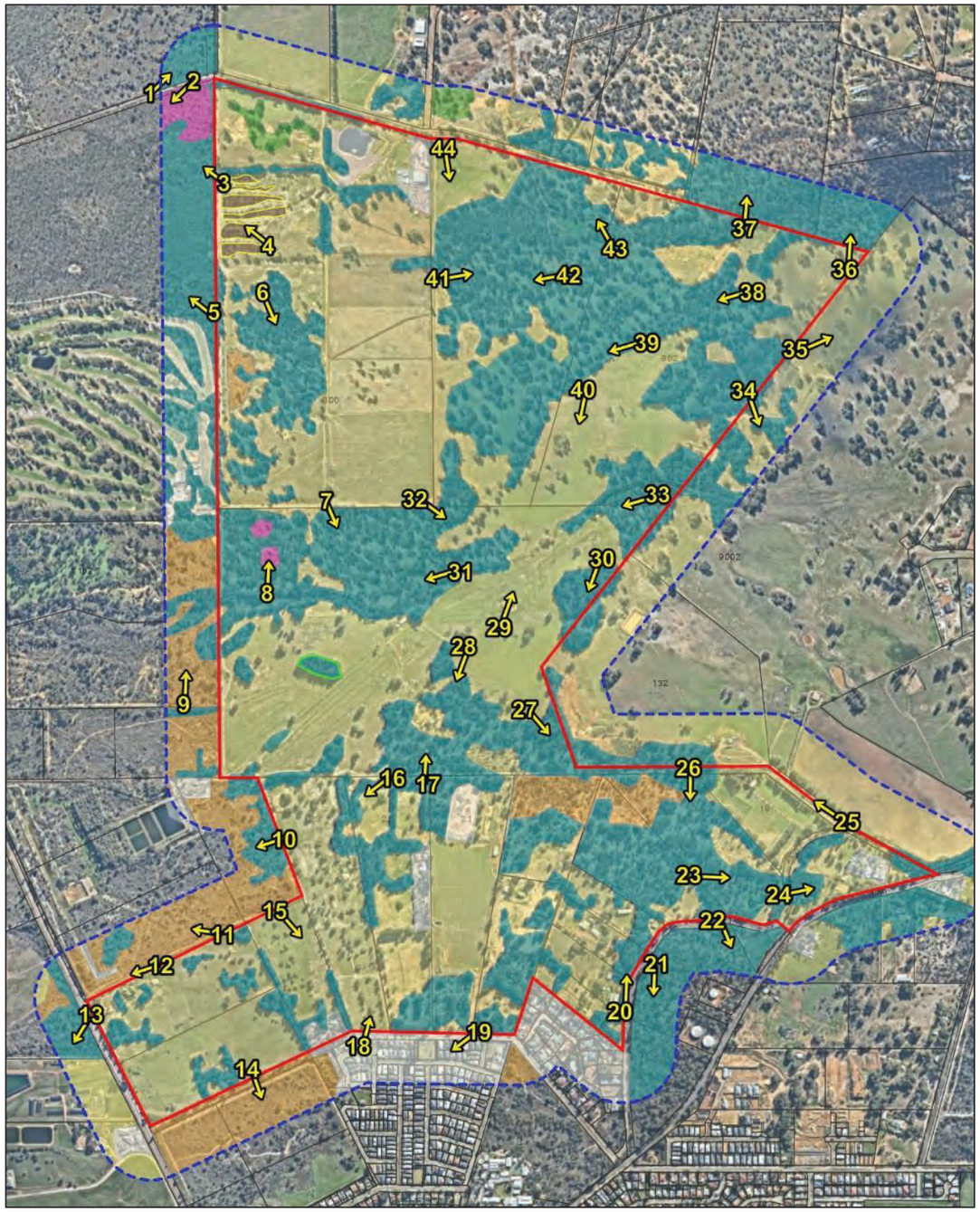
Development / Design Stage / Requirement	Metropolitan Region Scheme Amendment	Local Planning Scheme Amendment	Structure Plan	Subdivision Application	Development Application
Element 1 Location					
A1.1 Development Location	The majority of the land is expected to have a moderate or low hazard level when developed. Development can achieve a BAL-29 rating, subject to appropriate setbacks and is suitable for development in accordance with the objectives of SPP3.7.	This can include additional development provisions to promote improved fire management measures, including the approval of management plans for any retained bushland.	Preparation of a bushfire management plan to support the structure plan and proposed subdivision design. The BMP is to provide evidence to support the exclusion of POS areas as established and managed to low threat in accordance with AS 3959 is required.	Prepare a BMP to reflect the final subdivision design. Proposed BAL ratings to be confirmed when lot layout is known. Restricting development in portions of land with a BAL-40/FZ rating to be implemented by a Local development Plan or restrictive covenant. Any staging would require interim measures.	Approval of any development application on land with a BAL-12.5 rating or higher, is to have regard to SPP 3.7 and the Guidelines. The approval and can control the location and siting of the development.
Element 2 Siting and Design					
A2.1 Asset Protection zone (APZ).	This is not relevant to the MRS Amendment as there is no detailed subdivision to assess the APZs.	This is not relevant to the LPS Amendment as there is no detailed subdivision to assess the APZs.	The structure plan design needs to ensure that there is a suitable setback between hazard areas and development sites which can contain an appropriate APZ. The APZs are unlikely to be fully contained within each lot and so this will require the use of other land such as a road reserve.	Prepare a BMP to reflect the final subdivision design. The revised BMP will confirm the location and size of the APZs based upon a BAL-29 setback.	Approval of any development application on land with a BAL-12.5 rating or higher, is to have regard to SPP 3.7 and the Guidelines. If necessary, the approval and can stipulate APZ requirements.
Element 3 Vehicular Access					
A3.1 Public Road	The subject land currently has multiple access from existing public roads, while noting that these will require upgrading for the full development.	This can include additional development provisions, including development contributions if required for road upgrading.	The road design is expected to comply with design requirements in Liveable Neighbourhoods.	The road design is to comply with design requirements and this will be confirmed in the revised BMP. Interim access for staging is to be provided by public road connections.	Is not applicable.

Development / Design Stage / Requirement	Metropolitan Region Scheme Amendment	Local Planning Scheme Amendment	Structure Plan	Subdivision Application	Development Application
A3.2a Multiple access routes (SP Sb Do)	The site has multiple access routes at both the district and local level. These will be further reinforced in accordance with the District Structure Plan.	The site has multiple access routes at both the district and local level. These will be further reinforced in accordance with the District Structure Plan.	The site has multiple access routes at both the district and local level. These will be further reinforced in accordance with the District Structure Plan. Multiple internal access routes are to be provided connecting to the external road network.	Would be in accordance with the structure plan and bushfire management plan. Any staging would require interim access measures.	Approval of any development application is to have regard to access under an approved bushfire management plan.
A3.2b Emergency access way (SP Sb Do)	Is not applicable to the Amendment as there is no subdivision design.	Is not applicable to the Amendment as there is no subdivision design.	It may be applicable depending upon the subdivision design.	Would be provided in accordance with the structure plan and bushfire management plan. Any staging would require interim access measures.	Is not applicable.
A3.3 Through-roads (SP Sb)	Is not applicable to the Amendment as there is no subdivision design.	Is not applicable to the Amendment as there is no subdivision design.	Any Cul-de-sac's and dead-end roads would have to be justified in the BMP as they are to be avoided in bushfire prone areas because they do not provide access in different directions for residents.	Any Cul-de-sac's and dead-end roads would have to be justified in the BMP as they are to be avoided in bushfire prone areas because they do not provide access in different directions for residents.	Is not applicable.
A3.4a Perimeter roads (SP Sb)	Is not applicable to the Amendment as there is no subdivision design.	Is not applicable to the Amendment as there is no subdivision design.	The structure plan will identify the primary hazard areas and reinforce the need to provide a physical separation to these in the form of a perimeter road. The requirement for a suitable separation distance may affect the road design width as this could be more than 20m.	The requirement for a suitable separation distance may affect the road design width as this could be more than 20m. Would be shown in the revised BMP.	Is not applicable.
A3.4b Fire service access route (SP Sb)	Is not applicable to the Amendment as there is no subdivision design.	Is not applicable to the Amendment as there is no subdivision design.	Any EAW would have to be justified as they can only be provided as a link to public roads 'where no alternative exists'.	The BMP would have to provide any information why no alternative exists to providing a public road in place of any proposed EAW's. Any staging would require interim access measures.	Is not applicable.

Development / Design Stage / Requirement	Metropolitan Region Scheme Amendment	Local Planning Scheme Amendment	Structure Plan	Subdivision Application	Development Application
A3.5 Battle-axe access legs (Sb)	Is not applicable to the Amendment as there is no subdivision design.	Is not applicable to the Amendment as there is no subdivision design.	Is not applicable to the Amendment as there is no subdivision design.	Any battle axe lot would have to be justified as these are to be avoided in bushfire prone areas.	Is not applicable.
A3.6 Private driveways (Dd Do)	Is not applicable to the Amendment as there is no subdivision design.	Is not applicable to the Amendment as there is no subdivision design.	The structure plan will contain the framework which determines the application of A3.6 in terms of the lot, sizes, provision of reticulated water and local road speed limits.	The BMP would document the application of A3.6.	It may be applicable depending upon the size of the lots.
A3.7 Fire Service Access Route	Is not applicable to the Amendment as there is no subdivision design	Is not applicable to the Amendment as there is no subdivision design	These should be shown on the Structure Plan as part of the local access.	Would be in accordance with the structure plan and bushfire management plan. Any staging would require interim access measures.	Is not applicable.
Element 4 Water					
A4.1 Identification of future water supply (SP)	A reticulated water supply will be provided.	A reticulated water supply will be provided.	A reticulated water supply will be provided.	A reticulated water supply will be provided.	Additional, supplementary supplies may be required depending upon the proposal.
A4.2 Provision of water for firefighting purposes Sb Dd Do	A reticulated water supply will be provided.	A reticulated water supply will be provided.	A reticulated water supply will be provided.	A reticulated water supply will be provided.	Additional, supplementary supplies may be required depending upon the proposal.

Development / Design Stage / Requirement	Metropolitan Region Scheme Amendment	Local Planning Scheme Amendment	Structure Plan	Subdivision Application	Development Application
High Risk Land Uses					
Proposed high risk land uses need special consideration.	High risk uses can potentially occur in an Urban zone but are subject to the Local Planning Scheme zoning provisions. These are only likely to be relative minor, such as a service station.	Can be controlled through zoning and development provisions.	Can be controlled through the provisions of any structure plan.	Is not applicable.	Can require a BMP and a risk assessment.
Vulnerable Land Uses					
Proposed vulnerable land uses need special consideration.	Vulnerable land uses can potentially occur in an Urban zone but are subject to the Local Planning Scheme zoning provisions.	Can be controlled through zoning and development provisions. The proposed caravan park / lifestyle village on Lot 800 is already provided for in the existing zoning.	Can be controlled through the provisions of any structure plan.	Is not applicable.	Can require a BMP and an evacuation plan. Would generally be acceptable in a residential area.

Appendix 1 – Vegetation Photographs



Photograph Locations

Photo No 1

Vegetation Classification
Class A Forest - Low open forest A-04

Description
Banksia woodland/forest over shrubland



Photo No 2

Vegetation Classification
Class C Shrubland - Closed heath C-10

Description
Heath type vegetation to approximately 1m.



Photo No 3

Vegetation Classification
Class A Forest - Open forest A-03

Description
Eucalypts and Banksia to 15m with more than 40% canopy coverage over mixed shrubland understorey.



Photo No 4

Vegetation Classification
Class D Scrub - Open scrub D-14

Description
Lucerne fodder plants / crop



Appendix 1 - Vegetation Photographs

Photo No 5

Vegetation Classification
Class A Forest - Open forest A-03

Description
Eucalypts and Banksia to 15m with more than 50% canopy coverage over mixed shrubland understorey.



Photo No 6

Vegetation Classification
Class A Forest - Open forest A-03

Description
Eucalypts to 20m within the site with more than 50% canopy coverage. Degraded understorey.



Photo No 7

Vegetation Classification
Class A Forest - Open forest A-03

Description
High quality Eucalypts to 20m with more than 50% canopy coverage, over shrubland understorey.



Photo No 8

Vegetation Classification
Class C Shrubland - Open heath C-11

Description
Grass trees less than 1m in height with variable coverage over grass.



LUSHfire and planning

Photo No 9

Vegetation Classification

Class D Scrub - Closed scrub D-13

Description

Mixed scrub to 2m height, 40% canopy coverage. Dense surface layer/understory with continuous very heavy surface fuel loads.



Photo No 10

Vegetation Classification

Class A Forest - Open forest A-03

Description

Eucalypts to 20m with more than 40% canopy coverage over mixed shrubland understorey.



Photo No 11

Vegetation Classification

Class D Scrub - Closed scrub D-13

Description

Mixed scrub Parrot Bush, to 4m height, 40% canopy coverage. Dense surface layer/understory with continuous very heavy surface fuel loads.



Photo No 12

Vegetation Classification

Class D Scrub - Closed scrub D-13

Description

Mixed scrub to 4m height, 40% canopy coverage. Dense surface layer/understory with continuous very heavy surface fuel loads.



Appendix 1 - Vegetation Photographs

Photo No 13

Vegetation Classification

Class A Forest - Open forest A-03

Description

Eucalypts to 20m with more than 40% canopy coverage over mixed shrubland understorey.



Photo No 14

Vegetation Classification

Class D Scrub - Closed scrub D-13

Description

Mixed scrub to 4m height, 40% canopy coverage. Dense surface layer/understory with continuous very heavy surface fuel loads.



Photo No 15

Vegetation Classification

Class G Grassland – Sown pasture G-26

Description

Broad acre grazing land.



Photo No 16

Vegetation Classification

Class A Forest - Open forest A-03

Description

Eucalypts to 20m with more than 40% canopy coverage over mixed shrubland and grass understorey.



LUSHfire and planning

Photo No 17

Vegetation Classification
Class A Forest - Open forest A-03

Description
Eucalypts to 20m with more than 40% canopy coverage over mixed shrubland and grass understorey.



Photo No 18

Vegetation Classification
Class G Grassland – Sown pasture G-26

Description
Broad acre grazing land.



Photo No 19

Vegetation Classification
Excludable - 2.2.3.2(f) Low Threat Vegetation

Description
Residential development with managed gardens



Photo No 20

Vegetation Classification
Class A Forest - Open forest A-03

Description
Eucalypts to 20m with more than 40% canopy coverage over mixed shrubland and grass understorey.



Appendix 1 - Vegetation Photographs

Photo No 21

Vegetation Classification
Class A Forest - Open forest A-03

Description
White Gum mixed forest to 25m with 30% canopy coverage over shrubland.



Photo No 22

Vegetation Classification
Class A Forest - Open forest A-03

Description
White Gum mixed forest to 25m with 30% canopy coverage over shrubland.



Photo No 23

Vegetation Classification
Class A Forest - Open forest A-03

Description
Eucalypts to 20m with more than 40% canopy coverage over mixed shrubland and grass understorey.



Photo No 24

Vegetation Classification
Class A Forest - Open forest A-03

Description
Eucalypts to 20m with more than 40% canopy coverage over mixed shrubland and grass understorey.



LUSHfire and planning

Photo No 25

Vegetation Classification
Class G Grassland – Tussock grassland G-22

Description
Unmanaged grassland



Photo No 26

Vegetation Classification
Class A Forest - Open forest A-03

Description
Eucalypts to 20m with more than 40% canopy coverage over mixed shrubland and grass understorey.



Photo No 27

Vegetation Classification
Class A Forest - Open forest A-03

Description
Eucalypts to 20m with more than 40% canopy coverage over mixed shrubland and grass understorey.



Photo No 28

Vegetation Classification
Class A Forest - Open forest A-03

Description
Eucalypts to 20m with more than 30% canopy coverage over grass understorey.



Appendix 1 - Vegetation Photographs

Photo No 29

Vegetation Classification
Class G Grassland – Sown pasture G-26

Description
Broad acre grazing land.



Photo No 30

Vegetation Classification
Class A Forest - Open forest A-03

Description
Eucalypts to 20m with more than 40% canopy coverage over mixed shrubland and grass understorey.



Photo No 31

Vegetation Classification
Class A Forest - Open forest A-03

Description
Eucalypts to 25m along drainage line with more than 40% canopy coverage over mixed shrubland and grass understorey.



Photo No 32

Vegetation Classification
Class A Forest - Open forest A-03

Description
Eucalypts to 20m with more than 30% canopy coverage over grass understorey.



LUSHfire and planning

Photo No 33

Vegetation Classification
Class A Forest - Open forest A-03

Description
Eucalypts to 25m along drainage line with more than 40% canopy coverage over mixed shrubland and grass understorey.



Photo No 34

Vegetation Classification
Class A Forest - Open forest A-03

Description
Eucalypts to 20m with more than 30% canopy coverage over grass understorey.



Photo No 35

Vegetation Classification
Class G Grassland – Sown pasture G-26

Description
Broad acre grazing land.



Photo No 36

Vegetation Classification
Class A Forest - Open forest A-03

Description
Eucalypts to 20m with more than 30% canopy coverage over grass understorey.



Appendix 1 - Vegetation Photographs

Photo No 37

Vegetation Classification
Class A Forest - Open forest A-03

Description
Eucalypts to 20m with more than 30% canopy coverage over grass understorey.



Photo No 38

Vegetation Classification
Class A Forest - Open forest A-03

Description
High quality Eucalypts to 20m on steep bank with more than 50% canopy coverage, over shrubland understorey.



Photo No 39

Vegetation Classification
Class A Forest - Open forest A-03

Description
Eucalypts to 20m with more than 30% canopy coverage over grass understorey.



Photo No 40

Vegetation Classification
Class G Grassland – Sown pasture G-26

Description
Broad acre grazing land.



Appendix 1 - Vegetation Photographs

Photo No 41

Vegetation Classification

Class A Forest - Open forest A-03

Description

Eucalypts to 20m with more than 30% canopy coverage over grass understorey.



Photo No 42

Vegetation Classification

Class A Forest - Open forest A-03

Description

White Gum mixed forest to 20m with 30% canopy coverage with minimal understorey.



Photo No 43

Vegetation Classification

Class A Forest - Open forest A-03

Description

White Gum mixed forest to 20m with 30% canopy coverage with minimal understorey.



Photo No 44

Vegetation Classification

Class G Grassland – Sown pasture G-26

Description

Broad acre grazing land.



LUSHfire and planning

APPENDIX 3

Environmental Assessment Report



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BULLSBROOK NORTH DISTRICT STRUCTURE PLAN

ENVIRONMENTAL ASSESSMENT REPORT

Prepared for: WPG Landholdings No. 5 Pty Ltd
Bullsbrook Investment Company Pty Ltd

Report Date: 10 May 2023

Version: 1

Report No. 2023-745



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Appendix 2: Draft Master Plan Concept
Appendix 3: Detailed Flora and Vegetation Survey (PGV Environmental, 2021)
Appendix 4: Detailed Flora and Vegetation Survey (PGV Environmental, 2022)
Appendix 5: Basic Fauna Survey (PGV Environmental, 2023)
Appendix 6: Aboriginal Heritage Inquiry System Reports

1 INTRODUCTION

1.1 Site Location

The Bullsbrook North District Structure Plan (DSP) area is located on various lots on Morrissey Road, Ashton Road, Kimberley Street, Great Northern Highway and Chittering Road, Bullsbrook in the City of Swan (hereafter referred to as the 'subject land'). The subject land is approximately 40km north-north-east of the Perth Central Business District (Figure 1). The DSP area is approximately 355ha in size and is bounded by Morrissey Road to the north, Great Northern Highway, Kimberley Street to the south and Ashton Road and Chittering Road to the east (Figure 2).

The subject land is currently zoned 'Rural' under the Metropolitan Region Scheme and 'General Rural' under the City of Swan Local Planning Scheme No. 17. The land is designated Urban Expansion under the North-East Sub Regional Planning Framework. The proposed amended DSP has been designed to facilitate the future residential development of the subject land.

WPG Landholdings No. 5 Pty Ltd and Bullsbrook Investment Company Pty Ltd commissioned PGV Environmental to prepare an Environmental Assessment Report to identify any areas of the subject land that may have significant environmental values and assess the environmental impact of the proposed DSP (Appendix 1) and Draft Master Plan Concept (Appendix 2).

1.2 Scope of Works

The Environmental Assessment has been undertaken to assess the environmental impacts of potential urban development of the subject land. The Environmental Assessment includes:

- A description of the recent and present land use including:
  - Surrounding land uses;
  - Assessment of current and historical activities on the subject land and surrounding areas; and
  - A search of the Department of Water and Environmental Regulation Contaminated Subject lands and Water Information; and
  - Heritage features.
- A description of the physical characteristics including:
  - Geology and Soils;
  - Hydrology;
  - Acid Sulphate Soil Risk Mapping.
- Description of the flora and vegetation characteristics from the Detailed Flora and Vegetation Surveys;
- Description of fauna habitats and potential for Conservation Significant fauna to utilise the subject land from the Basic Fauna Survey;
- Implications, if any, under Western Australian policies and legislation such as the *Environmental Protection Act 1986* and *Biodiversity Conservation Act 2016* and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*.

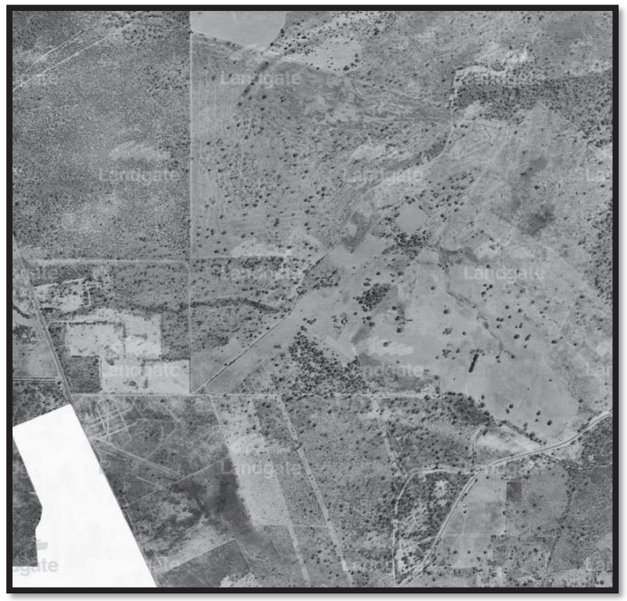
The EAR provides an assessment of the environmental suitability of the Draft Master Plan Concept in retaining any significant environmental features on the subject land.

2 EXISTING ENVIRONMENT

2.1 Land Use

Earliest available aerial photography for the subject land from 1965 shows that a large proportion of has been cleared for agricultural purposes with scattered trees and pockets of remnant native vegetation remaining (Plate 1) (Landgate, 2023).

Plate 1: Historical Aerial Photography from 1965 (Landgate, 2023)



2.2 Surrounding Land Use

The surrounding land includes bushland, a Wastewater Treatment Plant and the Chequers Golf Club to the west, rural land to the north and east and urban land and some areas of native vegetation to the south (Figure 2).

The south-western corner of the subject land is within the buffer of the Bullsbrook Wastewater Treatment Plant. It is expected that the wastewater treatment plant will be decommissioned in late 2023 and well prior to development in this part of the subject land.

The subject land is in the vicinity of the Royal Australian Airforce Base Pearce. PFAS (Per- and polyfluoroalkyl substances) is a chemical used in firefighting foam that was regularly used by the Australian Defence Force and other bodies in conducting firefighting drills. According to a Department of Defence Factsheet, PFAS was used historically on the RAAF Base Pearce.

The Department of Defence began investigations in April 2016 to identify the nature and extent of PFAS on and in the vicinity of RAAF Base Pearce. The analysis involved sampling of soil, sediment,

surface water and groundwater samples from on and off the Base as well as the sampling of some animal and plant material. An Investigation Area was established in which sampling was undertaken.

The results showed:

- PFAS levels were detected on the Base in soil and groundwater above the relevant guidance values.
- PFAS was not detected above relevant guidance levels in soil samples collected on residential properties within the nominated Investigation Area
- PFAS was detected in groundwater samples from 6 residential bores above drinking water guidance values
- PFAS was detected in Ellenbrook and Ki-it Monger Brook downstream of the Base

Six main source areas of PFAS contamination were identified as follows:

- Source Area A – Fire training Area
- Source Area B – Former fire training areas
- Source Area C – A hangar with a foam deluge system
- Source Area D – A former foam storage area
- Source Area J – Former fuel farm with a foam deluge system; and
- Source Area R – The RAAF Pearce landfill

The nearest Source Area to the subject land is Source Area G at the western boundary of the Great Northern Highway Lots which was a former fire training area did not have PFAS detected. Source Area R, the old RAAF Pearce landfill site to the west of Lot 3 was the closest source area that did detect PFAS. The other five Source Areas are located within the Base between 2.7km and 4.0km south-west of the subject land.

According to the PFAS Management Area Plan prepared in 2019 two bores were sampled in the middle of Source Area R. PFAS levels were detected in the groundwater with concentrations above the FSANZ drinking water guideline levels. The extent of impact under Source Area R was reported in the Management Area Plan as likely to be relatively localised to the landfill area. However, further testing of groundwater and surface water in the nearby creekline was recommended to improve the understanding with respect to the extent of PFAS impact associated with Source Area R.

PFAS is persistent in the environment and can move around by soil and water movement as well as being ingested by animals in the food chain. The most likely source of potential spread from point source contaminations on the RAAF Base subject land is by groundwater movement and surface water flow which is away from the subject land.

The western boundary of the subject land is approximately 150m from Source Area R at its nearest point. Groundwater information contained in the PFAS Management Area Plan confirms that groundwater under Source Area R flows in a westerly direction. As groundwater flows to the west, it does not seem conceivable that any groundwater contamination under Source Area R could flow upgradient to the subject land. The creekline that runs past Source Area R is the same creekline that runs through the subject land. The elevation of the creekline at the source is around 80m AHD while the elevation of the creekline near Source Area R is around 57m, a fall of 23m over a 1.2km length. The creekline is ephemeral, flowing only after significant rainfall, and is dammed at two points close

to the boundary of the subject land and the Defence Department property. It does not seem possible that a contaminant could flow upstream in the creekline from Source Area R to the subject land.

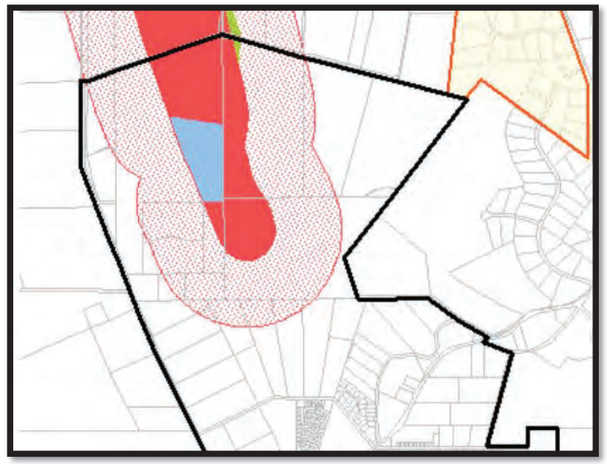
Groundwater, soil and surface water samples were taken from Lot 3 Ashton Road which is the lot closest to Source Area R on 1 October 2021 as commissioned by the Department of Defence as part of their investigations. All samples taken were tested for three PFAS chemicals that have health guidelines being perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) and perfluorohexane sulfonate (PFHxS). The testing did not record any concentrations of these chemicals with all results being less than the limit of reporting (DoD, 2021).

2.3 Basic Raw Materials

Figure 10 of the Bullsbrook Townsite Land Use Masterplan (City of Swan, 2014), and reproduced in this report as Plate 2 below, indicates that the subject land is close to two areas identified in the Masterplan report as "regionally significant Basic Raw Material" areas.

The larger area, shown in the red shaded area is a titanium resource that occurs to the west and north-west of the subject land. The 500m buffer to the titanium resource overlaps the western side of Lot 801.

Plate 2: Extract from Figure 10 showing Basic Raw Materials (City of Swan, 2014)



The Amendment report for the additional use for the caravan park site proposed for Lot 800 included a comment from the City officers referring to the DMIRS submission on the Amendment that indicates the titanium resource is not likely to be mined. Specifically, the report states:

> *Written advice received from the Department (email dated 6th February 2018, provided as Attachment 10), confirms that the presence of this resource deposit should not prevent development of the proposed caravan park, as there are no current mining activities and approvals and it is unlikely that the subject land will be mined due to the land-use conflict with the existing golf course* (City of Swan, 2019).

As a result, it would be expected that the development on the subject land would also not be affected by the titanium resource.

The other location identified as a "regionally significant Basic Raw Material" area is outlined in orange on Plate 2 and abuts the north-east corner of Lot 802. According to the legend of Figure 10 the area is a Sand resource, however the text of the Masterplan report states it is a Clay resource. While Figure 10 does not show any buffer to the yellow shaded area to the north-east, the text of the report states there is a 500m buffer to the Clay resource impacting on Lots 801 and 802 Morrissey Road.

Mapping from the Department of Mines, Industry Regulation and Safety (DMIRS, 2020) does not show any areas of Regionally Significant Raw Materials to the north-east of the subject land. The area shown in Figure 10 of the Masterplan is also not mapped as a Mining or Exploration Tenement or is shown in any of the following documents:

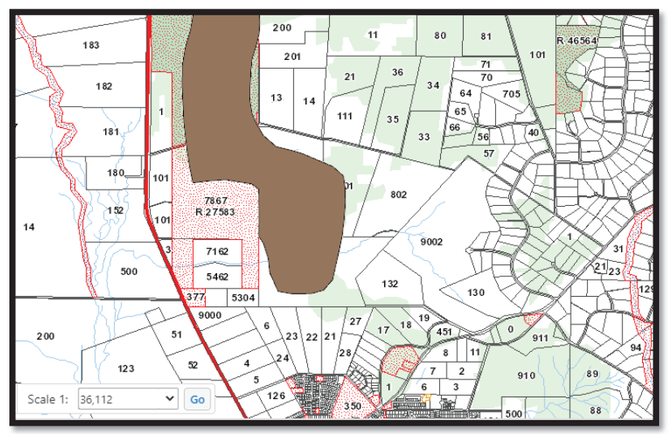
- Part of the SAPPR mapping for the draft Green Growth Plan; or
- A part of Significant Geological Supplies under the draft State Planning Policy 2.4 (DMIRS, 2020).

Therefore, PGV Environmental is not aware on what basis the mapping of the yellow sand/clay resource to the north-east of the subject land was made by the City of Swan in their Bullsbrook Townsite Land Use Masterplan report.

The discrepancy could have resulted from a change in the Basic Raw Material mapping from 2014 to 2020.

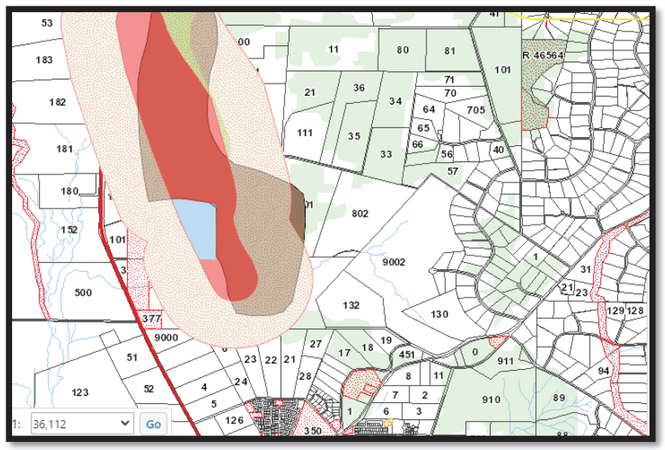
The DMIRS mapping shows part of the subject land as a regionally significant clay resource as shown in the brown shaded area on Plate 3. It is noted that the approved (2019) zoning for the caravan park on Lot 800 to the west of the subject land is located within the mapped regionally significant clay resource area. The mapped clay resource does not seem to have affected the rezoning or future use. Development of the lot as a caravan park will almost certainly sterilise the extraction of clay, or any other material, from that part of the subject land.

Plate 3: Regionally Significant Resource Mapping (DMIRS, 2020)



The area mapped as titanium and associated buffer in the DMIRS mapping (Plate 4) is consistent with Figure 10 from the City's Masterplan report.

Plate 4: Titanium Mineralization Project and Regionally Significant Resource Mapping (DMIRS, 2020)



2.4 Topography

The subject land is undulating with a ridge in the north-eastern area and more gently undulating land in the southern half. The land slopes gently down from the ridge to the north-west and more steeply from the ridge down to the south-east corner. Elevations range between approximately 144m Australian Height Datum (AHD) in the northeastern corner down to 44m in the southwestern corner (Figure 2).

2.5 Geology and Soils

2.5.1 Geology

The subject land is mapped as part of the Dandaragan Plateau which is a gently undulating plateau with areas of sandplain and some laterite capping on Cretaceous sediments (McArthur and Bettenay, 1960). The plateau has broad u-shaped valleys 80-150 m deep and smaller v-shaped east of the Gingin Scarp in the south (National Map, 2023). Soils are formed in colluvium and weathered rock (DPIRD, 2023).

There is an area in the south-west, adjoining the Great Northern Highway that is mapped in the Yanga System which are poorly drained plains with pale sands and deep sandy duplex, wet, semi-wet and saline wet soils (DPIRD, 2023) (Figure 3).

The south-western corner is on the Pinjarra Plain system which consists of broad low relief plain west of the foothills, comprising predominantly Pleistocene fluvial sediments and some Holocene alluvium associated with major current drainage systems. The major soils are naturally poorly drained and many swamps occur (DPIRD, 2023).

The mapping also shows the Darling Fault running along the common boundary of Lots 801 and 802 and is a significant geological feature. The fault it is approximately 15,000km long and is a major geological boundary separating the Archaean Yilgarn Craton in the east from the younger Pinjarra Orogen and overlying Phanerozoic Perth Basin to the west. The fault zone is very ancient and initially formed during the Proterozoic Eon (Fitzsimons, 2003).

2.5.2 Soils

The soils subsystems mapped on the subject land (Figure 3) are described as follows:

- Reagan 1 Subsystem (222Re_1) which are on gentle slopes (<10%) with deep, rapidly drained loose brownish or pale sands with a sandy fabric;
- Reagan 2 Subsystem (222Re_2) are located on gentle slopes (<10%) with deep, well drained brownish or earthy sands situated below 222Re_1;
- Reagan 3 Subsystem (222Re_3) are on gentle slopes (<10%) and spurs (<20% slope) with shallow gravelly sands and few areas of lateritic outcrop;
- Reagan 4 Subsystem (222Re_4) are very gently inclined foot and low slopes (<5%) with deep rapidly drained grey siliceous or bleached sands.
- Reagan 5 Subsystem (222Re_5) are level to very gently inclined swampy drainage lines with poorly drained grey siliceous and pale yellow-brown sands;
- Reagan 6 Subsystem (222Re_6) are grey siliceous sands, pale yellow-brown sands and some yellow deep sands;
- Reagan 7 Subsystem (222Re_7) are level to very gently inclined outwash fans with deep, well drained grey siliceous sands or bleached sands overlying clay at depths greater than 1m;
- Yanga, Phase Ya1 (213Ya_Ya1) which is described as plain with moderately deep poorly drained pale yellow brown sands underlain by mottled clay; and
- Pinjarra, Phase Gf1 (213Pj_Gf1) which is a very gently undulating plain with moderately well drained yellow duplex or gradational soils with sand to sandy loam topsoil (DPIRD, 2021).

The Land Degradation Risk Categories of the soil phases are outlined in Table 1.

Table 1: Land Degradation Risk Categories

Soil Type	Water Erosion	Wind Erosion	Waterlogging	Flooding	Salinity risk
222Re_1	<3% of map unit has a high to extreme water erosion risk	30-50% of map unit has a high to extreme wind erosion risk	<3% of map unit has a moderate to very high waterlogging risk	<3% of the map unit has a moderate to high flood risk	<3% of map unit has a moderate to high salinity risk or is presently saline
222Re_2	<3% of map unit has a high to extreme water erosion risk	>70% of map unit has a high to extreme wind erosion risk	<3% of map unit has a moderate to very high waterlogging risk	<3% of the map unit has a moderate to high flood risk	<3% of map unit has a moderate to high salinity risk or is presently saline
222Re_3	<3% of map unit has a high to extreme water erosion risk	>70% of map unit has a high to extreme wind erosion risk	<3% of map unit has a moderate to very high waterlogging risk	<3% of the map unit has a moderate to high flood risk	<3% of map unit has a moderate to high salinity risk or is presently saline

Soil Type	Water Erosion	Wind Erosion	Waterlogging	Flooding	Salinity risk
222Re_4	<3% of map unit has a high to extreme water erosion risk	<3% of map unit has a high to extreme water erosion risk	<3% of map unit has a moderate to very high waterlogging risk	<3% of the map unit has a moderate to high flood risk	<3% of map unit has a moderate to high salinity risk or is presently saline
222Re_5	10-30% of map unit has a high to extreme water erosion risk	3-10% of map unit has a high to extreme wind erosion risk	50-70% of map unit has a moderate to very high waterlogging risk	50-70% of the map unit has a moderate to high flood risk	10-30% of map unit has a moderate to high salinity risk or is presently saline
222Re_6	<3% of map unit has a high to extreme water erosion risk	>70% of map unit has a high to extreme wind erosion risk	50-70% of map unit has a moderate to very high waterlogging risk	<3% of the map unit has a moderate to high flood risk	<3% of map unit has a moderate to high salinity risk or is presently saline
222Re_7	<3% of map unit has a high to extreme water erosion risk	>70% of map unit has a high to extreme wind erosion risk	<3% of map unit has a moderate to very high waterlogging risk	<3% of the map unit has a moderate to high flood risk	<3% of map unit has a moderate to high salinity risk or is presently saline
213Ya_Ya1	<3% of map unit has a high to extreme water erosion risk	30-50% of map unit has a high to extreme wind erosion risk	>70% of map unit has a moderate to very high waterlogging risk	<3% of the map unit has a moderate to high flood risk	3-10% of map unit has a moderate to high salinity risk or is presently saline
213Pj_Gf1	<3% of map unit has a high to extreme water erosion risk	<3% of map unit has a high to extreme wind erosion risk	10-30% of map unit has a moderate to very high waterlogging risk	<3% of the map unit has a moderate to high flood risk	10-30% of map unit has a moderate to high salinity risk or is presently saline

Water erosion risk is low on all of the soil units except unit 222Re_5. The Unit 222RE_5 soil unit is associated with the creekline, and has a slightly higher risk with 10-30% of map unit having a high to extreme water erosion risk. The majority of the soils have an increased risk of wind erosion.

Waterlogging is a risk in the 222Re_5, 222Re_6, 213Ya_Ya1 and 213Pj_Gf1 soil phases which are associated with the creekline and mapped in lower areas of the subject land. The risk of salinity is low and there is a very low risk of flooding mapped on the subject land.

2.6 Hydrology

There is very little information on groundwater under the site. One bore showed a groundwater depth of approximately 37m AHD (DWER, 2020), which is 7m below the lowest part of the subject land. Accordingly, there are no wetlands mapped on the subject land.

The creekline that runs through Lot 3, with a small area in Lot 802, is a small ephemeral watercourse that runs to Ellen Brook approximately 2.5km to the west of the subject land. The creekline has two dams, one on the south-eastern corner on Lot 802 and one on the western side on Lot 3. The largest

dam near the western boundary contains water all year round with large seasonal fluctuations of volume while the other dams dry out in most summers as determined using historical aerial photographs (Landgate, 2023).

2.7 Flora and Vegetation

2.7.1 Flora and Vegetation Surveys

A Reconnaissance Flora and Vegetation Survey was undertaken on Lots 801 and 802 Morrissey Road in 2020 and Lot 3 Ashton Road in 2021. A Detailed Flora and Vegetation Survey was undertaken on the northern part of the subject land in 2021 (PGV Environmental, 2021) and on the southern lots in 2022 (PGV Environmental, 2022) in accordance with *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016). The surveys included the mapping of vegetation types and condition and a compilation of flora species lists. The Detailed survey also included a targeted surveys for identified Threatened flora that were considered to potentially occur on the subject land. The survey reports are provided as Appendix 3 and 4.

Several lots in the southern part of the subject land were not able to be accessed for the surveys. The vegetation on these lots was assessed using aerial photography. The vegetation was considered to be parkland cleared with no areas containing an intact native understorey. The significance of the flora and vegetation in the whole subject land is not considered to be impacted by the exclusion of these lots from the Detailed Flora and Vegetation survey.

2.7.2 Flora

A total of 200 plant species were recorded during the flora surveys (Appendix 3 and 4). This total consisted of 150 native species and 50 introduced species (25%). The field work did not include a survey of all introduced species in the paddocks as these species have no bearing on the conservation significance of flora on the subject land.

Plant families with the greatest number of species were the Fabaceae (Wattle and Pea family – 32 species including 23 native and 9 introduced), Asteraceae (Daisy family – 20 species, 11 native and 9 introduced), Cyperaceae (9 species, all native), Myrtaceae (Myrtle family – 13 species, all native), Asparagaceae (Lily family – 9 species, all native), Proteaceae (Banksia family – 8 species, all native) and Poaceae (Grass family – 11 species, 2 native and 9 introduced) (Appendix 3 and 4).

One small area of intact native vegetation on Lot 802 Morrissey Road contained three plants of the Chittering Grass Wattle (*Acacia anomala*) (Figure 3) which is listed as Endangered under the *Biodiversity Conservation Act, 2016* (BC Act) and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

No other Threatened or Priority plant species were recorded on the subject land.

2.7.3 Vegetation Complex

Vegetation Complexes are a broad level of vegetation description which is based on the underlying geomorphology and rainfall (Heddle *et al*., 1980). The vegetation is mapped as part of the Reagan Complex (Heddle *et al.,* 1980) but does not meet the general description of this vegetation complex. The vegetation on the subject land better fits the description of the Mogumber– South vegetation complex which occurs about 1km east of the subject land (Appendix 3 and 4).

The percentage retention for both vegetation complexes is above EPA's target for a minimum of 10% for vegetation complexes state-wide in the Perth and Peel Region Constrained Areas and the area in protection for both complexes is below the 10% minimum criteria for vegetation complexes (DBCA, 2018).

2.7.4 Vegetation Type

Twelve vegetation types have been mapped on the subject land (PGV Environmental, 2021; PGV Environmental, 2022) (Figure 4) as follows:

CcEm[1] *Corymbia calophylla* (Marri)/*Eucalyptus marginata* (Jarrah) Woodland over *Xanthorrhoea preissii* Low Shrubland on laterite

CcEm[2] *Corymbia calophylla* (Marri)/*Eucalyptus marginata* (Jarrah) Woodland over *Xanthorrhoea preissii* Open Low Heath on sand

CcEm[3] *Corymbia calophylla* (Marri)/*Eucalyptus marginata* (Jarrah) Parkland Cleared over pasture

Cc *Corymbia calophylla* (Marri) Woodland over *Xanthorrhoea preissii/Hibbertia hypericoides/Caustis dioica* Open Low Heath

CcXp *Corymbia calophylla* (Marri) Woodland over *Xanthorrhoea preissii* Open Low Heath

Em *Eucalyptus marginata* (Jarrah) Woodland over weeds

Xp *Xanthorrhoea preissii* Open Heath over weeds

Ew *Eucalyptus wandoo* (Wandoo) Woodland over bare ground

EwBs *Eucalyptus wandoo* (Wandoo) Woodland over *Banksia sessilis* Shrubland over bare ground

ErCc *Eucalyptus rudis* (Flooded Gum)/*Corymbia calophylla* (Marri) Woodland over weeds

Ex Exotic trees

P Pines (Appendix 2 and 3)

2.7.5 Vegetation Condition

The condition of the native vegetation was mostly in Degraded and Completely Degraded condition due to the past clearing and long history of grazing under the trees (Figure 5). Two areas containing vegetation in Very Good condition were mapped, one small area on Lot 802 and a larger area in the north-west corner of Lot 3. Two areas in Good condition were recorded on Lot 3 and an additional five scattered areas of Good vegetation were mapped in the southern part of the subject land. These areas had abundant weeds mixed with native understorey species. There was one area of Good to Degraded vegetation on Lot 18 and an area of Good vegetation associated with the creekline (Appendix 2).

2.8 Fauna

A Basic Fauna Survey was undertaken by PGV Environmental in accordance with *Technical Guidance: Fauna Surveys for Environmental Impact Assessment* (EPA, 2020) (Appendix 5). The survey described four fauna habits including:

- Open Woodland Habitat mapped over the wooded areas of the subject land (46.7ha);
- Shrubland Habitat in small areas of intact native vegetation (3.24ha);

- Creekline habitat associated with the creeklines that transect Lots 801 and 802 Morrissey Road and a larger creekline that runs through Lot 3 Ashton Road (6.36 ha);
- Cleared Habitat which are the open cleared paddocks and other completely cleared areas (132.76 ha); and
- Parkland Cleared Habitat which is over the majority of the subject land and is made up of the trees over weeds (159.63 ha) (Figure 6).

The subject land contains many areas that have been significantly impacted by historical clearing and two areas that are in Very Good Condition. The vegetation in the central western part of the subject land in Very Good condition has some connectivity to native vegetation to the west. Otherwise, there is very little connectivity at ground level to other areas of intact vegetation adjacent to the subject land. The subject land is therefore considered to be mostly Highly Degraded Fauna Habitat due to disturbance and lack of connectivity.

The subject land contains some habitat for the following two species of Black Cockatoos, listed under the BC Act and EPBC Act:

- Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) (Endangered); and
- Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksii naso*) (Vulnerable).

The habitat includes foraging habitat, potential breeding habitat and potential roosting habitat. It is estimated that there is around 89.9 ha of foraging habitat on the subject land and 630 potential breeding habitat trees. No actual breeding or roosting has been recorded on the subject land.

The Priority 4 species Southern Brown Bandicoot or Quenda (*Isoodon fusciventer*) may occur in the larger area of intact native vegetation north of the creekline. The Rainbow Bee-eater (*Merops ornatus*), listed Marine under the EPBC Act, may intermittently visit the subject land (Appendix 5).

2.9 Heritage

2.9.1 European Heritage

Heritage sites can be listed under the following lists/registers:

- World Heritage Sites;
- National Heritage Sites;
- Commonwealth Heritage Sites;
- Sites on the register of the National Estate;
- Sites on the Western Australian Heritage Council Register; and
- Sites listed in the City of Swan Municipal Heritage Inventory List.

There are no listed Heritage Sites or Interim Heritage Sites on the subject land (National Map, 2023; Heritage Council of Western Australia, 2023; DAWE, 2023).

2.9.2 Aboriginal Heritage

There are two listed Aboriginal Heritage Sites on the subject land being Site ID 3525 Ellen Brook and Site 3583 KI-IT Monger Brook 2 (DPLH, 2023) (Appendix 6). Site 3525 extends from just north of

Muchea to Henley Brook (Plate 5). Site 3583 KI-IT Monger Brook 2 is mapped over the Bullsbrook townsite, the RAAF Base Pearce and over the eastern part of the subject land (Plate 6) (DPLH, 2023).

Plate 5: Site 3525 Ellen Brook

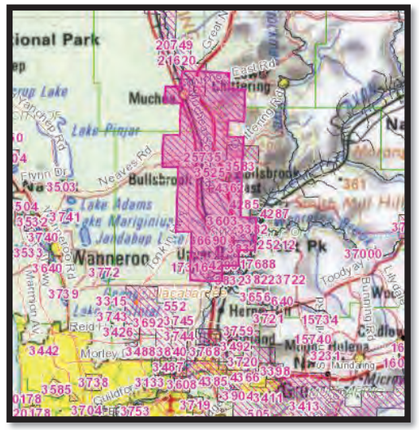
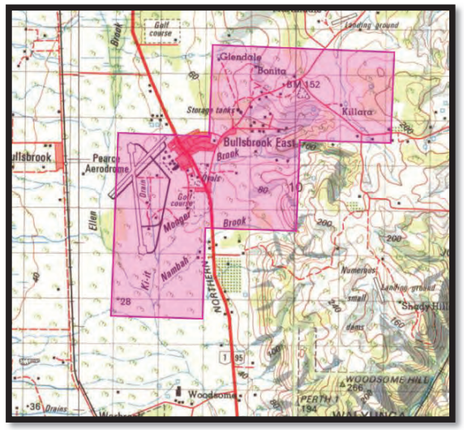


Plate 6: Site 3583 KI-IT Monger Brook 2



3 ENVIRONMENTAL ASSESSMENT

3.1 District Structure Plan

The Bullsbrook Townsite Northern Precinct DSP (Appendix 1) contains the following land use types:

- Residential development over most of the subject land;
- Two Primary Schools;
- A Local Retail Centre;
- Public Open Space; and
- Public Open Space – restricted (associated with the central creekline).

The areas of 'POS – Unrestricted' in the Draft Master Plan Concept are proposed to be used for a range of activities including retention of native vegetation, grassed areas and for stormwater drainage. The POS associated with the creekline will also function as an ecological corridor. The Draft Master Plan Concept (Appendix 2) shows a lifestyle retirement village/caravan park on Lot 800, a road network with several major streets labelled as Street Tree Avenues which will potentially contain retained trees and additional POS that proposed to retain high quality vegetation.

3.2 Land Use

The subject land has historically been mostly cleared and is not listed as a Contaminated Subject land. The proximity of the areas that are potentially impacted by PFAS are highly unlikely to impact on development as they are downstream both on the surface and for groundwater.

The past and present land use on the subject land is not considered a constraint to development.

3.3 Basic Raw Materials

The western part of Lot 800 is within the Regionally Significant Basic Raw Materials titanium resource area and parts of Lots 800 and 801 are within the titanium resource buffer area which may constrain development in the western part of the subject land. However, advice from DMIRS on the Amendment to rezone Lot 800 to allow a caravan park indicates that the potential for the titanium resource to be mined in the future is very low. The part of Lot 800 that contains the mapped titanium resource and the buffer was approved for a caravan park to be developed on the lot.

The potential presence of a clay resource to the north-east of the subject land as depicted in the Bullsbrook Masterplan needs further investigation on the potential impact of any buffer if the resource were to be quarried.

3.4 Geology and Soils

3.4.1 Geology

The Reagan geological unit is not a constraint for development.

3.4.2 Soils

Most the soils mapped on the subject land have a higher risk of being susceptible to wind erosion and therefore dust controls will be required during construction. Development of the land will negate the

wind erosion risk once the subject land is fully developed. The subject land is not susceptible to flooding or risk of salinity. Some of the soil phases have a moderate to high risk of waterlogging which will need to be considered in the engineering design and the Water Management Plan for stormwater and groundwater management.

Geotechnical investigations will need to be carried out to investigate any engineering constraints of the soils. The soils on the subject land do not provide an environmental impediment to the development of the subject land with appropriate stormwater and dust controls. There is a low risk of acid sulphate soils. If the clay resource is present as mapped this may be an impediment to development if the clay is proposed to be extracted.

3.5 Hydrology

Groundwater a minimum of 7m deep under the subject land and is not an impediment to development. Stormwater management will be required to be addressed in accordance with *Better Urban Water Management* (WAPC, 2008). A Water Management Strategy will be required at Local Structure Plan stage and an Urban Water Management Plan will be required at the subdivision stage.

Development near the central creekline is guided by the Bullsbrook Townsite Land Use Masterplan (City of Swan, 2014) which states:

> *Development adjacent to creek lines and wetlands require, as a general rule, buffers of at least 30m and 50m respectively. However final buffers to residential developments (envisaged to be taken up as foreshore reserves and to be separated from required 10% POS contributions), are to be determined at a more detailed structure planning stage upon detailed assessments of subject land specific biophysical factors.*

The creekline has been fully retained in the proposed DSP with a minimum 30m buffer, widening to around 260m at the western end and north of the creek (Appendix 1). A Foreshore Management Plan will be prepared at Structure Plan stage to guide the future public use and potential rehabilitation of the creek and foreshore area.

The creekline runs into Ellen Brook to the west which is a main tributary to the Swan River and as such the treatment of nutrients in stormwater will need to be addressed in the Water Management Plan avoid nutrients being transported downstream to Ellen Brook.

3.6 Flora and Vegetation

The flora and vegetation on the subject land has been significantly impacted by historical clearing. The proposed DSP and Draft Master Plan Concept have been developed to retain the areas with the highest environmental values for flora and vegetation within the subject land.

The Draft Master Plan Concept retains a large area of Very Good quality native vegetation to the north of the creekline that was identified in the Flora and Vegetation Survey as being in the best condition on the subject land (Appendix 1). The area is suitable to be used for public passive recreation with the development of a path network on already cleared parts of the site.

The Draft Master Plan Concept retains the small area of vegetation on the northern ridge that contains the Threatened plant species, Chittering Grass Wattle (Appendix 2). A management plan for this POS area should be prepared at subdivision stage to demonstrate how the native vegetation and the Chittering Grass Wattle will be protected from surrounding development.

3.7 Fauna

The fauna habitat values have been impacted by the extensive historical clearing on the subject land and as such the proposed development would have very little impact on native fauna habitat. The areas that have the highest values with intact native vegetation are proposed to be retained in POS. The Restrictive POS and POS as shown on the DSP contains the creekline which has a dammed area with permanent year-round water which provides habitat for waterbirds and other wildlife. The creekline and associated POS with retained vegetation maintains ecological linkage across the subject land.

The subject land contains foraging habitat for the two Black Cockatoo species as well as potential breeding and roosting habitat trees. It is estimated that there is 89.9 ha of foraging habitat on the subject land and the number of breeding trees is estimated to be 630. Clearing of vegetation would likely require a referral under the EPBC Act if more than 1ha of foraging habitat were to be cleared and more than one potential breeding habitat tree were to be cleared. It is likely that development of the subject land will require referral under the EPBC Act, either at Local Structure Plan stage or at subdivision stage.

The Draft Master Plan Concept identifies a road network which could retain existing trees or which could be planted with native trees. The retained and planted trees would provide fauna habitat for birds and small reptiles and are linked to bushland areas in Bush Forever sites to the south-east and along the western boundary as well as remnant vegetation on private land to the north-east.

A Fauna Management Plan should be prepared prior to clearing, including the trapping and relocation of both common and potential conservation significant species present on the subject land.

3.8 Heritage

The Ellen Brook Aboriginal Heritage Subject land 3525 and 3583 KI-IT Monger Brook 2 are mapped over most of the subject land. Advice should be sought to determine obligations under the *Aboriginal Heritage Act 1972*. The subject lands are mapped over a large area and there are numerous developments, recent and ongoing in the area. Therefore, the Heritage Sites are not likely to be a constraint to development.

4 SUMMARY AND CONCLUSIONS

4.1 Summary

The Environmental Assessment of the proposed amendment to the Bullsbrook North District Structure Plan has found the following:

- The historic and current land-uses on the subject land are not a constraint to residential development;
- The development potential of the subject land may be impacted by the mapped clay Regionally Significant Basic Raw Material on a part of Lot 800 although this did not stop rezoning for a caravan park. The mapped clay resource to the north-east may need to be investigated to determine whether future mining of this area could impact on the northern part of the subject land;
- The soils mapped on the subject land are not a constraint to development. Soil types with a high to extreme wind erosion risk can be managed for dust control during construction through the preparation and implementation of a Dust Management Plan. Areas prone to waterlogging risk are mostly not to be developed as they are associated with the creekline that is to be retained. Those areas mapped outside the creekline POS will need to be investigated for their waterlogging risk and, if necessary, earth-worked so that they are suitable for development;
- The ephemeral creekline has been retained in POS with a minimum 30m buffer. A Foreshore Management Plan will need to be prepared at Structure Plan stage to guide the future public use and potential rehabilitation of the creek and foreshore area;
- The retention of the creekline provides a corridor that maintains east west ecological linkage;
- A Water Management Strategy and Urban Water Management Plan will need to be prepared to design a stormwater management system that manages nutrients on site, and avoids the potential transport of nutrients downstream to the Ellen Brook;
- Three plants of the Chittering Grass Wattle (*Acacia anomala*), which is listed as Endangered under the State BC Act and the Commonwealth EPBC Act will be retained in Public Open Space. A Management Plan will need to be prepared at subdivision stage to protect the plants and the small area of native vegetation in which they occur;
- The subject land contains a large number of Marri, Jarrah and Wandoo trees which provide foraging and potential breeding habitat for Carnaby's and Forest Red-tailed Black Cockatoos. The Draft Master Plan Concept shows the retention of as many of the trees as possible. However, development of the subject land is highly likely to require the clearing of trees and will highly likely result in an impact that requires referral and assessment under the Commonwealth EPBC Act;
- There is likely to be other native fauna species that occur on the subject land that will require a trapping and relocation program prior to any clearing; and
- The subject land is within an Aboriginal Heritage Subject land (Ellen Brook) which may require approval under Section 18 of the *Aboriginal Heritage Act 1972*, however should not provide an impediment development as the Heritage Site is already substantially developed.

4.2 Conclusion

The Environmental Assessment of the Proposed Bullsbrook North District Structure Plan concludes that development of the subject land in accordance with the District Structure Plan will retain the important environmental attributes of the land and can be developed with appropriate management plans to avoid any adverse impacts on the environment.

Parts of the site may need further environmental approvals which are likely to be:

- Approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* for impacts on Black Cockatoo habitat; and
- Potentially permission under Section 18 of the *Aboriginal Heritage Act 1972.*

Additional management of the following factors will be required in future stages:

- Stormwater management plans in accordance with *Better Urban Water Management*;
- If required further investigation and possibly management for Acid Sulphate Soils;
- Environmental Management Plans for POS areas that retain native vegetation;
- Foreshore Management Plan for the creekline and foreshore area; and
- Fauna trapping and relocation plans prior to subdivision works.

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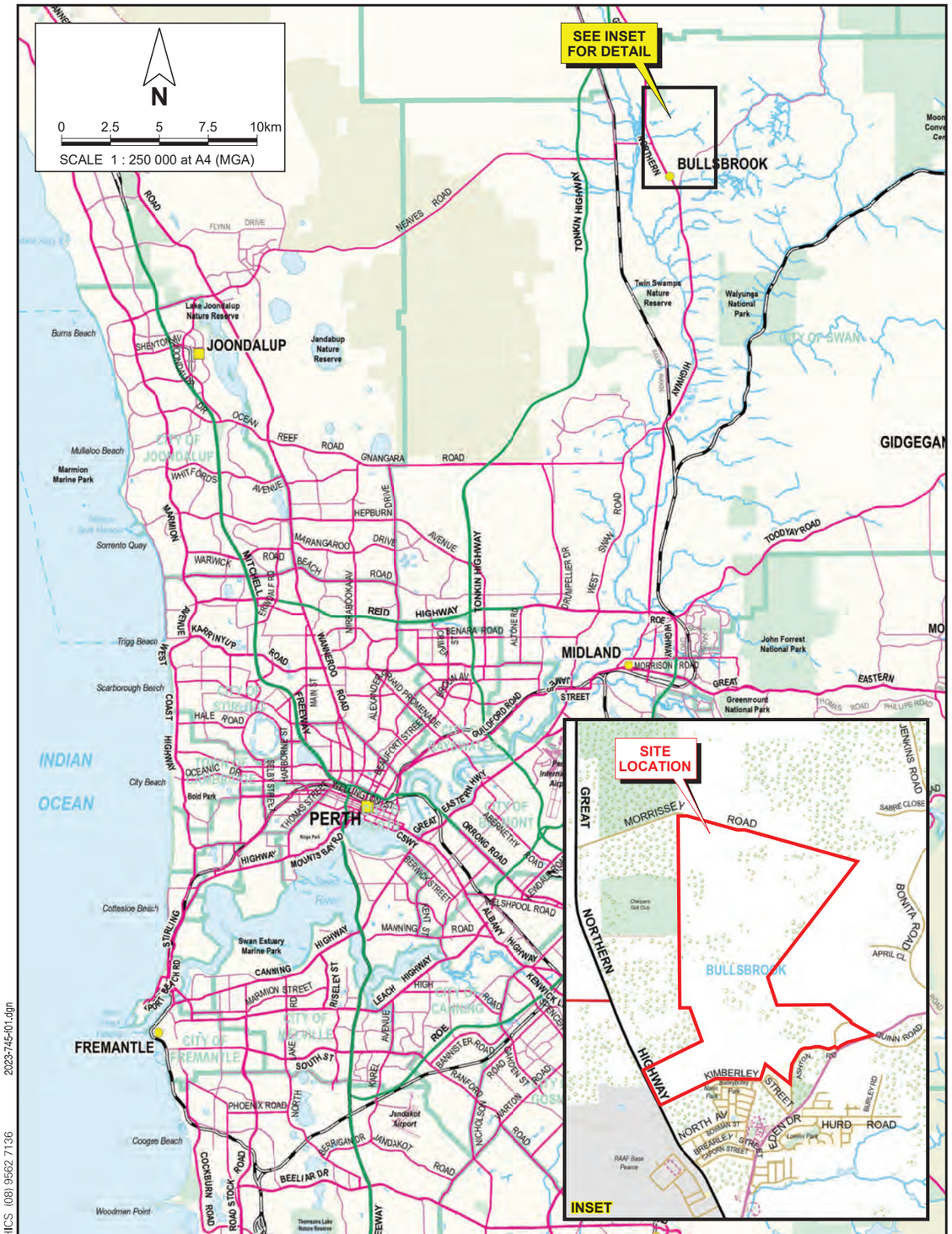
Western Australian Planning Commission (WAPC) (2020) *City of Swan Local Planning Scheme No. 17.* Government of Western Australia, Perth.

FIGURES



2023-745-f01.dgn

PINPOINT CARTOGRAPHICS (08) 9562 7136

pgv ENVIRONMENTAL

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BULLSBROOK NORTH DISTRICT STRUCTURE PLAN

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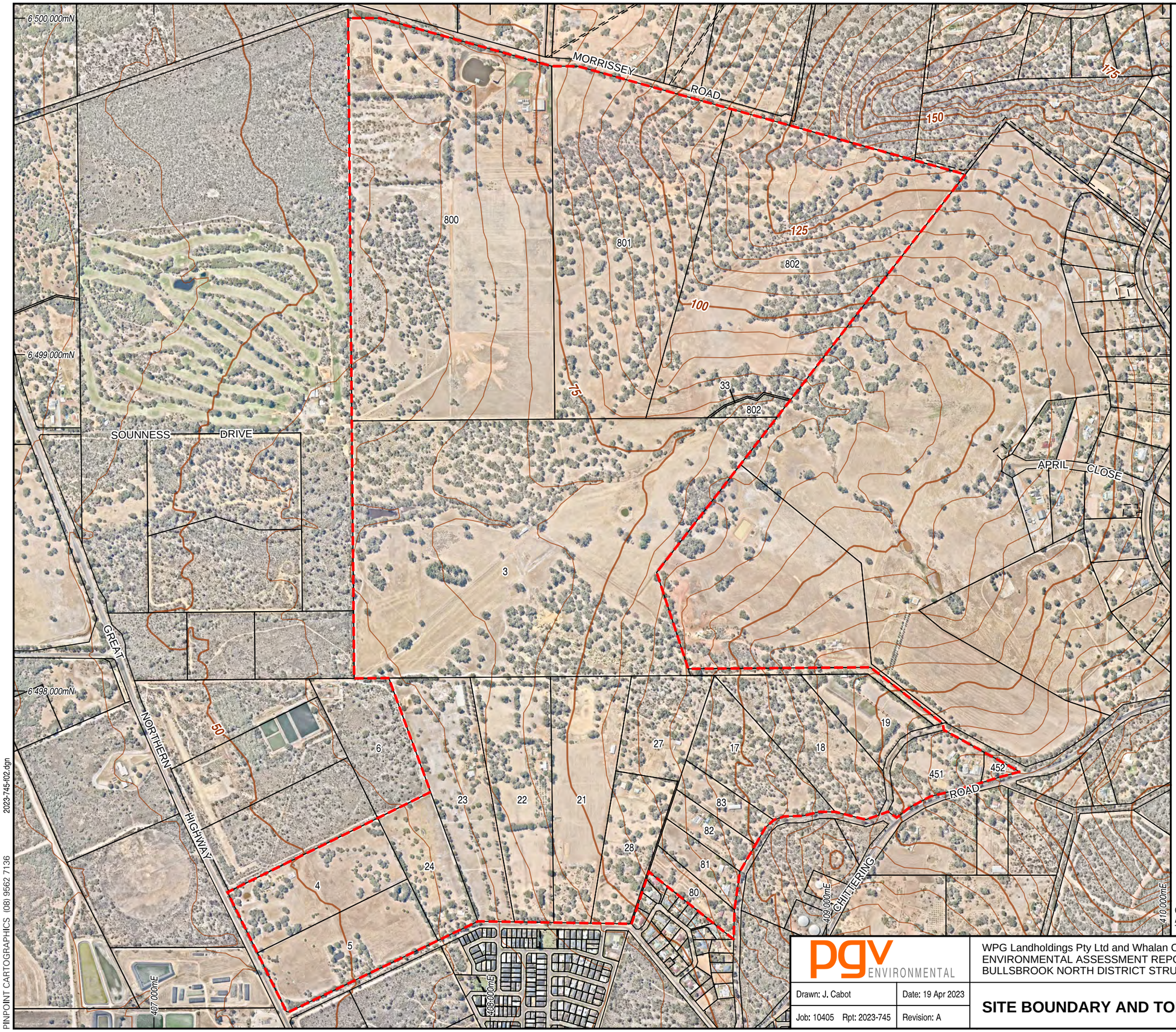
Job: 10405 Rpt: 2023-745 | Revision: A

SITE LOCATION

Figure 1



N

0 100 200 300 400 500m

SCALE 1 : 11 000 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Easement Boundary
- Topographic Contour

CADASTRAL SOURCE: Landgate, April 2023.
AERIAL PHOTOGRAPHY SOURCE: NearMap, flown February 2023.
TOPOGRAPHIC CONTOUR SOURCE: Landgate, 1:50,000 Topographic Mapping.

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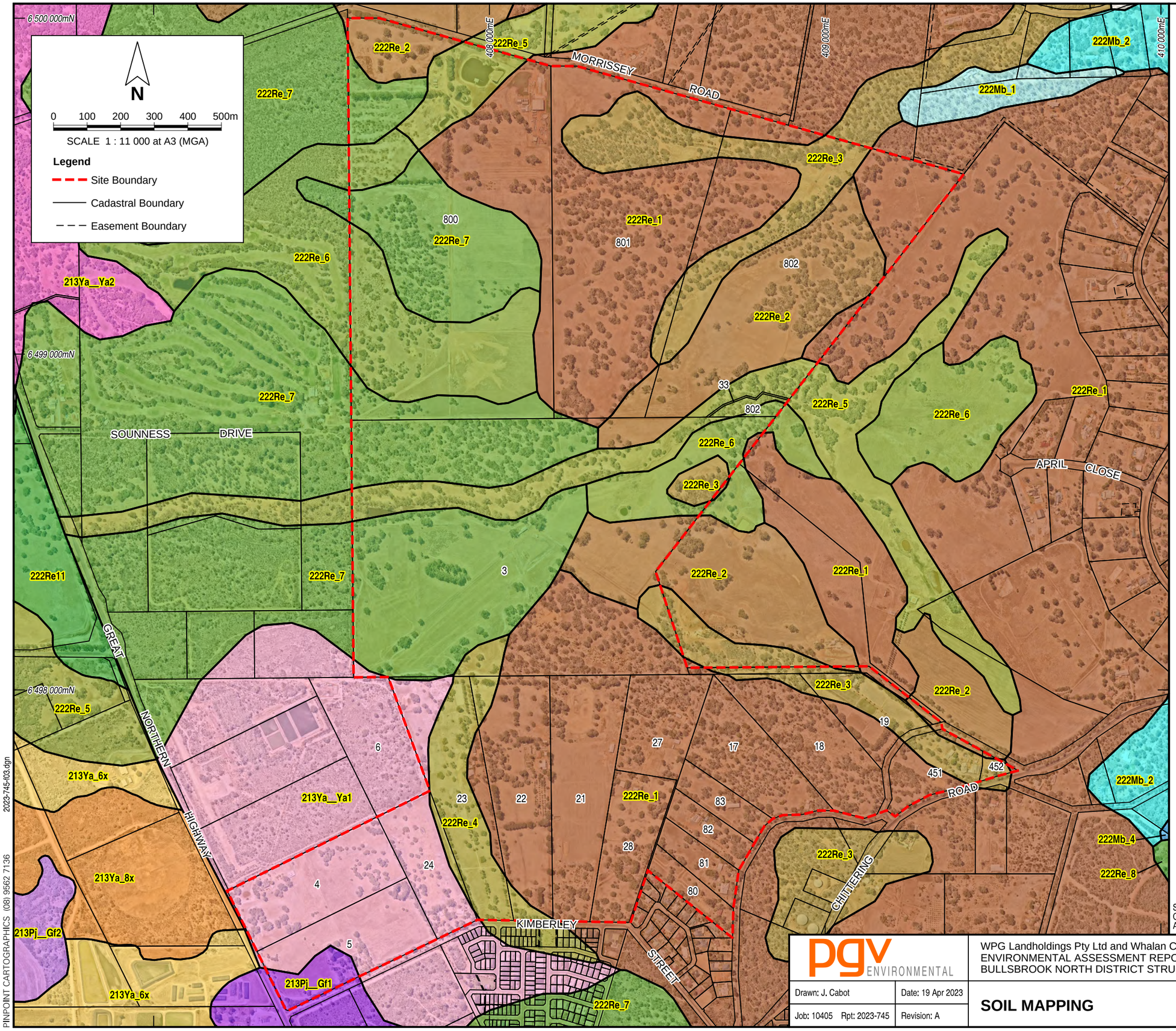
SITE BOUNDARY AND TOPOGRAPHY

Figure 2

2023-745-f02.dgn
PINPOINT CARTOGRAPHICS (08) 9562 7136



Soil Landscape Mapping

213Pj__Gf1 - Pinjarra, Phase Gf1
Very gently undulating plain. Moderately well drained yellow duplex or gradational soils with sand to sandy loam topsoil. Woodland of E. wandoo and E. calophylla.

213Pj__Gf2 - Pinjarra, Phase Gf2
Very gently undulating plain with imperfectly drained mottled yellow duplex soils with sand to sandy loam topsoil. Low woodland of E. wandoo. E. rudis along streams. C. Obesa on salt affected land.

213Ya__Ya1 - Yanga, Phase Ya1
Plain with moderately deep poorly drained pale yellow brown sands underlain by mottled clay.

213Ya__Ya2 - Yanga, Phase Ya2
Plain and swamp margins with deep poorly drained grey siliceous sand overlying clay.

213Ya_6x - Yanga 6x Phase
Flat plain with occasional low dunes. Yellowish brown duplex and poorly structured clay soils often with pans underlying. Low woodland with occasional tall E. rudis, Melaleuca spp., Teatree and E. camaldulensis and Casuarina spp.

213Ya_8x - Yanga 8x Phase
Flat plain with occasional low dunes. Subject to seasonal inundation.Deep white and pale yellow sands interspersed with swamp and generally underlain by siliceous/humic pans at depth.

222Mb_1 - Mogumber 1 Subsystem
Undulating broad crests and very gentle upper slopes <10% with common lateritic duricrust outcrop and shallow gravelly sands. Low woodland and shrubland of, E.todtiana and Acacia spp.

222Mb_2 - Mogumber 2 Subsystem
Undulating broad crests and upper slopes <10%. Deep loose brownish sand or pale sands with coloured subsoils.

222Mb_4 - Mogumber 4 Subsystem
Gently to moderately inclined slopes <10% with shallow gravelly sands and few areas of lateritic outcrop. Low woodland with some E.calophylla and E.marginata also with E. todtiana, Dryandra spp. and acacia spp..

222Re_1 - Reagan 1 Subsystem
Gentle slopes (<10%) with deep, rapidly drained loose brownish or pale sands with a sandy fabric. Jarrah-marri woodlands, banksia woodlands

222Re_2 - Reagan 2 Subsystem
Gentle slopes (<10%) with deep, well drained brownish or earthy sands situated below Re1.

222Re_3 - Reagan 3 Subsystem
Gentle slopes (<10%) and spurs (<20% slope) with shallow gravelly sands and few areas of lateritic outcrop.

222Re_4 - Reagan 4 Subsystem
Very gently inclined foot and low slopes (<5%) with deep rapidly drained grey siliceous or bleached sands.

222Re_5 - Reagan 5 Subsystem
Level to very gently inclined swampy drainage lines with poorly drained grey siliceous and pale yellow-brown sands. Low woodland of E.calophylla wandoo, some E.marginata. Melaleucas, E.rudis and reeds in wet areas.

222Re_6 - Reagan 6 Subsystem
Very gently inclined footslope seepage areas. Imperfectly drained grey siliceous sands or pale yellow-brown sands. Low woodland of E calophylla Nuytsia floribunda, B.prionotes, Melaleuca spp. and reeds.

222Re_7 - Reagan 7 Subsystem
Level to very gently inclined outwash fans with deep, well drained grey siliceous sands or bleached sands overlying clay at depths greater than 1 m.

222Re_8 - Reagan 8 Subsystem
Gentle to steep scarp hillslopes (5-35%) with imperfectly drained yellow duplex and less commonly yellow gradational soils associated with localized areas of siltstone. Minor (few) rock outcrops occur.

222Re11 - Reagan 11 Subsystem
Drainage depressions on the Dandaragan Plateau. Light soils of sandy to sandy loam texture often with underlying humic pans. Low woodland of E. calophylla, melaleuca ssp. and reeds

SOILS SOURCE: DPIRD, September 2021.
CADASTRAL SOURCE: Landgate, April 2023.
AERIAL PHOTOGRAPHY SOURCE: NearMap, flown February 2023.

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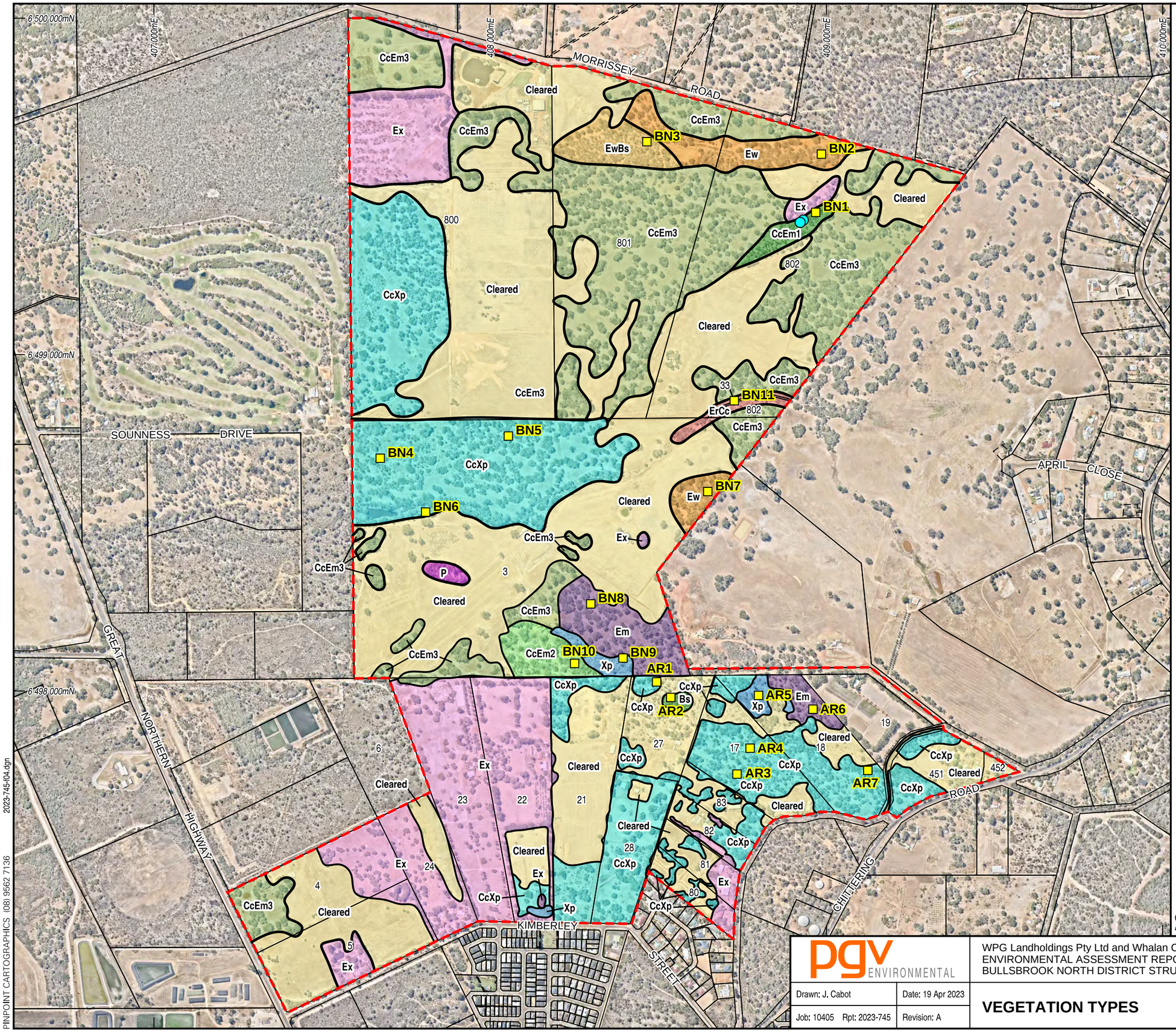
SOIL MAPPING

Figure 3

PINPOINT CARTOGRAPHICS (08) 9562 7136 2023-745-I03.dgn



N

0 100 200 300 400 500m

SCALE 1 : 11 000 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Easement Boundary
- Quadrat Location
- Vegetation Type Boundary

Threatened Species

- *Acacia anomala* Location

Vegetation Types

CcEm¹
Corymbia calophylla (Marri)/*Eucalyptus marginata* (Jarrah) Woodland over *Xanthorrhoea preissii* Low Shrubland on laterite

CcEm²
Corymbia calophylla (Marri)/*Eucalyptus marginata* (Jarrah) Woodland over *Xanthorrhoea preissii* Open Low Heath on sand

CcEm³
Corymbia calophylla (Marri)/*Eucalyptus marginata* (Jarrah) Parkland Cleared over pasture

Cc
Corymbia calophylla (Marri) Woodland over *Xanthorrhoea preissii/Hibbertia hypericoides/Caustis dioica* Open Low Heath

Em
Eucalyptus marginata (Jarrah) Woodland over weeds

Xp
Xanthorrhoea preissii Open Heath over weeds

Ew
Eucalyptus wandoo (Wandoo) Woodland over bare ground

EwBs
Eucalyptus wandoo (Wandoo) Woodland over *Banksia sessilis* Shrubland over bare ground

ErCc
Eucalyptus rudis (Flooded Gum)/*Corymbia calophylla* (Marri) Woodland over weeds

P
Pines

Ex
Exotic Trees

Cleared

CADASTRAL SOURCE: Landgate, April 2023.
AERIAL PHOTOGRAPHY SOURCE: NearMap, flown February 2023.

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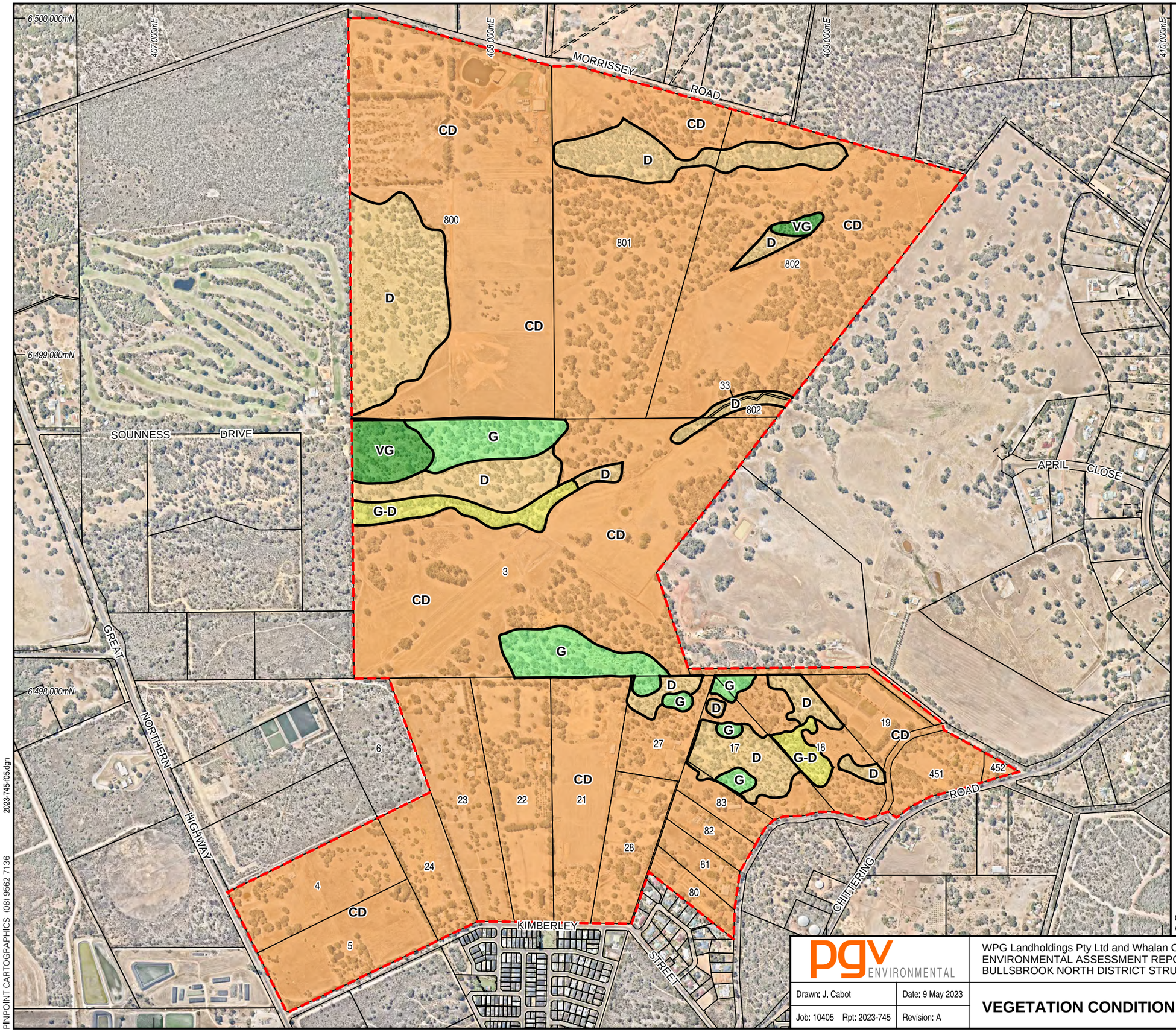
VEGETATION TYPES

Figure 4

2023-745-f04.dgn

PINPOINT CARTOGRAPHICS (08) 9562 7136



N

0 100 200 300 400 500m

SCALE 1 : 11 000 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Easement Boundary
- Vegetation Condition Boundary
- VG Vegetation Condition

Vegetation Condition

- Completely Degraded
- Degraded
- Good to Degraded
- Good
- Very Good

Vegetation Condition
(SOURCE: Bush Forever, Govt. of W.A., 2000)

P - Pristine
Pristine or nearly so, no obvious signs of disturbance.

Ex - Excellent
Vegetation structure intact, disturbance affecting individual species and weeds are non aggressive species.

VG - Very Good
Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.

G - Good
Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.

D - Degraded
Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.

CD - Completely Degraded
The structure of the vegetation is no longer intact and the areas is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora composing weed or crop species with isolated native trees or shrubs.

CI - Cleared
No native vegetation remaining.

CADASTRAL SOURCE: Landgate, April 2023.
AERIAL PHOTOGRAPHY SOURCE: NearMap, flown February 2023.

pgv ENVIRONMENTAL

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BULLSBROOK NORTH DISTRICT STRUCTURE PLAN

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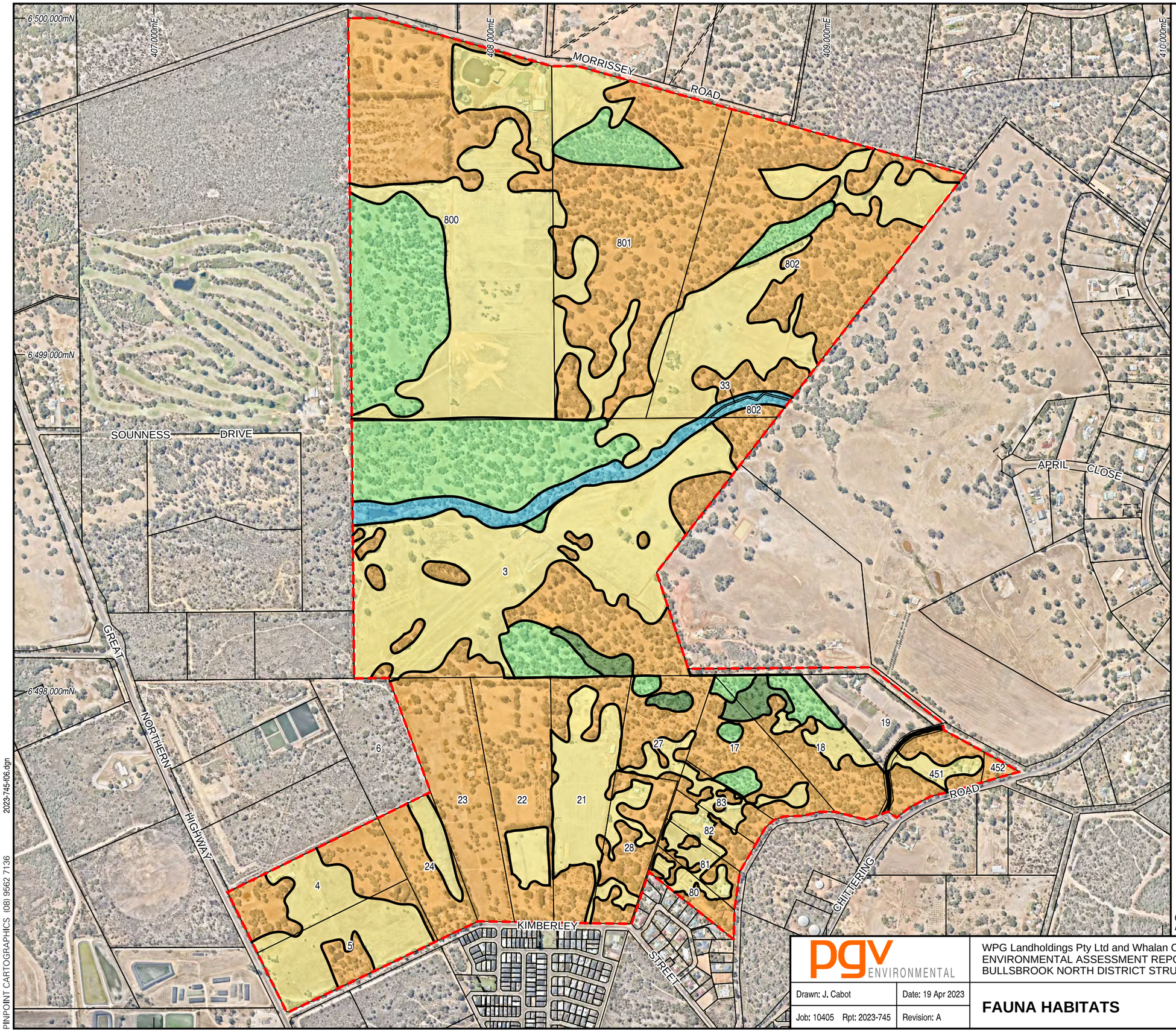
VEGETATION CONDITION

Figure 5

2023-745-105.dgn
PINPOINT CARTOGRAPHICS (08) 9562 7136



N

0 100 200 300 400 500m

SCALE 1 : 11 000 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Easement Boundary

Fauna Habitats

- Open Woodland Habitat
- Shrubland Habitat
- Creekline Habitat
- Parkland Cleared Habitat
- Cleared Habitat

CADASTRAL SOURCE: Landgate, April 2023.
AERIAL PHOTOGRAPHY SOURCE: NearMap, flown February 2023.

pgv ENVIRONMENTAL

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BULLSBROOK NORTH DISTRICT STRUCTURE PLAN

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Job: 10405 Rpt: 2023-745	Revision: A

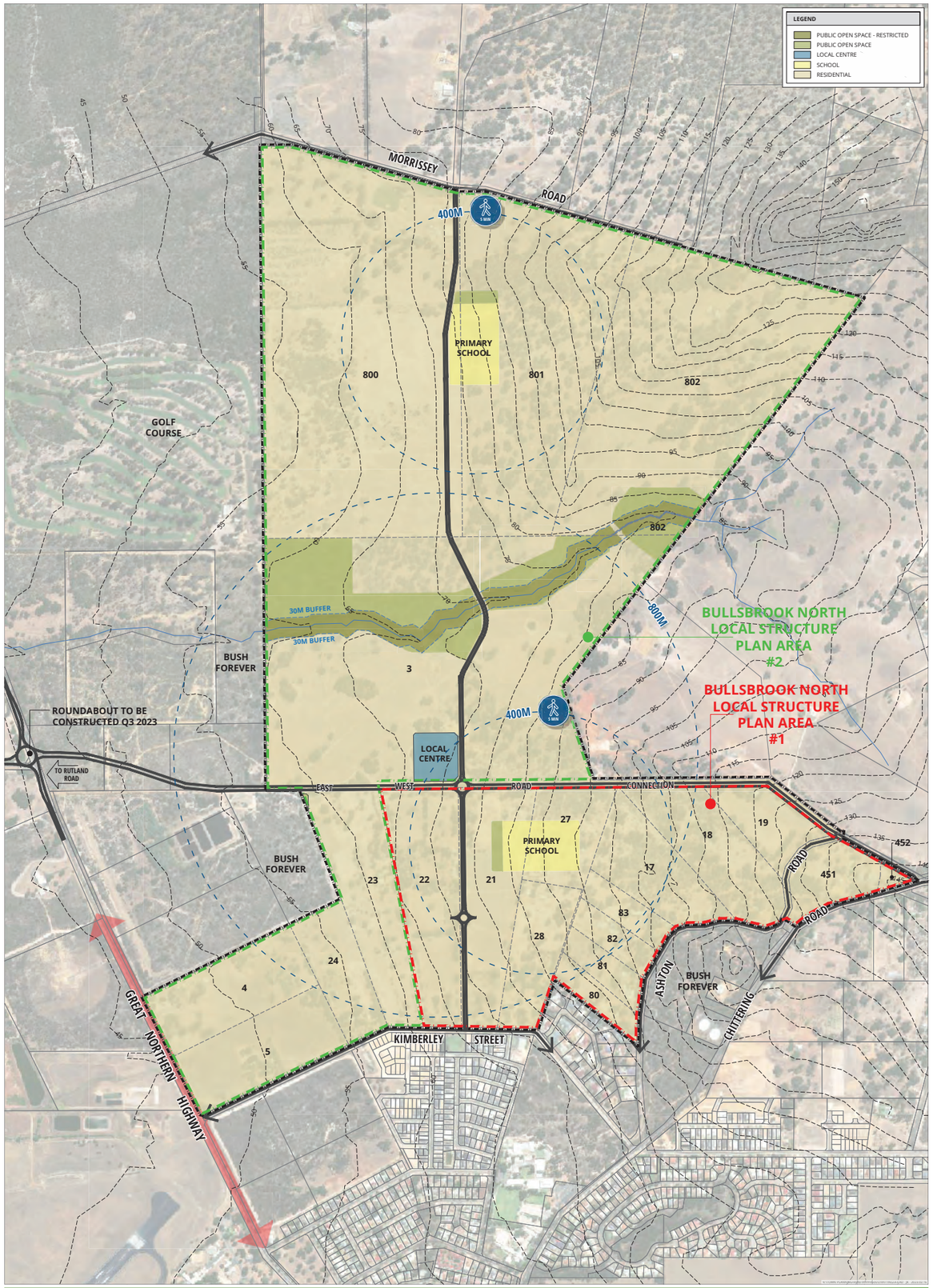
FAUNA HABITATS

Figure 6

PINPOINT CARTOGRAPHICS (08) 9562 7136 2023-745-f06.dgn

APPENDIX 1

District Structure Plan



PLAN 2: BULLSBROOK TOWNSITE DISTRICT STRUCTURE PLAN - NORTHERN PRECINCT

VARIOUS LOTS GREAT NORTHERN HIGHWAY - MORRISSEY ROAD TO KIMBERLEY STREET

BULLSBROOK

N

0 250 500 m

SCALE @ A1: 1:5000

9506-DSP-01-C

DRAWN: JS
DATE CREATED: 2023.03.15
PROJECTION: MGA50 GDA94
CADASTRE: LANDGATE
AERIAL: BING 2020

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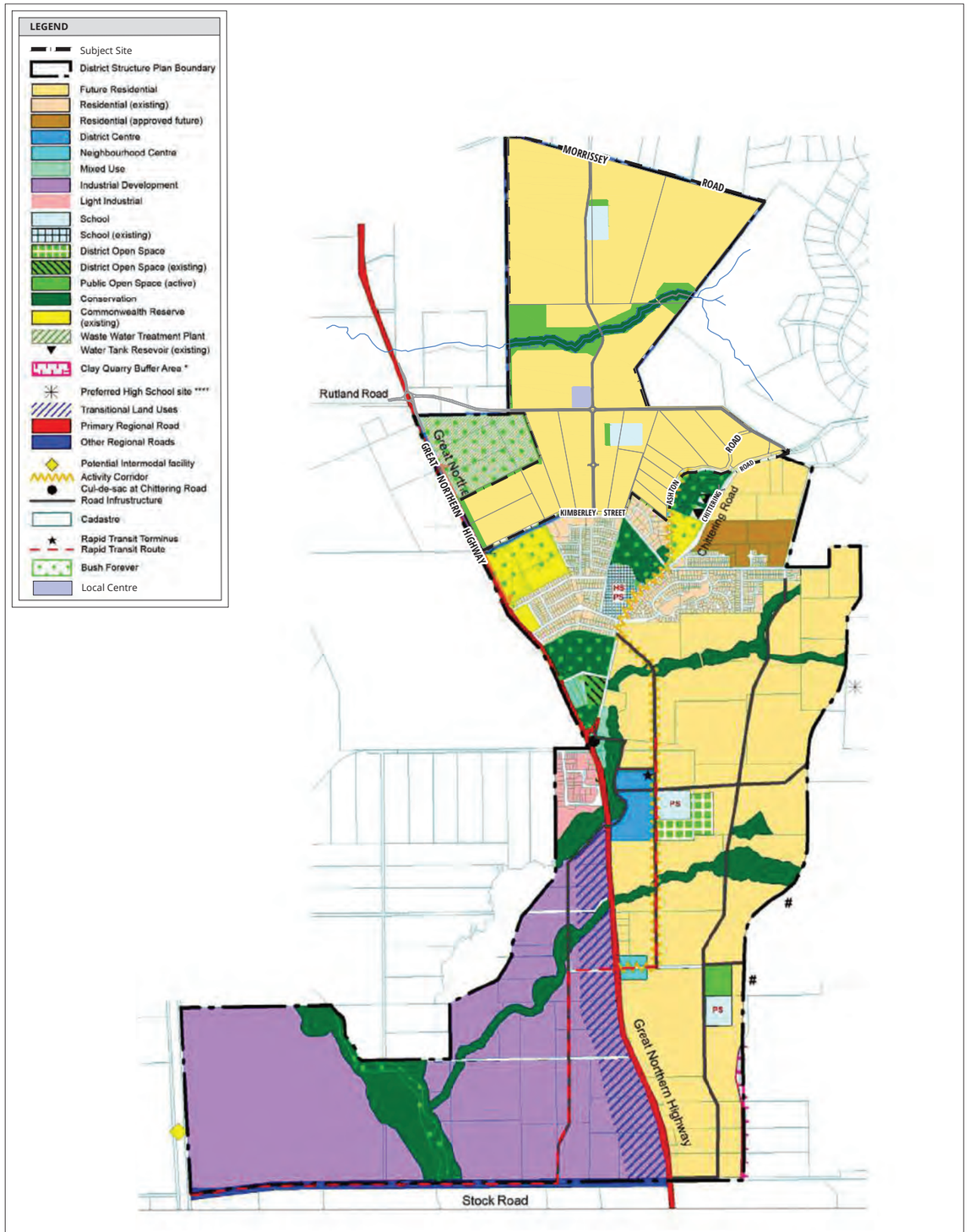

AMENDMENT No.	SUMMARY OF THE AMENDMENT	AMENDMENT TYPE	DATE APPROVED BY WAPC
1	NORTHERN PRECINCT - MODIFIED LAND USE DESIGNATION; INTRODUCTION OF PART 1 OF THE LSP	STANDARD	

N:\TOWN PLANNING\9000-9999\9506\DRAFTING\A-CAD - JK - 2023.02.16

PLAN 1: BULLSBROOK TOWNSITE DISTRICT STRUCTURE PLAN (AS AMENDED)

BULLSKBROOK

N

0 625 m

SCALE @ A3: 1:25,000

9506-FIG-04-C

DRAWN: JS
DATE CREATED: 2023.02.16
PROJECTION: MGA50 GDA94
CADASTRE: LANDGATE

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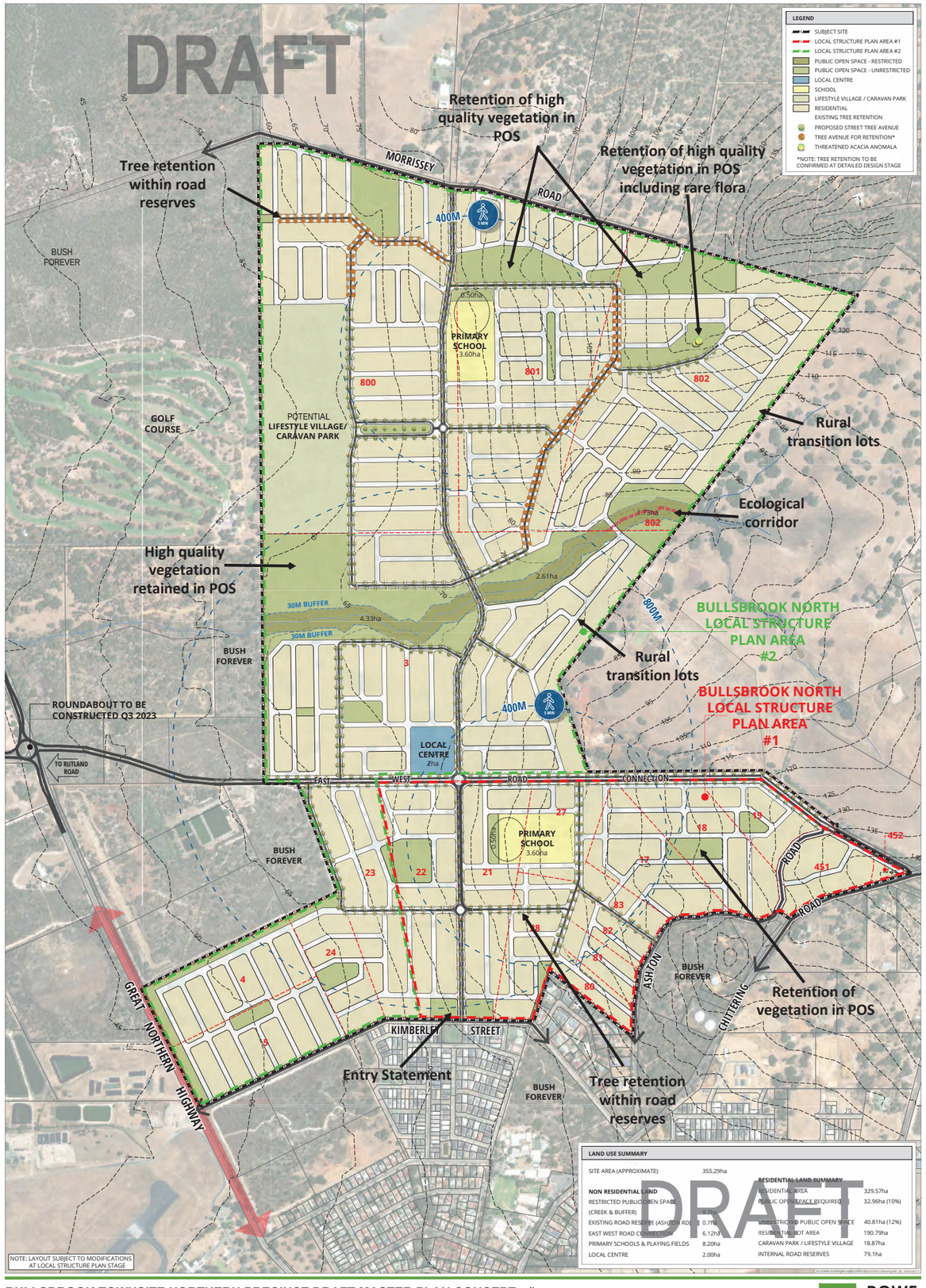
APPENDIX 2

Draft Master Plan Concept



BULLSBROOK TOWNSITE NORTHERN PRECINCT DRAFT MASTER PLAN CONCEPT

VARIOUS LOTS GREAT NORTHERN HIGHWAY - MORRISSEY ROAD TO KIMBERLEY STREET

BULLSBROOK

N

0 250 500 m

SCALE @ A1: 1:5000

9506-CON-05-C

DRAWN: WC
DATE CREATED: 2023.02.17
PROJECTION: GDA 1994 MGA94
CADASTRE: LANDGATE
AERIAL: BING 2020

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ROWE GROUP DESIGN

APPENDIX 3

Detailed Flora and Vegetation Survey (PGV Environmental, 2021)

BULLSBROOK NORTH MRS AMENDMENT

DETAILED FLORA AND VEGETATION SURVEY

Prepared for: Bullsbrook North Landowners Group

Report Date: 18 January 2022

Version: 1

Report No. 2021-614



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Table 2: Conservation Significant Flora identified in Database Searches

Table 3: Likelihood of Identified Significant Flora Species Occurring on the Site

Table 4: Threatened and Priority Ecological Communities likely to occur within 5km of the Site

Table 5: Vegetation Types on the Site

Table 6: Vegetation Condition Rating Scale

Plates

Plate 1: Aerial Photograph 1965 (Landgate, 2021)

Plate 2: Aerial Photograph 1974 (Landgate, 2021)

Plate 3: Aerial Photograph 2001 (Landgate, 2021)

Plate 4: *Acacia anomala* (Threatened) recorded on the site

Figures

Figure 1: Site Location

Figure 2: Site Boundary and Topography

Figure 3: Vegetation Types

Figure 4: Vegetation Condition

Appendices

Appendix 1: DBCA Flora Database Searches

Appendix 2: Naturemap Report

Appendix 3: Protected Matters Search Tool Report

Appendix 4: Conservation Codes

Appendix 5: TEC/PEC Database Search

Appendix 6: Flora Species List

Appendix 7: Quadrat Data

1 INTRODUCTION

1.1 Background

The Bullsbrook North MRS Amendment Area is located on Lots 800, 801 and 802 Morrissey Road, Lot 3 Ashton Road, Lots 22, 23 and 24 Kimberley Street and Lots 4 and 5 Great Northern Highway, Bullsbrook (Subject Land) in the City of Swan, approximately 40km north-north-east of the Perth Central Business District (Figure 1). The site is approximately 290ha in size and is bounded by Morrissey Road to the north, Great Northern Highway and a Wastewater Treatment Plant to the west, Kimberley Street to the south and rural land on the remaining boundaries (Figure 2).

The site is currently zoned 'Rural' under the Metropolitan Region Scheme (National Map, 2020) and 'General Rural' under the City of Swan Local Planning Scheme No. 17 (WAPC, 2020). The land is located inside the Bullsbrook DSP area and is designated Urban Expansion under the North-East Sub Regional Planning Framework. The proposed amendment to the Metropolitan Region Scheme (MRS) and Local Planning Scheme is to designate the area as 'Urban' to facilitate the future development of the subject land.

This Detailed Flora and Vegetation Survey was commissioned by Bullsbrook Landowners Group to identify if any Conservation Significant flora or vegetation are present on the subject land.

1.2 Scope of Works

A Detailed Flora and Vegetation Survey was undertaken in accordance with EPA Technical Guidance *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016). The survey included the following:

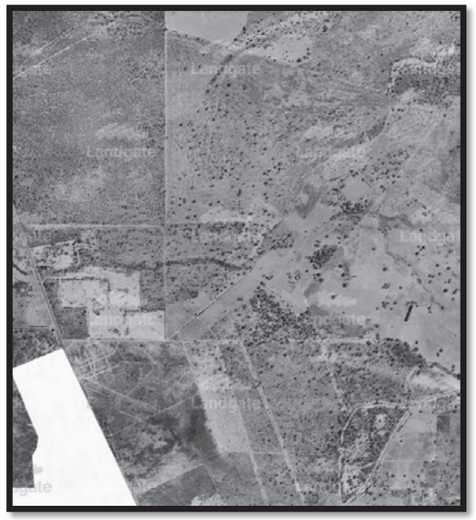
- Desktop search and review of the Department of Biodiversity, Conservation and Attractions (DBCA) Threatened and Priority flora and ecological community Databases;
- A search of the Naturemap website (DBCA, 2020);
- A search of the Commonwealth Government's Protected Matters Search Tool (DAWE, 2020) to identify species potentially occurring within the area that are protected under the *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999*;
- Examination of historic and recent aerial photography and contour and soil maps to provisionally identify vegetation types and condition;
- Field survey using quadrats to record native and introduced species as well as a thorough site walkover of any areas of native vegetation;
- Recording of any significant plant species using a hand-held GPS;
- Description and mapping of vegetation types and vegetation condition; and
- Compilation of a flora list.

2 EXISTING ENVIRONMENT

2.1 Land Use

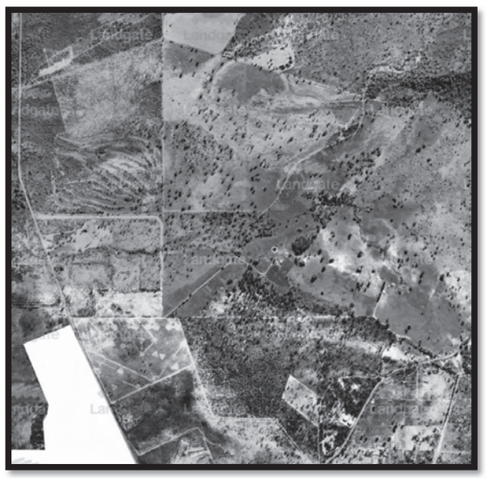
Earliest available aerial photography for the subject land from 1965 shows that a large proportion of has been cleared for agricultural purposes with scattered trees and pockets of remnant native vegetation remaining (Plate 1) (Landgate, 2021).

Plate 1: Historical Aerial Photography from 1965 (Landgate, 2021)



The 1974 aerial photograph shows a lot more clearing of trees throughout the site (Plate 2).

Plate 2: Historical Aerial Photography from 1974 (Landgate, 2021)



The condition of the site and agricultural land use in 2021 has remained similar over the past 40 years (Plate 3).

Plate 3: Historical Aerial Photography from 2021 (Landgate, 2021)



2.2 Topography

The subject land is undulating with a ridge in the northeastern lots and more gently undulating land in the southern half. The land slopes gently down from the ridge to the north-west and more steeply from the ridge down to the south-east corner. Elevations range between approximately 140m Australian Height Datum (AHD) at the northern end down to 44m near the south-west corner (Figure 2).

2.3 Geology and Soils

2.3.1 Geology

The subject land is mapped as part of the Dandaragan Plateau which is a gently undulating plateau with areas of sandplain and some laterite capping on Cretaceous sediments (McArthur and Bettenay, 1960). The plateau has broad u-shaped valleys 80-150 m deep and smaller v-shaped east of the Gingin Scarp in the south (National Map, 2020). Soils are formed in colluvium and weathered rock (DPIRD, 2020).

There is a small area in the south-west that is mapped in the Yanga System which are poorly drained plain with pale sands and deep sandy duplex, wet, semi-wet and saline wet soils (DPIRD, 2021).

The south-western corner is on the Pinjarra Plain system which consists of broad low relief plain west of the foothills, comprising predominantly Pleistocene fluvial sediments and some Holocene alluvium

associated with major current drainage systems. The major soils are naturally poorly drained and many swamps occur (DPIRD, 2021).

2.3.2 Soils

The soils subsystems mapped on the subject land are described as follows:

- Reagan 1 Subsystem (222Re_1) which are on gentle slopes (<10%) with deep, rapidly drained loose brownish or pale sands with a sandy fabric;
- Reagan 2 Subsystem (222Re_2)located on gentle slopes (<10%) with deep, well drained brownish or earthy sands situated below 222Re_1;
- Reagan 3 Subsystem (222Re_3) are on gentle slopes (<10%) and spurs (<20% slope) with shallow gravelly sands and few areas of lateritic outcrop;
- Reagan 5 Subsystem (222Re_5) are level to very gently inclined swampy drainage lines with poorly drained grey siliceous and pale yellow-brown sands;
- Reagan 6 Subsystem (222Re_6) are grey siliceous sands, pale yellow-brown sands and some yellow deep sands;
- Reagan 7 Subsystem (222Re_7) are level to very gently inclined outwash fans with deep, well drained grey siliceous sands or bleached sands overlying clay at depths greater than 1m;
- Yanga, Phase Ya1 (213Ya_Ya1) which is described as plain with moderately deep poorly drained pale yellow brown sands underlain by mottled clay; and
- Pinjarra, Phase Gf1 (213Pj_Gf1) which is a very gently undulating plain with moderately well drained yellow duplex or gradational soils with sand to sandy loam topsoil (DPIRD, 2021).

2.4 Hydrology

Groundwater under the subject land is at depth at approximately 37m AHD (DWER, 2020), which is greater than 30m below ground level. There are no mapped wetlands on the subject land.

An ephemeral creekline runs through the subject land from east to west. The creek is mostly on Lot 3 Ashton Road, with a small area in Lot 802 Morrissey Road. The creekline runs to Ellen Brook approximately 2.5km to the west of the subject land. The creekline has a series of dams, one on the eastern side and three on the western side. The largest dam in the western side appears to contain water year round while the other dams appear to be dry most summers as evidenced from historical aerial photography (Landgate, 2021).

3 METHODOLOGY

3.1 Database Searches

Searches of the following databases were undertaken prior to the site survey:

- Department of Biodiversity, Conservation and Attractions (DBCA) Threatened and Priority Flora databases and Threatened Ecological Communities database (Appendix 1) with a buffer radius of 10km;
- DBCA Naturemap Database (DBCA, 2020) (Appendix 2) with a buffer radius of 10km; and
- The Commonwealth Government's Protected Matters Search Tool to identify species potentially occurring within the area that are protected under the *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999* (DAWE, 2020). A radius of 5km was used for this database (Appendix 3).

3.2 Reconnaissance Surveys

Two Reconnaissance surveys were undertaken on different parts of the subject land. A Reconnaissance survey of Lots 801 and 802 Morrissey Road was undertaken on 16 June 2020. A Reconnaissance survey of Lot 3 Ashton Road was conducted on 18 June 2021. Both surveys recommended that a Detailed Survey be undertaken to ascertain if any conservation significant species occur on the site.

3.3 Detailed Survey

A Detailed spring flora and vegetation survey of the subject land was conducted by Dr Paul van der Moezel over 2 days on 2 September and 6 October 2021. The subject land was thoroughly walked to record all species. Information on flora composition and vegetation structure was recorded in eleven 10m x 10m non-permanent quadrats in representative vegetation types.

Most plant species were identified in the field. Some specimens were photographed or taken for identification at the Perth Reference Herbarium or office using standard reference guides.

3.4 Targeted Survey

The Reconnaissance Surveys concluded that three Threatened and four Priority species could occur in the small areas of intact vegetation on the subject land. The species are shown in Table 1 below together with their flowering times and the best time to survey each species.

Table 1: Conservation Significant Species Identified as Possibly Present

Species	Conservation Status	Flowering Time	Best Survey Period
Hypocalymma sylvestre	Threatened	August	Any time but preferably in August or later when seed has set
Thelymitra stellata (Star Sun-orchid)	Threatened	October-November	October - November

Species	Conservation Status	Flowering Time	Best Survey Period
Acacia anomala	Threatened	August-September	August - November or later when in pod
Grevillea candolleana	Priority 2	August-September	Any time but preferably August - November
Acacia drummondii subsp. *affinis*	Priority 3	July-August	Any time but preferable July-August or later when in pod
Oxymyrrhine coronata	Priority 4	July-December	July- December
Synaphea grandis	Priority 4	October-November	October - November

Most of the species were able to be identified during the Spring flora survey on 2 September. One of the Threatened species, the Star Sun-Orchid (*Thelymitra stellata*), grows in Jarrah/Marri woodlands on gravel and laterite soils and can only be identified when it is flowering from October to November.

A targeted survey for the Star Sun-Orchid was undertaken by Dr Paul van der Moezel of PGV Environmental on 6 October 2021 in accordance with the objectives of the *draft Survey Guidelines for Australia's Threatened Orchids* (Commonwealth of Australia, 2013). The survey area that contains native vegetation was walked on traverses spaced 20m apart where practicable. The low, open understorey enabled good visibility of plants and leaves on the ground within a 10m spread each side of the traverse. The track log is shown in Appendix 4.

3.5 Survey Conditions

The conditions that the survey was undertaken in are presented in Table 1 in order to assess the adequacy of the survey. Rainfall for Wanneroo was above average for July in 2021 being 247.0mm and below average in August being 86.0mm compared to mean values of 134.5mm and 105.6mm (BOM, 2021). The rainfall in September was 38.6mm compared to an average of 67.7mm (BOM, 2021). October had a higher than average rainfall of 133.2mm compared to the mean of 37.2mm (BOM, 2021). The above average rainfall in July is likely to have compensated for the low rainfall in August and September and seasonal rainfall is not considered a constraint to the survey.

Table 1: Statement of Botanical Survey Conditions

Issue	Constraints (Y/N)*	Comment
Competency/experience of the consultant conducting the survey	No	Dr Paul van der Moezel has extensive botanical survey experience in the Perth Metropolitan Region.
Proportion of the flora identified^	No	The timing of the survey in September and October was optimal to identify most flora species on the site including all potential Threatened and Priority Flora. No follow-up survey required.
Sources of information (historic/recent or new data)	No	The flora of the Perth Metropolitan Region is fairly well documented.

Issue	Constraints (Y/N)*	Comment
Proportion of the task achieved and further work that may need to be undertaken	No	Surveys in September and October identified at least 95% of the flora species on the site.
Timing/weather/season/cycle	No	The spring survey was optimal for most flora species. 2021 was a good year for ephemeral species.
Disturbances (Fire)	No	The fire age of the vegetation was greater than 5 years.
Intensity of survey (e.g. In retrospect was the intensity adequate)	No	The time spent on the site and relative ease of access made for a full coverage.
Completeness (e.g. was relevant area fully surveyed)	No	
Resources (e.g. degree of expertise available for plant identification)	No	Experienced botanist undertook most plant identifications on site.
Remoteness and/or access problems	No	Easily accessible site in the Perth Metropolitan Region
Availability of contextual (e.g. bioregional) information for the study area.	No	Bush Forever

*Constraints have been rated as Significant, Moderate or No constraints

^Fungi and nonvascular flora (e.g. algae, mosses and liverworts) were not specifically surveyed for during the survey.

4 RESULTS

4.1 Flora Database Searches

The search of the DBCA Threatened and Priority Flora Databases: the WA Herbarium database (WAHerb), the Threatened and Priority Flora Species List (TFPL) (Appendix 1) and Naturemap (Appendix 2) indicates that a number of species that are listed as Endangered, Threatened or Priority have been recorded within a 10km radius of the site. The EPBC Act Protected Matters Search Tool (Appendix 3) identifies species listed under the EPBC Act as potentially having habitat in the area. The results from these database searches are shown in Table 2. None of the species has been recorded from the survey area.

Table 2: Conservation Significant Flora Identified in Database Searches

Scientific Name	Common Name	Conservation Status (WA)	Status under EPBC Act
Calectasia cyanea	Blue Tinsel Lily	Critically Endangered	Critically Endangered
Grevillea althoferorum subsp. *fragilis*		Critically Endangered	Endangered
Grevillea curviloba subsp. *curviloba*	Narrow curved-leaf Grevillea	Critically Endangered	Endangered
Synaphea sp. Fairbridge Farm (D Papenfus 696)	Selena's Synaphea	Critically Endangered	Critically Endangered
Thelymitra dedmaniarum	Cinnamon Sun-orchid	Critically Endangered	Endangered
Trithuria occidentalis (Hydatella dioica)	Swan Hydatella	Critically Endangered	Endangered
Conospermum densiflorum subsp. *unicephalatum*	One-headed Smokebush	Endangered	Endangered
Darwinia foetida	Muchea Bell	Endangered	Critically Endangered
Diplolaena andrewsii	Native Wild Rose	Endangered	Endangered
Diuris purdiei	Purdie's Donkey-orchid	Endangered	Endangered
Eucalyptus leprophloia	Scaly-butt Mallee	Endangered	Endangered
Grevillea christineae	Christine's Grevillea	Endangered	Endangered
Grevillea curviloba subsp. *incurva*	Narrow curved-leaf Grevillea	Endangered	Endangered
Hypocalymma sylvestre		Endangered	Endangered
Thelymitra stellata	Star Sun-orchid	Endangered	Endangered
Acacia anomala	Grass Wattle, Chittering Grass Wattle	Vulnerable	Vulnerable
Andersonia gracilis	Slender Andersonia	Vulnerable	Endangered
Anigozanthos viridis subsp. *terraspectans*	Dwarf Green Kangaroo Paw	Vulnerable	Vulnerable
Anthocercis gracilis	Slender Tailflower	Vulnerable	Vulnerable
Chamelaucium sp. Gingin (N.G. Marchant 6)	Gingin Wax	Vulnerable	Endangered
Diuris micrantha	Dwarf Bee-orchid	Vulnerable	Vulnerable
Eleocharis keigheryi	Keighery's Eleocharis	Vulnerable	Vulnerable
Grevillea corrugata		Vulnerable	Endangered

Scientific Name	Common Name	Conservation Status (WA)	Status under EPBC Act
Hydrocotyle striata		Priority 1	
Drosera sewelliae		Priority 2	
Grevillea candolleana		Priority 2	
Hibbertia glomerata subsp. *ginginensis*		Priority 2	
Schoenus sp. Bullsbrook (J.J. Alford 915)		Priority 2	
Stylidium squamellosum	Maize Trigger Plant	Priority 2	
Tetraria sp. Chandala (G.J. Keighery 17055)		Priority 2	
Acacia drummondii subsp. *affinis*		Priority 3	
Acacia oncinophylla subsp. *oncinophylla*		Priority 3	
Adenanthos cygnorum subsp. *chamaephyton*		Priority 3	
Chamaescilla gibsonii		Priority 3	
Cyathochaeta teretifolia		Priority 3	
Eryngium pinnatifidum subsp. Palustre (G.J. Keighery 13459)		Priority 3	
Guichenotia tuberculata		Priority 3	
Haemodorum loratum		Priority 3	
Isotropis cuneifolia subsp. *glabra*		Priority 3	
Persoonia rudis		Priority 3	
Platysace ramosissima		Priority 3	
Schoenus capillifolius		Priority 3	
Stylidium aceratum		Priority 3	
Stylidium paludicola		Priority 3	
Verticordia serrata var. *linearis*		Priority 3	
Drosera occidentalis	Western Sundew	Priority 4	
Hydrocotyle lemnoides	Aquatic Pennywort	Priority 4	
Ornduffia submersa		Priority 4	
Oxymyrrhine coronata		Priority 4	
Stylidium longitubum	Jumping Jacks	Priority 4	
Synaphea grandis		Priority 4	
Verticordia lindleyi subsp. *lindleyi*		Priority 4	

Definitions of the Conservation Codes are in Appendix 5.

Based on the soil types and vegetation type and conditions observed during the survey the likelihood of conservation significant species identified in the database searches occurring on the site has been examined (Table 3).

Table 3: Likelihood of Identified Significant Flora Species Occurring on the Site

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
Critically Endangered			
Calectasia cyanea	Blue Tinsel Lily	The Blue Tinsel Lily prefers white, grey or yellow sand or gravel.	No – species does not occur in this area
Grevillea althoferorum subsp. *fragilis*		*Grevillea althoferorum* subsp. *fragilis* is recorded on the base of the Darling Scarp, growing in greyish - yellow colluvial sand (DEC, 2011).	Highly Unlikely – sandy habitat on the site is completely degraded
Grevillea curviloba subsp. *curviloba*	Narrow curved-leaf Grevillea	Narrow curved-leaf Grevillea occurs in grey sand in winter-wet heath. There are 17 known populations in an area between Muchea and Badgingarra (Phillimore and English, 2000).	Highly Unlikely – the site is not in the known species range and there is no winter wet areas.
Synaphea sp. Fairbridge Farm (D Papenfus 696)	Selena's Synaphea	Selena's Synaphea occurs in sandy with lateritic pebbles near winter-wet flats, in low woodland with weedy grasses.	Highly Unlikely – The site does not contain winter wet flats
Thelymitra dedmaniarum	Cinnamon Sun-orchid	Cinnamon sun orchid is known from only two locations in the Gidgegannup area. It is confined to open wandoo woodland on red-brown sandy loam associated with dolerite and granite outcropping (DEC, 2012).	Highly Unlikely – the soils do not have dolerite or granite outcropping
Trithuria occidentalis (Hydatella dioica)	Swan Hydatella	Swan Hydatella grows partly submerged on the edge of shallow, winter-wet claypans in very open shrubland of Robin Redbreast Bush (*Melaleuca lateritica*) and numerous annual herbs.	Highly Unlikely – The site is not suitable habitat.
Endangered			
Conospermum densiflorum subsp. *unicephalatum*	One-headed Smokebush	The One-headed Smokebush occurs on clay soils in low-lying areas.	Highly Unlikely – The site is not suitable habitat and this species has not been recorded within 10km of the site.
Darwinia foetida	Muchea Bell	The Muchea Bell is found in grey-white sand on swampy, seasonally wet sites.	Highly Unlikely – The site does not contain swampy areas
Diplolaena andrewsii	Native Wild Rose	The Native Wild Rose occurs on loam, clay in association with granite outcrops and hillsides.	Highly Unlikely – not granite habitat
Diuris purdiei	Purdie's Donkey-orchid	Purdie's Donkey Orchid occurs in grey-black sand in moist winter-wet swamps.	Highly Unlikely – The site is not swamp habitat

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
Eucalyptus leprophloia	Scaly-butt Mallee	Scaly-butt Mallee occurs on white or grey sand over laterite on valley slopes.	Highly Unlikely – The site is not suitable habitat and this species has not been recorded within 10km of the site.
Grevillea christineae	Christine's Grevillea	Christine's Grevillea prefers clay loam, sandy clay, often moist.	Highly Unlikely – The site is not wet habitat and creekline areas are completely degraded
Grevillea curviloba subsp. *incurva*	Narrow curved-leaf Grevillea	Narrow curved-leaf Grevillea prefers sand, sandy loam in winter-wet heath.	Highly Unlikely – The site is not winter wet heath habitat
Hypocalymma sylvestre		*Hypocalymma sylvestre* has been recorded from yellow-brown sandy loam in woodland on lateritic hilltop.	Possible – may occur in small area of intact vegetation on the site
Thelymitra stellata	Star Sun-orchid	The Star Sun-orchid prefers sand, gravel or lateritic loam.	Possible – may occur in small area of intact vegetation on the site
Vulnerable			
Acacia anomala	Grass Wattle, Chittering Grass Wattle	The Grass Wattle prefers lateritic soils and slopes.	Possible– may occur in small area of intact vegetation on the site
Andersonia gracilis	Slender Andersonia	Slender Andersonia occurs in white/grey sand, sandy clay, gravelly loam in winter-wet areas, near swamps.	Highly Unlikely – The site is not low-lying habitat and this species has not been recorded within 10km of the site
Anigozanthos viridis subsp. *terraspectans*	Dwarf Green Kangaroo Paw	The Dwarf Green Kangaroo Paw occurs on grey sand, clay loam in winter-wet depressions.	Highly Unlikely – The site is not low-lying habitat
Anthocercis gracilis	Slender Tailflower	Slender Tailflower occurs in sandy or loamy soils near granite outcrops.	Highly Unlikely – There are no granite outcrops and the species has not been recorded within 10km of the site
Chamaluaceum lullfitzii (previously *Chamelaucium* sp. Gingin (N.G. Marchant 6)	Gingin Wax	Gingin wax grows in white/yellow sand supporting open low woodland.	Highly Unlikely – sandy habitat on the site is completely degraded
Diuris micrantha	Dwarf Bee-orchid	The Dwarf Bee-orchid is usually found on brown loamy clay in winter-wet swamps, in shallow water.The range of this species extends south from Kwinana.	Highly Unlikely – not suitable habitat and not recorded within 10km of the site.

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
Eleocharis keigheryi	Keighery's Eleocharis	Keighery's Eleocharis occurs in clay, sandy loam and is emergent in freshwater: creeks, claypans.	Highly Unlikely – creekline habitat on the site is completely degraded
Grevillea corrugata		*Grevillea corrugata* occurs in gravelly loam on roadsides.	Highly Unlikely – not loamy soils
Priority 1			
Hydrocotyle striata		*Hydrocotyle striata* occurs in clay near springs.	No – no spring habitat
Priority 2			
Drosera sewelliae		*Drosera sewelliae* grows in laterite and silica sand soils.	Highly Unlikely – Not silica sand soils
Grevillea candolleana		*Grevillea candolleana* occurs in laterite, lateritic loam on hillsides.	Possible – may occur in small area of intact vegetation on the site
Hibbertia glomerata subsp. *ginginensis*		*Hibbertia glomerata* subsp. *ginginensis* occurs in sand, brown clay, laterite near roadsides.	Highly Unlikely - no clay habitat
Schoenus sp. Bullsbrook (J.J. Alford 915)		*Schoenus* sp. Bullsbrook (J.J. Alford 915) grows in grey peaty sand on low-lying flats.	Highly Unlikely – no peaty habitat
Stylidium squamellosum	Maize Trigger Plant	Maize Trigger Plant grows in brown to red-brown clay loam on winter-wet habitats and depressions, open woodland, shrubland.	Highly Unlikely – not clayey soils
Tetraria sp. Chandala (G.J. Keighery 17055)		*Tetraria* sp. Chandala is recorded from a mound spring in peaty sand (Western Australian Herbarium, 2005).	No – not mound spring habitat
Priority 3			
Acacia drummondii subsp. *affinis*		*Acacia drummondii* subsp. *affinis* grows in lateritic gravelly soils.	Possible – may occur in small area of intact vegetation on the site
Acacia oncinophylla subsp. *oncinophylla*		*Acacia oncinophylla* subsp. *oncinophylla* occurs in granitic soils	No – not granitic habitat
Adenanthos cygnorum subsp. *chamaephyton*		*Adenanthos cygnorum* subsp. *chamaephyton* occurs in grey sand, lateritic gravel.	Possible in – may occur in small area of intact vegetation on the site
Chamaescilla gibsonii		*Chamaescilla gibsonii* grows in clay to sandy clay on winter-wet flats, shallow water-filled claypans.	Highly Unlikely – not clayey soils
Cyathochaeta teretifolia		*Cyathochaeta teretifolia* occurs in grey sand, sandy clay on swamps, creek edges.	Highly Unlikely – creek habitat on the site is completely degraded

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
Eryngium pinnatifidum subsp. Palustre (G.J. Keighery 13459)		*Eryngium pinnatifidum* subsp. Palustre is recorded from a winter wet claypan, water to 20 cm deep in grey-brown clay (Western Australian Herbarium, 1989)	No – not suitable habitat
Guichenotia tuberculata		*Guichenotia tuberculata* grows in sand clay over laterite, sand.	Highly Unlikely – sandy habitat on the site is completely degraded
Haemodorum loratum		*Haemodorum loratum* prefers grey or yellow sand, gravel.	Possible in – may occur in small area of intact vegetation on the site
Isotropis cuneifolia subsp. *glabra*		*Isotropis cuneifolia* subsp. *glabra* grows in sand, clay loam on winter-wet flats.	Highly Unlikely – no flats on the site
Persoonia rudis		*Persoonia rudis* occurs in white, grey or yellow sand, often over laterite.	Possible – may occur in small area of intact vegetation on the site
Platysace ramosissima		*Platysace ramosissima* prefers sandy soils	Possible – may occur in small area of intact vegetation on the site
Schoenus capillifolius		*Schoenus capillifolius* grows in brown mud on claypans.	No – no claypan habitat
Stylidium aceratum		*Stylidium aceratum* occurs in sandy soils in swamp heathland.	Highly Unlikely – no swampy habitat
Stylidium paludicola		*Stylidium paludicola* prefers peaty sand over clay in winter wet habitats in Marri and Melaleuca woodland, Melaleuca shrubland.	Highly Unlikely – no peaty habitat
Verticordia serrata var. *linearis*		*Verticordia serrata* var. *linearis* grows in white sand, gravel in open woodland.	Highly Unlikely – No white sand on the site
Priority 4			
Drosera occidentalis	Western Sundew	The Western Sundew occurs in sandy and clayey soils in swamps and wet depressions.	Highly Unlikely – there is no swampy habitat
Hydrocotyle lemnoides	Aquatic Pennywort	Aquatic Pennywort occurs in swamps	No – no suitable permanently wet areas on the site
Ornduffia submersa		*Ornduffia submersa* grows in freshwater 0.05-0.6 m deep. Pools, lakes, swamps, winter-wet depressions, claypans.	Highly Unlikely – The site is not low-lying habitat
Oxymyrrhine coronata		*Oxymyrrhine coronata* occurs in lateritic gravel.	Possible – may occur in small area of intact vegetation on the site
Stylidium longitubum	Jumping Jacks	Jumping Jacks prefer sandy clay, clay in seasonal wetlands.	Highly Unlikely – The site is not wetland habitat

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
Synaphea grandis		*Synaphea grandis* occurs in laterite.	Possible – may occur in small area of intact vegetation on the site
Verticordia lindleyi subsp. *lindleyi*		*Verticordia lindleyi* subsp. *lindleyi* prefers sand, sandy clay in winter-wet depressions.	Highly Unlikely – The site is not suitable habitat

* sourced from Florabase, DBCA database searches and SPRAT (DoEE, 2018) unless otherwise denoted

4.2 TEC and PEC Database Searches

A search of DBCA's Threatened (TEC) and Priority Ecological Communities (PEC) database was conducted within a radius of 5km around the site (07-0720EC) (Appendix 5). Seven conservation significant Ecological Communities were identified and an additional TEC was identified in the Protected Matters Search Tool Report (Appendix 3) (Table 2).

Table 4: Threatened and Priority Ecological Communities likely to occur within 5km of the Site

Number	Description	Conservation Status in WA	Status under the EPBC Act
Mound Springs SCP	Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain)	Critically Endangered	Endangered
SCP3a	*Corymbia calophylla - Kingia australis* woodlands on heavy soils, Swan Coastal Plain	Critically Endangered	Endangered
SCP3c	*Corymbia calophylla - Xanthorrhoea* preissii woodlands and shrublands, Swan Coastal Plain	Critically Endangered	Endangered
Muchea Limestone	Shrublands and woodlands on Muchea Limestone of the Swan Coastal Plain	Endangered	Endangered
SCP07	Herb rich saline shrublands in clay pans	Vulnerable	Critically Endangered
SCP08	Herb rich shrublands in clay pans	Vulnerable	Critically Endangered as part of 'Claypans of the Swan Coastal Plain'
Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered
Tuart WL SCP	Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain ecological community	Priority 3	Critically Endangered

4.3 Flora

A total of 154 plant species were recorded during the flora survey (Appendix 6). This total consisted of 111 native species and 43 introduced species (28%). The field work did not include a survey all introduced species in the paddocks as this would have extended the amount of survey effort and the results have no bearing on the conservation significance of flora species on the site.

Plant families with the greatest number of species were the Fabaceae (Wattle and Pea family – 26 species including 18 native and 8 introduced), Asteraceae (Daisy family – 16 species, 8 native and 8 introduced), Cyperaceae (9 species, all native), Myrtaceae (Myrtle family – 8 species, all native), Asparagaceae (Lily family – 8 species, all native), Proteaceae (Banksia family – 8 species, all native) and Poaceae (Grass family – 8 species, 1 native and 7 introduced).

The total number of species recorded in the eleven quadrats sampled ranged from 7-27 (Appendix 7). The low number of species generally reflects the poor quality of the native understorey in many areas. The vegetation in Very Good condition contained higher species richness than the vegetation in Degraded condition.

One Threatened species, *Acacia anomala*, was recorded on the site. Three plants were recorded in a small area of Very Good quality Marri Woodland over Low Shrubland on sloping sight with outcropping laterite (Figure 3).

Acacia anomala (Chittering Grass Wattle) is a slender rush-like shrub 0.2-0.5m high that is known to occur on lateritic soils and slopes in the Swan, Chittering and Kalamunda areas.

Plate 4: *Acacia anomala* (Threatened) recorded on the site



4.4 Vegetation Complex

Vegetation Complexes are a broad level of vegetation description which is based on the underlying geomorphology and rainfall (Heddle *et al*., 1980). The vegetation is part of the Reagan Complex which is described as "Vegetation ranges from low open woodland of *Banksia* species *Eucalyptus todtiana* (Pricklybark) to closed heath depending on the depth of soil" (Heddle *et al.,* 1980).

The vegetation on the site does not meet the general description of this vegetation complex. The vegetation on the site better fits the description of the Mogumber– South vegetation complex which occurs about 1km east of the site and is broadly described as "Open Woodland of *Eucalyptus calophylla* (Marri) with some admixture of *E. marginata* (Jarrah) and a second storey of *E. todtiana-Banksia attenuata-B. menziesii-B. ilicifolia*".

4.5 Vegetation

4.5.1 Vegetation Type

Vegetation complexes are a very broad mapping unit used to map the vegetation at the scale of the Swan Coastal Plain for example. For small scale sites, such as the survey area, vegetation mapping can be further refined by using vegetation types which are based on the composition and structure of the dominant species rather than based on geomorphology.

Nine native vegetation types and two non-native vegetation types were described and mapped on the site. The vegetation types are described in Table 5 and mapped in Figure 3.

Table 5: Vegetation Types on the Site

Vegetation Type	Description	Photograph
CcEm[1] *Corymbia calophylla* (Marri)/*Eucalyptus marginata* (Jarrah) Woodland over *Xanthorrhoea preissii* Low Shrubland on laterite	One small area of this vegetation type occurs on Lot 802 at the top of a short but moderately steep slope. Marri trees are sparse with the understorey more prominent, dominated by *Xanthorrhoea preissii* and *X. brunonis.* Other common shrub species include *Morelotia octandra, Cryptandra arbutiflora, Mesomelaena pseudostygia, Hakea lissocarpha, Chamaescilla corymbosa, Desmocladus fascicularis* and *Drosera erythrorhiza.* The soils are orange sandy loam with small laterite rocks at the surface. Quadrat BN1 is representative of this vegetation type.	
CcEm[2] *Corymbia calophylla* (Marri)/*Eucalyptus marginata* (Jarrah) Woodland over *Xanthorrhoea preissii* Open Low Heath on sand	This vegetation type occurs on a portion of Lot 3 on gently sloping sandy soils. Marri and Jarrah trees are typically over 20m high with Marri more prominent than Jarrah. The understorey is low (<1m) and open with common species *Xanthorrhoea preissii, Daviesia nudiflora, Phyllanthus calycinus* and *Trachymene pilosa.* The soils are yellow-brown sand. Quadrat BN10 is representative of this vegetation type.	

Vegetation Type	Description	Photograph
CcEm^3 *Corymbia calophylla* (Marri)*/ Eucalyptus marginata* (Jarrah) Parkland Cleared over pasture	A large number of Marri and Jarrah trees occur throughout the site over pasture. The trees range in age from young to mature but are mostly small (diameter <50cm). The soils are grey to orange sands. No quadrats sampled in parkland cleared areas	
Cc *Corymbia calophylla* (Marri) Woodland over *Xanthorrhoea preissii/ Hibbertia hypericoides/ Caustis dioica* Open Low Heath	This vegetation type occurs at the western, lower parts of the site on Lot 3 and 800 on light coloured sand. Marri trees are 10-15m high and with sparse to moderately cover. The understorey is low and open and typically contains *Xanthorrhoea preissii, Hibbertia hypericoides, Caustis dioica, Mesomelaena pseudostygia* and *Desmocladus flexuosus.* The soils are light orange-brown sand. Quadrats BN4, 5 and 6 are representative of this vegetation type.	

Vegetation Type		Description	Photograph
Em	*Eucalyptus marginata* (Jarrah) Woodland over weeds	This vegetation type occurs on Lot 3 on gently sloping sandy soils. Jarrah is up to 20m high with no Marri present. The understorey is completely degraded with few to no native species present. The soils are dark brown loamy sand. Quadrat BN8 is representative of this vegetation type.	
Xp	*Xanthorrhoea preissii* Open Heath over weeds	This vegetation type occurs on Lot 3 on gently sloping sandy soils. Trees are absent although historic aerial photography from 1965 shows them to be present. *Xanthorrhoea preissii* is around 1m high and reasonably dense at 30-50% cover. Most of the ground cover are introduced species. The soils are orange-brown sand. Quadrat BN9 is representative of this vegetation type.	

Vegetation Type		Description	Photograph
Ew	*Eucalyptus wandoo* (Wandoo) Woodland over bare ground	A large area of this vegetation type occurs on a ridge on Lots 801 and 802 and a small stand on high ground on Lot 3. Wandoo trees are mostly young over an almost completely bare understorey which is has abundant surface lateritic gravel and rocks. Coverage of introduced species is very low where the rocks are at the surface. Annual Veldtgrass is very common in areas with more sand over laterite. The soils are orange, sandy loam with small laterite pebbles at the surface. Quadrats BN2 and 7 are representative of this vegetation type.	
EwBs	*Eucalyptus wandoo* (Wandoo) Woodland over *Banksia sessilis* Shrubland over bare ground	Occurs on Lot 801. Similar to Ew but with a mid-shrub cover of *Banksia sessilis* (Parrot Bush) and in some places *Leptospermum roei* both up to 2m high. The ground cover is very sparse with a low coverage of both native and introduced ephemeral species. The soils are orange, sandy loam with abundant gravel and small laterite pebbles at the surface. Quadrat BN3 is representative of this vegetation type.	

Vegetation Type		Description	Photograph
ErCc	*Eucalyptus rudis* (Flooded Gum)/*Corymbia calophylla* (Marri) Woodland over weeds	This vegetation type only occurs at the upper parts of the creek that runs through the site. Flooded Gum and Marri are up to 15m high and equal cover of 15-20% each. The understorey is all introduced species with typical riparian species **Oxalis purpurea, *Hesperantha falcata, *Moraea flaccida* and **Lotus subbiflorus.* The soils are orange-brown loamy sand. The creekline had a small amount of flowing water in it on 6 October 2021. Quadrat BN3 is representative of this vegetation type.	
Ex	Exotic trees	Exotic trees have been planted mostly on the southern lots as well as on Lot 800. Typical tree species planted include River Red Gum (*Eucalyptus camaldulensis*), Swamp Mahogany (*Eucalyptus robusta*), River Oak (*Casuarina cunninghamiana*) and Cape Lilac (*Melia azedarach*)	

Vegetation Type	Description	Photograph
P Pines	A stand of planted Pine trees occurs at the western end of Lot 3	

4.5.2 Vegetation Condition

The condition of the vegetation was assessed according to the system of Keighery as described in Bush Forever (Government of Western Australia, 2000) (Table 6).

Table 6: Vegetation Condition Rating Scale

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate to it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

The condition of the native vegetation was mostly in Degraded and Completely Degraded condition due to the past clearing and long history of grazing under the trees. Two areas containing vegetation in Very Good condition were mapped, one small area on Lot 802 and a larger area in the north-west corner of Lot 3. Two areas in Good condition were recorded on Lot 3. These areas had abundant weeds mixed with native understorey species.

No areas were recorded in Excellent condition.

4.6 Conservation Significance of Flora and Vegetation

4.6.1 Flora

One Threatened species, *Acacia anomala* (Chittering Grass Wattle), was recorded on the site in the intact vegetation associated with the ridge in Lot 802 (Figure 3). *Acacia anomala* is listed as Threatened under the State *Biodiversity Conservation Act* and Vulnerable under the Commonwealth EPBC Act.

According to the Approved conservation Advice, *Acacia anomala* is known from 13 populations, occurring in three disjunct localities over a 45km range on the western slopes of the Darling Range – Kalamunda/Bickley, Chittering/Bullsbrook, and Pickering Brook. The three plants recorded in the survey area represent a small but new population for the species, within its known distribution.

Threatened species are protected under both the State and Commonwealth environmental legislation.

The population on the site is located within a small area of native vegetation in Very Good condition. While the area is small, it is considered viable to retain as an area of native vegetation within any future development of the site. The remnant in which the plants are found should be fenced off from public access.

4.6.2 Vegetation

4.6.2.1 Vegetation Complex

There is approximately 3,107ha (33.84%) of the pre-European extent of the Reagan Complex-remaining on the Dandaragan Plateau with 3.72% of the complex in secure reserves (DBCA, 2018). The vegetation on the site better fits the description of the Mogumber– South vegetation complex of which there is approximately 38.6% of the pre-European extent remaining (DBCA, 2018) and 176.96ha in secure reserves (1.19% of the original extent) (DBCA, 2018).

The percentage retention for both vegetation complexes is above EPA's target for minimum 30% retention of vegetation complexes State-wide in the Perth and Peel Region Constrained Areas and the area in protection for both complexes is below the 10% minimum criteria for vegetation complexes.

4.6.2.2 Threatened and Priority Ecological Communities

The vegetation is not considered to be part of a Threatened or Priority Ecological Community.

5 SUMMARY AND CONCLUSIONS

The 2021 Detailed Flora and Vegetation Survey of the Bullsbrook North subject land resulted in the following findings:

- Native vegetation occurs on most of the lots in the survey area but usually as parkland cleared Marri, Jarrah and Wandoo trees over pasture. Native vegetation in Good condition or better occurs on Lots 3, 801 and 802. Only two areas containing intact native vegetation in Very Good condition were recorded;
- Eleven vegetation types were described and mapped for the site, including nine native vegetation types and two exotic types. Most of the vegetation contained a mix of Marri and Jarrah trees with some pure Wandoo stands on areas of outcropping laterite and gravel. One small area of Marri and Flooded Gum (*Eucalyptus rudis*) occurred at the eastern end of a creek that runs through the site;
- A total of 154 plant species were recorded during the flora survey, consisting of 111 native species and 43 introduced species;
- One Threatened species, *Acacia anomala* (Chittering Grass Wattle), was recorded on Lot 802. Three plants were recorded in a small area of Very Good Marri/Jarrah vegetation. The population is a new record for this species. The population, and the vegetation in which it is found should be protected in any future development of the site; and
- The vegetation complexes occurring on the site are above the EPA's 30% retention targets but below the 10% protection targets. Only the two areas containing vegetation in Very Good condition are good examples of the vegetation complexes and should be considered for retention in any future development of the site.

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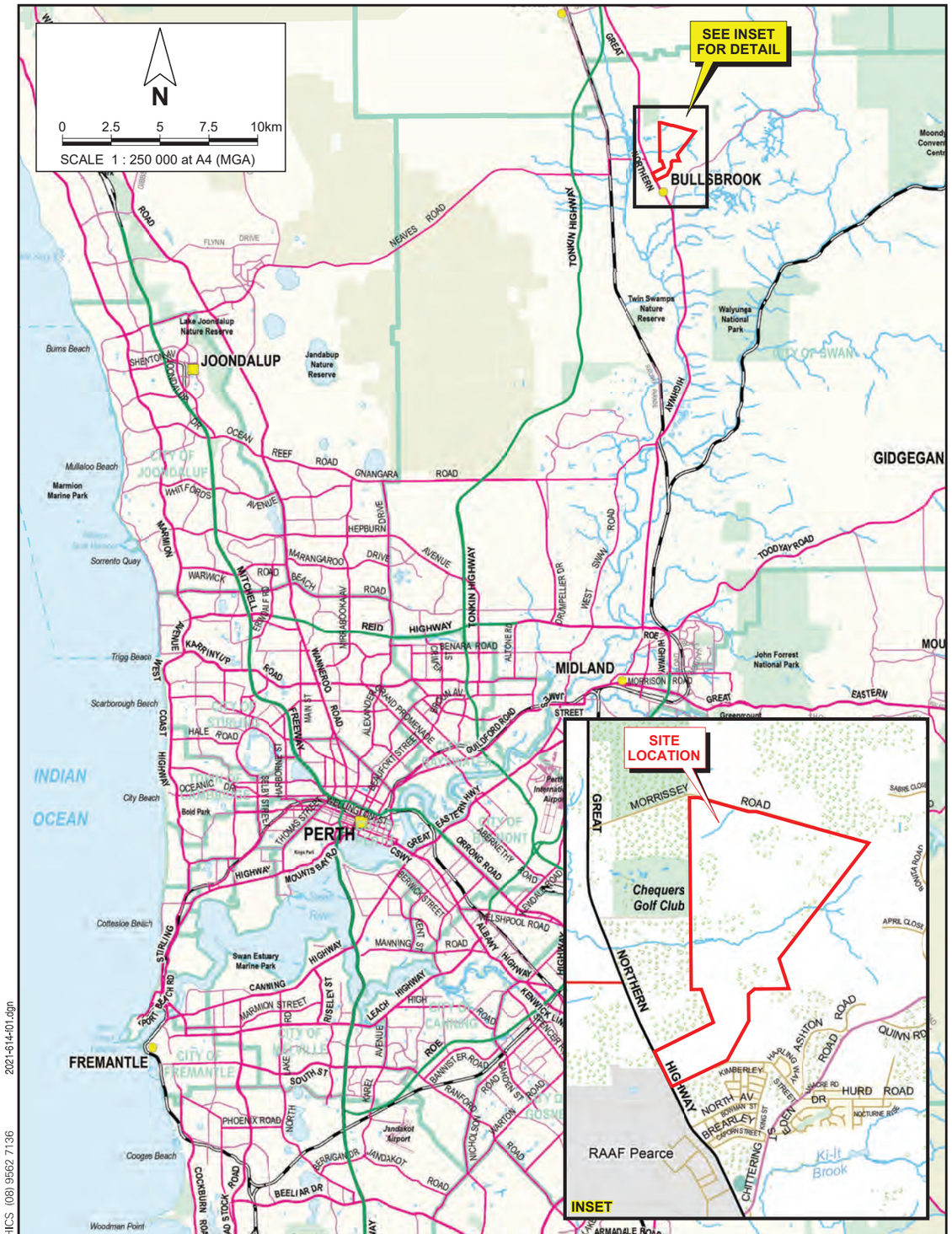
FIGURES



2021-614-101.dgn

PINPOINT CARTOGRAPHICS (08) 9562 7136

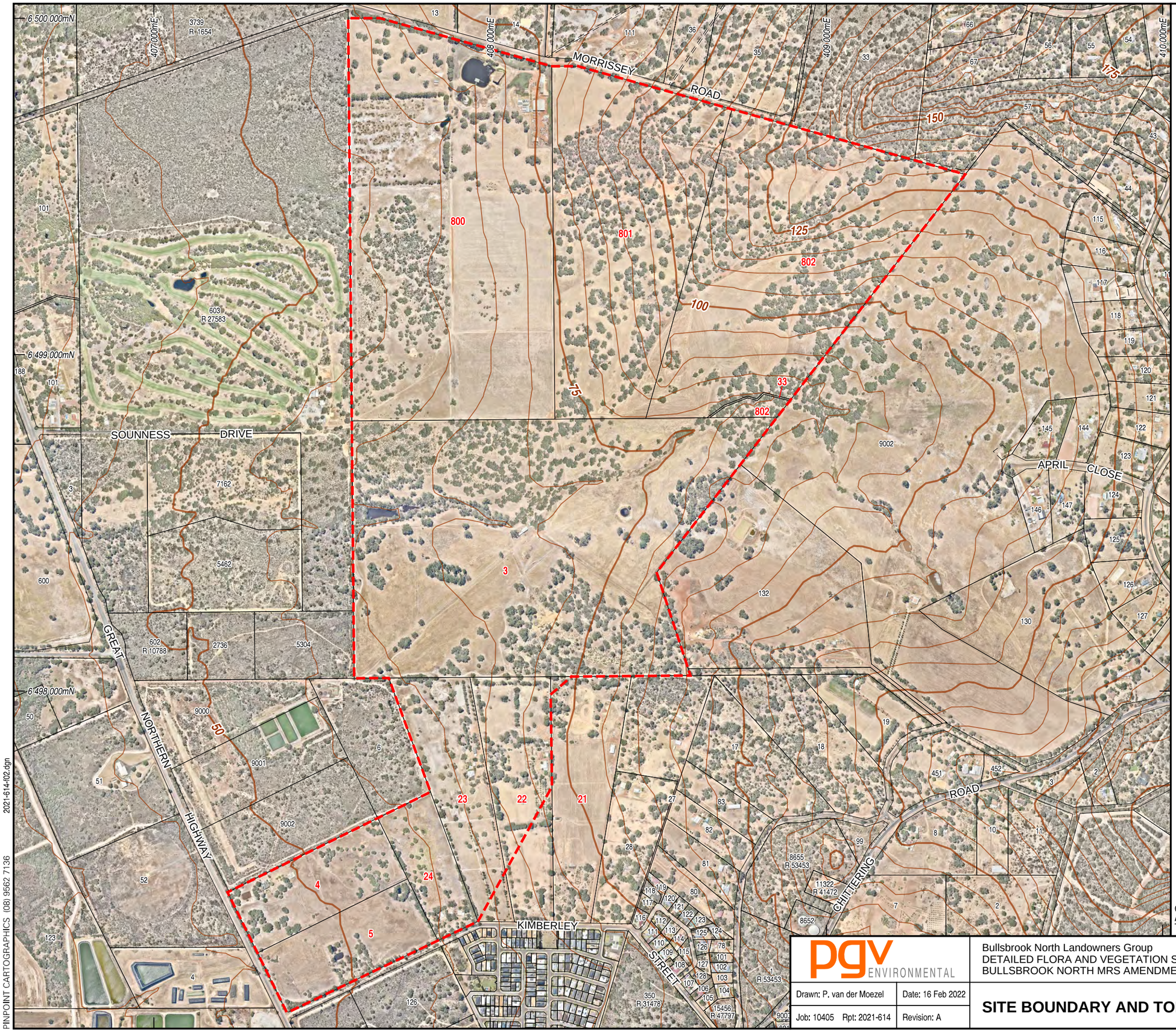
pgv ENVIRONMENTAL

Bullsbrook North Landowners Group
DETAILED FLORA AND VEGETATION SURVEY
BULLSBROOK NORTH MRS AMENDMENT

Drawn: P. van der Moezel	Date: 16 Feb 2022
Job: 10405 Rpt: 2021-614	Revision: A

SITE LOCATION

Figure 1



N

0 100 200 300 400 500m

SCALE 1 : 11 000 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Easement Boundary
- Topographic Contour

CADASTRAL SOURCE: Landgate, February 2022.
AERIAL PHOTOGRAPHY SOURCE: NearMap, flown January 2022.
TOPOGRAPHIC CONTOURS SOURCE: Landgate, 1:50,000 Topographic Mapping.

PINPOINT CARTOGRAPHICS (08) 9562 7136 2021-614-f02.dgn

pgv ENVIRONMENTAL

Bullsbrook North Landowners Group
DETAILED FLORA AND VEGETATION SURVEY
BULLSBROOK NORTH MRS AMENDMENT

Drawn: P. van der Moezel | Date: 16 Feb 2022
Job: 10405 Rpt: 2021-614 | Revision: A

SITE BOUNDARY AND TOPOGRAPHY

Figure 2

N

0 100 200 300 400 500m

SCALE 1 : 11 000 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Easement Boundary
- Quadrat Location
- Vegetation Type Boundary

Threatened Species

- *Acacia anomala* Location

Vegetation Types

CcEm¹
Corymbia calophylla (Marri)/*Eucalyptus marginata* (Jarrah) Woodland over *Xanthorrhoea preissii* Low Shrubland on laterite

CcEm²
Corymbia calophylla (Marri)/*Eucalyptus marginata* (Jarrah) Woodland over *Xanthorrhoea preissii* Open Low Heath on sand

CcEm³
Corymbia calophylla (Marri)/*Eucalyptus marginata* (Jarrah) Parkland Cleared over pasture

Cc
Corymbia calophylla (Marri) Woodland over *Xanthorrhoea preissii/Hibbertia hypericoides/Caustis dioica* Open Low Heath

Em
Eucalyptus marginata (Jarrah) Woodland over weeds

Xp
Xanthorrhoea preissii Open Heath over weeds

Ew
Eucalyptus wandoo (Wandoo) Woodland over bare ground

EwBs
Eucalyptus wandoo (Wandoo) Woodland over *Banksia sessilis* Shrubland over bare ground

ErCc
Eucalyptus rudis (Flooded Gum)/*Corymbia calophylla* (Marri) Woodland over weeds

P
Pines

Ex
Exotic Trees

Cleared

CADASTRAL SOURCE: Landgate, February 2022.
AERIAL PHOTOGRAPHY SOURCE: NearMap, flown January 2022.

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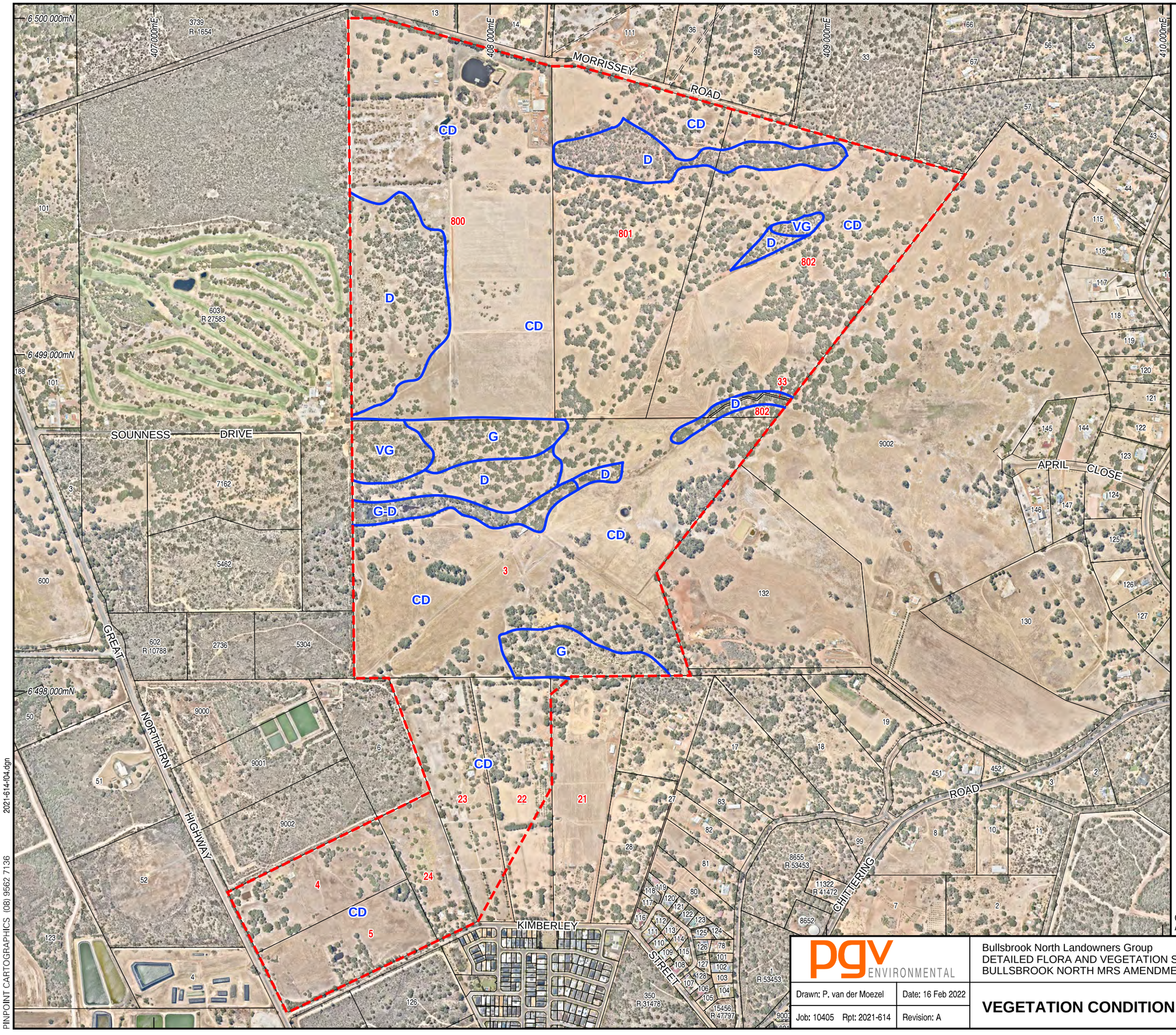
Drawn: P. van der Moezel | Date: 17 Feb 2022
Job: 10405 Rpt: 2021-614 | Revision: A

VEGETATION TYPES

Figure 3

PINPOINT CARTOGRAPHICS (08) 9562 7136 2021-614-f03.dgn



N

0 100 200 300 400 500m

SCALE 1 : 11 000 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Easement Boundary
- Vegetation Condition Boundary
- VG Vegetation Condition

Vegetation Condition
(SOURCE: Bush Forever, Govt. of W.A., 2000)

P - Pristine
Pristine or nearly so, no obvious signs of disturbance.

Ex - Excellent
Vegetation structure intact, disturbance affecting individual species and weeds are non aggressive species.

VG - Very Good
Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.

G - Good
Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.

D - Degraded
Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.

CD - Completely Degraded
The structure of the vegetation is no longer intact and the areas is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora composing weed or crop species with isolated native trees or shrubs.

Cl - Cleared
No native vegetation remaining.

CADASTRAL SOURCE: Landgate, February 2022.
AERIAL PHOTOGRAPHY SOURCE: NearMap, flown January 2022.

pgv ENVIRONMENTAL

Bullsbrook North Landowners Group
DETAILED FLORA AND VEGETATION SURVEY
BULLSBROOK NORTH MRS AMENDMENT

Drawn: P. van der Moezel | Date: 16 Feb 2022
Job: 10405 Rpt: 2021-614 | Revision: A

VEGETATION CONDITION

Figure 4

PINPOINT CARTOGRAPHICS (08) 9562 7136 2021-614-f04.dgn

APPENDIX 1

DBCA Flora Database Searches

FID	Sheet	NameID	Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_Method	Precision	Date
278	8569037	3219	Acacia anomala	T	Grasslike shrub to 50 cm.	Flat (road reserve). Sandy clay with some laterite (10%). Brown/grey soil. SE aspect.	Isolated clumps of trees (Corymbia calophylla/Eucalyptus marginata) over Low Heathland 0.5- 1 m. Associated species: Xanthorrhoea gracilis, Leschenaultia sp. ?, Hakea sp. ?			Smith Road (western verge) adjacent to Lot 89, ca 850 m SE of Chittering Road	GPS	1	10/09/2013
279	8569045	3219	Acacia anomala	T	Grasslike shrub to 50 cm.	Slope. Brown, grey sandy loam with laterite 10%. SW aspect.	Open Jarrah/Marri woodland over Open Shrubland. With Xanthorrhoea preissii, Hakea sp. ?, Grevillea sp. ?, Banksia spp. ?, Stylidium spp. ?			291 Jess Road, population occurs on Private Property (Lot 181 and Lot 182)	GPS	1	20/09/2013
280	723649	3219	Acacia anomala	T					Prints from slides supplied by H. Kretchmar.	Muchea area.	MAN	4	//
281	723673	3219	Acacia anomala	T	Herb: 30 - 40 cm. Flowers bright yellow.	Hill with gravel pit, laterite over clay.	Eucalyptus accedens/Eucalyptus marginata shrubland.			Bullsbrook - Chittering Valley Road	MAN	4	9/09/1980
283	723665	3219	Acacia anomala	T		Gravel.				Muchea	MAN	3	/08/1965
286	723223	3219	Acacia anomala	T	Suffrutex caespitosus, 30 - 45 cm alt; fl. luteis.	In gravel.				Near Bullsbrook, Darling Range	MAN	3	/09/1966
287	723215	3219	Acacia anomala	T	Spindly plant 0.3; flowers yellow.	On road verge.	In Jarrah forest.			Smiths Road, 2 km NE of Bullsbrook	MAN	3	4/09/1981
291	859419	3219	Acacia anomala	T	Plants to 0.3 m.	On brown loam and laterite, on lateritic hill above lower slopes of grey sand.	In low scrub to 3.0 m. With Acacia willdenoweana, Hakea lasianthoides Trymalium angustifolium, Caladenia flava, in woodland of Euc. calophylla, E. marginata, E. accedens, Dryandra sessilis.			Burley Park, Bullsbrook, at junction of Chittering and Smith Roads	MAN	3	31/08/1987
292	723630	3219	Acacia anomala	T	Herb: 20 - 30 cm. Flowers bright yellow - styles turn brown and stamens (i.e. filaments).	Gravel pit, laterite over clay.				East Bullsbrook	MAN	3	9/09/1980
294	723681	3219	Acacia anomala	T						0.3 miles along Smiths Road, Smiths Road is ca 3 km from Bullsbrook East along Chittering Road	MAN	3	17/08/1982
296	5551323	3219	Acacia anomala	T	Grass-like, 0.5 m high. Multiple stems of grass-like shrub.	Hillside. Laterite.	Jarrah/Marri forest over scrub.			Jenkin's Road, Bullsbrook,	AUTO	3	//
297	759015	3219	Acacia anomala	T						About 3 km E of Bullsbrook, E of Smiths Road	MAN	3	/01/1985

FID	Sheet	NameID	Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_Method	Precision	Date
302	1662465	3219	Acacia anomala	T	In bud and flower.	On ridgetop slope with SSW aspect in dry yellow-brown sand with gravel, boulder, laterite, and sheet rock form. Very small section burnt two years ago. Quite a few plants are growing on or near the table and spoon drains of the Shire's *	Open, stunted Jarrah/Marri with Blackboys, Hibbertia hypercioides, Hakea lissocarpha, Dryandra sessilis, Dryandra nivea, Petrophile striata, Hovea trisperma, Daviesia cordata, Synaphaea petiolaris, Lechenaulta biloba, *		Abundance: 190 plants; 40 on W side of road, 100 on E side of road, estimate 50 more not counted.	2.4 km along Jenkins Road from the junction of Chittering Road coinciding with the NE corner of P.P. number 12 - both sides of Jenkins Road	MAN	4	28/08/1991
1701	319724	11229	Acacia drummondii subsp. affinis	3						7 km from Bullsbrook East towards Chittering	AUTO	3	23/11/1976
1712	319643	11229	Acacia drummondii subsp. affinis	3	Shrub 0.3 m to 0.5 m tall, stem dividing near ground level into many more or less ascending branches; branchlets often red brown; pinnules recurved (sometimes more or less flat); flower heads light, bright, yellow.	In laterite on a rise.				Ca 7 km from Bullsbrook East towards Chittering	AUTO	3	2/08/1973
1718	319163	11229	Acacia drummondii subsp. affinis	3						About 5 km due ENE [of] Muchea	AUTO	3	2/11/1975
1725	319260	11229	Acacia drummondii subsp. affinis	3	Erect shrub to 0.5 m tall; pinnae patent to more or less ascending; pinnules prominently recruved, dark green above, sub-glaucous below; flower heads light yellow.	Gravel.	Jarrah - Marri woodland.			Ca 5 km due ENE of Muchea	AUTO	3	7/07/1973
3215	5082854	14129	Acacia oncinophylla subsp. oncinophylla	3		Dark brown gritty clay, with surface gravel and cobbels, on a very steep western midslope.	Eucalyptus calophylla Low Forest, over Acacia saligna Open Low Woodland, over Leptosperma erubescens, A. saligna Scrub, over Xanthorrhoea preissii Open Dwarf Scrub, over Hibbertia hypericoides, Phyllanthus calyinus Low Heath.			Walyunga National Park, in small gully 100 m E of railway line (c. 300m NE of major creekline) c. 2km ESE of Woodsome Hill. (Plot-WAYL09)	GPS	1	5/09/1996

FID	Sheet	NameID	Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_Method	Precision	Date
3235	7213182	14129	Acacia oncinophylla subsp. oncinophylla	3		Dark brown gritty clay, with surface gravel and cobbels, on a very steep western midslope.	Eucalyptus calophylla Low Forest, over Acacia saligna Open Low Woodland, over Leptosperma erubescens, A. saligna Scrub, over Xanthorrhoea preissii Open Dwarf Scrub, over Hibbertia hypericoides, Phyllanthus calyinus Low Heath.			Walyunga National Park, in small gully 100 m E of railway line (c. 300m NE of major creekline) c. 2km ESE of Woodsome Hill. (Plot-WAYL09)	GPS	1	5/09/1996
4906	8531277	11336	Adenanthos cygnorum subsp. chamaephyton	3		Slope on road verge MRD. Dry grey sand / loam / fluviatile gravel / laterite. Area burnt in 2007.	Woodland of Eucalyptus marginata, Thysanotus multiflorus, Hibbertia hypericoides, Hakea lissocarpha, Tetraria octandra.		Reproductive state: vegetative. Condition of population: healthy. Potential threats: roadworks.	Jenkins Road, Bullsbrook	GPS	1	21/10/2008
4923	7980817	11336	Adenanthos cygnorum subsp. chamaephyton	3		Laterite boulder. Dry brown loam.	Jarrah over Dryandra sessilis. With Xanthorrhoea preissii, Hakea undulata, Lambertia multiflora subsp. darlingensis.		Condition of population: healthy.	Jenkins Road extension road verge, Bullsbrook	GPS	1	9/09/2004
14121	1967592	19338	Chamaescilla gibsonii	3						Muchea	MAN	0	/10/1928
14124	1967487	19338	Chamaescilla gibsonii	3	Flowers deep blue.	Damp sandy clay.				36 mile peg, Great Northern Highway [3 miles N of turnoff to Muchea]	AUTO	3	25/09/1965
14127	1967509	19338	Chamaescilla gibsonii	3	Flowers deep blue.	Damp sandy clay.				36-37 mile peg, Great Northern Highway[c. 3 miles N of turnoff to Muchea]	MAN	0	25/09/1965
16265	6427839	16245	Cyathochaeta teretifolia	3	Tufted perennial herb, sterile.	Seasonal Wetland, flat ground, black sandy peaty clay, over ?clay, poor drainage, wet during winter/spring.	Low Forest A. Associated species: Melaleuca rhaphiophylla, Banksia littoralis.	abundant.		Nature Reserve, Muchea (System 6 Area C25) in System 6 Update quadrat much05	GPS	1	17/11/1994
16796	8124965	34773	Darwinia foetida	T	Shrub to 50 cm. Buds green - pink.	Low plain with dry grey sand.	Dense low heath dominated by Regelia sp. Associated species include Regelia sp., Melaleuca sp., Xanthorrhoea preissii, Allocasuarina humilis, Hibbertia hypericoides, Patersonia occidentalis, Conostylis sp., Bossiaea eriocarpa, Banksia dallanneyi, Hovea t	22 mature plants.	Plants occur approximately 30 m W of the SE corner of the property and approximately 5 m N of the southern firebreak.	UCL directly N of Muchea Nature Reserve, Muchea	GPS	1	8/09/2008
16797	8429227	34773	Darwinia foetida	T	Low, spreading shrubs to 0.6m x 1m, the leaves somewhat glaucous. Inflorescences inclined to nodding; bracts glaucous green tinged pinkish.	Moist flat; dark grey sand.	Melaleuca raphiophylla, Hypocalymma angustifolia, Acacia pulchella shrubland beneath marri, with invasion by blackberry, brazilian peppertrees, weedy grasses.	frequent - hundreds of plants.		Private property in corner of Neaves Road and Bingham Road, Bullsbrook	GPS	1	24/10/2010

FID	Sheet	NameID	Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_Method	Precision	Date
16798	8863776	34773	Darwinia foetida	T	Low spreading shrub, 0.4 m x 0.4 m and 0.3 m high. Crowded angular leaves to 7 mm long, green to reddish. Terminal inflorescences, many flowered 'head', red/purple within red/purple bracts.			locally common.	Some very large sprawling plants in this population. Love and Veldt grasses are invading entire area.	C. 2.6 km N of Rutland Road, Muchea South Road intersection along the unmade Almeria Parade Road Reserve	GPS	1	3/09/2015
16799	8863857	34773	Darwinia foetida	T	Low spreading shrub, 0.3 m x 0.3 m and 0.2 m high. Crowded angular leaves to 5 mm long, green. Terminal inflorescences, many flowered 'head', pale pink within pale green bracts.			frequent in a 70 m linear area.	Some very large sprawling plants in this population. Love and Veldt grasses are invading entire area.	C. 100 m N of Rutland Road, Bullsbrook, along unmade Almeria Parade Road Reserve, on the E side of the rail line	GPS	1	22/10/2015
16800	1333801	34773	Darwinia foetida	T		In swampy sand.				S of Muchea	AUTO	3	13/11/1963
16801	1333836	34773	Darwinia foetida	T						Muchea	MAN	3	/12/1927
16802	1333828	34773	Darwinia foetida	T	Small shrub; bracts red-green.	In sandy soil.	With Banksia, Adenanthos sericea association.			0.75 miles N of Muchea X-roads	AUTO	3	28/10/1960
16803	6427820	34773	Darwinia foetida	T	Domed low shrub, flowers green, bracts green/red.	Wet Flat, grey sand, poor drainage, wet during winter/spring.	Dwarf Scrub C. Associated species: Melaleuca sp.B.	abundant.		Nature Reserve, Muchea (System 6 Area C25) in System 6 Update quadrat much03	GPS	1	13/10/1994
16804	6407366	34773	Darwinia foetida	T	Compact, perennial shrub, 25 cm high x 40 cm wide. Flowers green/red.	Plain. Winter wet area. Dry/moist grey/brown soil.	Medium trees within dense shrub/sedge layer. Characteristic species: Banksia, Xanthorrhoea and Hakea.	300+ plants.	1% in bud. Infestation area of this weed: 11-100 sq.m.	70 m from SE corner of Nature Reserve, just S of Muchea	GPS	1	9/09/2002
16805	6407382	34773	Darwinia foetida	T		Dry grey sand.	Banksia woodland. With Banksia menziesii and Nuytsia.			NE Ellenbrook Bushland, Site 2	GPS	1	18/11/2002
16806	6407374	34773	Darwinia foetida	T	Compact shrub, 0.5 m high x 0.5 m wide. Flowers green/red.		Woodland over Heath B. With Banksia menziesii, Viminaria, Xanthorrhoea.	300+ plants.	40% of population flowering.	Gnangara Water Reserve, Location 1518, 1.35 km from SE direction along diagonal firebreak to the NE corner of the reserve. Population located on eastern side of track that runs parallel with firebreak	GPS	1	29/10/2002
16807	6570046	34773	Darwinia foetida	T	Low rounded shrub to 0.3 m by 0.2 m, flowers green, bracts green/red.	Wet Flat, brown loamy sand over cream sand, poor drainage, wet during winter/spring.	Associated species: Melaleuca sp. B.			NE Ellen Brook Bushland (Bush Forever Site 2) in System 6 Update quadrat mill01, Bullsbrook	GPS	1	3/11/1995

FID	Sheet	NameID	Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_Method	Precision	Date
16808	6059082	34773	Darwinia foetida	T	Tangled domed shrub 60 x 60 cm; infl. bracts red in centre, outer green, flowers wet for smell.	Winter wet-damp flats, peaty sandy clay.	Assoc. vegn.: Regelia inops/Melaleuca incana/Kunzea recurva shrubland over Hypocalymma angustifolia over sedges.	locally common.		Muchea Nature Reserve, Muchea	MAN	3	1/10/2001
16809	6019749	34773	Darwinia foetida	T	Domed shrub to 0.3 m by 0.3 m. Flowers green, bracts red-green.	Seasonally wet area alongside sumpland (depression). Grey sand.	Pericalymma ellipticum and Astartea aff. fascicularis Heathland adjacent to Melaleuca rhaphiophylla and Banksia littoralis Low Forest A.			Gnangara Water Reserve, Swan Location 1518 (leased to the Commonwealth Government for a bombing range, lease 37L 776) part System 6 Area C25, Muchea	MAN	0	17/11/1994
16810	7887442	34773	Darwinia foetida	T	Perennial, prostrate compact shrub 0.5 m high x 0.5 m wide.	Palusplain Multiple Use Wetland. Grey black soil. Burnt Spring 2006.	Corymbia calophylla, Melaleuca rhaphiophylla, Hypocalymma angustifolium.	21-50 plants (25 alive, 22 dead)	Percentage of population in fruit 30%.	SW corner of Lot 200, Neaves Road, Bullsbrook	GPS	1	9/03/2007
16811	1335448	34773	Darwinia foetida	T	Compact shrub 27 cm high. Heads nodding. Floral bracts reddish green.	Grey-white sand.	In low heath.	frequent.		Muchea townsite, 0.5 km S along Carl street	MAN	0	6/11/1984
16812	8171009	34773	Darwinia foetida	T	Erect or spreading shrub, 0.7 m high. Flowers green brown.	Road drain / drainage line. Brown sandy loam. Area burnt > 15 years ago.	Dominated by Watsonia meriana.	20 alive mature plants, 3 dead plants.		600 m N of Brand Highway intersection, Great Northern Highway, Muchea	GPS	1	23/02/2016
16813	8170983	34773	Darwinia foetida	T	Erect or spreading shrub, 0.7 m high. Flowers green brown.	Road drain / drainage line. Brown sandy loam. Area burnt > 15 years ago.	Dominated by Watsonia meriana.	20 alive mature plants, 3 dead plants.		600 m N of Brand Highway intersection, Great Northern Highway, Muchea	GPS	1	22/11/2016
16814	8170991	34773	Darwinia foetida	T	Erect or spreading shrub, 0.7 m high. Flowers green brown.	Road drain / drainage line. Brown sandy loam. Area burnt > 15 years ago.	Dominated by Watsonia meriana.	20 alive mature plants, 3 dead plants.		600 m N of Brand Highway intersection, Great Northern Highway, Muchea	GPS	1	23/02/2016
16815	8456240	34773	Darwinia foetida	T	Small compact shrub <0.30 m.	Roadverge.	Modified vegetation with roadverge plantings. Some areas almost completely degraded. Xanthorrhoea preissii and Allocasuarina humilis over Low Open Shrubland of Darwinia foetida and Baeckea camphorosmae. High number of weeds.	25 plants.		Great Northern Highway, W side, ca. 3.2 - 3.4 km S of Brand Highway and ca. 530 m N of Wandena Road, Bullsbrook	GPS	1	26/11/2018
18644	1157280	4452	Diplolaena andrewsii	T	Divoricate shrub to 1 m high.	Creek bank, brown loamy sand over granite rocks.	Euc. rudis, E. wandoo woodland over Grevillea vestita, Trymalium floribundum.			Wooroloo Brook - O'Brien Road crossing at Gidgegannup 1:100,000 Map 2134 Grid 162890	MAN	0	25/07/1990
19123	2386372	3115	Drosera occidentalis	4		Clayey sand soils.				Rutland road and Great Northern Highway junction, Bullsbrook	AUTO	3	22/10/1987

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19124	8722692	3115	Drosera occidentalis	4		Grows in peaty sand around the margins of swamps, winter wet depressions and watersheds in open areas.	Swamp heathland.			Ca 0.3 m E of the junction of Great Northern Highway and Rutland Road, near Bullsbrook	GPS	1	9/11/1991
19131	6352162	3115	Drosera occidentalis	4	Pygmy.	White/yellow sand. Swamp.		occasional.		Great Northern Highway, Rutland Road, Bullsbrook	MAN	3	22/10/1983
19133	5812291	3115	Drosera occidentalis	4	Small rosetted herb 3 mm high. Flowers 1-2 mm, several on an erect stem 8-10 mm in length.	In moist sandy clay soil. Seasonally wet depressions.	Amongst sedges. Bordered by Banksia woodland associated plants include Drosera nitidula, D. parvula, Pericalymma elliptica, Viminea juncea, Stirlingia latifolia and Lechenaultia floribunda.	common.		Great Northern Highway just N of Rutland Avenue in Bullsbrook East, just N of R.A.A.F. Pearce Aerodrome,	MAN	3	5/11/1985
19230	8329311	8912	Drosera sewelliae	2	Small tufted herb 2 cm.	Conglomerate. Laterite, boulders, shallow grey gravel-sand pockets. Midslope W slope.	Woodland E. marginata subsp. thalassica with C. calophylla. Allocasuarina humilis, Banksia eriocarpa, Calothamnus sanguineus, Conostylis setigera, Hibbertia hypericoides, Lambertia multiflora var. darlingenis, Melaleuca trichophylla, Xanthorrhoea preissi			Lots to the immediate N of the formed part of Powderbark Road, Lower Chittering. Plot 1	MAN	3	29/11/2007
19232	7693583	8912	Drosera sewelliae	2		Growing in laterite and silica sand soils.	In light open forest.			On Chittering Road, just S of Muchea East Road, Lower Chittering	GPS	1	/09/2007
19233	7768982	8912	Drosera sewelliae	2	A fibrous rooted perennial pygmy sundew herb, >2.5 cm diameter, petioles green, lamina reddish, more or less elliptic; Inflorescence(s) scape(s) 1 rarely 2, each >6-flowered, Sepals reddish, ovate-elliptic, semi-erect in fruit. Petals broadly obovate, me	Growing in laterite and silica sand soils.	In light open forest.			On Chittering Road, just S of Muchea East Road, Lower Chittering	GPS	1	21/09/1991
19412	6512372	17605	Eleocharis keigheryi	T	Erect annually renewed sedge; flowers green.	Sumpland (claypan); clay grey/brown.	Sedges.	abundant in deepest area of claypan, in mown area of airfield.		SW side of Pearce Airforce Base (System 6 Area M15, Bush Forever Site 294) opposite in town area to E of the boundary road	GPS	1	20/09/1994
19424	7782039	17605	Eleocharis keigheryi	T	Clumping grass-like sedge to about 40 cm high. Green flowers with yellow hairs.	Seasonally inundated clay pan with brown clay.	Cotula coronopifolia, Triglochin sp., sedges and weed spp.	abundant in deepest section of claypan.		RAAF Pearce Aerodrome, Bullsbrook, population located on SW side of the airforce base in an open clay pan	GPS	1	17/09/2007

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21103	4140362	41801	Eryngium pinnatifidum subsp. Palustre (G.J. Keighery 13459)	3	Tuberous perennial herb to 20 cm. Flowers pale blue, in full flower.	Winter wet flats. Brown sandy loam over clay.	Melaleuca viminea, M. uncinata open shrubland.	common but scattered.		Bullsbrook Nature Reserve, Pearce	MAN	0	19/10/1992
21113	8893519	41801	Eryngium pinnatifidum subsp. Palustre (G.J. Keighery 13459)	3	Tuberous perennial herb. Leaves mostly tubular.	Seasonally wet poorly drained flat. Black sand.	Melaleuca uncinata, M. brevifolia over Leptocarpus canus and a rich herb layer.		Vegetation condition: very good. Claypan TEC, communities 7 & 8.	Plot Bull 08. Bullsbrook Nature Reserve	GPS	1	11/09/2012
27490	4564928	33559	Grevillea althoferorum subsp. fragilis	T	Low immature and dehisced fruit.					Bullsbrook Nature Reserve, 900 m N of Morissey Road on E boundary	MAN	0	10/01/1997
27491	4961471	33559	Grevillea althoferorum subsp. fragilis	T	Spreading shrub to 50 cm. Pale yellow flowers. Greyish hairy bipinnate leaves.	Flat plain at base of scarp. Greyish-yellow sand.	Banksia woodland with Banksia menziesii, Xanthorrhoea, Hibbertia sp., Banksia attenuata.			Bullsbrook Nature Reserve, on E boundary, ca 850 m N of Morissey Road	GPS	1	26/11/1997
27492	4357248	33559	Grevillea althoferorum subsp. fragilis	T	Compact, spreading shrub 30 cm high x 45 cm wide. Appears at end of flowering period. Flowers pale yellow. Leaves dark green. Most bushes exhibiting signs of stress, leaves browning off.	Plain, dry. Dense organic litter cover in some areas. Greyish-yellow sand.	Low woodland. Banksia, Xanthorrhoea, Hibbertia, Conospermum, sedges.		Abundance: c. 30 over an area 30 x 40 m. Vegetation in good condition. Indication there may be Phytophthora in reserve. Small areas of dead Banksia and Isopogons.	Bullsbrook Nature Reserve, E boundary (off Morrissey road)	GPS	1	5/10/1995
27493	7374852	33559	Grevillea althoferorum subsp. fragilis	T			Banksia woodland. With Banksia attenuata and B. menziesii.			Bullsbrook Nature Reserve (Population 2). Eastern boundary of reserve, ca 900 m N of Morrisey Road	GPS	1	22/12/2005
27494	7692439	33559	Grevillea althoferorum subsp. fragilis	T	Bluish-green, lignotuberous shrub with non-pungent leaves. 0.3 m x 0.4-1 m. Yellow with reddish to reddish-brown buds.	Undulating plain. Outwash plain of the Darling Range. Grey sand over yellow sand.	Banksia-Corymbia woodland with Corymbia calophylla, Banksia menziesii, B. attenuata, B. grandis, Adenanthos sp., Hibbertia sp., Ptilotus manglesii, Xanthorrhoea sp., Mesomelaena tetragona, Stirlingia latifolia, Lobelia sp., Isopogon, Petrophile spp.	rare (10-50 plants seen).	Third year of drought. Very little in flower.	Nature Reserve at end of Morrissey Road (off Great Northern Highway) Bullsbrook, 1 km from Highway, eastern side of fire trail, walk in ca 1 km till you see a farmers shed. Plants are opposite this	GPS	1	6/09/2002

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27495	7692420	33559	Grevillea althoferorum subsp. fragilis	T	Bluish-green, lignotuberous shrub with non-pungent leaves. 0.3 m x 0.4-1 m. Yellow with reddish to reddish-brown buds.	Undulating plain. Outwash plain of the Darling Range. Grey sand over yellow sand.	Banksia-Corymbia woodland with Corymbia calophylla, Banksia menziesii, B. attenuata, B. grandis, Adenanthos sp., Hibbertia sp., Ptilotus manglesii, Xanthorrhoea sp., Mesomelaena tetragona, Stirlingia latifolia, Lobelia sp., Isopogon, Petrophile spp.	rare (10-50 plants seen).	Third year of drought. Very little in flower.	Nature Reserve at end of Morrissey Road (off Great Northern Highway) Bullsbrook, 1 km from Highway, eastern side of fire trail, walk in ca 1 km till you see a farmers shed. Plants are opposite this	GPS	1	6/09/2002
27497	8645078	33559	Grevillea althoferorum subsp. fragilis	T	Shrub to 1 m high x 1.2 m wide.	SW aspect. White/brown sand. Extends from firebreak into sandy area under Jarrah/Marri.	Open Jarrah/Marri Woodland over Open Shrubland over Open Sedgeland. Associated species: Jarrah, Marri, Caladenia sp.?, Petrophile macrostachya, Xanthorrhoea preissii, Banksia attenuata, B. grandis, Hibbertia hypericoides, Neurachne sp.?		Pop. 1.	Bullsbrook Nature Reserve	GPS	1	14/11/2014
27498	7692471	33559	Grevillea althoferorum subsp. fragilis	T	Bluish-green, lignotuberous shrub with non-pungent leaves. 0.4 m x 0.6-1 m. Yellow with reddish buds.	Undulating plain. Base of sand hill beside track. Yellow sand with laterite.	Banksia woodland with B. menziesii, B. attenuata, Hibbertia sp., Xanthorrhoea sp., Mesomelaena tetragona (Semiphore sedge).	rare (10-50 plants seen).	Second year of drought. Very little in flower.	Nature Reserve at end of Morrissey Road (off Great Northern Highway) Bullsbrook, 1 km from Highway, eastern side of fire trail, walk in ca 1 km till you see a farmers shed. Plants are opposite this	GPS	1	8/09/2001
27933	8329192	1975	Grevillea candolleana	2	15 cm small shrub.	Laterite conglomerate with boulders, minor sand pockets. Upper backslope of ridge.	Woodland to open forest of Eucalyptus marginata subsp. thalassica with Corymbia calophylla. Open shrubland of Xanthorrhoea, Allocasuraina and Styphelia species. Allocasuraina humilis, Bossiaea eriocarpa, Calothamnus sanguineus, Conostylis setigera, Hibbe			Lots to the immediate N of the formed part of Powderbark Road, Lower Chittering. Plot 5	GPS	3	6/12/2007
28027	8471908	1984	Grevillea curviloba	T	Shrub 1.5 m high x 2 m wide. Flowers white.	Flat, white sand.	Shrubland with scattered Marri. Leptospermum erubescens.	35 plants		Smith Park, on the corner of Smith Road and Chittering Road, City of Swan Reserve	GPS	1	9/09/2011
28028	8471894	1984	Grevillea curviloba	T	Shrub 1.5 m high x 2 m wide. Flowers white.	Flat, white sand.	Road verge vegetation. Acacia saligna, Gastrolobium spinosum, Banksia sessilis.	20 plants.		Burly Park, (City of Swan Reserve), corner of Smith Road and Chittering Road, along Smith Rd boundary and ca 10 m into the reserve, Bullsbrook	GPS	0	9/09/2011
28030	4832817	1984	Grevillea curviloba	T	Shrub, much branched at base, flowering stems to 2 m. Flowers white, largely post flowering.	Sandy rises in wetland.	Regelia/Actinostrobus shrubland.			Muchea Nature Reserve, Muchea,	AUTO	3	18/10/1996

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28031	4832795	1984	Grevillea curviloba	T	Shrub, much branched at base, flowering stems to 2 m. Largely post flowering.	Sandy rises in wetland.	Regelia/Actinostrobus shrubland.			Muchea Nature Reserve, Muchea,	AUTO	3	18/10/1996
28032	5207002	1984	Grevillea curviloba	T	Spreading shrub with prostrate vegetative growth and flowering/fruiting growth to 2 m. Bright green trifurcate foliage.	Low lying area of sandplain. Grey peaty sand over clay.	Cleared vegetation with weeds, grasses, Hakea sp., Melaleuca sp., Acacia sp.			Corner of Rutland and Railway Roads, S of Muchea townsite, on road and rail reserve W side	GPS	1	16/12/1998
28033	2415887	1984	Grevillea curviloba	T						Bullsbrook, Swan River	AUTO	3	14/08/1900
28034	4832809	1984	Grevillea curviloba	T	Shrub, much branched at base, flowering stems to 2 m. Flowers white, largely post flowering.	Sandy rises in wetland.	Regelia/Actinostrobus shrubland.			Muchea Nature Reserve, Muchea,	AUTO	3	18/10/1996
28036	1112821	1984	Grevillea curviloba	T	Prostrate vegetative branches and erect leafy flowering branches; up to 2.5 m high.	In semi-disturbed area. Deep sand, with a high water-table.	With Regelia ciliata, Conospermum triplinervium.		Abundance: frequent.	Near Muchea.	MAN	3	10/06/1976
28038	2415933	1984	Grevillea curviloba	T						Muchea	AUTO	3	/09/1927
28043	5207010	1984	Grevillea curviloba	T	Spreading shrub with prostrate vegetative growth and flowering/fruiting growth to 2 m. Bright green trifurcate foliage.	Low lying area of sandplain. Grey peaty sand over clay.	Open woodland with weeds, grasses, Hakea sp., Watsonia, Jacksonia furcellata.			Corner of Archibald and Muchea South Road, Muchea townsite, in vacant block at edge of road	MAN	0	16/12/1998
28049	5383676	1984	Grevillea curviloba	T		Flat, grey, moist sand.	Open, semi-disturbed, degraded, scrubby site. Associated species: Acacia saligna, Jacksonia furcellata, Melaleuca sp., Adenanthos cygnorum, Blackboys, Watsonia, Banksia littoralis, Cape Tulip, Anigozanthos manglesii and very dense grasses.	41 mature plants, 20 seedlings.	Population No. 14.	2.45 km SSE down Muchea South Road from Muchea township, population adjoins E side of road and W side of railway line,	GPS	1	4/10/1996
28052	5383706	1984	Grevillea curviloba	T		Flat.	Completely open, previously disturbed/degraded site. Fringed by odd Marri and Paperbarks. Acacia saligna, Hakea prostrata, H. varia, Blackboys, Capeweed and other dense agricultural weeds and Kikuya grass growth - Hibbertia sp., Melaleuca sp., Stirlingia	21 mature plants, 25 seedlings.	Population No. 5A & 5B.	Pop. 5A, 1.8 km N along Brand Highway from junction of railway crossing at Muchea and 20 m on E side of road, Pop.5B 25 m E of Pop.5A and or 5 m E of railway line,	GPS	1	26/09/1996

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28058	5414148	1984	Grevillea curviloba	T	Open, erect shrub 2.5 m high x 1 m wide. Plant tends to be prostrate when young then erect branches develop. Flowering profusely. Pods common.	Low lying. Red sand-clay-gravel over ironstone.	Sparse vegetation, mainly veldt grasses. Associated species: Acacia saligna, Corymbia calophylla, Viminaria juncea, Watsonia, grasses, etc.	common.		Muchea Nature Reserve, corner of Railway Parade and Archibald Street,	MAN	0	9/09/1998
28060	6511686	1984	Grevillea curviloba	T	Prostrate shrub with erect flowering branches to 2 m by 2 m. Fruiting.	Wet Flat; grey sand over sand. Poor drainage, wet during winter/spring.	Open Scrub, Associated species: Xanthorrhoea preissii.	abundance: 1 of 8 plants in 1 population.		Muchea Nature Reserve, Muchea South Road. System 6 Area C25; Muchea townsite (adjacent System 6 Update plot much 02)	GPS	1	13/10/1994
28061	6511724	1984	Grevillea curviloba	T	Prostrate shrub with erect flowering branches to 2 m by 2 m. Fruiting.	Wet Flat; grey sand over sand. Poor drainage, wet during winter/spring.	Open Scrub, Associated species: Xanthorrhoea preissii.	abundance: 1 of 8 plants in 1 population.		Muchea Nature Reserve, Muchea South Road. System 6 Area C25; Muchea townsite (adjacent System 6 Update plot much 02)	GPS	1	13/10/1994
28062	6511694	1984	Grevillea curviloba	T	Prostrate shrub with erect flowering branches to 2 m by 2 m. Fruiting.	Wet Flat; grey sand over sand. Poor drainage, wet during winter/spring.	Open Scrub, Associated species: Xanthorrhoea preissii.	abundance: 1 of 8 plants in 1 population.		Muchea Nature Reserve, Muchea South Road. System 6 Area C25; Muchea townsite (adjacent System 6 Update plot much 02)	GPS	1	13/10/1994
28064	6511708	1984	Grevillea curviloba	T	Prostrate shrub with erect flowering branches to 2 m by 2 m. Fruiting.	Wet Flat; grey sand over sand. Poor drainage, wet during winter/spring.	Open Scrub, Associated species: Xanthorrhoea preissii.	abundance: 1 of 8 plants in 1 population.		Muchea Nature Reserve, Muchea South Road. System 6 Area C25; Muchea townsite (adjacent System 6 Update plot much 02)	GPS	1	13/10/1994
28067	6330207	1984	Grevillea curviloba	T	Clumped shrub, prostrate branches then erect 1.8 m high x 1 m wide. In fruit, apparently spreading by grading and seed.	Roadverge. Lateritic sand over laterite.	Road verge herbs.		Spreading along verge from planted enrichment plantings.	Burley Park, Bullsbrook	TOPO	2	23/11/2002
28068	7934041	1984	Grevillea curviloba	T		Plain with grey sand.	Shrubland to 1.5 m with Jacksonia sp., Melaleuca sp. and Xanthorrhoea sp.	4 clumps.	Pop. 3.	NE corner of reserve no. 1336, Muchea, ca. 30 m E of gate into reserve on N boundary	GPS	1	9/01/2008
28069	6511600	1984	Grevillea curviloba	T	Prostrate shrub with erect flowering branches to 2 m by 2 m. Fruiting.	Wet Flat; grey sand over sand. Poor drainage, wet during winter/spring.	Open Scrub, Associated species: Xanthorrhoea preissii.	abundance: 1 of 8 plants in 1 population.		Muchea Nature Reserve, Muchea South Road, System 6 Area C25. Muchea townsite (adjacent System 6 Update plot much 02)	GPS	1	13/10/1994
28070	6511716	1984	Grevillea curviloba	T	Prostrate shrub with erect flowering branches to 2 m by 2 m. Fruiting.	Wet Flat; grey sand over sand. Poor drainage, wet during winter/spring.	Open Scrub, Associated species: Xanthorrhoea preissii.	abundance: 1 of 8 plants in 1 population.		Muchea Nature Reserve, Muchea South Road. System 6 Area C25; Muchea townsite (adjacent System 6 Update plot much 02)	GPS	1	13/10/1994

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28071	6511732	1984	Grevillea curviloba	T	Prostrate shrub with erect flowering branches to 2 m by 2 m. Fruiting.	Wet Flat; grey sand over sand. Poor drainage, wet during winter/spring.	Open Scrub, Associated species: Xanthorrhoea preissii.	abundance: 1 of 8 plants in 1 population.		Muchea Nature Reserve, Muchea South Road. System 6 Area C25; Muchea townsite (adjacent System 6 Update plot much 02)	GPS	1	13/10/1994
28072	6511740	1984	Grevillea curviloba	T	Prostrate shrub with erect flowering branches to 2 m by 2 m. Fruiting.	Wet Flat; grey sand over sand. Poor drainage, wet during winter/spring.	Open Scrub, Associated species: Xanthorrhoea preissii.	abundance: 1 of 8 plants in 1 population.		Muchea Nature Reserve, Muchea South Road. System 6 Area C25; Muchea townsite (adjacent System 6 Update plot much 02)	GPS	1	13/10/1994
28074	7934319	1984	Grevillea curviloba	T		Plain with grey sand.	Shrubland to 1.5 m high with Jacksonia sp., Melaleuca sp. and Xanthorrhoea sp.	at least 31 clumps.	Pop. 3.	NE corner of reserve no. 2336, Muchea, ca. 30 m E of gate into reserve on N boundary	GPS	1	12/12/2007
28077	8008485	1984	Grevillea curviloba	T	Prostrate and erect shrub to 2 m. Flowers white.	Flats. Grey sand.	Banksia sp., Melaleuca sp,. weeds.			Occurs at the intersection of Brand Highway and Rutland Road, Muchea within the rail reserve. Plants occur on the NW and SE corners	GPS	1	6/01/2009
28080	8863768	1984	Grevillea curviloba	T	Spreading shrub to 1.6 m with pinnatifid leaves, in early flower bud stage. Juvenile growth prostrate with broader leaf lobes than the mature upright leaves.	Flat, grey sand to sandy-loam, highly disturbed bushland corridor on rail and unmade road reserve.	Open Tall Shrubland of Acacia saligna over Open Shrubland of Xanthorrhoea preissii and Acacia ? cochlearis over African love grass, perennial Veldt grass and Cyathochaeta avenacea. Occasional Thysanotus ? patersonii and Hakea prostrata.	c. 120 plants in sometimes dense local patches, over a 230 m length.	Canker evident on many shrubs.	Rail reserve, E side, c. 210 m N of West Road rail crossing, Bullsbrook	GPS	1	6/09/2016
28083	1112848	1984	Grevillea curviloba	T	Spreading low shrub 1 m x 2.5 m wide, flowers white.	Winter wet. Peaty sand over clay.	Melaleuca low woodland.		Abundance: common.	Muchea Townsite Reserve.	MAN	3	27/08/1985
28084	8816433	1984	Grevillea curviloba	T	Upright shrub, to 2 m high. Variable width. White flowers.	Lower slope. Near to creekline. Flat. Grey loamy sand.	Occasional Acacia saligna over Shrubland of Grevillea curviloba and Xanthorrhoea preissii over Closed Grassland of mixed weed species dominated by Agrostis curvula and Ehrharta calycina. Associated species: Corynotheca micrantha, Burchardia congesta, Jac	ca 25 shrubs in one localised area.	Plants are in poor condition. Insects are having a secondary impact on the population which is stressed from weed competition and drying climate.	Ca 20 m S of Neaves Road along Railway Road, on the E side of the rail reserve, Bullsbrook	GPS	1	22/10/2015
28086	9068732	1984	Grevillea curviloba	T	Erect shrub to 1.5 m.	Flat, drainage line with moist grey sand to sandy loam.	Low shrubland of Grevillea curviloba subsp. incurva, Xanthorrhoea preissii, Acacia saligna; over very low open sedgeland and weeds.	occasional - 4 clumps.	Found within population of Grevillea curviloba subsp. incurva.	Northern boundary of Muchea Nature Reserve (2336), Shire of Chittering	GPS	1	31/08/2011

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28087	9068767	1984	Grevillea curviloba	T	Shrub with white flowers.	Well drained flat ground, degraded habitat. Grey sand.	Tall open scrub of Acacia saligna and Jacksonia sp.; over open heath of Grevillea curviloba subsp. curviloba with occasional Xanthorrhoea preissii; over weeds of Eragrostis curvula, Watsona sp. and Poa sp.			Between Railway Parade and Almeria parade, E of the railway line, c. 230 m S of West Road railway crossing, Bullsbrook	GPS	1	30/08/2012
28089	9068724	1984	Grevillea curviloba	T	Prostrate to erect shrub 0.2 - 2 m high. White flowers.	Drainage line with grey sand.	Woodland of Corymbia calophylla, Banksia littoralis; over shrubland of Hakea prostrata, H. varia, Xanthorrhoea preissii and Allocasuarina humilis; over low heath and sedgeland.	frequent, found in clumps throughout nature reserve.		Southern end of Muchea Nature Reserve (2336), 150 m E of Railway Parade, 50 m N of the reserve boundary	GPS	1	31/08/2011
28090	9068821	1984	Grevillea curviloba	T	Prostrate to erect shrub 1 - 2 m high. White flowers.	Drainage line with grey sand over clay.	Tall open shrubland of Hakea varia, over open heath of Regelia ciliata, over herbland and weeds.	abundant.		NE corner of intersection of Rutland Road and Railway Parade, Bullsbrook	GPS	1	30/08/2012
28091	9068805	1984	Grevillea curviloba	T	Shrub up to 2 m with white flowers.		Open woodland Melaleuca rhaphiophylla to 4 m; over open shrubland of Viminaria juncea, Acacia saligna and occasional Melaleuca viminea; over low open shrubland of Grevillea curviloba subsp. incurva and sedges with significant weed invasion of Arum lillie			Opposite Muchea Nature Reserve (R2336), E of Muchea South Road, N of the railway line, 750 m S of Brand Highway, within the rail reserve, Muchea	GPS	1	9/09/2011
28092	9068791	1984	Grevillea curviloba	T	Juvenile shrub.	Grey sand to sandy loam.	Open Melaleuca rhaphiophylla woodland; over Grevillea curviloba subsp. incurva, G. curviloba subsp. curviloba, Xanthorrhoea preissii, Acacia saligna, Grevillea obtusifolia and weeds.			Muchea Nature Reserve, along the northern boundary, 75 m W of Railway Parade	GPS	1	31/08/2011
28093	9068783	1984	Grevillea curviloba	T	Clonal shrub up to 2 m with white/cream flowers. Some plants prostrate.	Grey sand.		occasional.		Park and Drain Reserve (R39007), SW corner of Muchea South Road and Archibald Street, Muchea town site, Shire of Chittering	GPS	1	2/09/2011
28094	9068759	1984	Grevillea curviloba	T	Very large shrub over 2 m. White flowers.	Flat with dark brown loam.	Occasional Xanthorrhoea preissii and weeds including Watsonia, Couch grass, love grass, veldt grass.	occasional - 1 adult and 3 juveniles in area.		In railway reserve, 360 m S of Strachen Road, E of Railway Parade and W of railway line, Bullsbrook	GPS	1	21/09/2011
28095	9068775	1984	Grevillea curviloba	T	Shrub over 2 m high, in bud. Some plants prostrate.	Dark brown loam sand.	Tall open scrub of Acacia saligna with occasional Banksia littoralis, B. sessilis, Hakea varia; over open heath of Stirlingia latifolia, Dianella revoluta and weeds of Eragrostis curvula, Oxalis sp. Babiana sp., Asparagoides.	locally frequent.		Between Almeria Parade and the railway line, c. 700 m S of Strachen Road railway crossing, Bullsbrook	GPS	1	17/08/2012

FID	Sheet	NameID	Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_Method	Precision	Date
28096	2415925	1984	Grevillea curviloba	T	Shrub 1.5 - 1.8 m with white flowers and pinnate leaves.	In sand.				Bullsbrook	AUTO	3	5/10/1972
28097	8153280	1984	Grevillea curviloba	T	Prostrate to erect shrub, 2 m high. Flowers white.	Flat, grey sand.	With Acacia saligna, Grevillea curviloba subsp. curviloba, Jacksonia furcellata, Xanthorrhoea preissii.			On the northern boundary fence of Muchea Nature Reserve and towards Railway Road Muchea. Ca 20 m E of the entry gate	GPS	1	7/01/2009
30408	2697246	16952	Guichenotia tuberculata	3						Near Bullsbrook, between New Norcia and Perth	AUTO	3	/09/1902
31813	3072932	19775	Hibbertia glomerata subsp. ginginensis	2		Near roadside drain.	Growing at the base of Jarrah saplings.			E side of Great Northern Highway at 36 mile peg [23 km S of Bindoon on the Great Northern Highway]	AUTO	3	//
31816	8013721	19775	Hibbertia glomerata subsp. ginginensis	2		Lower slope. Loam over laterite.	Woodland, Eucalyptus marginata over Dryandra sessilis, Conostephium pendula, Corymbia calophylla.			Jenkins Road extension, Bullsbrook	GPS	1	9/09/2004
32580	1137654	6233	Hydrocotyle lemnoides	4						Ellen Brook Nature Reserve	AUTO	3	22/08/1989
32583	1048104	6233	Hydrocotyle lemnoides	4	Corolla mauve. Leaves floating, stem rooted in clay.	Growing in fresh water, stem rooted in clay.				15 km N of Midland on Great Northern Highway, Martyn Reserve	MAN	3	7/10/1976
32586	1048112	6233	Hydrocotyle lemnoides	4		Growing in shallow water over mud.				Short-necked Tortoise Reserve ca. 15 km N of Midland	MAN	4	13/09/1985
32600	1048139	6233	Hydrocotyle lemnoides	4	Leaves floating, stem rooted in clay. Corolla mauve.	Growing in fresh water, stem rooted in clay.				15 km N of Midland on Great Northern Highway. Martyn Reserve	MAN	3	7/10/1976
32661	8836647	11074	Hydrocotyle striata	1	Spreading annual. Height: 5-10 cm.	Seasonally inundated depression within a Mound Spring. Moist, undulating slightly. Black peaty sand. Fire history: Autumn 1995.	Low Open forest of Melaleuca preissiana over Pteridium esculentum. With Cyathochaeta teretifolia (P3), Hibbertia perfoliata.	dense cover in localised ca 40 m x 30 m area. (Site not surveyed closely, plants maybe more widespread on Lot).	Collection made for identification as it had not been seen prior to removal of extremely dense cover of Blackberry initiated in 2012. Site is a Mound Spring of the Swan Coastal Plain threatened Ecological Community.	Lot 800, Pine Road, Bullsbrook. Land is vested within the Dept of Planning and Infrastructure and is adjoining Conservation Estate known as Neaves Road Nature Reserve	GPS	1	16/11/2016
32830	9233008	19601	Hypocalymma sylvestre	T	Shrub 0.5 m high, white flowers.	Quartz ridge. Slopes.	Powderbark wandoo woodland.			Lot 11, Sandow Road, southern end of property	GPS	1	16/09/2019
33500	2867982	16317	Isotropis cuneifolia subsp. glabra	3						Muchea	AUTO	3	10/10/1952

FID	Sheet	NameID	Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_Method	Precision	Date
39591	8772592	36200	Ornduffia submersa	4	Aquatic annual, 0.3 cm high. Submerged leaves collected.	Small ephemeral creek flowing east towards Ellen Book on large palusplain wetland. Brown / white sandy clay with more clay in the channel of the creek. Area burnt > 10 years ago.	Eucalyptus rudis subsp. rudis isolated mid trees over Melaleuca rhaphiophylla low woodland over grassland dominated by Ehrharta longiflora and Bromus diandrus.			E of Brand Highway, c. 1 km S of Muchea	GPS	1	15/09/2014
39674	6960014	34843	Oxymyrrhine coronata	4		Slope. Brown loam over laterite.	Eucalyptus marginata over Dryandra sessilis. Corymbia calophylla, Xanthorrhoea preissii, Petrophile linearis, Hemiandra pungens, Calothamnus sanguineus.	> 50 plants.		Jenkins Road extension, Bullsbrook	GPS	1	9/09/2004
40183	1050281	2271	Persoonia rudis	3						Between Muchea and Bullsbrook.	MAN	3	3/11/1974
40198	4244737	2271	Persoonia rudis	3	Multistemmed low spreading shrub, to 40 cm x 40 cm. In fruit.	Colluvial yellow sand.	Eucalyptus marginata woodland.	rare in area.		Bullsbrook Nature Reserve, Pearce	MAN	3	12/08/1993
41291	3578186	11132	Platysace ramosissima	3	Flowers cream.					32 mile peg, Great Northern Highway [ca 29 km SSW of Bindoon]	AUTO	3	//
41299	4087844	11132	Platysace ramosissima	3	Herb to 30 cm, finished flowering	Sandy soil, flat.	Heath to 1.2 m, not burnt.		Locally common.	Nature reserve on Great Northern Highway just north of Rutland Rd on east side along internal fire breaks	MAN	0	8/12/1994
43513	6533388	980	Schoenus capillifolius	3	Annual herb, flowers brown.	Seasonal Wetland, flat ground, brown clay, poor drainage, wet during winter/spring.	Low Scrub B, Associated species: Kunzea littericola Ms, Verticordia densiflora.			Eastern side of Pearce Airforce Base near Singapore Airforce Training Centre, System 6 Area M15, in System 6 Update quadrat xpearce02	GPS	1	20/09/1994
43696	4097610	16279	Schoenus sp. Bullsbrook (J.J. Alford 915)	2	Delicate herb 15 cm high, flowers brown and green.	Low lyingflat, grey peaty sand over ? clay.	Herbs and low shrubs.	common.		Twin Swamps Nature Reserve, 8 km S of Bullsbrook	MAN	0	31/10/1986
45301	8709394	18564	Stylidium aceratum	3	Herb to 5 cm, flowers pink with yellow throat.	Flat. Clay. Swampy.	With Stylidium spp., Actinostrobus arenarius, Melaleuca spp.			Bullsbrook Nature Reserve, along Great Northern Highway	GPS	1	21/10/2008
45303	3282945	18564	Stylidium aceratum	3	Leaves reddish, spathulate, stems reddish at baase, green further up, fleshy bracts. Flowers deep pink bands at throat, outside very pale pink.	Seasonal swamp.	Dominated by Melaleuca scabra, Actinostrobus pyramidalis and Kunzea with numerous sedges and ephemeral herbs.			Black Swamp Nature Reserve on Great Northern Highway; 1 km S of Wandena Road, Bullsbrook (S end)	MAN	0	3/11/1993

FID	Sheet	NameID	Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_Method	Precision	Date
45304	4980336	18564	Stylidium aceratum	3	Annual herb. Corolla dark-pink. No retrorse tooth on column bend.	Grows in sandy soils.	On swamp heathland.			Along Great Northern Highway N of Bullsbrook, 1 km S of Wandena Road (S end) on E side of the highway	MAN	0	9/11/1991
45305	8640645	18564	Stylidium aceratum	3	Annual herb, pink/white flowers.	Winter wet swamp. White/brown sand.	Low shrubland. With Actinostrobus sp., Kunzea sp., Myrtaceae sp., Restionaceae sp., Stylidium inundatum.	> 1000.		Bullsbrook Nature Reserve, just E of Brand Highway on internal track, N of Bullsbrook	GPS	1	21/11/2012
45311	2959143	18564	Stylidium aceratum	3	Erect herb, 3 cm high. Flowers pink and white.	Swamp. White clayey sand. In low sedgeland.			Abundance: abundant.	8 km N of Bullsbrook	MAN	0	1/11/1984
45313	8505306	18564	Stylidium aceratum	3	Erect herb to 100 mm high and 25 mm wide. Petals vertical paired, pink to pale pink (white). Spur at back poorly developed. Appendage on upper petals narrow. Column without spur or lump at bend.	Black damp sand.	Growing near Melaleuca sp., Centrolepis aristata and C. polygyna. Some salt tolerant plants growing nearby.	many.		Bullsbrook Nature Reserve, Great Northern Highway	GPS	1	7/11/2003
45320	8893322	18564	Stylidium aceratum	3	Small annual herb.	Seasonally wet poorly drained flat. Grey sand.	Melaleuca uncinata, M. bracteosa shrubland over sedges.		Vegetation condition: excellent. Claypan TEC, communities 7 & 8.	Plot Bull 06. Bullsbrook Nature Reserve	GPS	1	28/10/2013
45995	2694263	7756	Stylidium longitubum	4	Erect leafless herb with red succulent stems and pink flowers.	Recently dried muddy depression in swamp.				Twin Swamps Wildlife Sanctuary (Reserve No. A 27621) Ellen Brook - Bullsbrook area	TOPO	2	28/12/1971
46185	7838204	25800	Stylidium paludicola	3	Herb to 1 m tall.	Peat based mound spring. Permanently wet site with water oozing from entire surface. Dips and mounds occur in peat layer.	With forest - woodland of Melaleuca preissiana over dense shrubland of Cyclosorrus interruptus, Pteridium esculentum, Agonis linearifolia, Astartea fascicularis, Isolepis prolifera, Lobelia alata, Burchardia sp.	occasional.		ca 950 m W of western end of Gaston Road in Bullsbrook	GPS	1	26/11/2007
46619	2949210	7801	Stylidium squamellosum	2	Corollas yellow, marked brown on reverse. Forming clumps close to the soil, not stalked on proproots as in other populations of this species; leaves slightly longer than typical.	Low wet area.	Drosera heteromera, D. menziesii, Verticordia, Grevillea.		Not infraspecifically different from typical S. squamellosum, however.	37 mile peg on Northern Highway near Bullsbrook	MAN	3	27/10/1967

FID	Sheet	NameID	Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_Method	Precision	Date
47299	4543602	16867	Synaphea grandis	4	Shrub with many stems; scapes to 1 m; flowers yellow.	On lateritic hill.	In Wandoo woodland.			ca 1 mile E of Muchea crossroads	MAN	0	1/11/1971
47300	4543599	16867	Synaphea grandis	4	Shrub with many stems; scapes to 1 m; flowers yellow.	On lateritic hill.	In Wandoo woodland.			ca 1 mile E of Muchea crossroads	MAN	0	1/11/1971
48561	4864743	35581	Tetraria sp. Chandala (G.J. Keighery 17055)	2	Rhizomatous herb 1.6 m high, 1 m wide; flowers brown; fruits brown.	Mound spring, black peat over clay & humic sand.	Assoc. vegn.: Melaleuca rhaphiophylla forest over sedges.		Abundance: very common.	Property on W side of Neaves Road, Wanneroo	TOPO	2	4/02/1997
50713	2841886	32658	Trithuria occidentalis	T	Reddish annual herb.	Slightly submerged clay pan, open.			Abundance: common	Warbrook Siding, Upper Swan	AUTO	3	18/10/1978
52431	8329281	12460	Verticordia serrata var. linearis	3	30-80 cm compact shrub.	Grey sand, lichen crust in places. Eastern end of valley that opens to the W. Site in middle of 'U' valley.	Woodland of Eucalyptus marginata subsp. thalassica, C. calophylla (scattered E. accedens). Open low shrubland. Acacia pulchella subsp. glaberrima, Alexgeorgia nitens, Caustis dioica, Desmocladius fasciculatus, Dryandra lindleyana subsp. sylvestris, Hakea			Lots to the immediate N of the formed part of Powderbark Road, Lower Chittering. Plot 9	GPS	3	7/12/2007
52434	1894544	12460	Verticordia serrata var. linearis	3	Slender shrub to 80 cm.	On sandy flat.	In Jarrah-Marri open forest.			E of Muchea	AUTO	3	9/07/1988
52436	1557866	12460	Verticordia serrata var. linearis	3	3 ft high, yellow flowers.					Muchea	AUTO	3	18/12/1963
52440	7159072	12460	Verticordia serrata var. linearis	3		Slope. Laterite. Brown loam.	Eucalyptus marginata over Dryandra sessilis, Daviesia nodiflora, Banksia grandis, Dryandra sessilis, Petrophile linearis.			Road verge Jenkins Road extension; Bullsbrook	GPS	1	31/01/2005
52446	2033747	12460	Verticordia serrata var. linearis	3	To 90 cm high, to 45 cm wide. Flowers bright yellow. Erect shrubs with blooms in 4-8 cm heads.	Gravelly soil.				Muchea	AUTO	3	15/10/1979
52447	2033720	12460	Verticordia serrata var. linearis	3	80 cm high x 15 cm wide. Flowers golden yellow.	White sand and gravel on road verge.	Growing in association with Adenanthos cygnorum.		This specimen was collected for painting.	N of Bullsbrook	AUTO	3	22/10/1987
52448	2033739	12460	Verticordia serrata var. linearis	3	150 cm high, 30 cm wide. Flowers yellow.	White sand.				NE of Muchea	AUTO	3	15/10/1981

FID	PopId	Nameid	Taxon	ConsStatus	WARank	PopNumber	SubPopCode	District	Vesting	Purpose1	CountDate	Method	MatCount	JuvCount	SeedlCount	LiveTotal	CountType	AreaOccupy	InFlower	PopConditi	HabConditi	HabNotes	SoilCondit	Landform	RockType	Gravel	SoilType	SoilColor	Drainage	Aspect	AssSpecies
76	98390	3219	Acacia anomala	T	VU	1	A	PERTH HILLS	PRI		3/09/2013 0:00	ACT_IND	8	0	0	0	PLANTS	100	Y	MODERATE	GOOD		MOIST	SLOPE	LATERITE	GRVL_10	SAND	BROWN	WLL_DRND	SE	Marianthus sp, Lambertia sp, Banksia sp
77	98391	3219	Acacia anomala	T	VU	1	B	PERTH HILLS	PRI		5/09/2013 0:00	ACT_IND	0	0	0	0	PLANTS	0			GOOD	Some rubbish dumping . Area may also have been gravel pit									Marianthus sp, Lambertia sp, Banksia sp
78	98392	3219	Acacia anomala	T	VU	1	C	PERTH HILLS	PRI		4/09/2017 0:00	ACT_IND	0	0	0	26	PLANTS	1300	N	POOR	VRY_GOOD	Open woodland, tall open scrub, very open sedgeland.	DRY	SLOPE	LATERITE	GRVL_50	SAND	RED_BRWN	WLL_DRND	NW	Corymbia callophyla, Acacia pulchella, Astroloma glaucescens, Babingtonia camphorosmae, Banksia dallanneyi var. dallanneyi, Bossiaea eriocarpa, Eucalyptus marginata subsp. thalassica, Grevillea synapheae subsp. synapheae, Hakea stenocarpa, Hakea undulata
79	86254	3219	Acacia anomala	T	VU	2	A	PERTH HILLS	PRI		11/09/2013 0:00	ACT_IND	0	0	0	0	PLANTS	400		SENSCNT	GOOD		MOIST	RIDGE	LATERITE	GRVL_30	SAND	BROWN	WLL_DRND	SE	Xanthorrhoea pressi, Hakea lissocarpa, Lechenaultia sp?, Caladenia flava
80	107945	3219	Acacia anomala	T	VU	2	B	PERTH HILLS	LGA	VER	10/09/2013 0:00	ACT_IND	1	0	0	0	PLANTS	2	Y	POOR	DEGRADED	Weeds are encroachihng along road verge providing fuel to any fire (increased intensity, increased frequency)	MOIST	FLAT	LATERITE	GRVL_10	CLAY_SND	BROWN	WLL_DRND	SE	Xanthorrhoea gracilis Lechenaultia sp?, Veldt grass
81	98403	3219	Acacia anomala	T	VU	3	A	PERTH HILLS	PRI		26/09/2013 0:00	ACT_IND	14	11	14	0	PLANTS	10	Y	MODERATE	GOOD	Edge of small laterite ridge (old gravel pit??)	DRY	RIDGE	LATERITE	GRVL_100	SAND	GREY	WLL_DRND	NW	Hibbertia hypericoides, Conostylis sp?,Banksia sp?,Hakea sp?
82	98404	3219	Acacia anomala	T	VU	3	B	PERTH HILLS	LGA	REC	27/09/2013 0:00	ACT_IND	0	0	0	0	PLANTS	0			GOOD	2 star pickets (quadrat?) were found in area of TPFL cords but no plants.This pop not found but also pop 9 of Gre cur cur not found (result of PC maybe ???)	MOIST	FLAT			SAND	BROWN	WLL_DRND	N	Astroloma sp, Kennedia sp, Acacia applanata, Acacia willdenowiana, Adenanthos sp, Grevillea sp, Calytrix sp, Stirlingia latifolia, Sowerbaea laxiflora, Lysinema ciliatum, Leptospermum erubescens, Scaevola sp
83	86255	3219	Acacia anomala	T	VU	4		PERTH HILLS	PRI		24/09/1994 0:00	ESTMT	1	0	0	1		0	Y				DRY	SLOPE	LATERITE	GRVL_30	SAND	BROWN			Eucalyptus wandoo,Eucalyptus marginata,Xanthorrhoea preissii
84	86256	3219	Acacia anomala	T	VU	5		PERTH HILLS	PRI		25/09/2013 0:00	ACT_IND	3	0	0	0	PLANTS	2	Y	MODERATE	GOOD		DRY	FLAT	LATERITE	GRVL_10	SAND	GREY	WLL_DRND	WSW	Xanthorroeae sp?, Hibbertia hypericoides, Conostylis sp?, HAkea sp? Grevillea sp, Drosera sp
92	98414	3219	Acacia anomala	T	VU	8	A	PERTH HILLS	CC	NRE	24/09/2013 0:00	ACT_IND	0	0	0	0	PLANTS	0			GOOD		DRY	SLOPE	LATERITE	GRVL_10	SAND	GREY	WLL_DRND	SW	Hakea sp,Grevileea sp,Xanthoroeaea sp, Banksia sp, Hibbertia sp
93	98415	3219	Acacia anomala	T	VU	8	B	PERTH HILLS	PRI		19/09/2013 0:00	ACT_IND	0	0	0	0	PLANTS	0			GOOD		DRY	SLOPE	LATERITE	GRVL_30	SAND	GREY	WLL_DRND	SW	Conostylis sp, Banksia sessilis, Grevillea spp, Hakea spp, Haemodorum sp,Glisrocaryon sp, Xanthorroeae sp
94	98416	3219	Acacia anomala	T	VU	8	C	PERTH HILLS	LGA	VER	20/09/2013 0:00	ACT_IND	10	0	0	0	PLANTS	700	Y		GOOD	Gravel extrasction has occurred in the area in past; no signs of fire									Xanthorroeae sp, Conostylis sp, Banksia sessilis, Grevillea spp, Hakea spp, Haemodorum sp.

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95	98417	3219	Acacia anomala	T	VU	8	D	PERTH HILLS	LGA	VER	17/09/2013 0:00	ACT_IND	0	0	0	0	PLANTS	0			GOOD	Signs of disturbance, modified understorey, weeds. No signs of fire.	DRY	FLAT	LATERITE	GRVL_10	SAND	GREY	WLL_DRND	SW	Xanthorrhoea preissii, Dryandra sessilis, Acacia applanata, Hibbertia hypericiodes, Amphipogon turbinatus
96	98418	3219	Acacia anomala	T	VU	8	E	PERTH HILLS	LGA	VER	15/08/1987 0:00		0	0	0	0		0	Y												
101	86251	3219	Acacia anomala	T	VU	10	A	PERTH HILLS	PRI		23/09/2013 0:00	ACT_IND	53	3	16	0	PLANTS	####	Y	HEALTHY			DRY	SLOPE	LATERITE	GRVL_10	SND_LOAM	GREY	WLL_DRND	SW	Xanthorroeaea sp, Hibbertia sp, Hakea sp, Grevliiea sp Drosera sp, Scaevola sp
102	107963	3219	Acacia anomala	T	VU	10	B	PERTH HILLS	PRI		20/09/2013 0:00	ACT_IND	10	0	0	0	PLANTS	####	Y	MODERATE	GOOD		DRY	SLOPE	LATERITE	GRVL_10	SND_LOAM	BROWN	WLL_DRND	SW	Jarrah, Marri, Xanthorroeae preissii, Hakea sp, Grevillea sp, Acacia spp, Banksia spp?,Stylidium sp?
103	107964	3219	Acacia anomala	T	VU	10	C	PERTH HILLS	PRI		20/09/2013 0:00	ACT_IND	10	0	0	0	PLANTS	####	Y	MODERATE	GOOD		DRY	SLOPE	LATERITE	GRVL_10	SND_LOAM	BROWN	WLL_DRND	SW	Jarrah, Marri, Xanthorroeae preissii, Hakea sp, Grevillea sp, Acacia spp, Banksia spp?,Stylidium sp?
109	86252	3219	Acacia anomala	T	VU	12		PERTH HILLS	LGA	VER	20/09/2013 0:00	ACT_IND	0	0	0	0	PLANTS	0			GOOD	Pop is between road and fence so in precarious location.	DRY	SLOPE	LATERITE	GRVL_10	SND_LOAM	BROWN	WLL_DRND	W	Xanthorroeae sp, Conostylis sp, Banksia sessilis, Grevillea spp, Hakea spp,Drosera sp, Hibbertia sp
110	98400	3219	Acacia anomala	T	VU	13	A	PERTH HILLS	LGA	VER	13/09/2013 0:00	ACT_IND	0	0	0	0	PLANTS	0			GOOD		DRY	SLOPE	LATERITE	GRVL_10	SAND	GREY	WLL_DRND	S	Banksia sessilis Hakea sp, Drosera sp,
111	98401	3219	Acacia anomala	T	VU	13	B	PERTH HILLS	PRI		14/10/2013 0:00	ACT_IND	20	0	0	0	PLANTS	1000	Y	MODERATE	GOOD	Habitat in good condition some staghorns in trees may indicate PC	DRY	SLOPE	LATERITE	GRVL_10	SAND	GREY	WLL_DRND	SW	Jarrah, Marri, Banksia sessilis, B.spp?, Stylidium spp, Drosera spp, Caladenia sp,
112	86253	3219	Acacia anomala	T	VU	14		PERTH HILLS	PRI		7/12/2007 0:00		0	0	0	0		0	N	HEALTHY		Surrounding vegetation healthy. Part of poorly reserved Dandaragan - South vegetation.	DRY	SLOPE	LATERITE	GRVL_30	SAND	GREY			Eucalyptus marginata subsp. thalassica,Corymbia calophylla,Allocasuarina huegeliana
662	89611	11229	Acacia drummondii subsp. affinis	3		7		SWAN COASTAL	UNKNOWN	UNKNOWN	23/11/1976 0:00		0	0	0	0		0	Y					SLOPE	LATERITE						
1101	91854	14129	Acacia oncinophylla subsp. oncinophylla	3		13		PERTH HILLS	CC	NPK	5/09/1996 0:00		0	0	0	0		0	N			DomSp:Hibbertia hypericodes, Phyllanthus calyinus		SLOPE		GRVL_30	CLAY	BROWN		W	Eucalyptus calophylla,Acacia saligna,Leptospermum erubescens,Xanthorrhoea preissii
1618	89664	11336	Adenanthos cygnorum subsp. chamaephyton	3		5		PERTH HILLS	LGA	VER	26/10/1996 0:00	ESTMT	70	0	0	70		0	N			Soil: Red-brown clay loam with > 90 % laterite.					CLA_LOAM	RED_BRWN			
1619	89665	11336	Adenanthos cygnorum subsp. chamaephyton	3		6		PERTH HILLS	LGA	VER	26/10/1996 0:00	ESTMT	120	0	0	120		0	N			Soil: yellow-brown clat loam with about 80% laterite. Original vegetation possibly Marri woodland.					CLA_LOAM	BROWN			

FID	PopId	Nameid	Taxon	ConsStatus	WARank	PopNumber	SubPopCode	District	Vesting	Purpose1	CountDate	Method	MatCount	JuvCount	SeedlCount	LiveTotal	CountType	AreaOccupy	InFlower	PopConditi	HabConditi	HabNotes	SoilCondit	Landform	RockType	Gravel	SoilType	SoilColor	Drainage	Aspect	AssSpecies
1629	89654	11336	Adenanthos cygnorum subsp. chamaephyton	3		14		PERTH HILLS	LGA	VER	9/09/2004 0:00		0	0	0	0		0	N				DRY	FLAT	LATERITE		LOAM	BROWN			Dryandra sessilis,Xanthorrhoea preissii,Hakea undulata
6301	93213	16245	Cyathochaeta teretifolia	3		4		SWAN COASTAL	NON	UCL	16/11/1994 0:00		0	0	0	0		0	N												
6307	93194	16245	Cyathochaeta teretifolia	3		10		SWAN COASTAL	LGA	VER	13/11/2007 0:00	ACT_IND	1	0	0	1		0	N			Open forest over tall open scrub over sedgeland. Meeboldina sp. Ground wet all year. 90% litter coverage.		FLAT			LOAM	BROWN	PERMINUN		Melaleuca preissiana,Astartea scoparia,Lepidosperma effusum
6308	93195	16245	Cyathochaeta teretifolia	3		11		SWAN COASTAL	CC	CFF	17/11/1994 0:00		0	0	0	0		0	N			VegClass:Low Forest A		CD_SMPLD			PEAT	BLACK	SEASINUN		Melaleuca rhaphiophylla,Banksia littoralis
6506	105271	34773	Darwinia foetida	T	EN	1	A	SWAN COASTAL	CC	CFF	19/11/2008 0:00	ESTMT	250	0	0	250		0	Y			Open scrub over low heath C over open low sedges over herbs.	DRY	FL_PLAIN			SAND	GREY			Xanthorrhoea preissii,Banksia menziesii,Viminaria juncea,Melaleuca scabra
6507	105272	34773	Darwinia foetida	T	EN	1	B	SWAN COASTAL	LGA	VER	3/11/2009 0:00	ACT_IND	0	0	469	0		0	N			Dense low heath C dominated by Regelia sp.	DRY	FL_PLAIN			SAND	GREY			Xanthorrhoea preissii,Allocasuarina humilis,Hibbertia hypericoides,Patersonia occidentalis
6508	96622	34773	Darwinia foetida	T	EN	2		SWAN COASTAL	NON	UCL	14/11/2008 0:00	ESTMT	500	0	0	500		0	Y			Low Forest A over Low Woodland B over Low Scrub B over Open Herbs.	MOIST	SLOPE			PEAT	GREY			Xanthorrhoea preissii,Banksia menziesii,Allocasuarina fraseriana,Corymbia calophylla
6509	105274	34773	Darwinia foetida	T	EN	3	A	SWAN COASTAL	PRI		2/07/2010 0:00	ESTMT	1000	0	0	1000		####	N			Open low woodland over Heath B over Dwarf scrub D.	DRY	FL_PLAIN			SAND	GREY			Xanthorrhoea preissii,Banksia menziesii,Hakea varia,Stirlingia latifolia
6510	105275	34773	Darwinia foetida	T	EN	3	B	SWAN COASTAL	PRI		18/11/2008 0:00	ESTMT	100	0	0	100		0	Y			Low Woodland A over Heath B over Dwarf Scrub D over Open Herbs.	DRY	FL_PLAIN			SAND	GREY			Banksia menziesii,Acacia saligna,Xanthorrhoea preissii,Banksia dallanneyi
6511	96623	34773	Darwinia foetida	T	EN	4		SWAN COASTAL	PRI		9/03/2007 0:00	ESTMT	25	0	0	25		0	N			Palusplain multiple use wetland.					SAND	GRY_BLCK			Corymbia calophylla,Melaleuca rhaphiophylla,Hypocalymma angustifolium
6512	113549	34773	Darwinia foetida	T	EN	5	A	SWAN COASTAL	LGA	VER	9/09/2015 0:00	ACT_IND	166	12	0	0	PLANTS	500	Y	HEALTHY	GOOD	Habitat 1. Corymbia calophylla Open Woodland over Jacksonia sternbergiana Tall Open Shrubland over Regelia ciliata, Acacia pulchella, Xanthorrhoea preissii Open Shrubland over Hypocalymma angustifolia, Hibbertia hypericoides, Melaleuca seriata Low Shrubl	MOIST	FL_PLAIN			SND_LOAM	BROWN	WLL_DRND		Phlebocarya ciliata, Patersonia occidentalis, Hypolaena exsulca, Conostylis juncea, Dasypogon bromeliifolius, Cyathochaeta avenacea, Schoenus subfascicularis, Desmocladus fascicularis, Adenanthos obovatus, Burchardia congesta, Stirlingia latifolia, Alexg

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6513	113551	34773	Darwinia foetida	T	EN	5	B	SWAN COASTAL	RAI	RRE	3/09/2015 0:00	ACT_IND	18	0	0	0	PLANTS	100	Y	HEALTHY	GOOD	Tall Open Shrubland of Acacia saligna,Jacksonia furcellata, occ. Nuytsia floribunda & Banksia attenuata over Shrubland of Melaleuca seriata, Acacia pulchella, Xanthorrhoea preissii, Regelia ciliata, Pericalymma ellipticum over Low Shrubland of Calot	MOIST	FL_PLAIN			SND_LOAM	BROWN	WLL_DRND		
6514	113552	34773	Darwinia foetida	T	EN	6	A	SWAN COASTAL	LGA	VER	22/10/2015 0:00	ACT_IND	10	1	0	0	PLANTS	600	Y	HEALTHY	DEGRADED	Tall Shrubland of Acacia saligna, Jacksonia sternbergiana (both species have 50% senescence) over Open Shrubland of Xanthorrhoea preissii, Regelia ciliata over Open Sedgland of Desmocladus virgatus and Lyginia barbata and Grassland of *Agrostis curvula a	MOIST	FL_PLAIN			SND_LOAM	BROWN	WLL_DRND		Other weed species along the road reserve are detailed in Population 5A Report Form.
6515	113554	34773	Darwinia foetida	T	EN	6	B	SWAN COASTAL	RAI	RRE	22/10/2015 0:00	ACT_IND	2	0	0	0	PLANTS	70	Y	HEALTHY	GOOD	Tall Shrubland of Acacia saligna, Jacksonia sternbergiana (both species have 50% senescence) over Open Shrubland of Xanthorrhoea preissii, Regelia ciliata over Open Sedgland of Desmocladus virgatus and Lyginia barbata and Grassland of *Agrostis curvula a	MOIST	FL_PLAIN			SND_LOAM	BROWN	WLL_DRND		

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6516	117269	34773	Darwinia foetida	T	EN	7		PERTH HILLS	MRD	VER	26/11/2018 0:00	ACT_IND	0	32	0	0	PLANTS	1		HEALTHY	DEGRADED	No actual Darwinia foetida habitat exists at this site. The fragmented area so far retained on the road verge, is basically a sumpland that has retained some native species amongst dense Watsonia. Regelia ciliata, Hypocalymma angustifolium, Verticordia	DRY	CD_DMPLD			SND_LOAM	BROWN	SEASINUN	W	
6517	117270	34773	Darwinia foetida	T	EN	8		SWAN COASTAL	MRD	VER	7/12/2018 0:00	ACT_IND	25	5	0	0	PLANTS	1502	Y	HEALTHY	DEGRADED	Soil is sand over sandy loam. A large proportion of the site is Completely Degraded with 100% *Eragrostis curvula and *Ehrharta calycina. At the best condition habitat, the vegetation was <2% Xanthorrhoea preissii and Allocasuarina humilis over Low Op	DRY	FLAT			SAND	GREY	WLL_DRND		Planted species included Hakea prostrata, Grevillea crithmifolia, G. preissii, Allocasuarina humilis, Calothamnus quadrifidus, Leptospermum erubescens. Other weeds included *Vicia sativa and *Euphorbia terracina.
7516	90820	3115	Drosera occidentalis	4		1		PERTH HILLS	LGA	REC	6/01/1986 0:00	ESTMT	0	0	0	####		0	N												
7604	94007	17605	Eleocharis keigheryi	T	VU	7		SWAN COASTAL	COM	AIR	17/09/2007 0:00	ESTMT	0	0	0	0		0	Y			Open tall sedges.	DRY	FLAT			CLA_LOAM	BROWN			Cotula coronopifolia
####	96526	33559	Grevillea althoferorum subsp. fragilis	T	CR	1		PERTH HILLS	CC	CFF	24/02/2011 0:00	EXT_GRQD	0	0	0	0	PLANTS	0	N	HEALTHY	EXCELENT	Some minor weeds noted lining the track but they are not present in significant numbers	DRY	SLOPE			SAND				[veg class] Layer 1: Banksia attenuata, occasional Eucalyptus marginata and Corymbia calophylla Banksia grandsi, Hibbertia hypericoides, Petrophile macrostachya, Allocasuarina humilis
####	102713	14408	Grevillea curviloba subsp. curviloba	T	CR	1	A	SWAN COASTAL	RAI	RRE	6/11/2013 0:00	ACT_IND	0	0	0	289	PLANTS	0	N		GOOD		DRY	OD_DRGLN			SAND				

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####	106261	14408	Grevillea curviloba subsp. curviloba	T	CR	1	C	SWAN COASTAL	LGA	VER	30/08/2011 0:00	ACT_CLMP	17	0	0	0	CLUMPS	600			GOOD	Sand over clay. Weeds: Ehrharta calycina, Hypochaeris glabra, Watsonia, Eragrostis curvula, Asparagus asparagoides.	MOIST	OD_DRGLN		GRVL_10	SND_LOAM	GREY	SEASINUN		Herbland: Acanthocarpus preissii, Thysanotus ?manglesianus, Burchardia bairdiae, Drosera glanduligera, Dianella revoluta, Drosera stolonifera, banksia dallanneyi, Lepidisperma squamatum, Stirlingia latifolia, Tricoryne elatior, Conostylis festucacea, Bau
####	109321	14408	Grevillea curviloba subsp. curviloba	T	CR	1	D	SWAN COASTAL	LGA	VER	6/11/2013 0:00		0	0	0	52		0	N		GOOD		DRY	OD_DRGLN			SAND				
####	102719	14408	Grevillea curviloba subsp. curviloba	T	CR	5	A	SWAN COASTAL	RAI	RRE	2/12/2015 0:00	ACT_IND	135	0	0	0	PLANTS	0	N	HEALTHY	DEGRADED	Degraded grassland (Eragrostis curvula, Cynodon dactylon, Avena barbata)	DRY	FLAT			SND_LOAM	GREY	WLL_DRND		Isolated individuals of Nuytsia floribunda and Jacksonia sternbergiana
####	102720	14408	Grevillea curviloba subsp. curviloba	T	CR	5	B	SWAN COASTAL	RAI	RRE	2/12/2015 0:00	ACT_IND	198	0	0	0	PLANTS	0	N	HEALTHY	DEGRADED	Degraded grassland, Eragrostis curvula, with patches of Watsonia meriana	DRY	FLAT			SND_LOAM	GREY	SEASINUN		Isolated individuals of Acacia saligna, Nuytsia fluribunda, Xanthorrhoea preissii and Jacksonia sternbergiana
####	102721	14408	Grevillea curviloba subsp. curviloba	T	CR	5	C	SWAN COASTAL	LGA	VER	3/09/2004 0:00	ACT_IND	2	0	5	7		0	Y			Acacia sp., weeds-grasses.	DRY	FLAT			LOAM	BROWN			
####	102722	14408	Grevillea curviloba subsp. curviloba	T	CR	5	D	SWAN COASTAL	RAI	RRE	2/12/2015 0:00	ACT_IND	0	0	0	0		0	N		DEGRADED	Degraded grassland - Eragrostis curvula, Cenchrus clandestinus	DRY	FLAT		GRVL_10	SND_LOAM	GREY	WLL_DRND		
####	109315	14408	Grevillea curviloba subsp. curviloba	T	CR	5	E	SWAN COASTAL	RAI	RRE	30/08/2012 0:00	ESTMT	44	0	0	0	CLUMPS	1800	Y	HEALTHY	DEGRADED	Tall open scrub (Acacia saligna, Jacksonia sp.), over open heath (Grevillea curviloba ssp curviloba with occasional Xanthorrea preissii). Weeds: Eragrostis curvula, Watsonia sp, various Poa spp On top of drain embankment - Locally modified environment.		FLAT		GRVL_10	SAND	GREY	WLL_DRND		
####	109316	14408	Grevillea curviloba subsp. curviloba	T	CR	5	F	SWAN COASTAL	RAI	RRE	3/12/2015 0:00	ACT_IND	165	0	0	0	PLANTS	0	N	HEALTHY	DEGRADED	Degraded grassland (Eragrostis curvula, Ehrharta calycina, Cenchrus clandestinus)	DRY	FLAT		GRVL_10	SND_LOAM	GREY	WLL_DRND		

FID	PopId	Nameid	Taxon	ConsStatus	WARank	PopNumber	SubPopCode	District	Vesting	Purpose1	CountDate	Method	MatCount	JuvCount	SeedlCount	LiveTotal	CountType	AreaOccupy	InFlower	PopConditi	HabConditi	HabNotes	SoilCondit	Landform	RockType	Gravel	SoilType	SoilColor	Drainage	Aspect	AssSpecies
####	109318	14408	Grevillea curviloba subsp. curviloba	T	CR	5	G	SWAN COASTAL	LGA	VER	1/08/2012 0:00	ESTMT	10	0	0	0	CLUMPS	20	Y	HEALTHY	DEGRADED	Tall open scrub (Acacia saligna) with occasional Banksia littoralis, Hakea varia, Banksia sessilis over open heath (Grevilliea curviloba subsp. curviloba, with occasional Xanothorrhoea preissii). Occasional Sterlingia latifolia and Dianella revoluta. We		FLAT		GRVL_10	SND_LOAM	BROWN			
####	92203	14408	Grevillea curviloba subsp. curviloba	T	CR	6		SWAN COASTAL	CC	CFF	6/11/2013 0:00	ACT_IND	0	0	0	30	PLANTS	0	N												
####	102736	14409	Grevillea curviloba subsp. incurva	T	EN	2	A	SWAN COASTAL	LGA	VER	17/08/2011 0:00	ACT_CLMP	2	0	0	0	CLUMPS	2	N	MODERATE	COM_DEGR	Occasional Acacia saligna and occasional Grevillea curviloba subsp. incurva over perrenial veldt and other weeds. Mowed road verge	MOIST	FLAT			LOAM_SND	GREY	WLL_DRND		
####	102737	14409	Grevillea curviloba subsp. incurva	T	EN	2	B	SWAN COASTAL	RAI	RRE	2/12/2015 0:00	ACT_IND	9	0	0	0	PLANTS	0	N	HEALTHY	DEGRADED		DRY	FLAT	LIMESTN		SAND	GREY	WLL_DRND		Hyparrhenia hirta
####	102739	14409	Grevillea curviloba subsp. incurva	T	EN	3	A	SWAN COASTAL	CC	CFF	3/11/2013 0:00	ACT_IND	0	0	0	24		0	Y	HEALTHY	GOOD	Weeds: Hypochaeris glabra, Ehrharta longiflora, Ursinia anthemoides, Ehrharta calycina, Schinus terebinthifolius	MOIST	FLAT		GRVL_10	SAND	GREY	WLL_DRND		Melaleuca low woodland,Xanthorrhoea preissii,Banksia menziesii,Acacia saligna
####	102740	14409	Grevillea curviloba subsp. incurva	T	EN	3	B	SWAN COASTAL	CC	CFF	31/08/2011 0:00	ACT_CLMP	9	0	0	0	CLUMPS	450	Y	MODERATE	GOOD	Weeds - Ursinia anthemoides, Ehrharta calycina, Hypochaeris glabra, Watsonia sp., Romulea roseae. Habitat appears to be in decline	MOIST	OD_DRGLN			SAND	GREY	WLL_DRND		Luginia barbata, Calytrix flavescens, Bossiaea eriocarpa, Melaleuca sp., Xanthorrhoeae preissii, Lyginia imberbis, Tricoryne elatior, Corynotheca micrantha, Nytsia floribunda, Calytrix angulata, Stirlingia latifolia.

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####	102741	14409	Grevillea curviloba subsp. incurva	T	EN	3	C	SWAN COASTAL	CC	CFF	31/08/2011 0:00	ACT_CLMP	60	21	0	0	CLUMPS	1100	Y	MODERATE	EXCELENT		MOIST	OD_DRGLN		GRVL_10	SAND	GREY	WLL_DRND		Jacksonia sternbergiana, Banksia dallanneyi var. dallanneyi, tricoryne elatior, Lepidosperma longitudinale, Desmocladus fasciculatus, Opercularia vaginata, Kennedia prostrata, Drosera pallida, Hypochaeris glabra
####	102742	14409	Grevillea curviloba subsp. incurva	T	EN	3	D	SWAN COASTAL	CC	CFF	31/08/2011 0:00	ACT_CLMP	5	0	0	0	CLUMPS	130	N	MODERATE	DEGRADED	Weeds (Hypochaeris glabra, Erharta longiflora, Ursinia anthemoides, Arctotheca calendula, Vicia sativa, Schinus terebinthifolius) Greater than 70% cover of weeds.	MOIST	OD_DRGLN			SND_LOAM	GREY	WLL_DRND		Lyginia imberba
####	109326	14409	Grevillea curviloba subsp. incurva	T	EN	3	E	SWAN COASTAL	CC	NRE	13/04/2012 0:00	ACT_CLMP	37	3	0	0	CLUMPS	3000		HEALTHY	VRY_GOOD	1. Melaleuca rhapiophylla. Weeds: Ehrharta calycina, Pennisetum clandestinum, Schinus terebinthifolius, Briza maxima Minimal weed invasion.	DRY	SLOPE		GRVL_10	SAND	GREY	WLL_DRND		Weeds (*E
####	109327	14409	Grevillea curviloba subsp. incurva	T	EN	3	F	SWAN COASTAL	CC	NRE	13/04/2012 0:00	ACT_IND	0	0	0	0	CLUMPS	3000	N	HEALTHY	VRY_GOOD	2. Anthocarpus preissii. Weeds: Ehrharta calycina, Pennisetum clandestinum, Schinus terebinthifolius, Briza maxima. Minimal weed invasion	DRY	SLOPE		GRVL_10	SAND	GREY	WLL_DRND		
####	102748	14409	Grevillea curviloba subsp. incurva	T	EN	5	A	PERTH HILLS	MRD	VER	7/09/2011 0:00	ACT_CLMP	10	1	0	0	CLUMPS	100	Y	MODERATE	GOOD	Weed layer - Wild oats, Veldt grass, Love grass, Pennisetum clandestinum Site very weedy	MOIST	FLAT			LOAM_SND	BROWN		
####	102749	14409	Grevillea curviloba subsp. incurva	T	EN	5	B	PERTH HILLS	RAI	RRE	19/11/2015 0:00	ACT_IND	73	0	0	0	PLANTS	0	N	HEALTHY	DEGRADED	Weed/Herb layer with Oxalis, Wild oats, Veldt grass, Love grass.	DRY	FLAT			SND_LOAM	GREY	SEASINUN		

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####	102730	14409	Grevillea curviloba subsp. incurva	T	EN	12	A	SWAN COASTAL	LGA	VER	7/09/2004 0:00	ESTMT	50	0	30	50		0	N			Xanthorrhoea, Banksia littoralis, Anigozanthos manglesii, Watsonia, Cape Tulip & very dense grasses.	INUNDATE	FLAT	LIMESTN		LOAM	BROWN			Acacia saligna,Jacksonia furcellata,Melaleuca sp.,Adenanthos cygnorum
####	102731	14409	Grevillea curviloba subsp. incurva	T	EN	12	B	SWAN COASTAL	RAI	RRE	2/12/2015 0:00	ACT_IND	68	0	0	0	PLANTS	0	N	HEALTHY	DEGRADED		DRY	FLAT			SND_LOAM	GREY	SEASINUN		
####	92208	14409	Grevillea curviloba subsp. incurva	T	EN	16	A	SWAN COASTAL	LGA	PAR	21/09/2011 0:00	ACT_CLMP	40	18	0	0	CLUMPS	150	N	MODERATE	GOOD	Weeds(Watsonia, Eragrostis curvula, Briza maxima, Briza minor, Ursinia anthemoides, Moraea sp., Hypochaeris glabra)					SAND	GREY			
####	110250	14409	Grevillea curviloba subsp. incurva	T	EN	16	B	SWAN COASTAL	LGA	VER	21/09/2011 0:00	ACT_CLMP	8	2	0	0	CLUMPS	1000	N		DEGRADED	Weeds (Watsonia spp., Ergrastis curvula, Briza maxima, Briza minor, Ursinia anthemoides, Moraea sp., Hypochaeris glabra)		FLAT	IRONSTN		SAND	GREY			
####	92206	14409	Grevillea curviloba subsp. incurva	T	EN	18	A	PERTH HILLS	LGA	REC	23/11/2002 0:00		0	0	0	0		0	N						LATERITE		SAND				
####	110270	14409	Grevillea curviloba subsp. incurva	T	EN	18	B	PERTH HILLS	PRI	REC	7/09/2011 0:00	ESTMT	35	0	0	0	CLUMPS	6000	Y	HEALTHY	EXCELENT	Signs of disturbance, very scattered weeds	DRY	FLAT	LATERITE		SAND	WHITE			Conostylis sp., Xanthorrohoea preissii, Lechenaultia biloba, Burchardia sp, Astroloma marcocalyx, Banksia sessilis, Hypocalymma anagustifolium
####	110271	14409	Grevillea curviloba subsp. incurva	T	EN	18	C	PERTH HILLS	PRI	REC	20/10/2015 0:00	ACT_IND	0	0	0	2	PLANTS	0	N	HEALTHY	GOOD		MOIST	FLAT	LATERITE	GRVL_30	SAND	GREY	WLL_DRND		Banksia sessilis, Xanthorrhoea preissii, Hakea stenocarpa, Lepidosperma squamatum, Leptospermum erubescens.
####	110289	14409	Grevillea curviloba subsp. incurva	T	EN	18	D	PERTH HILLS	LGA	VER	20/10/2015 0:00	ACT_IND	0	0	0	22	PLANTS	0		HEALTHY	GOOD		MOIST	FLAT	LATERITE	GRVL_30	SAND	GREY	WLL_DRND		Banksia sessilis, Xanthorrhoea preissii, Hakea stenocarpa, Lepidosperma squamatum, Leptospermum erubescens.
####	110229	14409	Grevillea curviloba subsp. incurva	T	EN	19	A	SWAN COASTAL	LGA	VER	22/10/2015 0:00	ESTMT	0	0	0	10	PLANTS	150	Y	POOR	DEGRADED	Occasional Acacia saligna over Shrubland of Grevillea curviloba subsp. incurva and Xanthorrhoea preissii over Closed Grassland of mixed weed species dominated by *Agrostis curvula and *Ehrharta calycina.		FLAT			LOAM_SND	GREY	WLL_DRND		Corynotheca micrantha, *Avena sp., *Briza spp., *Lolium sp., *Cenchrus clandestinus, Burchardia congesta, Jacksonia furcellata, Stirlingia latifolia, *Zantedeschia aethiopica.

FID	PopId	Nameid	Taxon	ConsStatus	WARank	PopNumber	SubPopCode	District	Vesting	Purpose1	CountDate	Method	MatCount	JuvCount	SeedlCount	LiveTotal	CountType	Area Occupy	InFlower	PopConditi	HabConditi	HabNotes	SoilCondit	Landform	RockType	Gravel	SoilType	SoilColor	Drainage	Aspect	AssSpecies
####	110231	14409	Grevillea curviloba subsp. incurva	T	EN	19	B	SWAN COASTAL	RAI	RRE	22/10/2015 0:00	ESTMT	0	0	0	15	PLANTS	350	Y	POOR	DEGRADED	Occasional Acacia saligna over Shrubland of Grevillea curviloba subsp. incurva and Xanthorrhoea preissii over Closed Grassland of mixed weed species dominated by *Agrostis curvula and *Ehrharta calycina.		FLAT			LOAM_SND	GREY	WLL_DRND		Corynotheca micrantha, *Avena sp., *Briza spp., *Lolium sp., *Cenchrus clandestinus, Burchardia congesta, Jacksonia furcellata, Stirlingia latifolia, *Zantedeschia aethiopica.
####	94924	19775	Hibbertia glomerata subsp. ginginensis	2		8		PERTH HILLS	LGA	VER	9/09/2004 0:00	UNKNOWN	20	0	0	20		0	N			VegClass:Woodland E.marginata over D.sessilis		SLOPE	LATERITE		LOAM				Eucalyptus marginata,Dryandra sessilis,Conostephium pendulum,Corymbia calophylla
####	96636	34843	Oxymyrrhine coronata	4		2		PERTH HILLS	PRI		14/01/1994 0:00	ESTMT	400	0	0	400		0	Y			On lateritic caprock & pisolytic gravel, esp. scraped substrate (edge of gravel pit).			LATERITE	GRVL_30					
####	96640	34843	Oxymyrrhine coronata	4		7		PERTH HILLS	CC	CFF	9/01/2002 0:00	UNKNOWN	460	0	0	460		0	Y			DomSp: Jarrah, Marri.	DRY	SLOPE	LATERITE	GRVL_30		YEL_BRWN			Dryandra sessilis,Dryandra squarrosa,Adenanthos cygnorum subsp. chamaephyton,Hakea ruscifolia
####	96629	34843	Oxymyrrhine coronata	4		13		PERTH HILLS	PRI	VER	9/09/2004 0:00	UNKNOWN	50	0	0	50		0	N			Other DomSp illegible		SLOPE	LATERITE		LOAM	BROWN			Eucalyptus marginata,Dryandra sessilis,Corymbia calophylla,Xanthorrhoea preissii
####	85959	2271	Persoonia rudis	3		10		PERTH HILLS	CC	CFF	12/08/1993 0:00		0	0	0	0		0	N								SAND	YELLOW			Eucalyptus marginata
####	89591	11132	Platysace ramosissima	3		3		PERTH HILLS	CC	CFF	8/12/1994 0:00		0	0	0	0		0	N					FLAT			SAND				
####	84520	980	Schoenus capillifolius	3		6		SWAN COASTAL	COM	AIR	20/09/1994 0:00		0	0	0	0		0	N			Hypocalymma angustifolium, Eragrotis elongata, Hesperantha falcata, Chorizandra enodis, Leptocarpus roycei		FLAT	LATERITE		CLAY	BROWN	SEASINUN		Eucalyptus wandoo,Viminaria juncea,Kunzea,Verticordia densiflora
####	89302	7756	Stylidium longitubum	4		2		SWAN COASTAL	CC	CFA	28/12/1971 0:00		0	0	0	0		0	N				MOIST	OD_SWAMP							
####	89532	10862	Thelymitra stellata	T	EN	19		PERTH HILLS	LGA	VER	15/11/1975 0:00		0	0	0	0		0	N						LATERITE						Eucalyptus marginata,Eucalyptus calophylla
####	89543	10862	Thelymitra stellata	T	EN	31		PERTH HILLS	PRI		15/11/2005 0:00		0	0	0	2		0	Y												
####	90123	12460	Verticordia serrata var. linearis	3		4		PERTH HILLS	LGA	VER	9/07/1988 0:00		0	0	0	0		0	N					FLAT			SAND				Eucalyptus marginata,Eucalyptus calophylla
####	90127	12460	Verticordia serrata var. linearis	3		8		PERTH HILLS	PRI	VER	31/01/2005 0:00		0	0	0	0		0	N			DomSp:Perrophile linearis		SLOPE	LATERITE		LOAM	BROWN			Eucalyptus marginata,Dryandra sessilis,Daviesia nudiflora,Banksia grandis

APPENDIX 2

Naturemap Report

NatureMap Species Report

Created By Guest user on 10/07/2020

Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	116° 02' 11" E,31° 38' 17" S
Buffer	10km
Group By	Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	1057	4109
Other specially protected fauna	1	1
Priority 1	1	1
Priority 2	6	10
Priority 3	18	64
Priority 4	10	26
Rare or likely to become extinct	20	360
TOTAL	**1113**	**4571**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Rare or likely to become extinct					
1.	3219	*Acacia anomala (Grass Wattle)*		T	
2.	24345	*Botaurus poiciloptilus (Australasian Bittern)*		T	
3.	1213	*Calectasia cyanea (Blue Tinsel Lily)*		T	
4.	24731	*Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black Cockatoo)*		T	
5.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)*		T	
6.	48400	*Calyptorhynchus sp. (white-tailed black cockatoo)*		T	
7.	34773	*Darwinia foetida*		T	Y
8.	24092	*Dasyurus geoffroii (Chuditch, Western Quoll)*		T	
9.	4452	*Diplolaena andrewsii*		T	
10.	17605	*Eleocharis keigheryi*		T	
11.	33559	*Grevillea althoferorum subsp. fragilis*		T	
12.	14408	*Grevillea curviloba subsp. curviloba*		T	
13.	14409	*Grevillea curviloba subsp. incurva*		T	
14.	33983	*Leioproctus douglasiellus (a short-tongued bee)*		T	
15.	24142	*Petrogale lateralis subsp. lateralis (Black-flanked Rock-wallaby, Black-footed Rock-wallaby)*		T	
16.	25345	*Pseudemydura umbrina (Western Swamp Tortoise, Western Swamp Turtle)*		T	
17.	48237	*Rostratula australis (Australian Painted Snipe)*		T	
18.	10862	*Thelymitra stellata (Star Orchid)*		T	
19.	32658	*Trithuria occidentalis (Swan Hydatella)*		T	
20.	34113	*Westralunio carteri (Carter's Freshwater Mussel)*		T	
Other specially protected fauna					
21.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
Priority 1					
22.	11074	*Hydrocotyle striata*		P1	
Priority 2					
23.	8912	*Drosera sewelliae (Red Woolly Sundew)*		P2	
24.	1975	*Grevillea candolleana*		P2	
25.	19775	*Hibbertia glomerata subsp. ginginensis*		P2	
26.	16279	*Schoenus sp. Bullsbrook (J.J. Alford 915)*		P2	Y
27.	7801	*Stylidium squamellosum (Maize Trigger Plant)*		P2	
28.	35581	*Tetraria sp. Chandala (G.J. Keighery 17055)*		P2	
Priority 3					
29.	11229	*Acacia drummondii subsp. affinis*		P3	
30.	14129	*Acacia oncinophylla subsp. oncinophylla*		P3	
31.	11336	*Adenanthos cygnorum subsp. chamaephyton*		P3	
32.	19338	*Chamaescilla gibsonii*		P3	
33.	16245	*Cyathochaeta teretifolia*			

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	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
				P3	
34.	41801	*Eryngium pinnatifidum subsp. Palustre (G.J. Keighery 13459)*		P3	
35.	48579	*Euoplos inornatus (inornate trapdoor spider (northern Jarrah Forest))*		P3	
36.	16952	*Guichenotia tuberculata*		P3	
37.	1469	*Haemodorum loratum*		P3	
38.	16317	*Isotropis cuneifolia subsp. glabra*		P3	
39.	33982	*Leioproctus contrarius (a short-tongued bee)*		P3	
40.	25249	*Neelaps calonotos (Black-striped Snake, black-striped burrowing snake)*		P3	
41.	2271	*Persoonia rudis*		P3	
42.	11132	*Platysace ramosissima*		P3	
43.	980	*Schoenus capillifolius*		P3	
44.	18564	*Stylidium aceratum*		P3	
45.	25800	*Stylidium paludicola*		P3	
46.	12460	*Verticordia serrata var. linearis*		P3	
Priority 4					
47.	3115	*Drosera occidentalis (Western Sundew)*		P4	
48.	6233	*Hydrocotyle lemnoides (Aquatic Pennywort)*		P4	
49.	24215	*Hydromys chrysogaster (Water-rat, Rakali)*		P4	
50.	48588	*Isoodon fusciventer (Quenda, southwestern brown bandicoot)*		P4	
51.	48024	*Notamacropus eugenii subsp. derbianus (Tammar Wallaby, Tammar)*		P4	
52.	36200	*Ornduffia submersa*		P4	
53.	34843	*Oxymyrrhine coronata*		P4	
54.	7756	*Stylidium longitubum (Jumping Jacks)*		P4	
55.	16867	*Synaphea grandis*		P4	
56.	14714	*Verticordia lindleyi subsp. lindleyi*		P4	
Non-conservation taxon					
57.	15466	*Acacia applanata*			
58.	15469	*Acacia barbinervis subsp. barbinervis*			
59.	11926	*Acacia drewiana subsp. drewiana*			
60.	3374	*Acacia huegelii*			
61.	18217	*Acacia iteaphylla*	Y		
62.	3409	*Acacia lasiocarpa (Panjang)*			
63.	15721	*Acacia lasiocarpa var. sedifolia*			
64.	3410	*Acacia lateriticola*			
65.	3454	*Acacia nervosa (Rib Wattle)*			
66.	3502	*Acacia pulchella (Prickly Moses)*			
67.	15482	*Acacia pulchella var. goadbyi*			
68.	15483	*Acacia pulchella var. pulchella*			
69.	15480	*Acacia pulchella var. reflexa*			
70.	3527	*Acacia saligna (Orange Wattle, Kudjong)*			
71.	30033	*Acacia saligna subsp. lindleyi*			
72.	30032	*Acacia saligna subsp. saligna*			
73.	3541	*Acacia sessilis*			
74.	3554	*Acacia squamata*			
75.	3602	*Acacia willdenowiana (Grass Wattle)*			
76.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
77.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
78.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
79.	24262	*Acanthiza inornata (Western Thornbill)*			
80.	1205	*Acanthocarpus canaliculatus*			
81.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
82.		*Acariformes sp.*			
83.	25536	*Accipiter fasciatus (Brown Goshawk)*			
84.	6205	*Actinotus leucocephalus (Flannel Flower)*			
85.	1775	*Adenanthos cygnorum (Common Woollybush)*			
86.	1779	*Adenanthos drummondii*			
87.	1791	*Adenanthos obovatus (Basket Flower)*			
88.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
89.	23474	*Agrostocrinum hirsutum*			
90.	1261	*Agrostocrinum scabrum (Blue Grass Lily)*			
91.	23501	*Agrostocrinum scabrum subsp. scabrum*			
92.	184	*Aira caryophyllea (Silvery Hairgrass)*	Y		
93.	187	*Aira praecox (Early Hairgrass)*	Y		
94.	1056	*Alexgeorgea nitens*			
95.	1732	*Allocasuarina humilis (Dwarf Sheoak)*			
96.		*Allothereua maculata*			
97.	2652	*Alternanthera nodiflora (Common Joyweed)*			
98.	2668	*Amaranthus powellii (Powell's Amaranth)*	Y		
99.	20184	*Amphipogon laguroides subsp. laguroides*			

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	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
100.	200	*Amphipogon turbinatus*			
101.		*Amphisopodidae sp.*			
102.	2380	*Amyema miquelii (Stalked Mistletoe)*			
103.		*Aname mainae*			
104.		*Aname tepperi*			
105.	1060	*Anarthria laevis*			
106.	24312	*Anas gracilis (Grey Teal)*			
107.	24316	*Anas superciliosa (Pacific Black Duck)*			
108.		*Ancylidae sp.*			
109.	6311	*Andersonia heterophylla*			
110.	6314	*Andersonia lehmanniana*			
111.	11471	*Andersonia lehmanniana subsp. lehmanniana*			
112.	7833	*Angianthus preissianus*			
113.	11470	*Anigozanthos bicolor subsp. bicolor*			
114.	1409	*Anigozanthos humilis (Catspaw)*			
115.	11434	*Anigozanthos humilis subsp. humilis*			
116.	1411	*Anigozanthos manglesii (Mangles Kangaroo Paw, Kurulbrang)*			
117.	29487	*Anigozanthos manglesii var. x angustifolius*			
118.	1413	*Anigozanthos preissii (Albany Catspaw)*			
119.	1416	*Anigozanthos viridis (Green Kangaroo Paw, Kurulbardang)*			
120.	29436	*Anigozanthos viridis subsp. Cataby (S.D. Hopper 1786)*			
121.	11566	*Anigozanthos viridis subsp. viridis*			
122.	44629	*Anilios australis*			
123.		*Anopheles atratipes*			
124.	25241	*Antaresia stimsoni subsp. stimsoni (Stimson's Python)*			
125.	24561	*Anthochaera carunculata (Red Wattlebird)*			
126.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
127.	12724	*Anthotium junciforme*			
128.	24599	*Anthus australis subsp. australis (Australian Pipit)*			
129.	3686	*Aotus cordifolia*			
130.	3688	*Aotus gracillima*			
131.	1117	*Aphelia cyperoides*			
132.	1119	*Aphelia nutans*			
133.	43548	*Aphelia sp. Albany (B.G. Briggs 596)*			
134.	24991	*Aprasia repens (Sand-plain Worm-lizard)*			
135.	24285	*Aquila audax (Wedge-tailed Eagle)*			
136.		*Araneus cyphoxis*			
137.	7838	*Arctotheca calendula (Cape Weed, African Marigold)*	Y		
138.	1264	*Arnocrinum preissii*			
139.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
140.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
141.		*Astartea aff. fascicularis sthcst*			
142.	20350	*Astartea affinis (West-coast Astartea)*			
143.	20283	*Astartea scoparia (Common Astartea)*			
144.	6323	*Astroloma ciliatum (Candle Cranberry)*			
145.	6328	*Astroloma glaucescens*			
146.	6330	*Astroloma macrocalyx (Swan Berry)*			
147.	6334	*Astroloma pallidum (Kick Bush)*			
148.	6337	*Astroloma stomarrhena (Red Swamp Cranberry)*			
149.	6339	*Astroloma xerophyllum*			
150.	17233	*Austrostipa campylachne*			
151.	17234	*Austrostipa compressa*			
152.	17237	*Austrostipa elegantissima*			
153.	17240	*Austrostipa flavescens*			
154.	17254	*Austrostipa tenuifolia*			
155.	36441	*Babingtonia camphorosmae (Camphor Myrtle)*			
156.		*Badumna insignis*			
157.	1382	*Baeometra uniflora*	Y		
158.		*Baetidae sp.*			
159.	32681	*Banksia armata (Prickly Dryandra)*			
160.	32682	*Banksia armata var. armata*			
161.	1800	*Banksia attenuata (Slender Banksia, Piara)*			
162.	32679	*Banksia bipinnatifida subsp. multifida*			
163.	32580	*Banksia dallanneyi subsp. dallanneyi var. dallanneyi*			
164.	32577	*Banksia dallanneyi subsp. dallanneyi var. mellicula*			
165.	32523	*Banksia fraseri var. fraseri*			
166.	1822	*Banksia ilicifolia (Holly-leaved Banksia)*			
167.	1834	*Banksia menziesii (Firewood Banksia)*			
168.	1835	*Banksia micrantha*			
169.	32080	*Banksia sessilis var. sessilis*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
170.	1852	*Banksia telmatiaea (Swamp Fox Banksia)*			
171.	32315	*Barbula calycina*			
172.		*Barnardius zonarius*			
173.	740	*Baumea arthrophylla*			
174.	741	*Baumea articulata (Jointed Rush)*			
175.	743	*Baumea juncea (Bare Twigrush)*			
176.	747	*Baumea rubiginosa*			
177.	5382	*Beaufortia elegans (Elegant Beaufortia)*			
178.	5387	*Beaufortia macrostemon (Darling Range Beaufortia)*			
179.	7046	*Bellardia trixago (Bellardia)*	Y		
180.	48868	*Bellardia viscosa*	Y		
181.	7855	*Bidens pilosa (Cobbler's Pegs)*	Y		
182.	25788	*Billardiera fraseri (Elegant Pronaya)*			
183.	3165	*Billardiera variifolia*			
184.	1417	*Blancoa canescens (Winter Bell)*			
185.	749	*Bolboschoenus caldwellii (Marsh Club-rush)*			
186.	4432	*Boronia ovata*			
187.	17665	*Boronia purdieana subsp. purdieana*			
188.	4438	*Boronia ramosa*			
189.	1272	*Borya scirpoidea*			
190.	1273	*Borya sphaerocephala (Pincushions)*			
191.	3710	*Bossiaea eriocarpa (Common Brown Pea)*			
192.		*Bostockia porosa*			
193.	8661	*Brachypodium distachyon (False Brome)*	Y		
194.	7867	*Brachyscome bellidioides*			
195.	7878	*Brachyscome iberidifolia*			
196.	42380	*Brachyurophis fasciolatus subsp. fasciolatus (Narrow-banded Shovel-nosed Snake)*			
197.	42381	*Brachyurophis semifasciatus (Southern Shovel-nosed Snake)*			
198.	244	*Briza maxima (Blowfly Grass)*	Y		
199.	245	*Briza minor (Shivery Grass)*	Y		
200.	249	*Bromus diandrus (Great Brome)*	Y		
201.	1383	*Burchardia bairdiae*			
202.	12770	*Burchardia congesta*			
203.	1385	*Burchardia multiflora (Dwarf Burchardia)*			
204.	25713	*Cacatua galerita (Sulphur-crested Cockatoo)*			
205.	24721	*Cacatua galerita subsp. galerita (Sulphur-crested Cockatoo)*	Y		
206.	25714	*Cacatua pastinator (Western Long-billed Corella)*			
207.	25715	*Cacatua roseicapilla (Galah)*			
208.	25716	*Cacatua sanguinea (Little Corella)*			
209.	24729	*Cacatua tenuirostris (Eastern Long-billed Corella)*	Y		
210.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
211.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
212.		*Caenidae sp.*			
213.	1276	*Caesia micrantha (Pale Grass Lily)*			
214.	1586	*Caladenia discoidea (Dancing Orchid)*			
215.	1592	*Caladenia flava (Cowslip Orchid)*			
216.	15348	*Caladenia flava subsp. flava*			
217.	1602	*Caladenia longicauda (Common White Spider Orchid)*			
218.	15365	*Caladenia longicauda subsp. longicauda*			
219.	1605	*Caladenia marginata (White Fairy Orchid)*			
220.	15503	*Caladenia paludosa*			
221.	18019	*Caladenia vulgata*			
222.	2846	*Calandrinia calyptrata (Pink Purslane)*			
223.	2854	*Calandrinia granulifera (Pygmy Purslane)*			
224.	2856	*Calandrinia liniflora (Parakeelya)*			
225.		*Calandrinia sp.*			
226.	16365	*Calandrinia sp. Kenwick (G.J. Keighery 10905)*			
227.	19309	*Calectasia narragara*			
228.	36600	*Callitris pyramidalis (Swamp Cypress)*			
229.	5415	*Calothamnus lateralis*			
230.	5426	*Calothamnus quadrifidus (One-sided Bottlebrush, Kwowdjard)*			
231.	5429	*Calothamnus sanguineus (Silky-leaved Blood flower, Pindak)*			
232.	25717	*Calyptorhynchus banksii (Red-tailed Black-Cockatoo)*			
233.	5439	*Calytrix angulata (Yellow Starflower)*			
234.	5458	*Calytrix flavescens (Summer Starflower)*			
235.	5479	*Calytrix strigosa*			
236.	5481	*Calytrix sylvana*			
237.	5485	*Calytrix variabilis*			
238.	19713	*Campsis radicans*	Y		
239.	1162	*Cartonema philydroides*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
240.	2951	*Cassytha flava (Dodder Laurel)*			
241.	2952	*Cassytha glabella (Tangled Dodder Laurel)*			
242.	11211	*Cassytha glabella forma dispar*			
243.	2956	*Cassytha pomiformis (Dodder Laurel)*			
244.	2957	*Cassytha racemosa (Dodder Laurel)*			
245.	11799	*Cassytha racemosa forma racemosa*			
246.	1742	*Casuarina obesa (Swamp Sheoak, Kuli)*			
247.	760	*Caustis dioica*			
248.		*Ceinidae sp.*			
249.	258	*Cenchrus ciliaris (Buffel Grass)*	Y		
250.	6539	*Centaurium erythraea (Common Centaury)*	Y		
251.	6542	*Centaurium tenuiflorum*	Y		
252.	1120	*Centrolepis alepyroides*			
253.	1121	*Centrolepis aristata (Pointed Centrolepis)*			
254.	1123	*Centrolepis caespitosa*			
255.	1125	*Centrolepis drummondiana*			
256.	1131	*Centrolepis inconspicua*			
257.	1132	*Centrolepis mutica*			
258.	1133	*Centrolepis pilosa*			
259.	1134	*Centrolepis polygyna (Wiry Centrolepis)*			
260.		*Ceratopogonidae sp.*			
261.		*Cercophonius granulosus*			
262.	17685	*Chaetanthus aristatus*			
263.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
264.	1280	*Chamaescilla corymbosa (Blue Squill)*			
265.	11299	*Chamaescilla corymbosa var. corymbosa*			
266.	8788	*Chamaescilla versicolor*			
267.	35598	*Chamelaucium sp. Winchester (C. Chapman s.n. PERTH 07879180)*			
268.	5498	*Chamelaucium uncinatum (Geraldton Wax)*			
269.	31	*Cheilanthes austrotenuifolia*			
270.	3169	*Cheiranthera preissiana*			
271.	43380	*Chelodina colliei (South-western Snake-necked Turtle)*			
272.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
273.	2491	*Chenopodium macrospermum*	Y		
274.		*Cherax quinquecarinatus*			
275.		*Cherax sp.*			
276.		*Chironominae sp.*			
277.		*Chironomus aff. alternans (V24) (CB)*			
278.	267	*Chloris gayana (Rhodes Grass)*	Y		
279.	272	*Chloris virgata (Feathertop Rhodes Grass)*	Y		
280.	17833	*Chordifex microcodon*			
281.	24980	*Christinus marmoratus (Marbled Gecko)*			
282.	24431	*Chrysococcyx basalis (Horsfield's Bronze Cuckoo)*			
283.	24432	*Chrysococcyx lucidus subsp. plagosus (Shining Bronze Cuckoo)*			
284.	6543	*Cicendia filiformis (Slender Cicendia)*	Y		
285.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
286.	4550	*Comesperma calymega (Blue-spike Milkwort)*			
287.	4551	*Comesperma ciliatum*			
288.	4561	*Comesperma scoparium (Broom Milkwort)*			
289.	4564	*Comesperma virgatum (Milkwort)*			
290.	15607	*Conospermum acerosum subsp. acerosum*			
291.	15041	*Conospermum canaliculatum*			
292.	15516	*Conospermum canaliculatum subsp. canaliculatum*			
293.	1875	*Conospermum huegelii (Slender Smokebush)*			
294.	1880	*Conospermum polycephalum*			
295.	1882	*Conospermum stoechadis (Common Smokebush)*			
296.	15520	*Conospermum stoechadis subsp. sclerophyllum*			
297.	15611	*Conospermum stoechadis subsp. stoechadis (Common Smokebush)*			
298.	1885	*Conospermum triplinervium (Tree Smokebush)*			
299.	6347	*Conostephium minus (Pink-tipped Pearl flower)*			
300.	6348	*Conostephium pendulum (Pearl Flower)*			
301.	6349	*Conostephium preissii*			
302.	1418	*Conostylis aculeata (Prickly Conostylis)*			
303.	11826	*Conostylis aculeata subsp. aculeata*			
304.	11552	*Conostylis aculeata subsp. bromelioides*			
305.	11513	*Conostylis aculeata subsp. cygnorum*			
306.	12109	*Conostylis aculeata subsp. preissii*			
307.	1420	*Conostylis androstemma (Trumpets)*			
308.	1423	*Conostylis aurea (Golden Conostylis)*			
309.	11438	*Conostylis candicans subsp. candicans*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
310.	1429	*Conostylis caricina*			
311.	12035	*Conostylis caricina subsp. caricina*			
312.	1436	*Conostylis juncea*			
313.	1454	*Conostylis setigera (Bristly Cottonhead)*			
314.	11597	*Conostylis setigera subsp. setigera*			
315.	1455	*Conostylis setosa (White Cottonhead)*			
316.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
317.		*Corduliidae sp.*			
318.	17700	*Coriandrum sativum (Coriander)*	Y		
319.		*Corixidae sp.*			
320.		*Cormocephalus aurantiipes*			
321.		*Cormocephalus strigosus*			
322.		*Cormocephalus turneri*			
323.	48259	*Cortaderia selloana subsp. selloana*	Y		
324.	25592	*Corvus coronoides (Australian Raven)*			
325.	24417	*Corvus coronoides subsp. perplexus (Australian Raven)*			
326.	17104	*Corymbia calophylla (Marri)*			
327.	1285	*Corynotheca micrantha (Sand Lily)*			
328.	7945	*Cotula coronopifolia (Waterbuttons)*	Y		
329.	7946	*Cotula cotuloides (Smooth Cotula)*			
330.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
331.	25595	*Cracticus tibicen (Australian Magpie)*			
332.	25596	*Cracticus torquatus (Grey Butcherbird)*			
333.	13354	*Craspedia variabilis*			
334.	17701	*Crassula closiana*			
335.	3137	*Crassula colorata (Dense Stonecrop)*			
336.	3139	*Crassula exserta*			
337.	3142	*Crassula natans*	Y		
338.	24918	*Crenadactylus ocellatus subsp. ocellatus (Clawless Gecko)*			
339.	7953	*Crepis foetida (Foetid Hawksbeard)*	Y		
340.	25398	*Crinia georgiana (Quacking Frog)*			
341.	25400	*Crinia insignifera (Squelching Froglet)*			
342.	25401	*Crinia pseudinsignifera (Bleating Froglet)*			
343.	35838	*Cristonia biloba subsp. biloba*			
344.	13470	*Cryptandra arbutiflora var. arbutiflora*			
345.	30893	*Cryptoblepharus buchananii*			
346.		*Cryptochironomus griseidorsum*			
347.	30899	*Ctenophorus adelaidensis (Southern Heath Dragon, Western Heath Dragon)*			
348.	25027	*Ctenotus australis*			
349.	25039	*Ctenotus fallens*			
350.		*Culex (Culex) australicus*			
351.		*Culicidae sp.*			
352.		*Culiseta atra*			
353.		*Curculionidae sp.*			
354.	6663	*Cuscuta epithymum (Lesser Dodder, Greater Dodder)*	Y		
355.	15404	*Cyanicula sericea*			
356.	51	*Cyathea cooperi*	Y		
357.	768	*Cyathochaeta avenacea*			
358.	54	*Cyclosorus interruptus*			
359.	40661	*Cycnogeton lineare*			
360.	24322	*Cygnus atratus (Black Swan)*			
361.	283	*Cynodon dactylon (Couch)*	Y		
362.	783	*Cyperus congestus (Dense Flat-sedge)*	Y		
363.	806	*Cyperus polystachyos (Bunchy Sedge)*			
364.	815	*Cyperus tenellus (Tiny Flatsedge)*	Y		
365.	816	*Cyperus tenuiflorus (Scaly Sedge)*	Y		
366.	17952	*Cyrtomium falcatum*	Y		
367.	17692	*Cytogonidium leptocarpoides*			
368.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*	Y		
369.	290	*Dactyloctenium radulans (Button Grass)*			
370.	7428	*Dampiera coronata (Wedge-leaved Dampiera)*			
371.	7454	*Dampiera linearis (Common Dampiera)*			
372.	7482	*Dampiera teres (Terete-leaved Dampiera)*			
373.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
374.	5531	*Darwinia thymoides*			
375.	1218	*Dasypogon bromeliifolius (Pineapple Bush)*			
376.	6218	*Daucus glochidiatus (Australian Carrot)*			
377.	3793	*Daviesia angulata*			
378.	15656	*Daviesia brachyphylla*			
379.	3805	*Daviesia decurrens (Prickly Bitter-pea)*			

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380.	18560	*Daviesia divaricata subsp. divaricata*			
381.	11879	*Daviesia hakeoides subsp. hakeoides*			
382.	3815	*Daviesia horrida (Prickly Bitter-pea)*			
383.	15505	*Daviesia incrassata subsp. incrassata*			
384.	3819	*Daviesia longifolia*			
385.	3824	*Daviesia nudiflora*			
386.	3832	*Daviesia physodes*			
387.	3835	*Daviesia preissii*			
388.	3845	*Daviesia triflora*			
389.	17663	*Desmocladus asper*			
390.	46362	*Desmocladus lateriflorus*			
391.	1259	*Dianella revoluta (Blueberry Lily)*			
392.	11636	*Dianella revoluta var. divaricata*			
393.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
394.	306	*Dichelachne crinita (Longhair Plumegrass)*			
395.	1287	*Dichopogon capillipes*			
396.	1289	*Dichopogon preissii*			
397.	17838	*Dielsia stenostachya*			
398.	320	*Digitaria sanguinalis (Crab Grass)*	Y		
399.		*Dingosa serrata*			
400.	1509	*Dioscorea hastifolia (Warrine, Wararn)*			
401.	24929	*Diplodactylus granariensis subsp. granariensis*			
402.	18589	*Diplopeltis huegelii subsp. lehmannii*			
403.	7055	*Dischisma capitatum (Woolly-headed Dischisma)*	Y		
404.	7961	*Dittrichia graveolens (Stinkwort)*	Y		
405.	11049	*Diuris corymbosa*			
406.	1638	*Diuris setacea (Bristly Donkey Orchid)*			
407.	24470	*Dromaius novaehollandiae (Emu)*			
408.	48751	*Drosera drummondii*			
409.	3095	*Drosera erythrorhiza (Red Ink Sundew)*			
410.	3097	*Drosera gigantea (Giant Sundew)*			
411.	3098	*Drosera glanduligera (Pimpernel Sundew)*			
412.	13195	*Drosera helodes*			
413.	3101	*Drosera heterophylla (Swamp Rainbow)*			
414.	13197	*Drosera hyperostigma*			
415.	3106	*Drosera macrantha (Bridal Rainbow)*			
416.	48767	*Drosera magna*			
417.	3109	*Drosera menziesii (Pink Rainbow)*			
418.	48709	*Drosera minutiflora*			
419.	3113	*Drosera neesii (Jewel Rainbow)*			
420.	3114	*Drosera nitidula (Shining Sundew)*			
421.	3118	*Drosera pallida (Pale Rainbow)*			
422.	3123	*Drosera platystigma (Black-eyed Sundew)*			
423.	3124	*Drosera pulchella (Pretty Sundew)*			
424.	13185	*Drosera spilos*			
425.	3131	*Drosera stolonifera (Leafy Sundew)*			
426.	13184	*Drosera walyunga*			
427.	19254	*Drosera zigzagia*			
428.		*Dugesiidae sp.*			
429.		*Dytiscidae sp.*			
430.	25251	*Echiopsis curta (Bardick)*			
431.	6681	*Echium plantagineum (Paterson's Curse)*	Y		
432.		*Edelia vittata*			
433.	25100	*Egernia napoleonis*			
434.		*Egretta novaehollandiae*			
435.	347	*Ehrharta calycina (Perennial Veldt Grass)*	Y		
436.	349	*Ehrharta longiflora (Annual Veldt Grass)*	Y		
437.	24290	*Elanus caeruleus subsp. axillaris (Australian Black-shouldered Kite)*			
438.	25250	*Elapognathus coronatus (Crowned Snake)*			
439.	822	*Eleocharis acuta (Common Spikerush)*			
440.	353	*Eleusine indica (Crowsfoot Grass)*	Y		
441.	1644	*Elythranthera emarginata (Pink Enamel Orchid)*			
442.		*Enchytraeidae sp.*			
443.		*Eolophus roseicapillus*			
444.	6131	*Epilobium billardiereanum (Glabrous Willow Herb)*			
445.	24567	*Epthianura albifrons (White-fronted Chat)*			
446.	374	*Eragrostis cilianensis (Stinkgrass)*	Y		
447.	376	*Eragrostis curvula (African Lovegrass)*	Y		
448.	378	*Eragrostis dielsii (Mallee Lovegrass)*			
449.	13950	*Eremaea asterocarpa subsp. asterocarpa*			

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450.	5541	*Eremaea pauciflora*			
451.	5542	*Eremaea purpurea*			
452.	17175	*Eremophila glabra subsp. albicans*			
453.	1646	*Eriochilus dilatatus (White Bunny Orchid)*			
454.	6219	*Eryngium pinnatifidum (Blue Devils)*			
455.	15446	*Eryngium pinnatifidum subsp. pinnatifidum*			
456.	5545	*Eucalyptus accedens (Powderbark Wandoo)*			
457.	5708	*Eucalyptus marginata (Jarrah, Djara)*			
458.	13548	*Eucalyptus marginata subsp. thalassica (Blue-leaved Jarrah)*			
459.	5763	*Eucalyptus rudis (Flooded Gum, Kulurda)*			
460.	5790	*Eucalyptus todtiana (Coastal Blackbutt)*			
461.	5797	*Eucalyptus wandoo (Wandoo, Wondu)*			
462.	3872	*Euchilopsis linearis (Swamp Pea)*			
463.		*Eucyclops edytae*			Y
464.	4648	*Euphorbia terracina (Geraldton Carnation Weed)*	Y		
465.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
466.	25623	*Falco longipennis (Australian Hobby)*			
467.	24041	*Felis catus (Cat)*	Y		
468.	20216	*Ficinia nodosa (Knotted Club Rush)*			
469.	1747	*Ficus carica (Common Fig)*	Y		
470.	2969	*Fumaria capreolata (Whiteflower Fumitory)*	Y		
471.	32370	*Funaria hygrometrica*			
472.	900	*Gahnia aristata*			
473.	907	*Gahnia trifida (Coast Saw-sedge)*			
474.	7321	*Galium divaricatum*	Y		
475.	25729	*Gallinula tenebrosa (Dusky Moorhen)*			
476.		*Gambusia sp.*			
477.	3895	*Gastrolobium calycinum (York Road Poison)*			
478.	20473	*Gastrolobium ebracteolatum*			
479.	20483	*Gastrolobium linearifolium*			
480.	20512	*Gastrolobium praemorsum*			
481.	19733	*Gastrolobium retusum*			
482.	3924	*Gastrolobium spinosum (Prickly Poison)*			
483.	42314	*Gavicalis virescens (Singing Honeyeater)*			
484.	24959	*Gehyra variegata*			
485.	32380	*Gemmabryum pachythecum*			
486.	4339	*Geranium molle (Dove's Foot Cranesbill)*	Y		
487.	25530	*Gerygone fusca (Western Gerygone)*			
488.	1520	*Gladiolus caryophyllaceus (Wild Gladiolus)*	Y		
489.	1524	*Gladiolus undulatus (Wild Gladiolus)*	Y		
490.	6143	*Glischrocaryon aureum (Common Popflower)*			
491.	47962	*Glyciphila melanops (Tawny-crowned Honeyeater)*			
492.	7991	*Gnephosis drummondii*			
493.		*Gnephosis tenuissima - drummondii complex*			
494.		*Gnephosis tenuissima-drummondii complex*			
495.	10909	*Gompholobium confertum*			
496.	3950	*Gompholobium knightianum*			
497.	3951	*Gompholobium marginatum*			
498.	3955	*Gompholobium preissii*			
499.	11083	*Gompholobium scabrum*			
500.	3957	*Gompholobium tomentosum (Hairy Yellow Pea)*			
501.	6149	*Gonocarpus cordiger*			
502.	6159	*Gonocarpus nodulosus*			
503.	6161	*Gonocarpus pithyoides*			
504.	29362	*Goodenia coerulea*			
505.	12551	*Goodenia micrantha*			
506.	7538	*Goodenia pulchella*			
507.	24443	*Grallina cyanoleuca (Magpie-lark)*			
508.	7394	*Grammatotheca bergiana*	Y		
509.	14282	*Gratiola pubescens*			
510.	14106	*Grevillea althoferorum*			Y
511.	19628	*Grevillea bipinnatifida subsp. bipinnatifida*			
512.	1984	*Grevillea curviloba*			
513.	8836	*Grevillea obtusifolia (Obtuse Leaved Grevillea)*			
514.	2066	*Grevillea pilulifera (Woolly-flowered Grevillea)*			
515.	2080	*Grevillea quercifolia (Oak-leaf Grevillea)*			
516.	14421	*Grevillea synapheae subsp. synapheae*			
517.	12824	*Grevillea vestita subsp. vestita*			
518.		*Gripopterygidae sp.*			
519.		*Gyrinidae sp.*			

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520.	1465	*Haemodorum discolor*			
521.	1468	*Haemodorum laxum*			
522.	1470	*Haemodorum paniculatum (Mardja)*			
523.	1472	*Haemodorum simplex*			
524.	1474	*Haemodorum sparsiflorum*			
525.	1475	*Haemodorum spicatum (Mardja)*			
526.	2149	*Hakea cristata (Snail Hakea)*			
527.	2158	*Hakea erinacea (Hedge-hog Hakea)*			
528.	2166	*Hakea incrassata (Marble Hakea)*			
529.	2175	*Hakea lissocarpha (Honey Bush)*			
530.	2197	*Hakea prostrata (Harsh Hakea)*			
531.	2203	*Hakea ruscifolia (Candle Hakea)*			
532.	31413	*Hakea sp. Walyunga (B. Keighery 2599)*			
533.	2212	*Hakea sulcata (Furrowed Hakea)*			
534.	2215	*Hakea undulata (Wavy-leaved Hakea)*			
535.	2216	*Hakea varia (Variable-leaved Hakea)*			
536.	24295	*Haliastur sphenurus (Whistling Kite)*			
537.	3961	*Hardenbergia comptoniana (Native Wisteria)*			
538.		*Harpacticoida sp*			
539.		*Hebridae sp.*			
540.	25408	*Heleioporus albopunctatus (Western Spotted Frog)*			
541.	25409	*Heleioporus barycragus (Hooting Frog)*			
542.	25410	*Heleioporus eyrei (Moaning Frog)*			
543.	25411	*Heleioporus inornatus (Whooping Frog)*			
544.	3016	*Heliophila pusilla*	Y		
545.	11451	*Hemarthria uncinata var. uncinata*			
546.	6838	*Hemiandra linearis (Speckled Snakebush)*			
547.	6839	*Hemiandra pungens (Snakebush)*			
548.		*Hemicorduliidae sp.*			
549.	25115	*Hemiergis initialis subsp. initialis*			
550.	25119	*Hemiergis quadrilineata*			
551.	6842	*Hemigenia barbata*			
552.		*Henicops dentatus*			
553.	1526	*Hesperantha falcata*	Y		
554.	5108	*Hibbertia acerosa (Needle Leaved Guinea Flower)*			
555.	5112	*Hibbertia aurea*			
556.	5114	*Hibbertia commutata*			
557.	5134	*Hibbertia huegelii*			
558.	5135	*Hibbertia hypericoides (Yellow Buttercups)*			
559.	45534	*Hibbertia hypericoides subsp. hypericoides*			
560.	45533	*Hibbertia hypericoides subsp. septentrionalis*			
561.	5139	*Hibbertia lasiopus (Large Hibbertia)*			
562.	5162	*Hibbertia racemosa (Stalked Guinea Flower)*			
563.	5171	*Hibbertia spicata*			
564.	5172	*Hibbertia stellaris (Orange Stars)*			
565.	48381	*Hibbertia striata*			
566.	5173	*Hibbertia subvaginata*			
567.	47965	*Hieraaetus morphnoides (Little Eagle)*			
568.	24491	*Hirundo neoxena (Welcome Swallow)*			
569.	13758	*Histiopteris incisa*			
570.		*Holconia westralia*			
571.	444	*Holcus lanatus (Yorkshire Fog)*	Y		
572.	445	*Holcus setiger (Annual Fog)*	Y		
573.	6222	*Homalosciadium homalocarpum*			
574.	3968	*Hovea trisperma (Common Hovea)*			
575.	12907	*Hovea trisperma var. grandiflora*			
576.	12859	*Hovea trisperma var. trisperma*			
577.	12741	*Hyalosperma cotula*			
578.	5216	*Hybanthus calycinus (Wild Violet)*			
579.		*Hydridae sp.*			
580.	6223	*Hydrocotyle alata*			
581.	6226	*Hydrocotyle callicarpa (Small Pennywort)*			
582.	6229	*Hydrocotyle diantha*			
583.		*Hydroptilidae sp.*			
584.	5817	*Hypocalymma angustifolium (White Myrtle, Kudjid)*			
585.	35074	*Hypocalymma angustifolium subsp. Dandaragan plateau (S. Patrick 702A)*			
586.	35070	*Hypocalymma angustifolium subsp. Swan Coastal Plain (G.J. Keighery 16777)*			
587.	5825	*Hypocalymma robustum (Swan River Myrtle)*			
588.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
589.	1070	*Hypolaena exsulca*			

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590.		*Idiommata blackwalli*			
591.	910	*Isolepis cernua (Nodding Club-rush)*			
592.	20200	*Isolepis cernua var. setiformis*			
593.	912	*Isolepis cyperoides*			
594.	14540	*Isolepis hystrix*	Y		
595.	917	*Isolepis marginata (Coarse Club-rush)*			
596.	919	*Isolepis oldfieldiana*			
597.	921	*Isolepis producta*			
598.	2221	*Isopogon asper*			
599.	2229	*Isopogon dubius (Pincushion Coneflower)*			
600.	19996	*Isopogon sp. Darling Range (F. Hort 1662)*			
601.	7396	*Isotoma hypocrateriformis (Woodbridge Poison)*			
602.	3992	*Isotropis cuneifolia (Granny Bonnets)*			
603.	4010	*Jacksonia floribunda (Holly Pea)*			
604.	4012	*Jacksonia furcellata (Grey Stinkwood)*			
605.	4029	*Jacksonia sternbergiana (Stinkwood, Kapur)*			
606.	1298	*Johnsonia pubescens (Pipe Lily)*			
607.	19632	*Johnsonia pubescens subsp. pubescens*			
608.	1175	*Juncus acutus (Spiny Rush)*	Y		
609.	1178	*Juncus bufonius (Toad Rush)*	Y		
610.	1180	*Juncus capitatus (Capitate Rush)*	Y		
611.	1184	*Juncus holoschoenus (Jointleaf Rush)*			
612.	1188	*Juncus pallidus (Pale Rush)*			
613.	1190	*Juncus planifolius (Broadleaf Rush)*			
614.	1195	*Juncus subsecundus (Finger Rush)*			
615.	4044	*Kennedia prostrata (Scarlet Runner)*			
616.	11898	*Kickxia elatine subsp. elatine*	Y		
617.	5835	*Kunzea micrantha*			
618.	17461	*Kunzea micrantha subsp. micrantha*			
619.	17785	*Kunzea micrantha subsp. petiolata*			
620.	5841	*Kunzea recurva*			
621.	19955	*Lachnagrostis plebeia*			
622.	17209	*Lachnostachys verbascifolia var. verbascifolia*			
623.	18585	*Lagenophora huegelii*			
624.	14083	*Lambertia multiflora var. darlingensis*			
625.	5034	*Lasiopetalum glabratum*			
626.	45082	*Lasiopetalum glutinosum subsp. latifolium*			
627.	4052	*Latrobea tenella*			
628.	4959	*Lawrencia squamata*			
629.	1307	*Laxmannia ramosa (Branching Lily)*			
630.	11911	*Laxmannia ramosa subsp. ramosa*			
631.	11464	*Laxmannia sessiliflora subsp. australis*			
632.	1309	*Laxmannia squarrosa*			
633.	7568	*Lechenaultia biloba (Blue Leschenaultia)*			
634.	7572	*Lechenaultia expansa*			
635.	7574	*Lechenaultia floribunda (Free-flowering Leschenaultia)*			
636.	1051	*Lemna disperma (Duckweed)*			
637.	8099	*Leontodon saxatilis (Hairy Hawkbit)*	Y		
638.	1075	*Lepidobolus preissianus*			
639.	925	*Lepidosperma angustatum*			
640.	41620	*Lepidosperma asperatum*			
641.	936	*Lepidosperma leptostachyum*			
642.	937	*Lepidosperma longitudinale (Pithy Sword-sedge)*			
643.		*Lepidosperma sp.*			
644.	1653	*Leporella fimbriata (Hare Orchid)*			
645.	1077	*Leptocarpus canus (Hoary Twine-rush)*			
646.	1078	*Leptocarpus coangustatus*			
647.	1080	*Leptocarpus scariosus*			
648.		*Leptoceridae sp.*			
649.	2344	*Leptomeria empetriformis*			
650.	5847	*Leptospermum erubescens (Roadside Teatree)*			
651.	5850	*Leptospermum laevigatum (Coast Teatree)*	Y		
652.	5857	*Leptospermum spinescens*			
653.	1088	*Lepyrodia macra (Large Scale Rush)*			
654.	25133	*Lerista elegans*			
655.	25148	*Lerista lineopunctulata*			
656.	25165	*Lerista praepedita*			
657.		*Lethocolea pansa*			
658.	6374	*Leucopogon conostephioides*			
659.	6397	*Leucopogon glaucifolius*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
660.	6434	*Leucopogon polymorphus*			
661.	6436	*Leucopogon propinquus*			
662.	6439	*Leucopogon pulchellus (Beard-heath)*			
663.	7672	*Levenhookia octomaculata (Eight-spotted Stylewort)*			
664.	7676	*Levenhookia pusilla (Midget Stylewort)*			
665.	7677	*Levenhookia stipitata (Common Stylewort)*			
666.	25005	*Lialis burtonis*			
667.	25661	*Lichmera indistincta (Brown Honeyeater)*			
668.	25415	*Limnodynastes dorsalis (Western Banjo Frog)*			
669.	4363	*Linum trigynum (French Flax)*	Y		
670.	36160	*Liparophyllum capitatum*			
671.	25378	*Litoria adelaidensis (Slender Tree Frog)*			
672.	9289	*Lobelia anceps (Angled Lobelia)*			
673.	7408	*Lobelia tenuior (Slender Lobelia)*			
674.	476	*Lolium perenne (Perennial Ryegrass)*	Y		
675.	478	*Lolium rigidum (Wimmera Ryegrass)*	Y		
676.		*Lolium sp.*			
677.	1222	*Lomandra brittanii*			
678.	1223	*Lomandra caespitosa (Tufted Mat Rush)*			
679.	1228	*Lomandra hermaphrodita*			
680.	1232	*Lomandra micrantha (Small-flower Mat-rush)*			
681.	1234	*Lomandra nigricans*			
682.	1239	*Lomandra preissii*			
683.	1243	*Lomandra sericea (Silky Mat Rush)*			
684.	1246	*Lomandra suaveolens*			
685.	4059	*Lotus angustissimus (Narrowleaf Trefoil)*	Y		
686.		*Lotus sp. (Bull 08)*			Y
687.	8564	*Lotus subbiflorus*	Y		
688.	4065	*Lupinus angustifolius (Narrowleaf Lupin)*	Y		
689.	12783	*Lycopodiella serpentina*			
690.	1097	*Lyginia barbata*			
691.	18049	*Lyginia imberbis*			
692.		*Lymnaeidae sp.*			
693.	36375	*Lysimachia arvensis (Pimpernel)*	Y		
694.	6456	*Lysinema ciliatum (Curry Flower)*			
695.	34736	*Lysinema pentapetalum*			
696.	5281	*Lythrum hyssopifolia (Lesser Loosestrife)*	Y		
697.	2838	*Macarthuria apetala*			
698.	2839	*Macarthuria australis*			
699.	1477	*Macropidia fuliginosa (Black Kangaroo Paw)*			
700.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
701.	24135	*Macropus robustus subsp. erubescens (Euro, Biggada)*			
702.	18119	*Macrozamia fraseri*			
703.	85	*Macrozamia riedlei (Zamia, Djiridji)*			
704.	24551	*Malurus pulcherrimus (Blue-breasted Fairy-wren)*			
705.	25654	*Malurus splendens (Splendid Fairy-wren)*			
706.	24583	*Manorina flavigula (Yellow-throated Miner)*			
707.	17637	*Marianthus candidus (White Marianthus)*			
708.	17636	*Marianthus coeruleopunctatus (Blue-spotted Marianthus)*			
709.	4079	*Medicago polymorpha (Burr Medic)*	Y		
710.	5880	*Melaleuca bracteosa*			
711.	5881	*Melaleuca brevifolia*			
712.	5893	*Melaleuca concreta*			
713.	5900	*Melaleuca cuticularis (Saltwater Paperbark)*			
714.	5920	*Melaleuca huegelii (Chenille Honeymyrtle)*			
715.	5926	*Melaleuca lateritia (Robin Redbreast Bush)*			
716.	20297	*Melaleuca osullivanii*			
717.	18394	*Melaleuca parviceps*			
718.	5952	*Melaleuca preissiana (Moonah)*			
719.	5958	*Melaleuca radula (Graceful Honeymyrtle)*			
720.	5959	*Melaleuca rhaphiophylla (Swamp Paperbark)*			
721.	19365	*Melaleuca ryeae*			
722.	5964	*Melaleuca seriata*			
723.		*Melaleuca sp. B FPR (BJK&NG 054)*			Y
724.	5978	*Melaleuca teretifolia (Banbar)*			
725.	5983	*Melaleuca trichophylla*			
726.	5984	*Melaleuca uncinata (Broom Bush, Kwidjard)*			
727.	5987	*Melaleuca viminea (Mohan)*			
728.	13280	*Melaleuca viminea subsp. viminea*			
729.	4085	*Melilotus indicus*	Y		

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730.	25184	*Menetia greyii*			
731.	24598	*Merops ornatus (Rainbow Bee-eater)*			
732.		*Mesamphisopodidae sp.*			
733.	955	*Mesomelaena pseudostygia*			
734.	957	*Mesomelaena tetragona (Semaphore Sedge)*			
735.		*Mesostigmata sp.*			
736.	6897	*Microcorys longifolia*			
737.	485	*Microlaena stipoides (Weeping Grass)*			
738.	10954	*Microtis media (Tall Mignonette Orchid)*			
739.	15419	*Microtis media subsp. media*			
740.		*Microvelia sp.*			
741.	8105	*Millotia myosotidifolia*			
742.	8106	*Millotia tenuifolia (Soft Millotia)*			
743.	7085	*Misopates orontium (Lesser Snapdragon)*	Y		
744.		*Missulena granulosa*			
745.		*Mixocyclops sp.*			
746.	7410	*Monopsis debilis*	Y		
747.	37440	*Monopsis debilis var. depressa*	Y		
748.	4662	*Monotaxis grandiflora (Diamond of the Desert)*			
749.	19585	*Monotaxis grandiflora var. grandiflora*			
750.	4666	*Monotaxis occidentalis*			
751.	19179	*Moraea flaccida (One-leaf Cape Tulip)*	Y		
752.	19180	*Moraea miniata (Two-leaf Cape Tulip)*	Y		
753.	25240	*Morelia spilota subsp. imbricata (Carpet Python)*			
754.	25192	*Morethia obscura*			
755.	2412	*Muehlenbeckia adpressa (Climbing Lignum)*			
756.	24223	*Mus musculus (House Mouse)*	Y		
757.	25610	*Myiagra inquieta (Restless Flycatcher)*			
758.	25420	*Myobatrachus gouldii (Turtle Frog)*			
759.	7289	*Myoporum caprarioides (Slender Myoporum)*			
760.	8114	*Myriocephalus appendiculatus (White-tip Myriocephalus)*			
761.	8116	*Myriocephalus guerinae*			
762.	8117	*Myriocephalus helichrysoides*			
763.	6192	*Myriophyllum drummondii*			
764.	25248	*Neelaps bimaculatus (Black-naped Snake)*			
765.		*Nematoda sp.*			
766.	25426	*Neobatrachus pelobatoides (Humming Frog)*			
767.	24738	*Neophema elegans (Elegant Parrot)*			
768.		*Nephila edulis*			
769.	492	*Neurachne alopecuroidea (Foxtail Mulga Grass)*			
770.	6974	*Nicotiana glauca (Tree Tobacco)*	Y		
771.	25252	*Notechis scutatus (Tiger Snake)*			
772.		*Notonectidae sp.*			
773.	2401	*Nuytsia floribunda (Christmas Tree, Mudja)*			
774.	48027	*Nyctophilus geoffroyi subsp. geoffroyi (Lesser Long-eared Bat)*			
775.	24195	*Nyctophilus gouldi (Gould's Long-eared Bat)*			
776.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
777.	16347	*Oenothera laciniata*	Y		
778.	8133	*Olearia elaeophila*			
779.	32716	*Olearia lehmanniana*			
780.	8143	*Olearia paucidentata (Autumn Scrub Daisy)*			
781.		*Oligochaeta sp.*			
782.		*Oniscidae sp.*			
783.		*Oribatida sp.*			
784.	36177	*Ornduffia albiflora*			
785.	4113	*Ornithopus compressus (Yellow Serradella)*	Y		
786.	7122	*Orobanche minor (Lesser Broomrape)*	Y		
787.		*Orthocladiinae sp.*			
788.	24085	*Oryctolagus cuniculus (Rabbit)*	Y		
789.	4355	*Oxalis perennans*			
790.	4358	*Oxalis purpurea (Largeflower Wood Sorrel)*	Y		
791.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
792.		*Palaemonidae sp.*			
793.		*Paracyclops intermedius*			
794.		*Paracymus pygmaeus*			
795.		*Paralimnophyes pullulus (V42)*			
796.		*Paramerina levidensis*			
797.	516	*Parapholis incurva (Coast Barbgrass)*	Y		
798.	25253	*Parasuta gouldii*			
799.	25681	*Pardalotus punctatus (Spotted Pardalote)*			

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800.	24626	*Pardalotus punctatus subsp. xanthopyge (Yellow-rumped Pardalote)*			
801.	25682	*Pardalotus striatus (Striated Pardalote)*			
802.	7089	*Parentucellia latifolia (Common Bartsia)*	Y		
803.	1546	*Patersonia juncea (Rush Leaved Patersonia)*			
804.	1550	*Patersonia occidentalis (Purple Flag, Koma)*			
805.	30471	*Patersonia occidentalis var. angustifolia*			
806.	30472	*Patersonia occidentalis var. occidentalis*			
807.	43760	*Pauridia occidentalis*			
808.		*Pedidromus velox*			Y
809.	40422	*Pentameris pallida*	Y		
810.	11109	*Pericalymma crassipes*			
811.	6006	*Pericalymma ellipticum (Swamp Teatree)*			
812.	16477	*Pericalymma ellipticum var. ellipticum*			
813.	16478	*Pericalymma ellipticum var. floridum*			
814.	13911	*Persicaria decipiens*			
815.	2258	*Persoonia comata*			
816.	2273	*Persoonia saccata (Snottygobble)*			
817.	48061	*Petrochelidon nigricans (Tree Martin)*			
818.	48066	*Petroica boodang (Scarlet Robin)*			
819.	24659	*Petroica goodenovii (Red-capped Robin)*			
820.	20391	*Petrophile juncifolia*			
821.	2299	*Petrophile linearis (Pixie Mops)*			
822.	2301	*Petrophile macrostachya*			
823.	2308	*Petrophile seminuda*			
824.	2310	*Petrophile shuttleworthiana*			
825.	2312	*Petrophile striata*			
826.	19825	*Petrorhagia dubia*	Y		
827.	24666	*Phalacrocorax melanoleucos subsp. melanoleucos (Little Pied Cormorant)*			
828.		*Phalacrocorax sp.*			
829.	25699	*Phalacrocorax varius (Pied Cormorant)*			
830.	24409	*Phaps chalcoptera (Common Bronzewing)*			
831.	18529	*Philotheca spicata (Pepper and Salt)*			
832.	1172	*Philydrella drummondii*			
833.	1173	*Philydrella pygmaea (Butterfly Flowers)*			
834.	1478	*Phlebocarya ciliata*			
835.	1479	*Phlebocarya filifolia*			
836.	48071	*Phylidonyris niger (White-cheeked Honeyeater)*			
837.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
838.	4675	*Phyllanthus calycinus (False Boronia)*			
839.	4	*Phylloglossum drummondii (Pigmy Clubmoss)*			
840.		*Physidae sp.*			
841.		*Phytophthora cinnamomi*			
842.	5244	*Pimelea floribunda*			
843.	11404	*Pimelea imbricata var. major*			
844.	11402	*Pimelea imbricata var. piligera*			
845.		*Pisum sativum*			
846.		*Planorbidae sp.*			
847.	7304	*Plantago major (Greater Plantain)*	Y		
848.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
849.	24747	*Platycercus spurius (Red-capped Parrot)*			
850.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
851.	24750	*Platycercus zonarius subsp. semitorquatus (Twenty-eight Parrot)*			
852.	24751	*Platycercus zonarius subsp. zonarius (Port Lincoln Parrot)*			
853.	4524	*Platytheca galioides*			
854.	25509	*Pletholax gracilis (Keeled Legless Lizard)*			
855.	571	*Poa annua (Winter Grass)*	Y		
856.	573	*Poa drummondiana (Knotted Poa)*			
857.	577	*Poa poiformis (Coastal Poa)*			
858.	25703	*Podargus strigoides (Tawny Frogmouth)*			
859.	8175	*Podolepis gracilis (Slender Podolepis)*			
860.	8177	*Podolepis lessonii*			
861.	8179	*Podolepis nutans (Nodding Podolepis)*			
862.	8182	*Podotheca angustifolia (Sticky Longheads)*			
863.	8183	*Podotheca chrysantha (Yellow Podotheca)*			
864.	25510	*Pogona minor (Dwarf Bearded Dragon)*			
865.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
866.	8188	*Pogonolepis stricta*			
867.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
868.	35157	*Polypogon maritimus var. subspatheaceus*	Y		
869.	582	*Polypogon monspeliensis (Annual Beardgrass)*	Y		

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870.	583	*Polypogon tenellus*			
871.	30854	*Polytelis anthopeplus subsp. westralis (Regent Parrot)*			
872.	4691	*Poranthera microphylla (Small Poranthera)*			
873.	2884	*Portulaca oleracea (Purslane, Wakati)*			
874.	1669	*Prasophyllum cyphochilum (Pouched Leek Orchid)*			
875.	1672	*Prasophyllum fimbria (Fringed Leek Orchid)*			
876.	25261	*Pseudechis australis (Mulga Snake)*			
877.	25511	*Pseudonaja affinis (Dugite)*			
878.	25259	*Pseudonaja affinis subsp. affinis (Dugite)*			
879.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			
880.	25433	*Pseudophryne guentheri (Crawling Toadlet)*			
881.	13255	*Pterochaeta paniculata*			
882.		*Pterostylis aff. nana*			
883.	12217	*Pterostylis sanguinea*			
884.		*Pterostylis sp.*			
885.	1698	*Pterostylis vittata (Banded Greenhood)*			
886.	2716	*Ptilotus declinatus (Curved Mulla Mulla)*			
887.	11260	*Ptilotus drummondii var. drummondii (Pussytail)*			
888.	2742	*Ptilotus manglesii (Pom Poms, Mulamula)*			
889.	2751	*Ptilotus polystachyus (Prince of Wales Feather)*			
890.	4172	*Pultenaea ericifolia*			
891.	4181	*Pultenaea reticulata*			
892.		*Purpureicephalus spurius*			
893.	25008	*Pygopus lepidopodus (Common Scaly Foot)*			
894.	8195	*Quinetia urvillei*			
895.	2933	*Ranunculus muricatus (Sharp Buttercup)*	Y		
896.	24245	*Rattus rattus (Black Rat)*	Y		
897.	6012	*Regelia ciliata*			
898.	48096	*Rhipidura albiscapa (Grey Fantail)*			
899.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
900.	15035	*Rhodanthe corymbosa*			
901.	13312	*Rhodanthe pyrethrum*			
902.		*Richardsonianidae sp.*			
903.	1556	*Romulea rosea (Guildford Grass)*	Y		
904.	11544	*Romulea rosea var. australis (Guildford Grass)*	Y		
905.		*Rotifera sp.*			
906.	2432	*Rumex conglomeratus (Clustered Dock)*	Y		
907.	2433	*Rumex crispus (Curled Dock)*	Y		
908.	40425	*Rytidosperma caespitosum*			
909.	40426	*Rytidosperma occidentale*			
910.	40427	*Rytidosperma setaceum*			
911.	48433	*Salicornia blackiana*			
912.	6483	*Samolus junceus*			
913.		*Sarcocornia sp. Bull8 (#53)*			Y
914.	7595	*Scaevola anchusifolia*			
915.	7603	*Scaevola canescens (Grey Scaevola)*			
916.	7613	*Scaevola glandulifera (Viscid Hand-flower)*			
917.	7619	*Scaevola lanceolata (Long-leaved Scaevola)*			
918.	7634	*Scaevola phlebopetala (Velvet Fanflower)*			
919.	12585	*Scaevola repens*			
920.	13182	*Scaevola repens var. repens*			
921.	41660	*Schenkia australis*			
922.	24	*Schizaea fistulosa (Narrow Comb Fern)*			
923.	973	*Schoenus asperocarpus (Poison Sedge)*			
924.	978	*Schoenus brevisetis*			
925.	982	*Schoenus clandestinus*			
926.	984	*Schoenus curvifolius*			
927.	985	*Schoenus discifer*			
928.	987	*Schoenus elegans*			
929.	991	*Schoenus grammatophyllus*			
930.	994	*Schoenus humilis*			
931.	8312	*Schoenus maschalinus*			
932.	1002	*Schoenus nanus (Tiny Bog Rush)*			
933.	17614	*Schoenus plumosus*			
934.	1011	*Schoenus rigens*			
935.	1013	*Schoenus sculptus (Gimlet Bog-rush)*			
936.	16254	*Schoenus sp. G Broad Sheath (K.L. Wilson 2633)*			
937.	1017	*Schoenus subbulbosus*			
938.	1026	*Schoenus unispiculatus*			
939.	6033	*Scholtzia involucrata (Spiked Scholtzia)*			

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940.	6034	*Scholtzia laxiflora*			
941.		*Scolopendra laeta*			
942.	6	*Selaginella gracillima (Tiny Clubmoss)*			
943.	20663	*Senecio multicaulis subsp. multicaulis*			
944.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
945.	15972	*Silene gallica var. gallica*	Y		
946.	8224	*Siloxerus filifolius*			
947.	8225	*Siloxerus humifusus (Procumbent Siloxerus)*			
948.	25266	*Simoselaps bertholdi (Jan's Banded Snake)*			
949.		*Simuliidae sp.*			
950.	30948	*Smicrornis brevirostris (Weebill)*			
951.	6988	*Solanum americanum (Glossy Nightshade)*	Y		
952.	7013	*Solanum hoplopetalum (Thorny Solanum)*			
953.	7022	*Solanum nigrum (Black Berry Nightshade)*	Y		
954.	8230	*Sonchus asper (Rough Sowthistle)*	Y		
955.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
956.	1312	*Sowerbaea laxiflora (Purple Tassels)*			
957.	33636	*Spergularia brevifolia*			
958.	8900	*Spergularia marina*			
959.	4205	*Sphaerolobium linophyllum*			
960.	4211	*Sphaerolobium vimineum (Leafless Globe Pea)*			
961.	635	*Sporobolus virginicus (Marine Couch)*			
962.	4733	*Stackhousia monogyna*			
963.	24645	*Stagonopleura oculata (Red-eared Firetail)*			
964.		*Sternopriscus browni*			
965.	12856	*Stirlingia abrotanoides*			
966.	2316	*Stirlingia latifolia (Blueboy)*			
967.	25597	*Strepera versicolor (Grey Currawong)*			
968.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
969.	25518	*Strophurus spinigerus*			
970.	24943	*Strophurus spinigerus subsp. inornatus*			
971.	24942	*Strophurus spinigerus subsp. spinigerus*			
972.	7679	*Stylidium adpressum (Trigger-on-stilts)*			
973.	7681	*Stylidium affine (Queen Triggerplant)*			
974.	12846	*Stylidium albolilacinum*			
975.	7684	*Stylidium amoenum (Lovely Triggerplant)*			
976.	30278	*Stylidium androsaceum*			
977.	25831	*Stylidium araeophyllum (Stilt Walker)*			
978.	48457	*Stylidium bindoon*			
979.	7693	*Stylidium brunonianum (Pink Fountain Triggerplant)*			
980.	7694	*Stylidium bulbiferum (Circus Triggerplant)*			
981.	7696	*Stylidium calcaratum (Book Triggerplant)*			
982.	7698	*Stylidium caricifolium (Milkmaids)*			
983.	7709	*Stylidium crossocephalum (Posy Triggerplant)*			
984.	7710	*Stylidium cygnorum*			
985.	7712	*Stylidium despectum (Dwarf Triggerplant)*			
986.	7713	*Stylidium dichotomum (Pins-and-needles)*			
987.	7716	*Stylidium diuroides (Donkey Triggerplant)*			
988.	11808	*Stylidium diuroides subsp. diuroides*			
989.	7717	*Stylidium divaricatum (Daddy-long-legs)*			
990.	7719	*Stylidium ecorne (Foot Triggerplant)*			
991.	7734	*Stylidium guttatum (Dotted Triggerplant)*			
992.	7736	*Stylidium hispidum (White Butterfly Triggerplant)*			
993.	7742	*Stylidium inundatum (Hundreds and Thousands)*			
994.	7768	*Stylidium obtusatum (Pinafore Triggerplant)*			
995.	7773	*Stylidium petiolare (Horn Triggerplant)*			
996.	7774	*Stylidium piliferum (Common Butterfly Triggerplant)*			
997.	25837	*Stylidium purpureum (Purple Fountain Triggerplant)*			
998.	33106	*Stylidium recurvum*			
999.	7785	*Stylidium repens (Matted Triggerplant)*			
1000.	25806	*Stylidium scariosum*			
1001.	7798	*Stylidium schoenoides (Cow Kicks)*			
1002.	45594	*Stylidium tenue subsp. majusculum (Showy Fountain Triggerplant)*			
1003.	7806	*Stylidium utricularioides (Pink Fan Triggerplant)*			
1004.	3181	*Stylobasium australe*			
1005.	1260	*Stypandra glauca (Blind Grass)*			
1006.	6476	*Styphelia tenuiflora (Common Pinheath)*			
1007.	2321	*Synaphea acutiloba (Granite Synaphea)*			
1008.	2323	*Synaphea gracillima*			
1009.	2329	*Synaphea spinulosa*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1010.	15532	*Synaphea spinulosa subsp. spinulosa*			
1011.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
1012.	24207	*Tachyglossus aculeatus (Short-beaked Echidna)*			
1013.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
1014.	33020	*Tamarix parviflora*	Y		
1015.		*Tanypodinae sp.*			
1016.	24167	*Tarsipes rostratus (Honey Possum, Noolbenger)*			
1017.		*Tasmanicosa leuckartii*			
1018.	20135	*Taxandria linearifolia*			
1019.	4251	*Templetonia drummondii*			
1020.	1034	*Tetraria capillaris (Hair Sedge)*			
1021.	1036	*Tetraria octandra*			
1022.	667	*Tetrarrhena laevis (Forest Ricegrass)*			
1023.	48342	*Tetratheca hirsuta subsp. hirsuta*			
1024.	4537	*Tetratheca nuda*			
1025.		*Thelymitra aff. pauciflora*			
1026.	1701	*Thelymitra antennifera (Vanilla Orchid)*			
1027.	10856	*Thelymitra benthamiana (Leopard Orchid)*			
1028.	1705	*Thelymitra crinita (Blue Lady Orchid)*			
1029.	1707	*Thelymitra flexuosa (Twisted Sun Orchid)*			
1030.	20731	*Thelymitra vulgaris*			
1031.	5080	*Thomasia foliosa*			
1032.	5084	*Thomasia grandiflora (Large Flowered Thomasia)*			
1033.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
1034.	1318	*Thysanotus arbuscula*			
1035.	1319	*Thysanotus arenarius*			
1036.	1320	*Thysanotus asper (Hairy Fringe Lily)*			
1037.	1338	*Thysanotus manglesianus (Fringed Lily)*			
1038.		*Thysanotus manglesianus/patersonii complex*			
1039.	1339	*Thysanotus multiflorus (Many-flowered Fringe Lily)*			
1040.	1343	*Thysanotus patersonii*			
1041.	1351	*Thysanotus sparteus*			
1042.	1354	*Thysanotus tenellus*			
1043.	1357	*Thysanotus thyrsoideus*			
1044.	1358	*Thysanotus triandrus*			
1045.	25519	*Tiliqua rugosa*			
1046.	25207	*Tiliqua rugosa subsp. rugosa*			
1047.		*Tipulidae sp.*			
1048.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
1049.	8248	*Tolpis barbata (Yellow Hawkweed)*	Y		
1050.	6280	*Trachymene pilosa (Native Parsnip)*			
1051.	1481	*Tribonanthes australis (Southern Tiurndin)*			
1052.	1483	*Tribonanthes longipetala (Branching Tiurndin)*			
1053.	8251	*Trichocline spathulata (Native Gerbera)*			
1054.	25723	*Trichoglossus haematodus (Rainbow Lorikeet)*			
1055.	1361	*Tricoryne elatior (Yellow Autumn Lily)*			
1056.	1363	*Tricoryne tenella*			
1057.	4289	*Trifolium angustifolium (Narrowleaf Clover)*	Y		
1058.	17542	*Trifolium arvense var. arvense*	Y		
1059.	17763	*Trifolium campestre var. campestre (Hop Clover)*	Y		
1060.	4293	*Trifolium cernuum (Drooping Flower Clover)*	Y		
1061.	4295	*Trifolium dubium (Suckling Clover)*	Y		
1062.	4298	*Trifolium hirtum (Rose Clover)*	Y		
1063.	19039	*Triglochin bulbosa*	Y		
1064.	33676	*Triglochin calcitrapa*			
1065.	147	*Triglochin mucronata*			
1066.	148	*Triglochin muelleri*			
1067.	150	*Triglochin stowardii*			
1068.	4737	*Tripterococcus brunonis (Winged Stackhousia)*			
1069.	1139	*Trithuria bibracteata*			
1070.	4839	*Trymalium angustifolium*			
1071.	13479	*Trymalium ledifolium var. rosmarinifolium*			
1072.	33418	*Trymalium odoratissimum subsp. odoratissimum*			
1073.	99	*Typha orientalis (Bulrush, Cumbungi)*			
1074.	24852	*Tyto alba subsp. delicatula (Barn Owl)*			
1075.	24983	*Underwoodisaurus milii (Barking Gecko)*			
1076.		*Urodacus novaehollandiae*			
1077.	8255	*Ursinia anthemoides (Ursinia)*	Y		
1078.	38388	*Ursinia anthemoides subsp. anthemoides*	Y		
1079.	45906	*Ustilago tepperi*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1080.	7148	*Utricularia multifida*			
1081.	7153	*Utricularia tenella*			
1082.	7157	*Utricularia violacea (Violet Bladderwort)*			
1083.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
1084.	7665	*Velleia trinervis*			
1085.	8257	*Vellereophyton dealbatum (White Cudweed)*	Y		
1086.	7666	*Verreauxia reinwardtii (Common Verreauxia)*			
1087.	6076	*Verticordia densiflora (Compacted Featherflower)*			
1088.	15432	*Verticordia densiflora var. densiflora*			
1089.	15434	*Verticordia insignis subsp. insignis*			
1090.	6101	*Verticordia nitens (Morrison Featherflower, Kodjeningara)*			
1091.	6107	*Verticordia pennigera*			
1092.	6110	*Verticordia plumosa (Plumed Featherflower)*			
1093.	12449	*Verticordia plumosa var. brachyphylla*			
1094.	24206	*Vespadelus regulus (Southern Forest Bat)*			
1095.	4322	*Vicia sativa (Common Vetch)*	Y		
1096.	17042	*Vitis vinifera*	Y		
1097.	24040	*Vulpes vulpes (Red Fox)*	Y		
1098.	722	*Vulpia bromoides (Squirrel Tail Fescue)*	Y		
1099.	11018	*Vulpia muralis*	Y		
1100.	724	*Vulpia myuros (Rat's Tail Fescue)*	Y		
1101.	7384	*Wahlenbergia capensis (Cape Bluebell)*	Y		
1102.	7389	*Wahlenbergia preissii*			
1103.	8282	*Waitzia suaveolens (Fragrant Waitzia)*			
1104.	12072	*Wurmbea dioica subsp. alba*			
1105.	1249	*Xanthorrhoea acanthostachya*			
1106.	1252	*Xanthorrhoea drummondii*			
1107.	1253	*Xanthorrhoea gracilis (Graceful Grass Tree, Mimidi)*			
1108.	1256	*Xanthorrhoea preissii (Grass tree, Palga)*			
1109.	6284	*Xanthosia candida*			
1110.	6287	*Xanthosia fruticulosa*			
1111.	6289	*Xanthosia huegelii*			
1112.	1049	*Zantedeschia aethiopica (Arum Lily)*	Y		
1113.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

APPENDIX 3

Protected Matters Search Tool Report

Australian Government
Department of the Environment and Energy

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

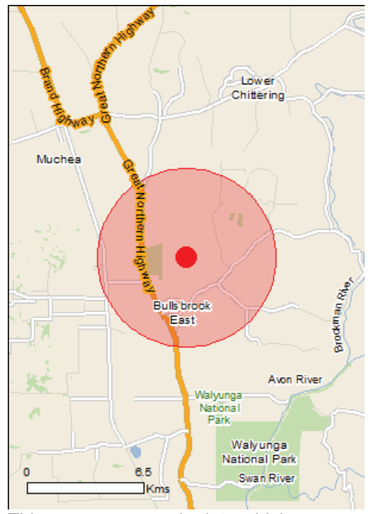
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 10/07/20 13:46:45

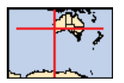
Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates
Buffer: 5.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	31
Listed Migratory Species:	8

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	12
Commonwealth Heritage Places:	None
Listed Marine Species:	13
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	2
Regional Forest Agreements:	1
Invasive Species:	37
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

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

Name	Status	Type of Presence
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area
Clay Pans of the Swan Coastal Plain	Critically Endangered	Community likely to occur within area
Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands of the Swan Coastal Plain	Endangered	Community known to occur within area
Shrublands and Woodlands on Muchea Limestone of the Swan Coastal Plain	Endangered	Community known to occur within area
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area
Calyptorhynchus latirostris Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Insects		
Leioproctus douglasiellus a short-tongued bee [66756]	Critically Endangered	Extinct within area
Mammals		

Name	Status	Type of Presence
Bettongia penicillata ogilbyi Woylie [66844]	Endangered	Species or species habitat may occur within area
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area
Other		
Westralunio carteri Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat may occur within area
Plants		
Acacia anomala Grass Wattle, Chittering Grass Wattle [8153]	Vulnerable	Species or species habitat known to occur within area
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat likely to occur within area
Anigozanthos viridis subsp. terraspectans Dwarf Green Kangaroo Paw [3435]	Vulnerable	Species or species habitat may occur within area
Anthocercis gracilis Slender Tailflower [11103]	Vulnerable	Species or species habitat may occur within area
Chamelaucium sp. Gingin (N.G.Marchant 6) Gingin Wax [88881]	Endangered	Species or species habitat may occur within area
Conospermum densiflorum subsp. unicephalatum One-headed Smokebush [64871]	Endangered	Species or species habitat may occur within area
Darwinia foetida Muchea Bell [83190]	Critically Endangered	Species or species habitat known to occur within area
Diplolaena andrewsii [6601]	Endangered	Species or species habitat likely to occur within area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat may occur within area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area
Eleocharis keigheryi Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat likely to occur within area
Eucalyptus leprophloia Scaly Butt Mallee, Scaly-butt Mallee [56712]	Endangered	Species or species habitat may occur within area
Grevillea althoferorum [64906]	Endangered	Species or species habitat likely to occur within area
Grevillea christineae Christine's Grevillea [64520]	Endangered	Species or species habitat likely to occur within area
Grevillea corrugata a shrub [65445]	Endangered	Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
Grevillea curviloba subsp. curviloba Curved-leaf Grevillea [64908]	Endangered	Species or species habitat known to occur within area
Grevillea curviloba subsp. incurva Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat likely to occur within area
Synaphea sp. Fairbridge Farm (D. Papenfus 696) Selena's Synaphea [82881]	Critically Endangered	Species or species habitat may occur within area
Thelymitra dedmaniarum Cinnamon Sun Orchid [65105]	Endangered	Species or species habitat likely to occur within area
Thelymitra stellata Star Sun-orchid [7060]	Endangered	Species or species habitat likely to occur within area

Listed Migratory Species [Resource Information]

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

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

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

Name
Commonwealth Land -
Defence - PEARCE - AP11OBSTRUCTION BEACON NO.5
Defence - PEARCE - AP15 WATER TREATMENT PLANT
Defence - PEARCE - AP17 WATER SUPPLY TANKS
Defence - PEARCE - AP2 OBSTRUCTION BEACON NO.2
Defence - PEARCE - AP4 AERIAL FARM
Defence - PEARCE - AP5 OPERATIONS SITE
Defence - PEARCE - AP6 OBSTRUCTION BEACON NO.3
Defence - PEARCE - AP7 OBSTRUCTION BEACON NO.1
Defence - PEARCE - AP9 OBSTRUCTION BEACON NO.4
Defence - PEARCE - RAAF BASE
Defence - VACANT LAND - BULLSBROOK AP102

Listed Marine Species [Resource Information]

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

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Haliaeetus leucogaster		
White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea		
Grey Wagtail [642]		Species or species habitat may occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus		
Osprey [952]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato)		
Painted Snipe [889]	Endangered*	Species or species habitat known to occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Bullsbrook	WA
Unnamed WA46564	WA

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

Name	State
South West WA RFA	Western Australia

Invasive Species [Resource Information]

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

Name	Status	Type of Presence
Birds		
Acridotheres tristis		
Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos		
Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis		
European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia		
Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus		
House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus		
Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Streptopelia chinensis		
Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Streptopelia senegalensis		
Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris		
Common Starling [389]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Funambulus pennantii Northern Palm Squirrel, Five-striped Palm Squirrel [129]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Genista linifolia Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-31.63779 116.03742

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

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

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

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

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APPENDIX 4

Conservation Codes

Conservation Codes for Western Australian Flora and Fauna

Specially protected fauna or flora are species* which have been adequately searched for and are deemed to be, in the wild, either rare, at risk of extinction, or otherwise in need of special protection, and have been gazetted as such. Conservation codes have been transitioned under regulations 170, 171 and 172 of the *Biodiversity Conservation Regulations 2018.*

T Threatened species – Schedules 1-4

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

- **Threatened fauna** is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.
- **Threatened flora** is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR Critically endangered species

Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN Endangered species

Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU Vulnerable species

Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife*

Conservation (Specially Protected Fauna) Notice 2018 for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

EX Presumed extinct species

Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW Extinct in the wild species

Species that "*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018.*

CD Species of special conservation interest (conservation dependent fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P Priority species

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

Priority 1: Poorly-known species

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

Priority 2: Poorly-known species

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

Priority 3: Poorly-known species

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

Priority 4: Rare, Near Threatened and other species in need of monitoring

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

*Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies or variety, or a distinct population).

Western Australian Ecological Communities

Threatened Ecological Communities

The BC Act provides for the statutory listing of threatened ecological communities (TECs) by the Minister.

Presumed Totally Destroyed (PD)

An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.

Critically Endangered (CR)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.

Endangered (EN)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

Vulnerable (VU)

An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

Priority Ecological Communities

Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community List under priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community. Ecological communities that are adequately known, and are rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

Priority One: Poorly-known ecological communities

Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤ 100ha).

Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.

Priority Two: Poorly-known ecological communities

Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

Priority Three: Poorly known ecological communities

(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:

(ii) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or;

(iii) munities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc.

Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.

Priority Four: Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.

(i) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands.

(ii) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for a higher threat category.

(iii) Ecological communities that have been removed from the list of threatened communities during the past five years.

Priority Five: Conservation Dependent ecological communities

Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Commonwealth of Australia Conservation Codes

Threatened Flora and Fauna

Threatened fauna and flora may be listed under Section 178 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in any one of the following six categories:

Extinct

A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.

Extinct in the wild

A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time:

a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.

Critically endangered

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing an extremely high risk of extinction in the wild.

Endangered

A taxon is Endangered when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing a very high risk of extinction in the wild.

Vulnerable

A taxon is Vulnerable when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing a high risk of extinction in the wild.

Conservation dependent

A native species is eligible to be included in the conservation dependent category at a particular time if, at that time:

a) the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or
b) the following subparagraphs are satisfied:
   i. the species is a species of fish;

ii. the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised;
iii. the plan of management is in force under a law of the Commonwealth or of a State or Territory;
iv. cessation of the plan of management would adversely affect the conservation status of the species.

The EPBC Act does not provide for listing in a data deficient category. Where sufficient data (evidence) is unavailable to allow assessment by the Threatened Species Scientific Committee against the criteria for listing, the species are found to be ineligible. A recommendation is made to the Minister to not include the species in any category under the EPBC Act. For reasons of transparency and to inform future research, the Threatened Species Scientific Committee publishes the names of those species found to be data deficient. As data deficient is not a listing category under the EPBC Act, this has no statutory implications and the species is not considered to be listed under the EPBC Act.

Threatened Ecological Communities

Threatened Ecological communities under the EPBC Act are listed in three categories.

Critically endangered

If, at that time, an ecological community is facing an extremely high risk of extinction in the wild in the immediate future (indicative timeframe being the next 10 years).

Endangered

If, at that time, an ecological community is not critically endangered but is facing a very high risk of extinction in the wild in the near future (indicative timeframe being the next 20 years).

Vulnerable

If, at that time, an ecological community is not critically endangered or endangered, but is facing a high risk of extinction in the wild in the medium–term future (indicative timeframe being the next 50 years).

APPENDIX 5

TEC/PEC Database Search

OCC_UNIQUE	COM_ID	COM_NAME	STATE_CATG	COMM_CATG	S_ID_COUNT	FIRST_S_ID	LAST_S_ID	BUFFER	BDY_ID	ORIG_FID
217	SCP07	Herb rich saline shrublands in clay pans (floristic community type 7 as originally described in Gibson et al. (1994))	Vulnerable	Critically Endangered	2	BULL06	BULL08	500	216	120
1832	SCP3a	Corymbia calophylla - Kingia australis woodlands on heavy soils, Swan Coastal Plain (floristic community type 3a as originally described in Gibson et al. (1994))	Critically Endangered	Endangered	2	CHITTERING PLOT1	CHITTERING01	500	222	126
933	Muchea Limestone	Shrublands and woodlands on Muchea Limestone of the Swan Coastal Plain	Endangered	Endangered	2	mypearce01	mypearce08	2000	227	130
114	SCP3c	Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in in Gibson et al. (1994))	Critically Endangered	Endangered	1	PEARCE02		500	230	133
509	SCP3c	Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in in Gibson et al. (1994))	Critically Endangered	Endangered	1	MYPEARCE05		500	231	134
507	SCP3c	Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in in Gibson et al. (1994))	Critically Endangered	Endangered	1	MYPEARCE03		500	232	135
508	SCP3c	Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in in Gibson et al. (1994))	Critically Endangered	Endangered	1	MYPEARCE04		500	233	136
932	SCP08	Herb rich shrublands in clay pans (floristic community type 8 as originally described in Gibson et al. (1994))	Vulnerable	Critically Endangered	2	mypearce07	xPearce02	500	234	137

OCC_UNIQUE	COM_ID	COM_NAME	STATE_CATG	COMM_CATG	S_ID_COUNT	FIRST_S_ID	LAST_S_ID	BUFFER	BDY_ID	ORIG_FID
506	SCP3c	Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in in Gibson et al. (1994))	Critically Endangered	Endangered	1	MYPEARCE02		500	235	138
1923	SCP3c	Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in in Gibson et al. (1994))	Critically Endangered	Endangered	1	MYPEARCE09		500	578	446
1924	SCP3c	Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in in Gibson et al. (1994))	Critically Endangered	Endangered	1	MYPEARCE10		500	579	447
2556	Mound Springs SCP	Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain)	Critically Endangered	Endangered	2	GastonRd	Nursery01	2000	1159	939
2512	Mound Springs SCP	Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain)	Critically Endangered	Endangered	1	Alpaca01		2000	1160	940
5060	SCP3c	Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in in Gibson et al. (1994))	Critically Endangered	Endangered	1	PearceSth01		500	3002	2589
113908	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld08190		200	110907	23101
113909	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld08191		200	110908	23102
113944	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld08226		200	110943	23137

OCC_UNIQUE	COM_ID	COM_NAME	STATE_CATG	COMM_CATG	S_ID_COUNT	FIRST_S_ID	LAST_S_ID	BUFFER	BDY_ID	ORIG_FID
114943	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld09225		200	111942	24136
114944	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld09226		200	111943	24137
118873	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13155		200	115872	28061
118874	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13156		200	115873	28062
118875	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13157		200	115874	28063
118876	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13158		200	115875	28064
118880	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13162		200	115879	28068
118881	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13163		200	115880	28069
118882	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13164		200	115881	28070
118883	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13165		200	115882	28071
118893	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13175		200	115892	28081
118894	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13176		200	115893	28082
118898	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13180		200	115897	28086
118899	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13181		200	115898	28087
118900	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13182		200	115899	28088
118901	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13183		200	115900	28089

OCC_UNIQUE	COM_ID	COM_NAME	STATE_CATG	COMM_CATG	S_ID_COUNT	FIRST_S_ID	LAST_S_ID	BUFFER	BDY_ID	ORIG_FID
118902	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13184		200	115901	28090
118903	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13185		200	115902	28091
118904	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13186		200	115903	28092
118905	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13187		200	115904	28093
118906	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13188		200	115905	28094
118907	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13189		200	115906	28095
118908	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13190		200	115907	28096
118909	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13191		200	115908	28097
118910	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13192		200	115909	28098
118911	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13193		200	115910	28099
118912	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13194		200	115911	28100
118913	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13195		200	115912	28101
118914	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13196		200	115913	28102
118915	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13197		200	115914	28103
118916	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13198		200	115915	28104
118917	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13199		200	115916	28105

OCC_UNIQUE	COM_ID	COM_NAME	STATE_CATG	COMM_CATG	S_ID_COUNT	FIRST_S_ID	LAST_S_ID	BUFFER	BDY_ID	ORIG_FID
118918	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13200		200	115917	28106
118919	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13201		200	115918	28107
118920	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13202		200	115919	28108
118921	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13203		200	115920	28109
118922	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13204		200	115921	28110
118923	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13205		200	115922	28111
118924	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13206		200	115923	28112
118925	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13207		200	115924	28113
118926	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13208		200	115925	28114
118927	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13209		200	115926	28115
118933	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13215		200	115932	28121
118941	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13223		200	115940	28129
118947	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13229		200	115946	28135
118951	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13233		200	115950	28139
118952	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13234		200	115951	28140
118953	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13235		200	115952	28141

OCC_UNIQUE	COM_ID	COM_NAME	STATE_CATG	COMM_CATG	S_ID_COUNT	FIRST_S_ID	LAST_S_ID	BUFFER	BDY_ID	ORIG_FID
118954	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13236		200	115953	28142
118955	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13237		200	115954	28143
118956	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13238		200	115955	28144
118957	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13239		200	115956	28145
118958	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13240		200	115957	28146
118959	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13241		200	115958	28147
118960	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13242		200	115959	28148
118961	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13243		200	115960	28149
118962	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13244		200	115961	28150
118964	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13246		200	115963	28152
118965	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13247		200	115964	28153
118966	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13248		200	115965	28154
118967	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13249		200	115966	28155
118968	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13250		200	115967	28156
118970	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13252		200	115969	28158
118971	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13253		200	115970	28159

OCC_UNIQUE	COM_ID	COM_NAME	STATE_CATG	COMM_CATG	S_ID_COUNT	FIRST_S_ID	LAST_S_ID	BUFFER	BDY_ID	ORIG_FID
118972	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13254		200	115971	28160
118975	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13257		200	115974	28163
118982	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13264		200	115981	28170
118983	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13265		200	115982	28171
118993	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13275		200	115992	28181
118994	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13276		200	115993	28182
118995	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13277		200	115994	28183
118996	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13278		200	115995	28184
118997	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13279		200	115996	28185
118999	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13281		200	115998	28187
119000	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13282		200	115999	28188
119001	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13283		200	116000	28189
119002	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13284		200	116001	28190
119003	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13285		200	116002	28191
119004	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13286		200	116003	28192
119022	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13304		200	116021	28210

OCC_UNIQUE	COM_ID	COM_NAME	STATE_CATG	COMM_CATG	S_ID_COUNT	FIRST_S_ID	LAST_S_ID	BUFFER	BDY_ID	ORIG_FID
119023	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13305		200	116022	28211
119025	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13307		200	116024	28213
119026	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13308		200	116025	28214
119027	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13309		200	116026	28215
119036	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13318		200	116035	28224
119037	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13319		200	116036	28225
119038	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13320		200	116037	28226
119039	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13321		200	116038	28227
119040	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13322		200	116039	28228
119042	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13324		200	116041	28230
119044	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13326		200	116043	28232
119046	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13328		200	116045	28234
119047	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13329		200	116046	28235
119048	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13330		200	116047	28236
119050	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13332		200	116049	28238
119051	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13333		200	116050	28239

OCC_UNIQUE	COM_ID	COM_NAME	STATE_CATG	COMM_CATG	S_ID_COUNT	FIRST_S_ID	LAST_S_ID	BUFFER	BDY_ID	ORIG_FID
119052	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13334		200	116051	28240
119053	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13335		200	116052	28241
119054	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13336		200	116053	28242
119055	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13337		200	116054	28243
119056	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13338		200	116055	28244
119057	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13339		200	116056	28245
119058	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13340		200	116057	28246
119059	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13341		200	116058	28247
119060	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13342		200	116059	28248
119061	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13343		200	116060	28249
119062	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13344		200	116061	28250
119063	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13345		200	116062	28251
119064	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13346		200	116063	28252
119079	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13361		200	116078	28267
119225	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13507		200	116224	28413
119228	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13510		200	116227	28416

OCC_UNIQUE	COM_ID	COM_NAME	STATE_CATG	COMM_CATG	S_ID_COUNT	FIRST_S_ID	LAST_S_ID	BUFFER	BDY_ID	ORIG_FID
119229	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13511		200	116228	28417
119230	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13512		200	116229	28418
119231	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13513		200	116230	28419
119234	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13516		200	116233	28422
122086	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16368		200	119085	31272
122087	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16369		200	119086	31273
122260	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16542		200	119259	31446
122261	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16543		200	119260	31447
122262	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16544		200	119261	31448
122263	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16545		200	119262	31449
122264	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16546		200	119263	31450
122265	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16547		200	119264	31451
122266	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16548		200	119265	31452
122267	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16549		200	119266	31453
122268	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16550		200	119267	31454
122269	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16551		200	119268	31455

OCC_UNIQUE	COM_ID	COM_NAME	STATE_CATG	COMM_CATG	S_ID_COUNT	FIRST_S_ID	LAST_S_ID	BUFFER	BDY_ID	ORIG_FID
122270	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16552		200	119269	31456
122282	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16564		200	119281	31468
122283	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16565		200	119282	31469
122502	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16784		200	119501	31688
122503	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16785		200	119502	31689
118963	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13245		200	115962	28151
118969	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13251		200	115968	28157
119041	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13323		200	116040	28229
119043	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13325		200	116042	28231
119045	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13327		200	116044	28233
119049	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13331		200	116048	28237
5054	SCP08	Herb rich shrublands in clay pans (floristic community type 8 as originally described in Gibson et al. (1994))	Vulnerable	Critically Endangered	1	xpearce01		500	0	804

APPENDIX 6

Flora Species List

SPECIES LIST – Bullsbrook North

PTERIDOPHYTA

PTERIDACEAE
Cheilanthes austrotenuifolia

MONOCOTYLEDONS

ANARTHRIACEAE
Lyginia barbata

ARACEAE
**Zantedeschia aethiopica*

ASPARAGACEAE
Chamaescilla corymbosa
Lomandra hermaphrodita
Lomandra caespitosa
Lomandra preissii
Lomandra purpurea
Sowerbaea laxiflora
Thysanotus manglesianus
Thysanotus patersonii

BORYACEAE
Borya sphaerocephala

COLCHICACEAE
Burchardia congesta

CYPERACEAE
Caustis dioica
Chaetospora curvifolia
Isolepis marginata
Lepidosperma leptostachyum
Lepidosperma pubisquameum
Lepidosperma squamatum
Mesomelaena pseudostygia
Mesomelaena tetragona
Morelotia octandra

DASYPOGONACEAE
Dasypogon bromeliifolius

HAEMODORACEAE
Anigozanthos humilis
Conostylis aculeata
Conostylis aurea
Conostylis setigera subsp. *setigera*
Haemodorum laxum
Haemodorum spicatum

HEMEROCALLIDACEAE
Caesia micrantha

IRIDACEAE
**Freesia alba x leichtlinii*
**Gladiolus caryophyllaceus*
**Hesperantha falcata*
Orthrosanthus laxus
Patersonia occidentalis
**Romulea rosea*

ORCHIDACEAE
Caladenia flava
Pterostylis ectypha

POACEAE
**Avena fatua*
**Briza maxima*
**Bromus diandrus*
**Ehrharta calycina*
**Ehrharta longiflora*
**Eragrostis curvula*
**Lolium perenne*
Neurachne alopecuroidea

RESTIONACEAE
Desmocladus fasciculatus
Desmocladus flexuosus
Leptocarpus scariosus

XANTHORRHOEACEAE
Xanthorrhoea brunonis
Xanthorrhoea gracilis
Xanthorrhoea preissii

DICOTYLEDONS

AMARANTHACEAE
Ptilotus manglesii

APIACEAE
Homalosciadium homalocarpum

ARALIACEAE
Hydrocotyle intertexta
Trachymene pilosa

ASTERACEAE
**Arctotheca calendula*
**Cotula turbinata*
Hyalosperma cotula
**Hypochaeris glabra*
Lagenophora huegelii
Millotia myosotidifolia
**Monoculus monstrosus*
Podolepis gracilis
Podotheca angustifolia
Podotheca gnaphalioides
Siloxerus humifusus
**Taraxacum officinale*
Trichocline spathulata
**Urospermum picroides*
**Ursinia anthemoides*
**Vellereophyton dealbatum*

BORAGINACEAE
**Echium plantagineum*

CAMPANULACEAE
**Wahlenbergia capensis*

CARYOPHYLLACEAE
**Cerastium glomeratum*
**Silene gallica*
**Stellaria media*

CELASTRACEAE
Tripterococcus brunonis

CRASSULACEAE
Crassula colorata

DILLENIACEAE
Hibbertia commutata
Hibbertia huegelii
Hibbertia hypericoides

DROSERACEAE
Drosera erythrorhiza
Drosera glanduligera
Drosera macrantha
Drosera menziesii

ELAEOCARPACEAE
Platytheca galioides

ERICACEAE
Styphelia macrocalyx
Styphelia pallida

EUPHORBIACEAE
**Euphorbia peplus*

FABACEAE
Acacia anomala **T**
Acacia drummondii subsp. *drummondii*
Acacia nervosa
**Acacia podalyriifolia*
Acacia pulchella
Acacia stenoptera
Daviesia divaricata
Daviesia nudiflora
Daviesia physodes
Daviesia preissii
Dillwynia laxiflora
Gastrolobium bilobum
Gastrolobium spinosum
Gompholobium marginatum
Hovea chorizemifolia
Jacksonia sternbergiana
Kennedia prostrata
Labichea punctata
**Lotus subbiflorus*
**Lupinus cosentinii*
**Ornithopus compressus*
Sphaerolobium medium
**Trifolium angustifolium*
**Trifolium arvense*
**Trifolium campestre*
**Trifolium hirtum*

FUMARIACEAE
**Fumaria capreolata*

GERANIACEAE
**Erodium botrys*
**Erodium cicutarium*

GOODENIACEAE
Lechenaultia biloba

LORANTHACEAE
Amyema miquelii
Nuytsia floribunda

MYRTACEAE
Calytrix flavescens
Corymbia calophylla
Eremaea pauciflora
Eucalyptus marginata
Eucalyptus rudis
Eucalyptus todtiana
Eucalyptus wandoo
Verticordia densiflora

OROBANCHACEAE
**Orobanche minor*

OXALIDACEAE
**Oxalis purpurea*

PHYLLANTHACEAE
Phyllanthus calycinus
Poranthera microphylla

PRIMULACEAE
**Lysimachia arvensis*

PROTEACEAE
Banksia kippistiana
Banksia dallanneyi
Banksia sessilis
Grevillea bipinnatifida
Hakea lissocarpha
Hakea prostrata
Hakea ruscifolia
Petrophile linearis

RHAMNACEAE
Cryptandra arbutiflora

RUBIACEAE
**Galium murale*

SCROPHULARIACEAE
**Dischisma arenarium*
**Dischisma capitatum*

STYLIDIACEAE
Stylidium amoenum
Stylidium piliferum
Stylidium scariosum
Stylidium sp.

THYMELEACEAE
Pimelea floribunda
Pimelea imbricata

VIOLACEAE
Hybanthus calycinus

APPENDIX 7

Quadrat Data

QUADRAT BN 1

50 408968 E 6499423 N

Vegetation: *Corymbia calophylla* (Marri) Woodland over *Xanthorrhoea preissii* Low Shrubland
Condition: Very Good
Soil Type: Orange sandy loam, small laterite boulders
Landform: Moderate slope
Date: 2 September 2021
Recorder: Paul van der Moezel



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Corymbia calophylla	8	15
Xanthorrhoea preissii	1	10
Xanthorrhoea brunonis	0.8	10
Lepidosperma squamatum	0.5	1
Morelotia octandra	0.4	20
Cryptandra arbutiflora	0.4	5
Mesomelaena pseudostygia	0.4	5
Sowerbaea laxiflora	0.4	<1
Hakea lissocarpha	0.3	2
Hibbertia hypericoides	0.3	1
Banksia dallanneyi	0.3	<1
Conostylis setigera	0.3	<1
Acacia nervosa	0.2	1
Ptilotus manglesii	0.2	<1
Stylidium scariosum	0.2	<1
Chamaescilla corymbosa	0.1	2
**Freesia alba x leichtlinii*	0.1	2

SPECIES	HEIGHT (m)	COVER (%)
Desmocladus fascicularis	0.1	2
Caladenia flava	0.1	<1
Trachymene pilosa	0.1	<1
**Galium murale*	<0.1	<1
Lagenophora huegelii	Flat	<1
Drosera erythrorhiza	Flat	2
Amyema miquelii	Parasite	<1
Drosera macrantha	Climber	<1
Thysanotus patersonii	Climber	<1

* introduced species

QUADRAT BN 2

50 408985 E 6499596 N

Vegetation: *Eucalyptus wandoo* (Wandoo) Woodland over bare ground
Condition: Degraded
Soil Type: Orange sandy loam, small laterite rocks
Landform: Top of low ridge
Date: 2 September 2021
Recorder: Paul van der Moezel



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Eucalyptus wandoo	12	20
**Gladiolus caryophyllaceus*	0.4	<1
**Ursinia anthemoides*	0.3	<1
Hibbertia commutata	0.2	<1
**Lysimachia arvensis*	0.2	<1
**Romulea rosea*	0.2	<1
Trachymene pilosa	0.1	<1
**Hypochaeris glabra*	Flat	1

* introduced species

QUADRAT BN 3

50 408466 E 6499633 N

Vegetation: *Eucalyptus wandoo* (Wandoo) Woodland over *Banksia sessilis* Shrubland over bare ground
Condition: Degraded
Soil Type: Gravel, some laterite rocks
Landform: Gentle slope
Date: 2 September 2021
Recorder: Paul van der Moezel



Quadrat (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Eucalyptus wandoo	12	10
Banksia sessilis	1.5-2.2	20
Leptospermum roei	1.9	2
Caladenia flava	0.2	<1
Gompholobium marginatum	0.2	<1
**Romulea rosea*	0.1	<1
Siloxerus humifusus	0.1	<1
**Ursinia anthemoides*	0.1	<1
Trachymene pilosa	<0.1	<1

* introduced species

QUADRAT BN 4

50 407673 E 6498692 N

Vegetation: *Corymbia calophylla* (Marri) Woodland over *Xanthorrhoea preissii/Hibbertia hypericoides* Open Low Heath
Condition: Very Good
Soil Type: Orange-brown sand
Landform: Flat
Date: 2 September 2021
Recorder: Paul van der Moezel



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Corymbia calophylla	10	15
Xanthorrhoea preissii	1	5
Xanthorrhoea brunonis	1	<1
Acacia pulchella	0.6	<1
Haemodorum laxum	0.5	<1
Lepidosperma leptostachyum	0.5	<1
Hibbertia hypericoides	0.4	15
Mesomelaena pseudostygia	0.4	5
Lepidosperma pubisquameum	0.4	1
Morelotia octandra	0.4	<1
Daviesia angulata	0.4	<1
Burchardia congesta	0.4	<1
Sowerbaea laxiflora	0.4	<1
Patersonia occidentalis	0.4	<1
**Gladiolus caryophyllaceus*	0.4	<1
Caustis dioica	0.3	10
**Romulea rosea*	0.2	1

SPECIES	HEIGHT (m)	COVER (%)
Lomandra hermaphrodita	0.2	<1
Conostylis setigera	0.2	<1
**Ursinia anthemoides*	0.1	1
Trachymene pilosa	0.1	1
**Ehrharta longiflora*	0.1	1
**Briza maxima*	0.1	1
**Dischisma arenarium*	0.1	<1
**Hypochaeris glabra*	Flat	1
Drosera erythrorhiza	Flat	<1
Thysanotus patersonii	Climber	<1

* introduced species

QUADRAT BN 5

50 408054 E 6498758 N

Vegetation: *Corymbia calophylla* (Marri) Woodland over *Xanthorrhoea preissii* Low Shrubland
Condition: Good
Soil Type: Light orange-brown sand
Landform: Flat
Date: 2 September 2021
Recorder: Paul van der Moezel



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Corymbia calophylla	15	10
Xanthorrhoea preissii	1.1	10
Acacia pulchella	0.8	1
Mesomelaena pseudostygia	0.5	2
**Romulea rosea*	0.4	10
Morelotia octandra	0.3	2
**Moraea flaccida*	0.3	<1
**Ehrharta calycina*	0.2	10
**Ursinia anthemoides*	0.2	<1
Desmocladus flexuosus	0.1	20
**Gladiolus caryophyllaceus*	0.1	<1
**Trifolium angustifolium*	<0.1	<1
**Hypochaeris glabra*	Flat	5
**Arctotheca calendula*	Flat	<1

* introduced species

QUADRAT BN 6

50 407808 E 6498532 N

Vegetation: *Corymbia calophylla* (Marri) Woodland over *Xanthorrhoea preissii/Caustis dioica/Mesomelaena pseudostygia* Open Low Heath
Condition: Good
Soil Type: Dark orange-brown loamy sand
Landform: Gentle Slope
Date: 2 September 2021
Recorder: Paul van der Moezel



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Corymbia calophylla	15	15
Xanthorrhoea preissii	1	2
Xanthorrhoea brunonis	0.8	1
Mesomelaena pseudostygia	0.5	20
Caustis dioica	0.4	20
Hibbertia hypericoides	0.4	1
**Romulea rosea*	0.3	2
Morelotia octandra	0.3	<1
Neurachne alopecuroidea	0.2	1
Lepidobolus preissianus	0.2	1
**Ursinia anthemoides*	0.2	<1
Conostylis setigera	0.2	<1
**Ehrharta longiflora*	0.1	2
Caladenia flava	0.1	<1
Borya sphaerocephala	0.1	<1
Anigozanthos humilis	0.1	<1
Crassula colorata	<0.1	<1

SPECIES	HEIGHT (m)	COVER (%)
**Hypochaeris glabra*	Flat	2
**Arctotheca calendula*	Flat	<1
Thysanotus manglesianus	Climber	<1
Drosera macrantha	Climber	<1
Drosera menziesii	Climber	<1

* introduced species

QUADRAT BN 7

50 408647 E 6498593 N

Vegetation: *Eucalyptus wandoo* (Wandoo) Woodland over weeds
Condition: Completely Degraded
Soil Type: Dark brown loamy sand
Landform: Top of low rise
Date: 6 October 2021
Recorder: Paul van der Moezel



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Eucalyptus wandoo	25	25
**Ehrharta longiflora*	0.3	60
**Bromus diandrus*	0.2	1
**Lolium perenne*	0.2	<1
**Spergularia arvensis*	0.1	1
**Trifolium campestre*	<0.1	<1
**Taraxacum officinale*	Flat	<1

* introduced species

QUADRAT BN 8

50 408299 E 6498259 N

Vegetation: *Eucalyptus marginata* (Jarrah) Woodland over weeds
Condition: Completely Degraded
Soil Type: Dark brown loamy sand
Landform: Gentle slope
Date: 6 October 2021
Recorder: Paul van der Moezel



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Eucalyptus marginata	20	25
**Ehrharta longiflora*	0.4	80
**Avena fatua*	0.6	<1
**Lolium perenne*	0.4	5
**Ursinia anthemoides*	0.3	<1
**Trifolium campestre*	0.1	2
**Lupinus cosentinii*	0.1	<1
**Taraxacum officinale*	Flat	10
**Hypochaeris glabra*	Flat	5

* introduced species

QUADRAT BN 9

50 408395 E 6498098 N

Vegetation: *Xanthorrhoea preissii* Open Heath over weeds
Condition: Good
Soil Type: Orange-brown sand
Landform: Gentle slope
Date: 6 October 2021
Recorder: Paul van der Moezel



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Hakea prostrata	1.9	2
Xanthorrhoea preissi	1.1	40
**Gladiolus caryophyllaceus*	0.6	<1
Acacia pulchella	0.5	1
Burchardia congesta	0.5	<1
Daviesia preissii	0.4	1
Phyllanthus calycinus	0.4	<1
Hibbertia hypericoides	0.4	<1
Podolepis gracilis	0.4	<1
Neurachne alopecuroidea	0.4	<1
**Ehrharta calycina*	0.3	70
**Silene gallica*	0.3	1
**Petrorhagia dubia*	0.3	<1
Podotheca gnaphalioides	0.3	<1
Banksia dallanneyi	0.3	<1
**Ursinia anthemoides*	0.2	1
Astroloma macrocalyx	0.2	<1
Lomandra preissii	0.2	<1
**Wahlenbergia capensis*	0.2	<1
Hyalosperma cotula	0.1	<1
**Dischisma arenarium*	0.1	<1
**Erodium botrys*	<0.1	<1
Crassula colorata	<0.1	<1
**Hypochaeris glabra*	Flat	1
**Taraxacum officinale*	Flat	<1

* introduced species

QUADRAT BN 10

50 408251 E 6498082 N

Vegetation: *Corymbia calophylla* (Marri)*/Eucalyptus marginata* (Jarrah) Woodland over *Xanthorrhoea preissii/Daviesia nudiflora* Open Low Heath

Condition: Good

Soil Type: Yellow-brown sand

Landform: Gentle slope

Date: 6 October 2021

Recorder: Paul van der Moezel



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Corymbia calophylla	22	25
Eucalyptus marginata	20	10
Xanthorrhoea preissii	1	5
Daviesia nudiflora	0.9	5
**Gladiolus caryophyllaceus*	0.5	<1
Phyllanthus calycinus	0.4	1
Mesomelaena pseudostygia	0.4	<1
Sowerbaea laxiflora	0.4	<1
**Briza maxima*	0.3	5
**Ehrharta calycina*	0.3	5
Caesia micrantha	0.3	<1
Hybanthus calycinus	0.3	<1
Morelotia octandra	0.3	<1
Conostylis aculeata	0.3	<1
Desmocladus flexuosus	0.2	1
**Ursinia anthemoides*	0.2	1
Astroloma macrocalyx	0.2	<1
Podotheca gnaphalioides	0.2	<1
Trachymene pilosa	0.1	2
Ptilotus manglesii	0.1	<1
**Hypochaeris glabra*	Flat	1
Drosera erythrorhiza	Flat	<1

* introduced species

QUADRAT BN 11

50 408726 E 6498863 N

Vegetation: *Eucalyptus rudis* (Flooded Gum)/*Corymbia calophylla* (Marri) Woodland over weeds
Condition: Degraded
Soil Type: Orange-brown loamy sand
Landform: Creekline
Date: 6 October 2021
Recorder: Paul van der Moezel



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Corymbia calophylla	15	20
Eucalyptus rudis	12	15
**Ehrharta calycina*	0.4	10
**Hesperantha falcata*	0.4	2
**Moraea flaccida*	0.4	1
**Ursinia anthemoides*	0.3	<1
**Briza maxima*	0.2	1
**Oxalis purpurea*	0.1	50
Isolepis marginata	0.1	2
**Lysimachia arvensis*	0.1	<1
**Romulea rosea*	0.1	<1
**Lotus subbiflorus*	<0.1	<1

* introduced species

APPENDIX 4

Detailed Flora and Vegetation Survey (PGV Environmental, 2022)

BULLSBROOK NORTH STAGE 1

DETAILED FLORA AND VEGETATION SURVEY

Prepared for: Whalan Consulting

Report Date: 16 December 2022

Version: 2

Report No. 2022-614



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Table 5: Vegetation Types on the Site

Table 6: Vegetation Condition Rating Scale

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Plate 1: Aerial Photograph from 1965 (Landgate, 2022)

Plate 2: Aerial Photograph from 1977 (Landgate, 2022)

Plate 3: Aerial Photograph from 2013 (Landgate, 2022)

Plate 4: Aerial Photograph from 2022 (Landgate, 2022)

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Figure 1: Site Location

Figure 2: Site Boundary and Topography

Figure 3: Vegetation Types

Figure 4: Vegetation Condition

Appendices

Appendix 1: DBCA Flora Database Searches

Appendix 2: Atlas of Living Australia Report

Appendix 3: Protected Matters Search Tool Report

Appendix 4: Conservation Codes

Appendix 5: DBCA TEC/PEC Database Search

Appendix 6: Flora Species List

Appendix 7: Quadrat Data

1 INTRODUCTION

1.1 Background

Bullsbrook North Stage 1 is located on Lots 21 and 27 Kimberley Street, Lots 17, 18 and 83 Ashton Road and Lots 415 and 452 Chittering Road, Bullsbrook (Site) in the City of Swan, approximately 40km north-north-east of the Perth Central Business District (Figure 1). The site is approximately 60ha in size and is bounded by Kimberley Street, Ashton Road and Chittering Road to the south and rural land on the other boundaries (Figure 2).

The site is currently zoned 'Rural' under the Metropolitan Region Scheme (National Map, 2022) and 'General Rural' under the City of Swan Local Planning Scheme No. 17 (WAPC, 2022). The land is located inside the Bullsbrook District Structure Plan (DSP) area and is designated Urban Expansion under the North-East Sub Regional Planning Framework. The proposed amendment to the Metropolitan Region Scheme (MRS) and Local Planning Scheme is to designate the area as 'Urban' to facilitate the future development of the site.

This Detailed Flora and Vegetation Survey was commissioned by Whalan Group to identify if any Conservation Significant flora or vegetation are present on the site. The results may inform potential amendments to the DSP to retain areas of conservation value within the Stage 1 Amendment area.

1.2 Scope of Works

A Detailed Flora and Vegetation Survey was undertaken in accordance with EPA Technical Guidance *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016). The survey included the following:

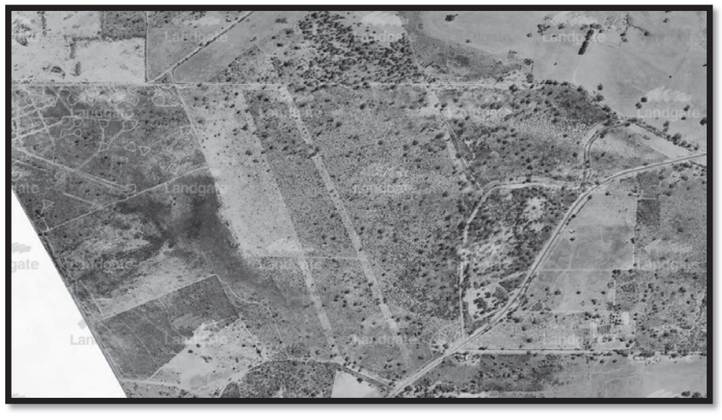
- Desktop search and review of the Department of Biodiversity, Conservation and Attractions (DBCA) Threatened and Priority flora and ecological community Databases;
- A search of the Atlas of Living Australia website (ALA, 2022);
- A search of the Commonwealth Government's Protected Matters Search Tool (DCCEEW, 2022) to identify species potentially occurring within the area that are protected under the *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999*;
- Examination of historic and recent aerial photography and contour and soil maps to provisionally identify vegetation types and condition;
- Field survey using quadrats to record native and introduced species as well as a thorough site walkover of any areas of native vegetation;
- Recording of any significant plant species using a hand-held GPS;
- Description and mapping of vegetation types and vegetation condition; and
- Compilation of a flora list.

2 EXISTING ENVIRONMENT

2.1 Land Use

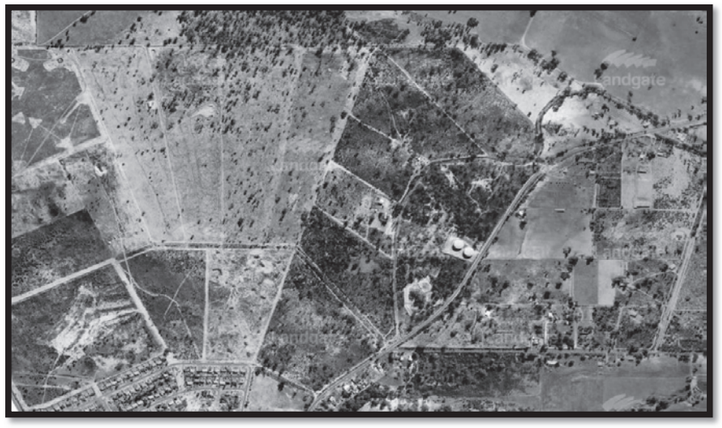
Earliest available aerial photography for the site from 1965 shows that a large proportion of has been cleared for agricultural purposes with scattered trees and pockets of remnant native vegetation remaining (Plate 1) (Landgate, 2022).

Plate 1: Aerial Photograph from 1965 (Landgate, 2022)



The 1977 aerial photograph shows a lot more clearing of trees throughout the site (Plate 2).

Plate 2: Aerial Photograph from 1977 (Landgate, 2022)



Urban development commenced to the south in 2013 (Plate 3).

Plate 3: Aerial Photograph from 2013 (Landgate, 2022)



The site use has not significantly changed from 2013 to 2022 (Plate 4).

Plate 4: Aerial Photograph from 2022 (Landgate, 2022)



2.2 Topography

The site is undulating, generally sloping up to the east. Elevations range between 64m Australian Height Datum (AHD) in the south-western corner to 144m AHD at the eastern end (Figure 2).

2.3 Geology and Soils

2.3.1 Geology

The site is mapped as part of the Dandaragan Plateau which is a gently undulating plateau with areas of sandplain and some laterite capping on Cretaceous sediments (McArthur and Bettenay, 1960). The plateau has broad u-shaped valleys 80-150 m deep and smaller v-shaped east of the Gingin Scarp in the south (National Map, 2022). Soils are formed in colluvium and weathered rock (DPIRD, 2022).

2.3.2 Soils

The soils subsystems mapped on the site are described as follows:

- Reagan 1 Subsystem (222Re_1) which are on gentle slopes (<10%) with deep, rapidly drained loose brownish or pale sands with a sandy fabric; and
- Reagan 3 Subsystem (222Re_3) are on gentle slopes (<10%) and spurs (<20% slope) with shallow gravelly sands and few areas of lateritic outcrop (DPIRD, 2022).

2.4 Hydrology

Groundwater under the site is at depth at approximately 37m AHD (DWER, 2022), which is greater than 30m below ground level. There are no wetlands or watercourses on the site.

3 METHODOLOGY

3.1 Database Searches

Searches of the following databases were undertaken prior to the site survey:

- Department of Biodiversity, Conservation and Attractions (DBCA) Threatened and Priority Flora databases and Threatened Ecological Communities database (Appendix 1) with a buffer radius of 10km;
- Atlas of Living Australia (ALA, 2022) (Appendix 2) with a buffer radius of 10km; and
- The Commonwealth Government's Protected Matters Search Tool to identify species potentially occurring within the area that are protected under the *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999* (DCCEEW, 2020). A radius of 5km was used for this database (Appendix 3).

3.2 Detailed Survey

A Detailed spring flora and vegetation survey of the site was conducted by Dr Paul van der Moezel on 4 October 2022. The parts of the site containing native understorey were thoroughly walked to record all species and vegetation types. Parts of the site that were cleared or parkland cleared did not need to be walked through. The track log is shown in Plate 5. Information on flora composition and vegetation structure was recorded in seven 10m x 10m non-permanent quadrats in representative vegetation types.

Plate 5: Track Log



Most plant species were identified in the field. Some specimens were photographed or taken for identification at the Perth Reference Herbarium or office using standard reference guides.

3.3 Survey Conditions

The conditions that the survey was undertaken in are presented in Table 1 in order to assess the adequacy of the survey. Rainfall for Pearce Airport (Site 009053) was slightly below average for July in 2022 being 123.0mm and above average in August being 191.0mm compared to mean values of 134.3mm and 106.8mm (BOM, 2022). The rainfall in September was 56.8mm compared to an average of 67.6mm (BOM, 2022). The above average rainfall in August is likely to have compensated for the low rainfall in September and seasonal rainfall is not considered a constraint to the survey.

Table 1: Statement of Botanical Survey Conditions

Issue	Constraints (Y/N)*	Comment
Competency/experience of the consultant conducting the survey	No	Dr Paul van der Moezel has extensive botanical survey experience in the Perth Metropolitan Region.
Proportion of the flora identified^	No	The timing of the survey in early October was optimal to identify most flora species on the site including all potential Threatened and Priority Flora. No follow-up survey required.
Sources of information (historic/recent or new data)	No	The flora of the Perth Metropolitan Region is fairly well documented.
Proportion of the task achieved and further work that may need to be undertaken	No	Survey in October identified at least 95% of the flora species on the site.
Timing/weather/season/cycle	No	The spring survey was optimal for most flora species. 2022 was a good year for ephemeral species.
Disturbances (Fire)	No	The fire age of the vegetation was greater than 5 years.
Intensity of survey (e.g. In retrospect was the intensity adequate)	No	The time spent on the site and relative ease of access made for a full coverage.
Completeness (e.g. was relevant area fully surveyed)	No	
Resources (e.g. degree of expertise available for plant identification)	No	Experienced botanist undertook most plant identifications on site.
Remoteness and/or access problems	No	Easily accessible site in the Perth Metropolitan Region
Availability of contextual (e.g. bioregional) information for the study area.	No	Bush Forever

*Constraints have been rated as Significant, Moderate or No constraints

^Fungi and nonvascular flora (e.g. algae, mosses and liverworts) were not specifically surveyed for during the survey.

4 RESULTS

4.1 Flora Database Searches

The search of the DBCA Threatened and Priority Flora Databases: the WA Herbarium database (WAHerb), the Threatened and Priority Flora Species List (TFPL) (Appendix 1) and Atlas of Living Australia (Appendix 2) indicates that a number of species that are listed as Endangered, Threatened or Priority have been recorded within a 10km radius of the site. The EPBC Act Protected Matters Search Tool (Appendix 3) identifies species listed under the EPBC Act as potentially having habitat in the area. The results from these database searches are shown in Table 2. None of the species has been recorded from the survey area.

Table 2: Conservation Significant Flora Identified in Database Searches

Scientific Name	Common Name	Conservation Status (WA)	Status under EPBC Act
Calectasia cyanea	Blue Tinsel Lily	Critically Endangered	Critically Endangered
Drakaea elastica	Glossy-leafed Hammer Orchid	Critically Endangered	Endangered
Eucalyptus x balanites	Cadda Road Mallee	Critically Endangered	Endangered
Grevillea althoferorum subsp. *fragilis*		Critically Endangered	Endangered
Grevillea curviloba subsp. *curviloba*	Narrow curved-leaf Grevillea	Critically Endangered	Endangered
Synaphea sp. Fairbridge Farm (D Papenfus 696)	Selena's Synaphea	Critically Endangered	Critically Endangered
Thelymitra dedmaniarum	Cinnamon Sun-orchid	Critically Endangered	Endangered
Trithuria occidentalis (Hydatella dioica)	Swan Hydatella	Critically Endangered	Endangered
Conospermum densiflorum subsp. *unicephalatum*	One-headed Smokebush	Endangered	Endangered
Darwinia foetida	Muchea Bell	Endangered	Critically Endangered
Diplolaena andrewsii	Native Wild Rose	Endangered	Endangered
Diuris purdiei	Purdie's Donkey-orchid	Endangered	Endangered
Eucalyptus leprophloia	Scaly-butt Mallee	Endangered	Endangered
Grevillea christineae	Christine's Grevillea	Endangered	Endangered
Grevillea curviloba subsp. *incurva*	Narrow curved-leaf Grevillea	Endangered	Endangered
Hypocalymma sylvestre		Endangered	Endangered
Macarthuria keigheryi	Keighery's Macarthuria	Endangered	Endangered
Thelymitra stellata	Star Sun-orchid	Endangered	Endangered
Acacia anomala	Grass Wattle, Chittering Grass Wattle	Vulnerable	Vulnerable
Andersonia gracilis	Slender Andersonia	Vulnerable	Endangered
Anigozanthos viridis subsp. *terraspectans*	Dwarf Green Kangaroo Paw	Vulnerable	Vulnerable
Anthocercis gracilis	Slender Tailflower	Vulnerable	Vulnerable
Chamaluaceum lullfitzii (previously *Chamelaucium* sp. Gingin (N.G. Marchant 6)	Gingin Wax	Vulnerable	Endangered
Diuris drummondii	Tall Donkey Orchid	Vulnerable	Vulnerable
Diuris micrantha	Dwarf Bee-orchid	Vulnerable	Vulnerable
Eleocharis keigheryi	Keighery's Eleocharis	Vulnerable	Vulnerable
Grevillea flexuosa	Zig Zag Grevillea	Vulnerable	Vulnerable
Grevillea corrugata		Vulnerable	Endangered
Paracaleana (Caleana) dixonii	Sandplain Duck Orchid	Vulnerable	Endangered
Hydrocotyle striata		Priority 1	
Drosera paleacea	Dwarf Sundew	Priority 1	
Levenhookia preissii	Preiss's Stylewort	Priority 1	
Calectasia grandiflora	Blue Tinsel Lily	Priority 2	
Drosera sewelliae		Priority 2	
Gastrolobium nudum		Priority 2	
Grevillea candolleana		Priority 2	
Hibbertia glomerata subsp. *ginginensis*		Priority 2	
Leucopogon plumuliflorus		Priority 2	
Schoenus sp. Bullsbrook (J.J. Alford 915)		Priority 2	
Stylidium squamellosum	Maize Trigger Plant	Priority 2	
Tetraria sp. Chandala (G.J. Keighery 17055)		Priority 2	
Acacia drummondii subsp. *affinis*		Priority 3	
Acacia oncinophylla subsp. *oncinophylla*		Priority 3	
Adenanthos cygnorum subsp. *chamaephyton*		Priority 3	
Beaufortia purpurea	Purple Beaufortia	Priority 3	
Chamaescilla gibsonii		Priority 3	
Cyathochaeta teretifolia		Priority 3	
Eryngium pinnatifidum subsp. Palustre (G.J. Keighery 13459)		Priority 3	
Guichenotia tuberculata		Priority 3	
Haemodorum loratum		Priority 3	
Isotropis cuneifolia subsp. *glabra*		Priority 3	
Persoonia rudis		Priority 3	
Platysace ramosissima		Priority 3	
Schoenus capillifolius		Priority 3	
Stylidium aceratum		Priority 3	
Stylidium paludicola		Priority 3	
Verticordia serrata var. *linearis*		Priority 3	
Drosera occidentalis	Western Sundew	Priority 4	
Hydrocotyle lemnoides	Aquatic Pennywort	Priority 4	
Ornduffia submersa		Priority 4	
Oxymyrrhine coronata		Priority 4	
Stylidium longitubum	Jumping Jacks	Priority 4	

Scientific Name	Common Name	Conservation Status (WA)	Status under EPBC Act
Synaphea grandis		Priority 4	
Verticordia lindleyi subsp. *lindleyi*		Priority 4	

Definitions of the Conservation Codes are in Appendix 5.

Based on the soil types and vegetation type and conditions observed during the survey the likelihood of conservation significant species identified in the database searches occurring on the site has been examined (Table 3).

Table 3: Likelihood of Identified Significant Flora Species Occurring on the Site

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
Critically Endangered			
Calectasia cyanea	Blue Tinsel Lily	The Blue Tinsel Lily prefers white, grey or yellow sand or gravel.	No – species does not occur in this area
Drakaea elastica	Glossy-leafed Hammer Orchid	The Glossy-leafed Hammer Orchid prefers low-lying situations adjoining winter-wet swamps and grows on bare patches of sand within otherwise dense vegetation in low-lying areas alongside winter-wet swamps, typically in banksia (*Banksia menziesii, B. attenuata* and *B. ilicifolia*) woodland or spearwood (*Kunzea glabrescens*) thicket vegetation (DEC, 2009).	Highly Unlikely – not suitable habitat
Eucalyptus x balanites	Cadda Road Mallee	The Cadda Road Mallee prefers sandy soils with lateritic gravel.	Highly Unlikely – not suitable habitat
Grevillea althoferorum subsp. *fragilis*		*Grevillea althoferorum* subsp. *fragilis* is recorded on the base of the Darling Scarp, growing in greyish - yellow colluvial sand (DEC, 2011).	Highly Unlikely – sandy habitat on the site is completely degraded
Grevillea curviloba subsp. *curviloba*	Narrow curved-leaf Grevillea	Narrow curved-leaf Grevillea occurs in grey sand in winter-wet heath. There are 17 known populations in an area between Muchea and Badgingarra (Phillimore and English, 2000).	Highly Unlikely – the site is not in the known species range and there are no winter wet areas.
Synaphea sp. Fairbridge Farm (D Papenfus 696)	Selena's Synaphea	Selena's Synaphea occurs in sandy with lateritic pebbles near winter-wet flats, in low woodland with weedy grasses.	Highly Unlikely – The site does not contain winter wet flats
Thelymitra dedmaniarum	Cinnamon Sun-orchid	Cinnamon sun orchid is known from only two locations in the Gidgegannup area. It is confined to open wandoo woodland on red-brown sandy loam associated with dolerite and granite outcropping (DEC, 2012).	Highly Unlikely – the soils do not have dolerite or granite outcropping

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
Trithuria occidentalis (Hydatella dioica)	Swan Hydatella	Swan Hydatella grows partly submerged on the edge of shallow, winter-wet claypans in very open shrubland of Robin Redbreast Bush (*Melaleuca lateritica*) and numerous annual herbs.	Highly Unlikely – The site is not suitable habitat.
Endangered			
Conospermum densiflorum subsp. *unicephalatum*	One-headed Smokebush	The One-headed Smokebush occurs on clay soils in low-lying areas.	Highly Unlikely – The site is not suitable habitat and this species has not been recorded within 10km of the site.
Darwinia foetida	Muchea Bell	The Muchea Bell is found in grey-white sand on swampy, seasonally wet sites.	Highly Unlikely – The site does not contain swampy areas
Diplolaena andrewsii	Native Wild Rose	The Native Wild Rose occurs on loam, clay in association with granite outcrops and hillsides.	Highly Unlikely – not granite habitat
Diuris purdiei	Purdie's Donkey-orchid	Purdie's Donkey Orchid occurs in grey-black sand in moist winter-wet swamps.	Highly Unlikely – The site is not swamp habitat
Eucalyptus leprophloia	Scaly-butt Mallee	Scaly-butt Mallee occurs on white or grey sand over laterite on valley slopes.	Highly Unlikely – The site is not suitable habitat and this species has not been recorded within 10km of the site.
Grevillea christineae	Christine's Grevillea	Christine's Grevillea prefers clay loam, sandy clay, often moist.	Highly Unlikely – The site is not wet habitat and creekline areas are completely degraded
Grevillea curviloba subsp. *incurva*	Narrow curved-leaf Grevillea	Narrow curved-leaf Grevillea prefers sand, sandy loam in winter-wet heath.	Highly Unlikely – The site is not winter wet heath habitat
Hypocalymma sylvestre		*Hypocalymma sylvestre* has been recorded from yellow-brown sandy loam in woodland on lateritic hilltop.	Unlikely – Soil type not suitable
Macarthuria keigheryi	Keighery's Macarthuria	Keighery's Macarthuria prefers white or grey sand on low-lying winter-wet damp sands growing among heathland, Jarrah and Sheoak/Banksia woodland and Banksia/Eucalypt Woodland (DEC, 2008).	Highly Unlikely – no winter wet habitat on the site
Thelymitra stellata	Star Sun-orchid	The Star Sun-orchid prefers sand, gravel or lateritic loam.	Unlikely – deep sandy soil type not suitable
Vulnerable			
Acacia aphylla	Leafless Rock Wattle	Leafless Rock Wattle occurs in sand, loam, clay loam on granite outcrops, hills.	Unlikely – Soil type not suitable

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
Acacia anomala	Grass Wattle, Chittering Grass Wattle	The Grass Wattle prefers lateritic soils and slopes.	Unlikely – Soil type not suitable
Andersonia gracilis	Slender Andersonia	Slender Andersonia occurs in white/grey sand, sandy clay, gravelly loam in winter-wet areas, near swamps.	Highly Unlikely – The site is not low-lying habitat and this species has not been recorded within 10km of the site
Anigozanthos viridis subsp. *terraspectans*	Dwarf Green Kangaroo Paw	The Dwarf Green Kangaroo Paw occurs on grey sand, clay loam in winter-wet depressions.	Highly Unlikely – The site is not low-lying habitat
Anthocercis gracilis	Slender Tailflower	Slender Tailflower occurs in sandy or loamy soils near granite outcrops.	Highly Unlikely – There are no granite outcrops and the species has not been recorded within 10km of the site
Chamaluaceum lullfitzii (previously *Chamelaucium* sp. Gingin (N.G. Marchant 6)	Gingin Wax	Gingin wax grows in white/yellow sand supporting open low woodland.	Highly Unlikely – sandy habitat on the site is completely degraded
Diuris drummondii	Tall Donkey Orchid	The Tall Donkey Orchid grows in low-lying depressions, swamps, in areas that contain surface water well into summer (Brown *et al*., 2013).	Highly Unlikely – no suitable habitat on the site
Diuris micrantha	Dwarf Bee-orchid	The Dwarf Bee-orchid is usually found on brown loamy clay in winter-wet swamps, in shallow water. The range of this species extends south from Kwinana.	Highly Unlikely – not suitable habitat and not recorded within 10km of the site.
Eleocharis keigheryi	Keighery's Eleocharis	Keighery's Eleocharis occurs in clay, sandy loam and is emergent in freshwater: creeks, claypans.	Highly Unlikely – creekline habitat on the site is completely degraded
Grevillea flexuosa	Zig Zag Grevillea	Zig Zag Grevillea occurs in red-brown sand with laterite and gravel, sand over granite on ridgetop plateaus and associated breakaways.	Highly Unlikely – no suitable habitat on the site
Grevillea corrugata		*Grevillea corrugata* occurs in gravelly loam on roadsides.	Highly Unlikely – not loamy soils
Paracaleana (Caleana) dixonii	Sandplain Duck Orchid	Sandplain Duck Orchid occurs in grey sand over granite.	Highly Unlikely – not suitable habitat
Priority 1			
Hydrocotyle striata		*Hydrocotyle striata* occurs in clay near springs.	No – no spring habitat
Drosera paleacea	Dwarf Sundew	Dwarf Sundew occurs in white sand, sandy clay	Highly Unlikely – not suitable habitat
Levenhookia preissii	Preiss's Stylewort	Preiss's Stylewort occurs in grey or black peaty sands in swamps.	Highly Unlikely – no peaty swamp habitat

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
Priority 2			
Calectasia grandiflora	Blue Tinsel Lily	Blue Tinsel Lily occurs in white, grey or yellow sand, sandy clay, gravel, laterite and granite in swampy areas, rock outcrops, flats, slopes and ridges.	Highly Unlikely – Not silica sand soils
Drosera sewelliae		*Drosera sewelliae* grows in laterite and silica sand soils.	Highly Unlikely – Not silica sand soils
Gastrolobium nudum		*Gastrolobium nudum* grows in red-brown clay, brown loam, gravel, laterite, granite on flats, slopes, hilltops, ridges, valleys, breakaways.	Highly Unlikely – no suitable habitat on the site
Grevillea candolleana		*Grevillea candolleana* occurs in laterite, lateritic loam on hillsides.	Unlikely – Soil type not suitable
Hibbertia glomerata subsp. *ginginensis*		*Hibbertia glomerata* subsp. *ginginensis* occurs in sand, brown clay, laterite near roadsides.	Highly Unlikely - no clay habitat
Leucopogon plumuliflorus		*Leucopogon plumuliflorus* grows in lateritic sandy soils amongst lateritic	Highly Unlikely – no suitable habitat on the site
Schoenus sp. Bullsbrook (J.J. Alford 915)		*Schoenus* sp. Bullsbrook (J.J. Alford 915) grows in grey peaty sand on low-lying flats.	Highly Unlikely – no peaty habitat
Stylidium squamellosum	Maize Trigger Plant	Maize Trigger Plant grows in brown to red-brown clay loam on winter-wet habitats and depressions, open woodland, shrubland.	Highly Unlikely – not clayey soils
Tetraria sp. Chandala (G.J. Keighery 17055)		*Tetraria* sp. Chandala is recorded from a mound spring in peaty sand (Western Australian Herbarium, 2005).	No – not mound spring habitat
Priority 3			
Acacia drummondii subsp. *affinis*		*Acacia drummondii* subsp. *affinis* grows in lateritic gravelly soils.	Unlikely – Soil type not suitable
Acacia oncinophylla subsp. *oncinophylla*		*Acacia oncinophylla* subsp. *oncinophylla* occurs in granitic soils	No – not granitic habitat
Adenanthos cygnorum subsp. *chamaephyton*		*Adenanthos cygnorum* subsp. *chamaephyton* occurs in grey sand, lateritic gravel.	Possible in – may occur in small area of intact vegetation on the site
Beaufortia purpurea	Purple Beaufortia	Purple Beaufortia occurs in lateritic or granitic soils on rocky slopes.	Highly Unlikely – no suitable habitat on the site
Chamaescilla gibsonii		*Chamaescilla gibsonii* grows in clay to sandy clay on winter-wet flats, shallow water-filled claypans.	Highly Unlikely – not clayey soils

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
Cyathochaeta teretifolia		*Cyathochaeta teretifolia* occurs in grey sand, sandy clay on swamps, creek edges.	Highly Unlikely – creek habitat on the site is completely degraded
Eryngium pinnatifidum subsp. Palustre (G.J. Keighery 13459)		*Eryngium pinnatifidum* subsp. Palustre is recorded from a winter wet claypan, water to 20 cm deep in grey-brown clay (Western Australian Herbarium, 1989)	No – not suitable habitat
Guichenotia tuberculata		*Guichenotia tuberculata* grows in sand clay over laterite, sand.	Highly Unlikely – sandy habitat on the site is completely degraded
Haemodorum loratum		*Haemodorum loratum* prefers grey or yellow sand, gravel.	Possible – may occur in small area of intact vegetation on the site
Isotropis cuneifolia subsp. *glabra*		*Isotropis cuneifolia* subsp. *glabra* grows in sand, clay loam on winter-wet flats.	Highly Unlikely – no flats on the site
Persoonia rudis		*Persoonia rudis* occurs in white, grey or yellow sand, often over laterite.	Possible – may occur in small area of intact vegetation on the site
Platysace ramosissima		*Platysace ramosissima* prefers sandy soils	Possible – may occur in small area of intact vegetation on the site
Schoenus capillifolius		*Schoenus capillifolius* grows in brown mud on claypans.	No – no claypan habitat
Stylidium aceratum		*Stylidium aceratum* occurs in sandy soils in swamp heathland.	Highly Unlikely – no swampy habitat
Stylidium paludicola		*Stylidium paludicola* prefers peaty sand over clay in winter wet habitats in Marri and Melaleuca woodland, Melaleuca shrubland.	Highly Unlikely – no peaty habitat
Verticordia serrata var. *linearis*		*Verticordia serrata* var. *linearis* grows in white sand, gravel in open woodland.	Highly Unlikely – No white sand on the site
Priority 4			
Drosera occidentalis	Western Sundew	The Western Sundew occurs in sandy and clayey soils in swamps and wet depressions.	Highly Unlikely – there is no swampy habitat
Hydrocotyle lemnoides	Aquatic Pennywort	Aquatic Pennywort occurs in swamps	No – no suitable permanently wet areas on the site
Ornduffia submersa		*Ornduffia submersa* grows in freshwater 0.05-0.6 m deep. Pools, lakes, swamps, winter-wet depressions, claypans.	Highly Unlikely – The site is not low-lying habitat
Oxymyrrhine coronata		*Oxymyrrhine coronata* occurs in lateritic gravel.	Unlikely – Soil type not suitable
Stylidium longitubum	Jumping Jacks	Jumping Jacks prefer sandy clay, clay in seasonal wetlands.	Highly Unlikely – The site is not wetland habitat
Synaphea grandis		*Synaphea grandis* occurs in laterite.	Unlikely – Soil type not suitable

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
Verticordia lindleyi subsp. *lindleyi*		*Verticordia lindleyi* subsp. *lindleyi* prefers sand, sandy clay in winter-wet depressions.	Highly Unlikely – The site is not suitable habitat

* sourced from Florabase (DBCA, 2017), DBCA database searches and SPRAT (DoEE, 2018) unless otherwise denoted

4.2 TEC and PEC Database Searches

A search of DBCA's Threatened (TEC) and Priority Ecological Communities (PEC) database was conducted within a radius of 5km around the site (07-0720EC) (Appendix 5). Seven conservation significant Ecological Communities were identified and an additional TEC was identified in the Protected Matters Search Tool Report (Appendix 3) (Table 2).

Table 4: Threatened and Priority Ecological Communities likely to occur within 5km of the Site

Number	Description	Conservation Status in WA	Status under the EPBC Act
Mound Springs SCP	Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain)	Critically Endangered	Endangered
SCP3a	*Corymbia calophylla - Kingia australis* woodlands on heavy soils, Swan Coastal Plain	Critically Endangered	Endangered
SCP3c	*Corymbia calophylla - Xanthorrhoea* preissii woodlands and shrublands, Swan Coastal Plain	Critically Endangered	Endangered
Muchea Limestone	Shrublands and woodlands on Muchea Limestone of the Swan Coastal Plain	Endangered	Endangered
SCP07	Herb rich saline shrublands in clay pans	Vulnerable	Critically Endangered
SCP08	Herb rich shrublands in clay pans	Vulnerable	Critically Endangered as part of 'Claypans of the Swan Coastal Plain'
Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered
Tuart WL SCP	Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain ecological community	Priority 3	Critically Endangered

4.3 Flora

A total of 113 plant species were recorded during the flora survey (Appendix 6). This total consisted of 87 native species and 26 introduced species (23.0%). The field work did not include a survey of all introduced species in the paddocks as this would have extended the amount of survey effort and the results have no bearing on the conservation significance of flora species on the site.

Plant families with the greatest number of species were the Asteraceae (Daisy family – 13 species including 7 native and 6 introduced), Fabaceae (Wattle and Pea family – 12 species, 9 native and 3

introduced), Poaceae (Grass family – 8 species, 2 native and 6 introduced) and Myrtaceae (Myrtle family – 7 species, all native).

The total number of species recorded in the eleven quadrats sampled ranged from 25-38 (Appendix 7) (average 29.4) with 4-12 weeds species (average 26.3%). The moderate number of species generally reflects the low condition native understorey in many areas. The vegetation in Very Good condition contained higher species richness than the vegetation in Degraded condition.

4.4 Vegetation Complex

Vegetation Complexes are a broad level of vegetation description which is based on the underlying geomorphology and rainfall (Heddle *et al*., 1980). The vegetation is mapped as part of the Reagan Complex which is described as "Vegetation ranges from low open woodland of *Banksia* species *Eucalyptus todtiana* (Pricklybark) to closed heath depending on the depth of soil" (Heddle *et al.,* 1980).

The vegetation on the site does not meet the general description of the Reagan vegetation complex. The vegetation on the site better fits the description of the Mogumber– South vegetation complex which is mapped as occurring about 1km east of the site and is broadly described as "Open Woodland of *Eucalyptus calophylla* (Marri) with some admixture of *E. marginata* (Jarrah) and a second storey of *E. todtiana-Banksia attenuata-B. menziesii-B. ilicifolia*".

A very small area of the site in the south-western corner is mapped in the Guildford Complex which is described as "a mixture of open forest to tall open forest of *E. calophylla – E. wandoo – E. marginata* and woodland of *E. wandoo* (with rare occurrences of *E. lane-poolei*). Minor components include *E. rudis – M. rhaphiophylla*" (Heddle *et al.,* 1980).

4.5 Vegetation

4.5.1 Vegetation Type

Vegetation complexes are a very broad mapping unit used to map the vegetation at the scale of the Swan Coastal Plain for example. For small scale sites, such as the survey area, vegetation mapping can be further refined by using vegetation types which are based on the composition and structure of the dominant species rather than based on geomorphology.

Four native vegetation types were described and mapped on the site. The vegetation types are described in Table 5 and mapped in Figure 3.

Table 5: Vegetation Types on the Site

Vegetation Type		Description	Photograph
Cc	*Corymbia calophylla* (Marri) Woodland over *Xanthorrhoea preissii* Open Low Heath	This vegetation type is the main type on the site. The condition of the understorey varies greatly with some area relatively intact and others mostly weeds. The better quality areas have some *Banksia sessilis* tall shrubs and *Xanthorrhoea preissii* as well as *Phyllanthus calycinus, Desmocladus flexuosus, Morelotia octandra* and other ground covers. Annual and Perennial Veldtgrass are the main weed species. The soils are dark brown sand likely over shallow lateritic gravel. Quadrats AR1, 3 and 7 are representative of this vegetation type.	
Em	*Eucalyptus marginata* (Jarrah) Woodland over weeds	One stand of Jarrah Woodland (no Marri trees) occurs at the northeastern end of Lot 18. The Jarrah trees are up to 14m high and average 20% cover. The only native species present are herbs and small groundcovers. Perennial Veldtgrass (*Ehrharta calycina*) and Couch Grass (*Cynodon*) dominate the degraded understorey. The soils are greyish-black sand. Quadrats AR6 is representative of this vegetation type.	

Vegetation Type		Description	Photograph
Bs	*Banksia sessilis* Shrubland over *Xanthorrhoea preissii* Open Heath	One stand of *Banksia sessilis* (Parrot Bush) occurs at the northern end of Lot 27. Some Parrot Bush also occurs in and around an old extraction area on Lot 17. *Leptospermum erubescens* is a common shrub to 2m while *xanthorrhoea preissii, Mesomelaena pseudostygia* and *Tricoryne elatior* common smaller shrubs. The soils are light orange-brown sand. Quadrats AR2 and 4 are representative of this vegetation type.	
Xp	*Xanthorrhoea preissii* Open Heath over weeds	One area containing the Xp vegetation type occurs at the northern end of Lot 18. *Xanthorrhoea preissii* is the most common shrub 1-1.6m high with *Banksia sessilis* occasionally present 2-3m high. This area is likely to have had trees removed in the past. Native species are sparse with some common species being *Calytrix angulata, Podotheca angustifolia.* The soils are dark grey sand. Quadrats AR5 is representative of this vegetation type.	

4.5.2 Vegetation Condition

The condition of the vegetation was assessed according to the system of Keighery as described in Bush Forever (Government of Western Australia, 2000) (Table 6).

Table 6: Vegetation Condition Rating Scale

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate to it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

The condition of the native vegetation was mostly in Degraded and Completely Degraded condition due to the past clearing and long history of grazing under the trees (Figure 4). Five small areas containing vegetation in Good condition were mapped on the site (Figure 4).

No areas were recorded in Very Good condition or better.

4.6 Conservation Significance of Flora and Vegetation

4.6.1 Flora

There were no Threatened or Priority flora species recorded on the site.

4.6.2 Vegetation

4.6.2.1 Vegetation Complex

There is approximately 3,107ha (33.84%) of the pre-European extent of the Reagan Complex-remaining on the Dandaragan Plateau with 3.72% of the complex in secure reserves (DBCA, 2018). The vegetation on the site better fits the description of the Mogumber– South vegetation complex of which there is approximately 38.6% of the pre-European extent remaining (DBCA, 2018) and 176.96ha in secure reserves (1.19% of the original extent) (DBCA, 2018).

The percentage retention for both vegetation complexes is above EPA's target for minimum 30% retention of vegetation complexes State-wide in the Perth and Peel Region Constrained Areas and the area in protection for both complexes is below the 10% minimum criteria for vegetation complexes.

The Guildford Complex is considered to be poorly reserved with 5.09% of the original extent of the vegetation remaining and 0.26% of the original extent in secure tenure (DBCA, 2018).

The area that is mapped in the Guildford complex is Completely Degraded and therefore not representative of the complex.

4.6.2.2 Threatened and Priority Ecological Communities

The vegetation is not considered to be part of a Threatened or Priority Ecological Community.

4.6.2.3 Ecological Linkages

The site abuts native vegetation in Bush Forever Site 88 'Ashton Road Bushland, Bullsbrook' to the south. The vegetation on the Bullsbrook North Stage 1 site does not have high ecological attributes that would function as part of a continuous ecological linkage through to the Bush Forever site.

The Marri and Jarrah trees on the site would provide some foraging habitat and potential breeding habitat for Carnaby's Black Cockatoos.

5 SUMMARY AND CONCLUSIONS

The 2022 Detailed Flora and Vegetation Survey of Bullsbrook North Stage 1 resulted in the following findings:

- The area has been subject to clearing for rural land uses over many decades;
- Native vegetation occurs on most of the lots in the survey area but usually as parkland cleared trees over pasture. Small areas of native vegetation in Good condition or better occur on Lot 27 Kimberley Street, and Lots 17 and 18 Ashton Road;
- Four vegetation types were described and mapped for the site. The main vegetation type was a Marri Woodland with a variable understorey with some areas containing relatively intact understorey and others full of weeds. One stand of Jarrah Woodland was recorded and small stands of Parrot Bush (*Banksia sessilis*) and Grass Tree (*Xanthorrhoea preissii*) were also recorded;
- A total of 113 plant species were recorded during the flora survey, consisting of 87 native species and 26 introduced species (23.0%);
- There were no Threatened or Priority flora species recorded on the site;
- The main vegetation complex assessed as occurring on the site (Mogumber South) is above the EPA's 30% retention target but below the 10% protection target. The small area mapped as Guildford Complex is in Degraded to Completely Degraded condition. The areas of vegetation in Good condition are not considered to be good examples of the vegetation complexes and are too small and fragmented to have any conservation reserve value;
- The vegetation is not a Threatened or Priority Ecological Community;
- The vegetation has very limited ecological linkage value;
- The Marri and Jarrah trees would have some value for local birds, including Carnaby's Black Cockatoos; and
- The areas of Marri Woodland in Good condition would have some aesthetic value and local value as fauna habitat within Public Open Space in any future development.

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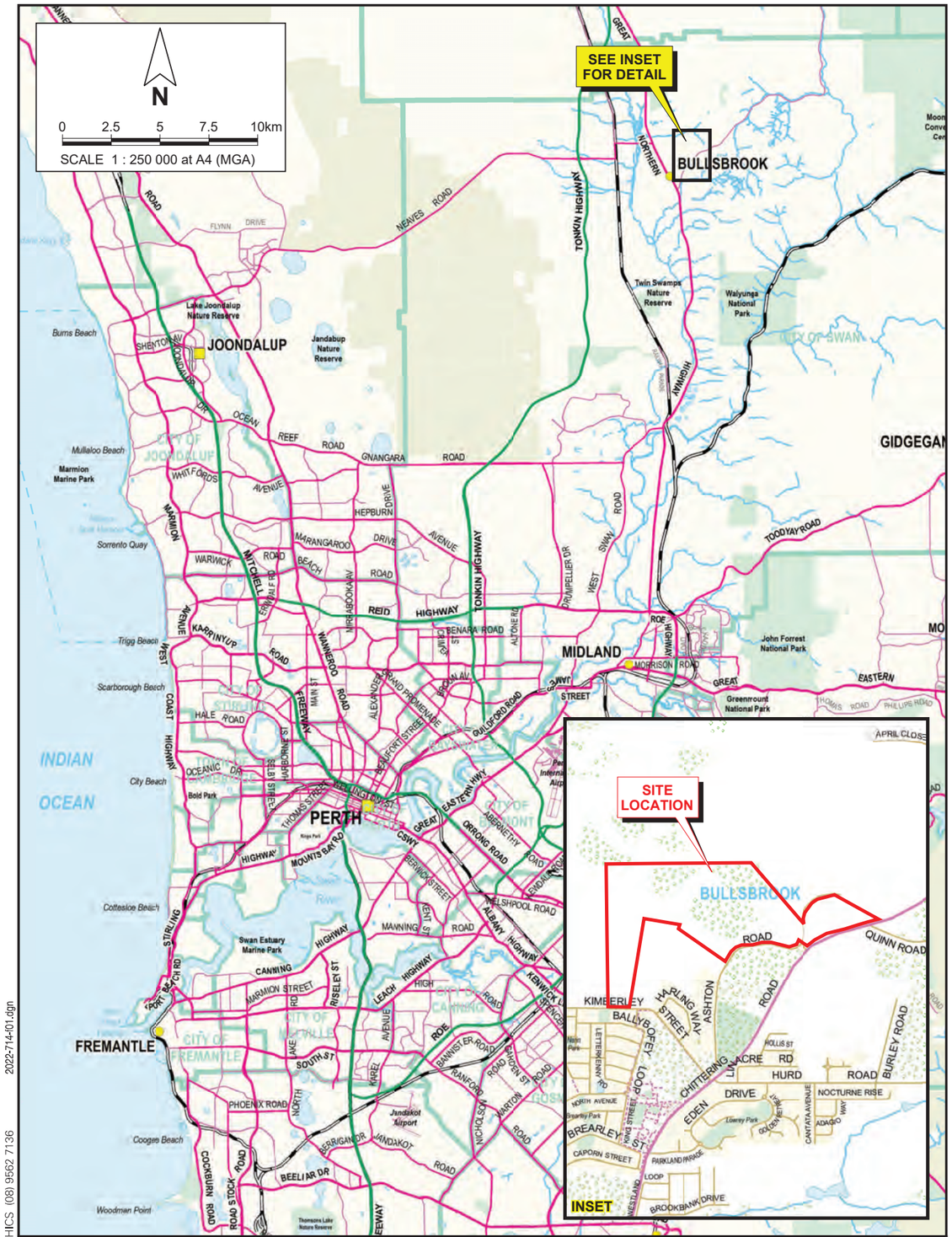
FIGURES



PINPOINT CARTOGRAPHICS (08) 9562 7136 2022-714-101.dgn

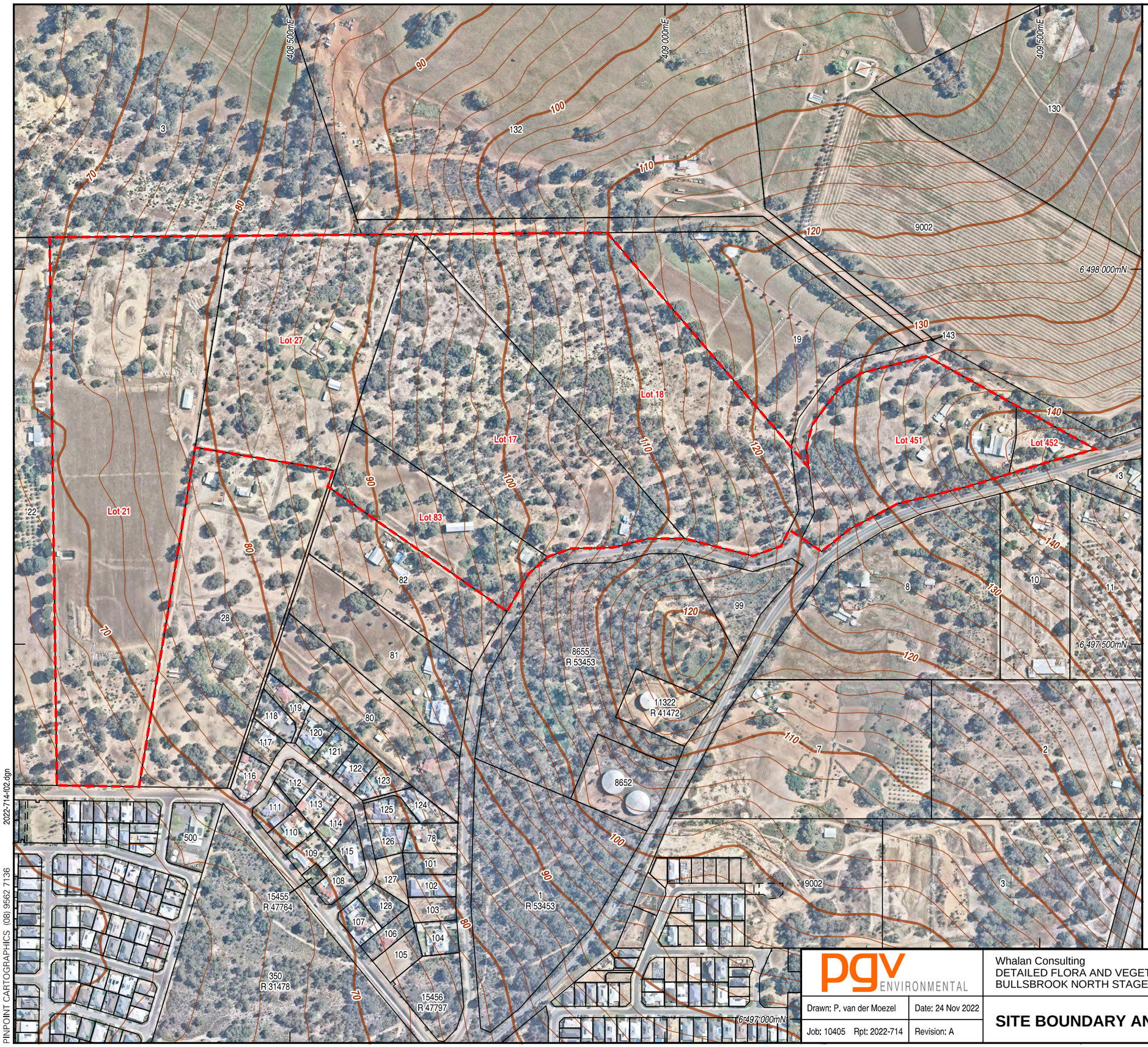
pgv ENVIRONMENTAL

Whalan Consulting
DETAILED FLORA AND VEGETATION SURVEY
BULLSBROOK NORTH STAGE 1

Drawn: P. van der Moezel	Date: 24 Nov 2022
Job: 10405 Rpt: 2022-714	Revision: A

SITE LOCATION

Figure 1



N

0 50 100 150 200m

SCALE 1 : 5 000 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Easement Boundary
- Topographic Contour

CONTOUR SOURCE: Dept. of Agriculture, 2000.
CADASTRAL SOURCE: Landgate, November 2022.
AERIAL PHOTOGRAPH SOURCE: NearMap, flown September 2022.

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PINPOINT CARTOGRAPHICS (08) 9562 7136

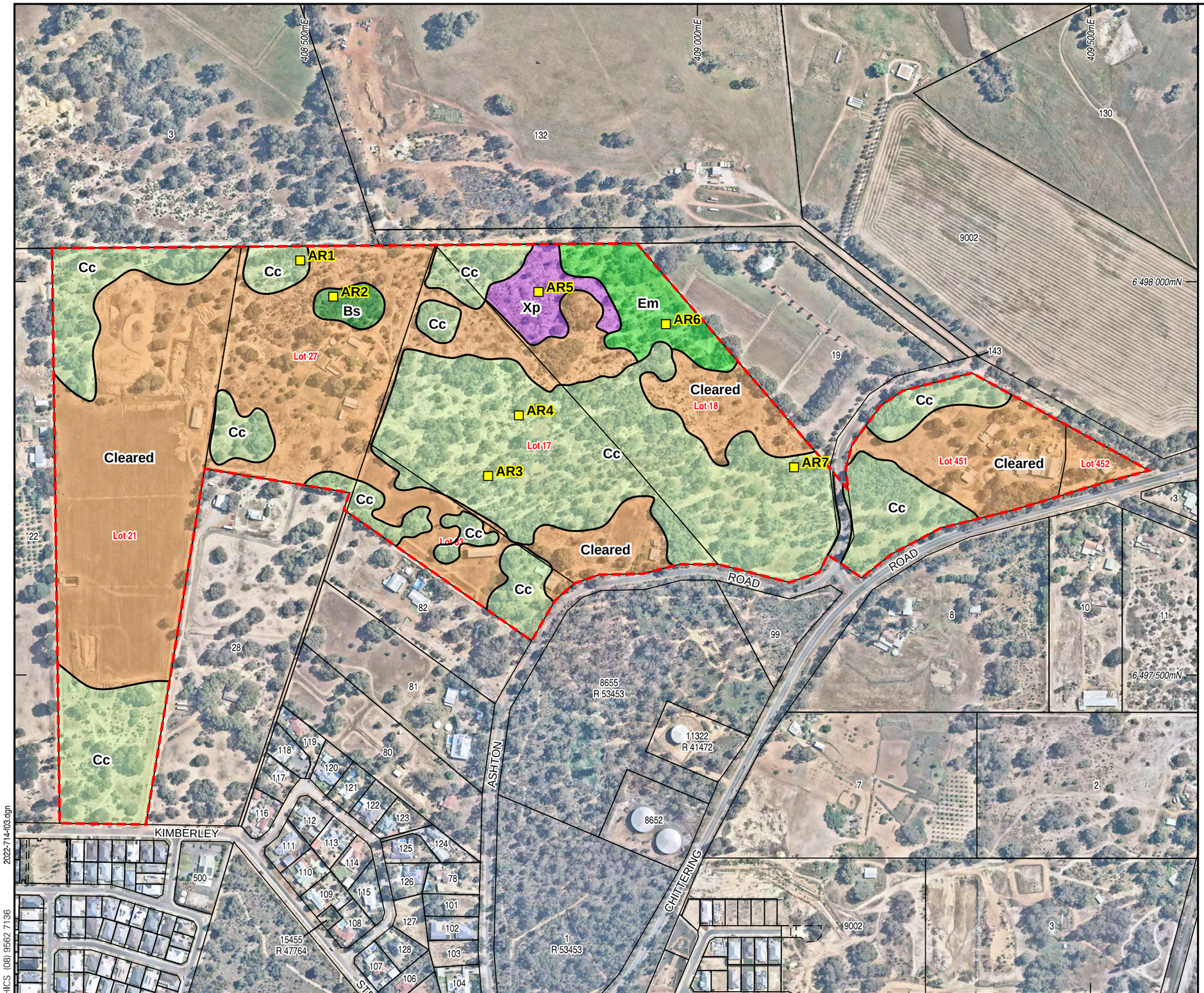
pgv ENVIRONMENTAL

Whalan Consulting
DETAILED FLORA AND VEGETATION SURVEY
BULLSBROOK NORTH STAGE 1

Drawn: P. van der Moezel | Date: 24 Nov 2022
Job: 10405 Rpt: 2022-714 | Revision: A

SITE BOUNDARY AND TOPOGRAPHY

Figure 2



N

0 50 100 150 200m

SCALE 1 : 5 000 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Easement Boundary
- Quadrat Location

Vegetation Types

Cc
Corymbia calophylla (Marri) Woodland over *Xanthorrhoea preissii* Open Low Heath

Em
Eucalyptus marginata (Jarrah) Woodland over weeds

Bs
Banksia sessilis Shrubland over *Xanthorrhoea preissii* Open Heath

Xp
Xanthorrhoea preissii Open Heath over weeds

Cleared

CADASTRAL SOURCE: Landgate, November 2022.
AERIAL PHOTOGRAPH SOURCE: NearMap, flown September 2022.

2022-714-f03.dgn

PINPOINT CARTOGRAPHICS (08) 9562 7136

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Job: 10405 Rpt: 2022-714 | Revision: A

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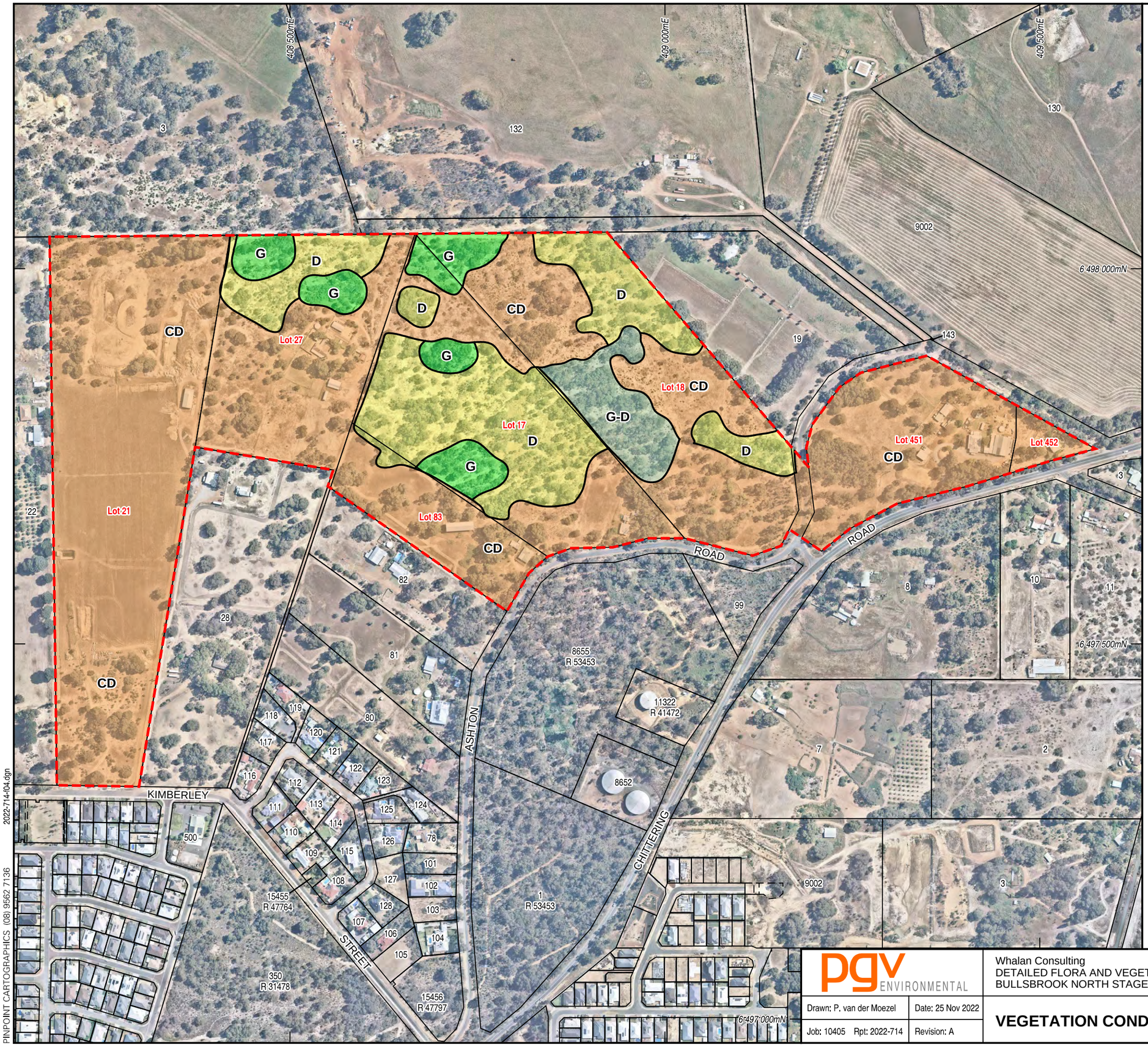
DETAILED FLORA AND VEGETATION SURVEY
BULLSBROOK NORTH STGAE 1

VEGETATION TYPES

Figure 3



N

0 50 100 150 200m

SCALE 1 : 5 000 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Easement Boundary

Vegetation Condition

- Good
- Good to Degraded
- Degraded
- Completely Degraded

Vegetation Condition
(SOURCE: Bush Forever, Govt. of W.A., 2000)

P - Pristine
Pristine or nearly so, no obvious signs of disturbance.

Ex - Excellent
Vegetation structure intact, disturbance affecting individual species and weeds are non aggressive species.

VG - Very Good
Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.

G - Good
Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.

D - Degraded
Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.

CD - Completely Degraded
The structure of the vegetation is no longer intact and the areas is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora composing weed or crop species with isolated native trees or shrubs.

CI - Cleared
No native vegetation remaining.

CADASTRAL SOURCE: Landgate, November 2022.
AERIAL PHOTOGRAPH SOURCE: NearMap, flown September 2022.

pgv ENVIRONMENTAL

Whalan Consulting
DETAILED FLORA AND VEGETATION SURVEY
BULLSBROOK NORTH STAGE 1

Drawn: P. van der Moezel | Date: 25 Nov 2022
Job: 10405 Rpt: 2022-714 | Revision: A

VEGETATION CONDITION

Figure 4

2022-714-f04.dgn
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APPENDIX 1

DBCA Flora Database Searches

FID	Sheet	NameID	Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_Method	Precision	Date
278	8569037	3219	Acacia anomala	T	Grasslike shrub to 50 cm.	Flat (road reserve). Sandy clay with some laterite (10%). Brown/grey soil. SE aspect.	Isolated clumps of trees (Corymbia calophylla/Eucalyptus marginata) over Low Heathland 0.5- 1 m. Associated species: Xanthorrhoea gracilis, Leschenaultia sp. ?, Hakea sp. ?			Smith Road (western verge) adjacent to Lot 89, ca 850 m SE of Chittering Road	GPS	1	10/09/2013
279	8569045	3219	Acacia anomala	T	Grasslike shrub to 50 cm.	Slope. Brown, grey sandy loam with laterite 10%. SW aspect.	Open Jarrah/Marri woodland over Open Shrubland. With Xanthorrhoea preissii, Hakea sp. ?, Grevillea sp. ?, Banksia spp. ?, Stylidium spp. ?			291 Jess Road, population occurs on Private Property (Lot 181 and Lot 182)	GPS	1	20/09/2013
280	723649	3219	Acacia anomala	T					Prints from slides supplied by H. Kretchmar.	Muchea area.	MAN	4	//
281	723673	3219	Acacia anomala	T	Herb: 30 - 40 cm. Flowers bright yellow.	Hill with gravel pit, laterite over clay.	Eucalyptus accedens/Eucalyptus marginata shrubland.			Bullsbrook - Chittering Valley Road	MAN	4	9/09/1980
283	723665	3219	Acacia anomala	T		Gravel.				Muchea	MAN	3	/08/1965
286	723223	3219	Acacia anomala	T	Suffrutex caespitosus, 30 - 45 cm alt; fl. luteis.	In gravel.				Near Bullsbrook, Darling Range	MAN	3	/09/1966
287	723215	3219	Acacia anomala	T	Spindly plant 0.3; flowers yellow.	On road verge.	In Jarrah forest.			Smiths Road, 2 km NE of Bullsbrook	MAN	3	4/09/1981
291	859419	3219	Acacia anomala	T	Plants to 0.3 m.	On brown loam and laterite, on lateritic hill above lower slopes of grey sand.	In low scrub to 3.0 m. With Acacia willdenoweana, Hakea lasianthoides Trymalium angustifolium, Caladenia flava, in woodland of Euc. calophylla, E. marginata, E. accedens, Dryandra sessilis.			Burley Park, Bullsbrook, at junction of Chittering and Smith Roads	MAN	3	31/08/1987
292	723630	3219	Acacia anomala	T	Herb: 20 - 30 cm. Flowers bright yellow - styles turn brown and stamens (i.e. filaments).	Gravel pit, laterite over clay.				East Bullsbrook	MAN	3	9/09/1980
294	723681	3219	Acacia anomala	T						0.3 miles along Smiths Road, Smiths Road is ca 3 km from Bullsbrook East along Chittering Road	MAN	3	17/08/1982
296	5551323	3219	Acacia anomala	T	Grass-like, 0.5 m high. Multiple stems of grass-like shrub.	Hillside. Laterite.	Jarrah/Marri forest over scrub.			Jenkin's Road, Bullsbrook,	AUTO	3	//
297	759015	3219	Acacia anomala	T						About 3 km E of Bullsbrook, E of Smiths Road	MAN	3	/01/1985

FID	Sheet	NameID	Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_Method	Precision	Date
302	1662465	3219	Acacia anomala	T	In bud and flower.	On ridgetop slope with SSW aspect in dry yellow-brown sand with gravel, boulder, laterite, and sheet rock form. Very small section burnt two years ago. Quite a few plants are growing on or near the table and spoon drains of the Shire's *	Open, stunted Jarrah/Marri with Blackboys, Hibbertia hypercioides, Hakea lissocarpha, Dryandra sessilis, Dryandra nivea, Petrophile striata, Hovea trisperma, Daviesia cordata, Synaphaea petiolaris, Lechenaulta biloba, *		Abundance: 190 plants; 40 on W side of road, 100 on E side of road, estimate 50 more not counted.	2.4 km along Jenkins Road from the junction of Chittering Road coinciding with the NE corner of P.P. number 12 - both sides of Jenkins Road	MAN	4	28/08/1991
1701	319724	11229	Acacia drummondii subsp. affinis	3						7 km from Bullsbrook East towards Chittering	AUTO	3	23/11/1976
1712	319643	11229	Acacia drummondii subsp. affinis	3	Shrub 0.3 m to 0.5 m tall, stem dividing near ground level into many more or less ascending branches; branchlets often red brown; pinnules recurved (sometimes more or less flat); flower heads light, bright, yellow.	In laterite on a rise.				Ca 7 km from Bullsbrook East towards Chittering	AUTO	3	2/08/1973
1718	319163	11229	Acacia drummondii subsp. affinis	3						About 5 km due ENE [of] Muchea	AUTO	3	2/11/1975
1725	319260	11229	Acacia drummondii subsp. affinis	3	Erect shrub to 0.5 m tall; pinnae patent to more or less ascending; pinnules prominently recruved, dark green above, sub-glaucous below; flower heads light yellow.	Gravel.	Jarrah - Marri woodland.			Ca 5 km due ENE of Muchea	AUTO	3	7/07/1973
3215	5082854	14129	Acacia oncinophylla subsp. oncinophylla	3		Dark brown gritty clay, with surface gravel and cobbels, on a very steep western midslope.	Eucalyptus calophylla Low Forest, over Acacia saligna Open Low Woodland, over Leptosperma erubescens, A. saligna Scrub, over Xanthorrhoea preissii Open Dwarf Scrub, over Hibbertia hypericoides, Phyllanthus calyinus Low Heath.			Walyunga National Park, in small gully 100 m E of railway line (c. 300m NE of major creekline) c. 2km ESE of Woodsome Hill. (Plot-WAYL09)	GPS	1	5/09/1996

FID	Sheet	NameID	Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_Method	Precision	Date
3235	7213182	14129	Acacia oncinophylla subsp. oncinophylla	3		Dark brown gritty clay, with surface gravel and cobbels, on a very steep western midslope.	Eucalyptus calophylla Low Forest, over Acacia saligna Open Low Woodland, over Leptosperma erubescens, A. saligna Scrub, over Xanthorrhoea preissii Open Dwarf Scrub, over Hibbertia hypericoides, Phyllanthus calyinus Low Heath.			Walyunga National Park, in small gully 100 m E of railway line (c. 300m NE of major creekline) c. 2km ESE of Woodsome Hill. (Plot-WAYL09)	GPS	1	5/09/1996
4906	8531277	11336	Adenanthos cygnorum subsp. chamaephyton	3		Slope on road verge MRD. Dry grey sand / loam / fluviatile gravel / laterite. Area burnt in 2007.	Woodland of Eucalyptus marginata, Thysanotus multiflorus, Hibbertia hypericoides, Hakea lissocarpha, Tetraria octandra.		Reproductive state: vegetative. Condition of population: healthy. Potential threats: roadworks.	Jenkins Road, Bullsbrook	GPS	1	21/10/2008
4923	7980817	11336	Adenanthos cygnorum subsp. chamaephyton	3		Laterite boulder. Dry brown loam.	Jarrah over Dryandra sessilis. With Xanthorrhoea preissii, Hakea undulata, Lambertia multiflora subsp. darlingensis.		Condition of population: healthy.	Jenkins Road extension road verge, Bullsbrook	GPS	1	9/09/2004
14121	1967592	19338	Chamaescilla gibsonii	3						Muchea	MAN	0	/10/1928
14124	1967487	19338	Chamaescilla gibsonii	3	Flowers deep blue.	Damp sandy clay.				36 mile peg, Great Northern Highway [3 miles N of turnoff to Muchea]	AUTO	3	25/09/1965
14127	1967509	19338	Chamaescilla gibsonii	3	Flowers deep blue.	Damp sandy clay.				36-37 mile peg, Great Northern Highway[c. 3 miles N of turnoff to Muchea]	MAN	0	25/09/1965
16265	6427839	16245	Cyathochaeta teretifolia	3	Tufted perennial herb, sterile.	Seasonal Wetland, flat ground, black sandy peaty clay, over ?clay, poor drainage, wet during winter/spring.	Low Forest A. Associated species: Melaleuca rhaphiophylla, Banksia littoralis.	abundant.		Nature Reserve, Muchea (System 6 Area C25) in System 6 Update quadrat much05	GPS	1	17/11/1994
16796	8124965	34773	Darwinia foetida	T	Shrub to 50 cm. Buds green - pink.	Low plain with dry grey sand.	Dense low heath dominated by Regelia sp. Associated species include Regelia sp., Melaleuca sp., Xanthorrhoea preissii, Allocasuarina humilis, Hibbertia hypericoides, Patersonia occidentalis, Conostylis sp., Bossiaea eriocarpa, Banksia dallanneyi, Hovea t	22 mature plants.	Plants occur approximately 30 m W of the SE corner of the property and approximately 5 m N of the southern firebreak.	UCL directly N of Muchea Nature Reserve, Muchea	GPS	1	8/09/2008
16797	8429227	34773	Darwinia foetida	T	Low, spreading shrubs to 0.6m x 1m, the leaves somewhat glaucous. Inflorescences inclined to nodding; bracts glaucous green tinged pinkish.	Moist flat; dark grey sand.	Melaleuca raphiophylla, Hypocalymma angustifolia, Acacia pulchella shrubland beneath marri, with invasion by blackberry, brazilian peppertrees, weedy grasses.	frequent - hundreds of plants.		Private property in corner of Neaves Road and Bingham Road, Bullsbrook	GPS	1	24/10/2010

FID	Sheet	NameID	Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_Method	Precision	Date
16798	8863776	34773	Darwinia foetida	T	Low spreading shrub, 0.4 m x 0.4 m and 0.3 m high. Crowded angular leaves to 7 mm long, green to reddish. Terminal inflorescences, many flowered 'head', red/purple within red/purple bracts.			locally common.	Some very large sprawling plants in this population. Love and Veldt grasses are invading entire area.	C. 2.6 km N of Rutland Road, Muchea South Road intersection along the unmade Almeria Parade Road Reserve	GPS	1	3/09/2015
16799	8863857	34773	Darwinia foetida	T	Low spreading shrub, 0.3 m x 0.3 m and 0.2 m high. Crowded angular leaves to 5 mm long, green. Terminal inflorescences, many flowered 'head', pale pink within pale green bracts.			frequent in a 70 m linear area.	Some very large sprawling plants in this population. Love and Veldt grasses are invading entire area.	C. 100 m N of Rutland Road, Bullsbrook, along unmade Almeria Parade Road Reserve, on the E side of the rail line	GPS	1	22/10/2015
16800	1333801	34773	Darwinia foetida	T		In swampy sand.				S of Muchea	AUTO	3	13/11/1963
16801	1333836	34773	Darwinia foetida	T						Muchea	MAN	3	/12/1927
16802	1333828	34773	Darwinia foetida	T	Small shrub; bracts red-green.	In sandy soil.	With Banksia, Adenanthos sericea association.			0.75 miles N of Muchea X-roads	AUTO	3	28/10/1960
16803	6427820	34773	Darwinia foetida	T	Domed low shrub, flowers green, bracts green/red.	Wet Flat, grey sand, poor drainage, wet during winter/spring.	Dwarf Scrub C. Associated species: Melaleuca sp.B.	abundant.		Nature Reserve, Muchea (System 6 Area C25) in System 6 Update quadrat much03	GPS	1	13/10/1994
16804	6407366	34773	Darwinia foetida	T	Compact, perennial shrub, 25 cm high x 40 cm wide. Flowers green/red.	Plain. Winter wet area. Dry/moist grey/brown soil.	Medium trees within dense shrub/sedge layer. Characteristic species: Banksia, Xanthorrhoea and Hakea.	300+ plants.	1% in bud. Infestation area of this weed: 11-100 sq.m.	70 m from SE corner of Nature Reserve, just S of Muchea	GPS	1	9/09/2002
16805	6407382	34773	Darwinia foetida	T		Dry grey sand.	Banksia woodland. With Banksia menziesii and Nuytsia.			NE Ellenbrook Bushland, Site 2	GPS	1	18/11/2002
16806	6407374	34773	Darwinia foetida	T	Compact shrub, 0.5 m high x 0.5 m wide. Flowers green/red.		Woodland over Heath B. With Banksia menziesii, Viminaria, Xanthorrhoea.	300+ plants.	40% of population flowering.	Gnangara Water Reserve, Location 1518, 1.35 km from SE direction along diagonal firebreak to the NE corner of the reserve. Population located on eastern side of track that runs parallel with firebreak	GPS	1	29/10/2002
16807	6570046	34773	Darwinia foetida	T	Low rounded shrub to 0.3 m by 0.2 m, flowers green, bracts green/red.	Wet Flat, brown loamy sand over cream sand, poor drainage, wet during winter/spring.	Associated species: Melaleuca sp. B.			NE Ellen Brook Bushland (Bush Forever Site 2) in System 6 Update quadrat mill01, Bullsbrook	GPS	1	3/11/1995

FID	Sheet	NameID	Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_Method	Precision	Date
16808	6059082	34773	Darwinia foetida	T	Tangled domed shrub 60 x 60 cm; infl. bracts red in centre, outer green, flowers wet for smell.	Winter wet-damp flats, peaty sandy clay.	Assoc. vegn.: Regelia inops/Melaleuca incana/Kunzea recurva shrubland over Hypocalymma angustifolia over sedges.	locally common.		Muchea Nature Reserve, Muchea	MAN	3	1/10/2001
16809	6019749	34773	Darwinia foetida	T	Domed shrub to 0.3 m by 0.3 m. Flowers green, bracts red-green.	Seasonally wet area alongside sumpland (depression). Grey sand.	Pericalymma ellipticum and Astartea aff. fascicularis Heathland adjacent to Melaleuca rhaphiophylla and Banksia littoralis Low Forest A.			Gnangara Water Reserve, Swan Location 1518 (leased to the Commonwealth Government for a bombing range, lease 37L 776) part System 6 Area C25, Muchea	MAN	0	17/11/1994
16810	7887442	34773	Darwinia foetida	T	Perennial, prostrate compact shrub 0.5 m high x 0.5 m wide.	Palusplain Multiple Use Wetland. Grey black soil. Burnt Spring 2006.	Corymbia calophylla, Melaleuca rhaphiophylla, Hypocalymma angustifolium.	21-50 plants (25 alive, 22 dead)	Percentage of population in fruit 30%.	SW corner of Lot 200, Neaves Road, Bullsbrook	GPS	1	9/03/2007
16811	1335448	34773	Darwinia foetida	T	Compact shrub 27 cm high. Heads nodding. Floral bracts reddish green.	Grey-white sand.	In low heath.	frequent.		Muchea townsite, 0.5 km S along Carl street	MAN	0	6/11/1984
16812	8171009	34773	Darwinia foetida	T	Erect or spreading shrub, 0.7 m high. Flowers green brown.	Road drain / drainage line. Brown sandy loam. Area burnt > 15 years ago.	Dominated by Watsonia meriana.	20 alive mature plants, 3 dead plants.		600 m N of Brand Highway intersection, Great Northern Highway, Muchea	GPS	1	23/02/2016
16813	8170983	34773	Darwinia foetida	T	Erect or spreading shrub, 0.7 m high. Flowers green brown.	Road drain / drainage line. Brown sandy loam. Area burnt > 15 years ago.	Dominated by Watsonia meriana.	20 alive mature plants, 3 dead plants.		600 m N of Brand Highway intersection, Great Northern Highway, Muchea	GPS	1	22/11/2016
16814	8170991	34773	Darwinia foetida	T	Erect or spreading shrub, 0.7 m high. Flowers green brown.	Road drain / drainage line. Brown sandy loam. Area burnt > 15 years ago.	Dominated by Watsonia meriana.	20 alive mature plants, 3 dead plants.		600 m N of Brand Highway intersection, Great Northern Highway, Muchea	GPS	1	23/02/2016
16815	8456240	34773	Darwinia foetida	T	Small compact shrub <0.30 m.	Roadverge.	Modified vegetation with roadverge plantings. Some areas almost completely degraded. Xanthorrhoea preissii and Allocasuarina humilis over Low Open Shrubland of Darwinia foetida and Baeckea camphorosmae. High number of weeds.	25 plants.		Great Northern Highway, W side, ca. 3.2 - 3.4 km S of Brand Highway and ca. 530 m N of Wandena Road, Bullsbrook	GPS	1	26/11/2018
18644	1157280	4452	Diplolaena andrewsii	T	Divoricate shrub to 1 m high.	Creek bank, brown loamy sand over granite rocks.	Euc. rudis, E. wandoo woodland over Grevillea vestita, Trymalium floribundum.			Wooroloo Brook - O'Brien Road crossing at Gidgegannup 1:100,000 Map 2134 Grid 162890	MAN	0	25/07/1990
19123	2386372	3115	Drosera occidentalis	4		Clayey sand soils.				Rutland road and Great Northern Highway junction, Bullsbrook	AUTO	3	22/10/1987

FID	Sheet	NameID	Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_Method	Precision	Date
19124	8722692	3115	Drosera occidentalis	4		Grows in peaty sand around the margins of swamps, winter wet depressions and watersheds in open areas.	Swamp heathland.			Ca 0.3 m E of the junction of Great Northern Highway and Rutland Road, near Bullsbrook	GPS	1	9/11/1991
19131	6352162	3115	Drosera occidentalis	4	Pygmy.	White/yellow sand. Swamp.		occasional.		Great Northern Highway, Rutland Road, Bullsbrook	MAN	3	22/10/1983
19133	5812291	3115	Drosera occidentalis	4	Small rosetted herb 3 mm high. Flowers 1-2 mm, several on an erect stem 8-10 mm in length.	In moist sandy clay soil. Seasonally wet depressions.	Amongst sedges. Bordered by Banksia woodland associated plants include Drosera nitidula, D. parvula, Pericalymma elliptica, Viminea juncea, Stirlingia latifolia and Lechenaultia floribunda.	common.		Great Northern Highway just N of Rutland Avenue in Bullsbrook East, just N of R.A.A.F. Pearce Aerodrome,	MAN	3	5/11/1985
19230	8329311	8912	Drosera sewelliae	2	Small tufted herb 2 cm.	Conglomerate. Laterite, boulders, shallow grey gravel-sand pockets. Midslope W slope.	Woodland E. marginata subsp. thalassica with C. calophylla. Allocasuarina humilis, Banksia eriocarpa, Calothamnus sanguineus, Conostylis setigera, Hibbertia hypericoides, Lambertia multiflora var. darlingenis, Melaleuca trichophylla, Xanthorrhoea preissi			Lots to the immediate N of the formed part of Powderbark Road, Lower Chittering. Plot 1	MAN	3	29/11/2007
19232	7693583	8912	Drosera sewelliae	2		Growing in laterite and silica sand soils.	In light open forest.			On Chittering Road, just S of Muchea East Road, Lower Chittering	GPS	1	/09/2007
19233	7768982	8912	Drosera sewelliae	2	A fibrous rooted perennial pygmy sundew herb, >2.5 cm diameter, petioles green, lamina reddish, more or less elliptic; Inflorescence(s) scape(s) 1 rarely 2, each >6-flowered, Sepals reddish, ovate-elliptic, semi-erect in fruit. Petals broadly obovate, me	Growing in laterite and silica sand soils.	In light open forest.			On Chittering Road, just S of Muchea East Road, Lower Chittering	GPS	1	21/09/1991
19412	6512372	17605	Eleocharis keigheryi	T	Erect annually renewed sedge; flowers green.	Sumpland (claypan); clay grey/brown.	Sedges.	abundant in deepest area of claypan, in mown area of airfield.		SW side of Pearce Airforce Base (System 6 Area M15, Bush Forever Site 294) opposite in town area to E of the boundary road	GPS	1	20/09/1994
19424	7782039	17605	Eleocharis keigheryi	T	Clumping grass-like sedge to about 40 cm high. Green flowers with yellow hairs.	Seasonally inundated clay pan with brown clay.	Cotula coronopifolia, Triglochin sp., sedges and weed spp.	abundant in deepest section of claypan.		RAAF Pearce Aerodrome, Bullsbrook, population located on SW side of the airforce base in an open clay pan	GPS	1	17/09/2007

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21103	4140362	41801	Eryngium pinnatifidum subsp. Palustre (G.J. Keighery 13459)	3	Tuberous perennial herb to 20 cm. Flowers pale blue, in full flower.	Winter wet flats. Brown sandy loam over clay.	Melaleuca viminea, M. uncinata open shrubland.	common but scattered.		Bullsbrook Nature Reserve, Pearce	MAN	0	19/10/1992
21113	8893519	41801	Eryngium pinnatifidum subsp. Palustre (G.J. Keighery 13459)	3	Tuberous perennial herb. Leaves mostly tubular.	Seasonally wet poorly drained flat. Black sand.	Melaleuca uncinata, M. brevifolia over Leptocarpus canus and a rich herb layer.		Vegetation condition: very good. Claypan TEC, communities 7 & 8.	Plot Bull 08. Bullsbrook Nature Reserve	GPS	1	11/09/2012
27490	4564928	33559	Grevillea althoferorum subsp. fragilis	T	Low immature and dehisced fruit.					Bullsbrook Nature Reserve, 900 m N of Morissey Road on E boundary	MAN	0	10/01/1997
27491	4961471	33559	Grevillea althoferorum subsp. fragilis	T	Spreading shrub to 50 cm. Pale yellow flowers. Greyish hairy bipinnate leaves.	Flat plain at base of scarp. Greyish-yellow sand.	Banksia woodland with Banksia menziesii, Xanthorrhoea, Hibbertia sp., Banksia attenuata.			Bullsbrook Nature Reserve, on E boundary, ca 850 m N of Morissey Road	GPS	1	26/11/1997
27492	4357248	33559	Grevillea althoferorum subsp. fragilis	T	Compact, spreading shrub 30 cm high x 45 cm wide. Appears at end of flowering period. Flowers pale yellow. Leaves dark green. Most bushes exhibiting signs of stress, leaves browning off.	Plain, dry. Dense organic litter cover in some areas. Greyish-yellow sand.	Low woodland. Banksia, Xanthorrhoea, Hibbertia, Conospermum, sedges.		Abundance: c. 30 over an area 30 x 40 m. Vegetation in good condition. Indication there may be Phytophthora in reserve. Small areas of dead Banksia and Isopogons.	Bullsbrook Nature Reserve, E boundary (off Morrissey road)	GPS	1	5/10/1995
27493	7374852	33559	Grevillea althoferorum subsp. fragilis	T			Banksia woodland. With Banksia attenuata and B. menziesii.			Bullsbrook Nature Reserve (Population 2). Eastern boundary of reserve, ca 900 m N of Morrisey Road	GPS	1	22/12/2005
27494	7692439	33559	Grevillea althoferorum subsp. fragilis	T	Bluish-green, lignotuberous shrub with non-pungent leaves. 0.3 m x 0.4-1 m. Yellow with reddish to reddish-brown buds.	Undulating plain. Outwash plain of the Darling Range. Grey sand over yellow sand.	Banksia-Corymbia woodland with Corymbia calophylla, Banksia menziesii, B. attenuata, B. grandis, Adenanthos sp., Hibbertia sp., Ptilotus manglesii, Xanthorrhoea sp., Mesomelaena tetragona, Stirlingia latifolia, Lobelia sp., Isopogon, Petrophile spp.	rare (10-50 plants seen).	Third year of drought. Very little in flower.	Nature Reserve at end of Morrissey Road (off Great Northern Highway) Bullsbrook, 1 km from Highway, eastern side of fire trail, walk in ca 1 km till you see a farmers shed. Plants are opposite this	GPS	1	6/09/2002

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27495	7692420	33559	Grevillea althoferorum subsp. fragilis	T	Bluish-green, lignotuberous shrub with non-pungent leaves. 0.3 m x 0.4-1 m. Yellow with reddish to reddish-brown buds.	Undulating plain. Outwash plain of the Darling Range. Grey sand over yellow sand.	Banksia-Corymbia woodland with Corymbia calophylla, Banksia menziesii, B. attenuata, B. grandis, Adenanthos sp., Hibbertia sp., Ptilotus manglesii, Xanthorrhoea sp., Mesomelaena tetragona, Stirlingia latifolia, Lobelia sp., Isopogon, Petrophile spp.	rare (10-50 plants seen).	Third year of drought. Very little in flower.	Nature Reserve at end of Morrissey Road (off Great Northern Highway) Bullsbrook, 1 km from Highway, eastern side of fire trail, walk in ca 1 km till you see a farmers shed. Plants are opposite this	GPS	1	6/09/2002
27497	8645078	33559	Grevillea althoferorum subsp. fragilis	T	Shrub to 1 m high x 1.2 m wide.	SW aspect. White/brown sand. Extends from firebreak into sandy area under Jarrah/Marri.	Open Jarrah/Marri Woodland over Open Shrubland over Open Sedgeland. Associated species: Jarrah, Marri, Caladenia sp.?, Petrophile macrostachya, Xanthorrhoea preissii, Banksia attenuata, B. grandis, Hibbertia hypericoides, Neurachne sp.?		Pop. 1.	Bullsbrook Nature Reserve	GPS	1	14/11/2014
27498	7692471	33559	Grevillea althoferorum subsp. fragilis	T	Bluish-green, lignotuberous shrub with non-pungent leaves. 0.4 m x 0.6-1 m. Yellow with reddish buds.	Undulating plain. Base of sand hill beside track. Yellow sand with laterite.	Banksia woodland with B. menziesii, B. attenuata, Hibbertia sp., Xanthorrhoea sp., Mesomelaena tetragona (Semiphore sedge).	rare (10-50 plants seen).	Second year of drought. Very little in flower.	Nature Reserve at end of Morrissey Road (off Great Northern Highway) Bullsbrook, 1 km from Highway, eastern side of fire trail, walk in ca 1 km till you see a farmers shed. Plants are opposite this	GPS	1	8/09/2001
27933	8329192	1975	Grevillea candolleana	2	15 cm small shrub.	Laterite conglomerate with boulders, minor sand pockets. Upper backslope of ridge.	Woodland to open forest of Eucalyptus marginata subsp. thalassica with Corymbia calophylla. Open shrubland of Xanthorrhoea, Allocasuraina and Styphelia species. Allocasuraina humilis, Bossiaea eriocarpa, Calothamnus sanguineus, Conostylis setigera, Hibbe			Lots to the immediate N of the formed part of Powderbark Road, Lower Chittering. Plot 5	GPS	3	6/12/2007
28027	8471908	1984	Grevillea curviloba	T	Shrub 1.5 m high x 2 m wide. Flowers white.	Flat, white sand.	Shrubland with scattered Marri. Leptospermum erubescens.	35 plants		Smith Park, on the corner of Smith Road and Chittering Road, City of Swan Reserve	GPS	1	9/09/2011
28028	8471894	1984	Grevillea curviloba	T	Shrub 1.5 m high x 2 m wide. Flowers white.	Flat, white sand.	Road verge vegetation. Acacia saligna, Gastrolobium spinosum, Banksia sessilis.	20 plants.		Burly Park, (City of Swan Reserve), corner of Smith Road and Chittering Road, along Smith Rd boundary and ca 10 m into the reserve, Bullsbrook	GPS	0	9/09/2011
28030	4832817	1984	Grevillea curviloba	T	Shrub, much branched at base, flowering stems to 2 m. Flowers white, largely post flowering.	Sandy rises in wetland.	Regelia/Actinostrobus shrubland.			Muchea Nature Reserve, Muchea,	AUTO	3	18/10/1996

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28031	4832795	1984	Grevillea curviloba	T	Shrub, much branched at base, flowering stems to 2 m. Largely post flowering.	Sandy rises in wetland.	Regelia/Actinostrobus shrubland.			Muchea Nature Reserve, Muchea,	AUTO	3	18/10/1996
28032	5207002	1984	Grevillea curviloba	T	Spreading shrub with prostrate vegetative growth and flowering/fruiting growth to 2 m. Bright green trifurcate foliage.	Low lying area of sandplain. Grey peaty sand over clay.	Cleared vegetation with weeds, grasses, Hakea sp., Melaleuca sp., Acacia sp.			Corner of Rutland and Railway Roads, S of Muchea townsite, on road and rail reserve W side	GPS	1	16/12/1998
28033	2415887	1984	Grevillea curviloba	T						Bullsbrook, Swan River	AUTO	3	14/08/1900
28034	4832809	1984	Grevillea curviloba	T	Shrub, much branched at base, flowering stems to 2 m. Flowers white, largely post flowering.	Sandy rises in wetland.	Regelia/Actinostrobus shrubland.			Muchea Nature Reserve, Muchea,	AUTO	3	18/10/1996
28036	1112821	1984	Grevillea curviloba	T	Prostrate vegetative branches and erect leafy flowering branches; up to 2.5 m high.	In semi-disturbed area. Deep sand, with a high water-table.	With Regelia ciliata, Conospermum triplinervium.		Abundance: frequent.	Near Muchea.	MAN	3	10/06/1976
28038	2415933	1984	Grevillea curviloba	T						Muchea	AUTO	3	/09/1927
28043	5207010	1984	Grevillea curviloba	T	Spreading shrub with prostrate vegetative growth and flowering/fruiting growth to 2 m. Bright green trifurcate foliage.	Low lying area of sandplain. Grey peaty sand over clay.	Open woodland with weeds, grasses, Hakea sp., Watsonia, Jacksonia furcellata.			Corner of Archibald and Muchea South Road, Muchea townsite, in vacant block at edge of road	MAN	0	16/12/1998
28049	5383676	1984	Grevillea curviloba	T		Flat, grey, moist sand.	Open, semi-disturbed, degraded, scrubby site. Associated species: Acacia saligna, Jacksonia furcellata, Melaleuca sp., Adenanthos cygnorum, Blackboys, Watsonia, Banksia littoralis, Cape Tulip, Anigozanthos manglesii and very dense grasses.	41 mature plants, 20 seedlings.	Population No. 14.	2.45 km SSE down Muchea South Road from Muchea township, population adjoins E side of road and W side of railway line,	GPS	1	4/10/1996
28052	5383706	1984	Grevillea curviloba	T		Flat.	Completely open, previously disturbed/degraded site. Fringed by odd Marri and Paperbarks. Acacia saligna, Hakea prostrata, H. varia, Blackboys, Capeweed and other dense agricultural weeds and Kikuya grass growth - Hibbertia sp., Melaleuca sp., Stirlingia	21 mature plants, 25 seedlings.	Population No. 5A & 5B.	Pop. 5A, 1.8 km N along Brand Highway from junction of railway crossing at Muchea and 20 m on E side of road, Pop.5B 25 m E of Pop.5A and or 5 m E of railway line,	GPS	1	26/09/1996

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28058	5414148	1984	Grevillea curviloba	T	Open, erect shrub 2.5 m high x 1 m wide. Plant tends to be prostrate when young then erect branches develop. Flowering profusely. Pods common.	Low lying. Red sand-clay-gravel over ironstone.	Sparse vegetation, mainly veldt grasses. Associated species: Acacia saligna, Corymbia calophylla, Viminaria juncea, Watsonia, grasses, etc.	common.		Muchea Nature Reserve, corner of Railway Parade and Archibald Street,	MAN	0	9/09/1998
28060	6511686	1984	Grevillea curviloba	T	Prostrate shrub with erect flowering branches to 2 m by 2 m. Fruiting.	Wet Flat; grey sand over sand. Poor drainage, wet during winter/spring.	Open Scrub, Associated species: Xanthorrhoea preissii.	abundance: 1 of 8 plants in 1 population.		Muchea Nature Reserve, Muchea South Road. System 6 Area C25; Muchea townsite (adjacent System 6 Update plot much 02)	GPS	1	13/10/1994
28061	6511724	1984	Grevillea curviloba	T	Prostrate shrub with erect flowering branches to 2 m by 2 m. Fruiting.	Wet Flat; grey sand over sand. Poor drainage, wet during winter/spring.	Open Scrub, Associated species: Xanthorrhoea preissii.	abundance: 1 of 8 plants in 1 population.		Muchea Nature Reserve, Muchea South Road. System 6 Area C25; Muchea townsite (adjacent System 6 Update plot much 02)	GPS	1	13/10/1994
28062	6511694	1984	Grevillea curviloba	T	Prostrate shrub with erect flowering branches to 2 m by 2 m. Fruiting.	Wet Flat; grey sand over sand. Poor drainage, wet during winter/spring.	Open Scrub, Associated species: Xanthorrhoea preissii.	abundance: 1 of 8 plants in 1 population.		Muchea Nature Reserve, Muchea South Road. System 6 Area C25; Muchea townsite (adjacent System 6 Update plot much 02)	GPS	1	13/10/1994
28064	6511708	1984	Grevillea curviloba	T	Prostrate shrub with erect flowering branches to 2 m by 2 m. Fruiting.	Wet Flat; grey sand over sand. Poor drainage, wet during winter/spring.	Open Scrub, Associated species: Xanthorrhoea preissii.	abundance: 1 of 8 plants in 1 population.		Muchea Nature Reserve, Muchea South Road. System 6 Area C25; Muchea townsite (adjacent System 6 Update plot much 02)	GPS	1	13/10/1994
28067	6330207	1984	Grevillea curviloba	T	Clumped shrub, prostrate branches then erect 1.8 m high x 1 m wide. In fruit, apparently spreading by grading and seed.	Roadverge. Lateritic sand over laterite.	Road verge herbs.		Spreading along verge from planted enrichment plantings.	Burley Park, Bullsbrook	TOPO	2	23/11/2002
28068	7934041	1984	Grevillea curviloba	T		Plain with grey sand.	Shrubland to 1.5 m with Jacksonia sp., Melaleuca sp. and Xanthorrhoea sp.	4 clumps.	Pop. 3.	NE corner of reserve no. 1336, Muchea, ca. 30 m E of gate into reserve on N boundary	GPS	1	9/01/2008
28069	6511600	1984	Grevillea curviloba	T	Prostrate shrub with erect flowering branches to 2 m by 2 m. Fruiting.	Wet Flat; grey sand over sand. Poor drainage, wet during winter/spring.	Open Scrub, Associated species: Xanthorrhoea preissii.	abundance: 1 of 8 plants in 1 population.		Muchea Nature Reserve, Muchea South Road, System 6 Area C25. Muchea townsite (adjacent System 6 Update plot much 02)	GPS	1	13/10/1994
28070	6511716	1984	Grevillea curviloba	T	Prostrate shrub with erect flowering branches to 2 m by 2 m. Fruiting.	Wet Flat; grey sand over sand. Poor drainage, wet during winter/spring.	Open Scrub, Associated species: Xanthorrhoea preissii.	abundance: 1 of 8 plants in 1 population.		Muchea Nature Reserve, Muchea South Road. System 6 Area C25; Muchea townsite (adjacent System 6 Update plot much 02)	GPS	1	13/10/1994

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28071	6511732	1984	Grevillea curviloba	T	Prostrate shrub with erect flowering branches to 2 m by 2 m. Fruiting.	Wet Flat; grey sand over sand. Poor drainage, wet during winter/spring.	Open Scrub, Associated species: Xanthorrhoea preissii.	abundance: 1 of 8 plants in 1 population.		Muchea Nature Reserve, Muchea South Road. System 6 Area C25; Muchea townsite (adjacent System 6 Update plot much 02)	GPS	1	13/10/1994
28072	6511740	1984	Grevillea curviloba	T	Prostrate shrub with erect flowering branches to 2 m by 2 m. Fruiting.	Wet Flat; grey sand over sand. Poor drainage, wet during winter/spring.	Open Scrub, Associated species: Xanthorrhoea preissii.	abundance: 1 of 8 plants in 1 population.		Muchea Nature Reserve, Muchea South Road. System 6 Area C25; Muchea townsite (adjacent System 6 Update plot much 02)	GPS	1	13/10/1994
28074	7934319	1984	Grevillea curviloba	T		Plain with grey sand.	Shrubland to 1.5 m high with Jacksonia sp., Melaleuca sp. and Xanthorrhoea sp.	at least 31 clumps.	Pop. 3.	NE corner of reserve no. 2336, Muchea, ca. 30 m E of gate into reserve on N boundary	GPS	1	12/12/2007
28077	8008485	1984	Grevillea curviloba	T	Prostrate and erect shrub to 2 m. Flowers white.	Flats. Grey sand.	Banksia sp., Melaleuca sp,. weeds.			Occurs at the intersection of Brand Highway and Rutland Road, Muchea within the rail reserve. Plants occur on the NW and SE corners	GPS	1	6/01/2009
28080	8863768	1984	Grevillea curviloba	T	Spreading shrub to 1.6 m with pinnatifid leaves, in early flower bud stage. Juvenile growth prostrate with broader leaf lobes than the mature upright leaves.	Flat, grey sand to sandy-loam, highly disturbed bushland corridor on rail and unmade road reserve.	Open Tall Shrubland of Acacia saligna over Open Shrubland of Xanthorrhoea preissii and Acacia ? cochlearis over African love grass, perennial Veldt grass and Cyathochaeta avenacea. Occasional Thysanotus ? patersonii and Hakea prostrata.	c. 120 plants in sometimes dense local patches, over a 230 m length.	Canker evident on many shrubs.	Rail reserve, E side, c. 210 m N of West Road rail crossing, Bullsbrook	GPS	1	6/09/2016
28083	1112848	1984	Grevillea curviloba	T	Spreading low shrub 1 m x 2.5 m wide, flowers white.	Winter wet. Peaty sand over clay.	Melaleuca low woodland.		Abundance: common.	Muchea Townsite Reserve.	MAN	3	27/08/1985
28084	8816433	1984	Grevillea curviloba	T	Upright shrub, to 2 m high. Variable width. White flowers.	Lower slope. Near to creekline. Flat. Grey loamy sand.	Occasional Acacia saligna over Shrubland of Grevillea curviloba and Xanthorrhoea preissii over Closed Grassland of mixed weed species dominated by Agrostis curvula and Ehrharta calycina. Associated species: Corynotheca micrantha, Burchardia congesta, Jac	ca 25 shrubs in one localised area.	Plants are in poor condition. Insects are having a secondary impact on the population which is stressed from weed competition and drying climate.	Ca 20 m S of Neaves Road along Railway Road, on the E side of the rail reserve, Bullsbrook	GPS	1	22/10/2015
28086	9068732	1984	Grevillea curviloba	T	Erect shrub to 1.5 m.	Flat, drainage line with moist grey sand to sandy loam.	Low shrubland of Grevillea curviloba subsp. incurva, Xanthorrhoea preissii, Acacia saligna; over very low open sedgeland and weeds.	occasional - 4 clumps.	Found within population of Grevillea curviloba subsp. incurva.	Northern boundary of Muchea Nature Reserve (2336), Shire of Chittering	GPS	1	31/08/2011

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28087	9068767	1984	Grevillea curviloba	T	Shrub with white flowers.	Well drained flat ground, degraded habitat. Grey sand.	Tall open scrub of Acacia saligna and Jacksonia sp.; over open heath of Grevillea curviloba subsp. curviloba with occasional Xanthorrhoea preissii; over weeds of Eragrostis curvula, Watsona sp. and Poa sp.			Between Railway Parade and Almeria parade, E of the railway line, c. 230 m S of West Road railway crossing, Bullsbrook	GPS	1	30/08/2012
28089	9068724	1984	Grevillea curviloba	T	Prostrate to erect shrub 0.2 - 2 m high. White flowers.	Drainage line with grey sand.	Woodland of Corymbia calophylla, Banksia littoralis; over shrubland of Hakea prostrata, H. varia, Xanthorrhoea preissii and Allocasuarina humilis; over low heath and sedgeland.	frequent, found in clumps throughout nature reserve.		Southern end of Muchea Nature Reserve (2336), 150 m E of Railway Parade, 50 m N of the reserve boundary	GPS	1	31/08/2011
28090	9068821	1984	Grevillea curviloba	T	Prostrate to erect shrub 1 - 2 m high. White flowers.	Drainage line with grey sand over clay.	Tall open shrubland of Hakea varia, over open heath of Regelia ciliata, over herbland and weeds.	abundant.		NE corner of intersection of Rutland Road and Railway Parade, Bullsbrook	GPS	1	30/08/2012
28091	9068805	1984	Grevillea curviloba	T	Shrub up to 2 m with white flowers.		Open woodland Melaleuca rhaphiophylla to 4 m; over open shrubland of Viminaria juncea, Acacia saligna and occasional Melaleuca viminea; over low open shrubland of Grevillea curviloba subsp. incurva and sedges with significant weed invasion of Arum lillie			Opposite Muchea Nature Reserve (R2336), E of Muchea South Road, N of the railway line, 750 m S of Brand Highway, within the rail reserve, Muchea	GPS	1	9/09/2011
28092	9068791	1984	Grevillea curviloba	T	Juvenile shrub.	Grey sand to sandy loam.	Open Melaleuca rhaphiophylla woodland; over Grevillea curviloba subsp. incurva, G. curviloba subsp. curviloba, Xanthorrhoea preissii, Acacia saligna, Grevillea obtusifolia and weeds.			Muchea Nature Reserve, along the northern boundary, 75 m W of Railway Parade	GPS	1	31/08/2011
28093	9068783	1984	Grevillea curviloba	T	Clonal shrub up to 2 m with white/cream flowers. Some plants prostrate.	Grey sand.		occasional.		Park and Drain Reserve (R39007), SW corner of Muchea South Road and Archibald Street, Muchea town site, Shire of Chittering	GPS	1	2/09/2011
28094	9068759	1984	Grevillea curviloba	T	Very large shrub over 2 m. White flowers.	Flat with dark brown loam.	Occasional Xanthorrhoea preissii and weeds including Watsonia, Couch grass, love grass, veldt grass.	occasional - 1 adult and 3 juveniles in area.		In railway reserve, 360 m S of Strachen Road, E of Railway Parade and W of railway line, Bullsbrook	GPS	1	21/09/2011
28095	9068775	1984	Grevillea curviloba	T	Shrub over 2 m high, in bud. Some plants prostrate.	Dark brown loam sand.	Tall open scrub of Acacia saligna with occasional Banksia littoralis, B. sessilis, Hakea varia; over open heath of Stirlingia latifolia, Dianella revoluta and weeds of Eragrostis curvula, Oxalis sp. Babiana sp., Asparagoides.	locally frequent.		Between Almeria Parade and the railway line, c. 700 m S of Strachen Road railway crossing, Bullsbrook	GPS	1	17/08/2012

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28096	2415925	1984	Grevillea curviloba	T	Shrub 1.5 - 1.8 m with white flowers and pinnate leaves.	In sand.				Bullsbrook	AUTO	3	5/10/1972
28097	8153280	1984	Grevillea curviloba	T	Prostrate to erect shrub, 2 m high. Flowers white.	Flat, grey sand.	With Acacia saligna, Grevillea curviloba subsp. curviloba, Jacksonia furcellata, Xanthorrhoea preissii.			On the northern boundary fence of Muchea Nature Reserve and towards Railway Road Muchea. Ca 20 m E of the entry gate	GPS	1	7/01/2009
30408	2697246	16952	Guichenotia tuberculata	3						Near Bullsbrook, between New Norcia and Perth	AUTO	3	/09/1902
31813	3072932	19775	Hibbertia glomerata subsp. ginginensis	2		Near roadside drain.	Growing at the base of Jarrah saplings.			E side of Great Northern Highway at 36 mile peg [23 km S of Bindoon on the Great Northern Highway]	AUTO	3	//
31816	8013721	19775	Hibbertia glomerata subsp. ginginensis	2		Lower slope. Loam over laterite.	Woodland, Eucalyptus marginata over Dryandra sessilis, Conostephium pendula, Corymbia calophylla.			Jenkins Road extension, Bullsbrook	GPS	1	9/09/2004
32580	1137654	6233	Hydrocotyle lemnoides	4						Ellen Brook Nature Reserve	AUTO	3	22/08/1989
32583	1048104	6233	Hydrocotyle lemnoides	4	Corolla mauve. Leaves floating, stem rooted in clay.	Growing in fresh water, stem rooted in clay.				15 km N of Midland on Great Northern Highway, Martyn Reserve	MAN	3	7/10/1976
32586	1048112	6233	Hydrocotyle lemnoides	4		Growing in shallow water over mud.				Short-necked Tortoise Reserve ca. 15 km N of Midland	MAN	4	13/09/1985
32600	1048139	6233	Hydrocotyle lemnoides	4	Leaves floating, stem rooted in clay. Corolla mauve.	Growing in fresh water, stem rooted in clay.				15 km N of Midland on Great Northern Highway. Martyn Reserve	MAN	3	7/10/1976
32661	8836647	11074	Hydrocotyle striata	1	Spreading annual. Height: 5-10 cm.	Seasonally inundated depression within a Mound Spring. Moist, undulating slightly. Black peaty sand. Fire history: Autumn 1995.	Low Open forest of Melaleuca preissiana over Pteridium esculentum. With Cyathochaeta teretifolia (P3), Hibbertia perfoliata.	dense cover in localised ca 40 m x 30 m area. (Site not surveyed closely, plants maybe more widespread on Lot).	Collection made for identification as it had not been seen prior to removal of extremely dense cover of Blackberry initiated in 2012. Site is a Mound Spring of the Swan Coastal Plain threatened Ecological Community.	Lot 800, Pine Road, Bullsbrook. Land is vested within the Dept of Planning and Infrastructure and is adjoining Conservation Estate known as Neaves Road Nature Reserve	GPS	1	16/11/2016
32830	9233008	19601	Hypocalymma sylvestre	T	Shrub 0.5 m high, white flowers.	Quartz ridge. Slopes.	Powderbark wandoo woodland.			Lot 11, Sandow Road, southern end of property	GPS	1	16/09/2019
33500	2867982	16317	Isotropis cuneifolia subsp. glabra	3						Muchea	AUTO	3	10/10/1952

FID	Sheet	NameID	Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_Method	Precision	Date
39591	8772592	36200	Ornduffia submersa	4	Aquatic annual, 0.3 cm high. Submerged leaves collected.	Small ephemeral creek flowing east towards Ellen Book on large palusplain wetland. Brown / white sandy clay with more clay in the channel of the creek. Area burnt > 10 years ago.	Eucalyptus rudis subsp. rudis isolated mid trees over Melaleuca rhaphiophylla low woodland over grassland dominated by Ehrharta longiflora and Bromus diandrus.			E of Brand Highway, c. 1 km S of Muchea	GPS	1	15/09/2014
39674	6960014	34843	Oxymyrrhine coronata	4		Slope. Brown loam over laterite.	Eucalyptus marginata over Dryandra sessilis. Corymbia calophylla, Xanthorrhoea preissii, Petrophile linearis, Hemiandra pungens, Calothamnus sanguineus.	> 50 plants.		Jenkins Road extension, Bullsbrook	GPS	1	9/09/2004
40183	1050281	2271	Persoonia rudis	3						Between Muchea and Bullsbrook.	MAN	3	3/11/1974
40198	4244737	2271	Persoonia rudis	3	Multistemmed low spreading shrub, to 40 cm x 40 cm. In fruit.	Colluvial yellow sand.	Eucalyptus marginata woodland.	rare in area.		Bullsbrook Nature Reserve, Pearce	MAN	3	12/08/1993
41291	3578186	11132	Platysace ramosissima	3	Flowers cream.					32 mile peg, Great Northern Highway [ca 29 km SSW of Bindoon]	AUTO	3	//
41299	4087844	11132	Platysace ramosissima	3	Herb to 30 cm, finished flowering	Sandy soil, flat.	Heath to 1.2 m, not burnt.		Locally common.	Nature reserve on Great Northern Highway just north of Rutland Rd on east side along internal fire breaks	MAN	0	8/12/1994
43513	6533388	980	Schoenus capillifolius	3	Annual herb, flowers brown.	Seasonal Wetland, flat ground, brown clay, poor drainage, wet during winter/spring.	Low Scrub B, Associated species: Kunzea littericola Ms, Verticordia densiflora.			Eastern side of Pearce Airforce Base near Singapore Airforce Training Centre, System 6 Area M15, in System 6 Update quadrat xpearce02	GPS	1	20/09/1994
43696	4097610	16279	Schoenus sp. Bullsbrook (J.J. Alford 915)	2	Delicate herb 15 cm high, flowers brown and green.	Low lyingflat, grey peaty sand over ? clay.	Herbs and low shrubs.	common.		Twin Swamps Nature Reserve, 8 km S of Bullsbrook	MAN	0	31/10/1986
45301	8709394	18564	Stylidium aceratum	3	Herb to 5 cm, flowers pink with yellow throat.	Flat. Clay. Swampy.	With Stylidium spp., Actinostrobus arenarius, Melaleuca spp.			Bullsbrook Nature Reserve, along Great Northern Highway	GPS	1	21/10/2008
45303	3282945	18564	Stylidium aceratum	3	Leaves reddish, spathulate, stems reddish at baase, green further up, fleshy bracts. Flowers deep pink bands at throat, outside very pale pink.	Seasonal swamp.	Dominated by Melaleuca scabra, Actinostrobus pyramidalis and Kunzea with numerous sedges and ephemeral herbs.			Black Swamp Nature Reserve on Great Northern Highway; 1 km S of Wandena Road, Bullsbrook (S end)	MAN	0	3/11/1993

FID	Sheet	NameID	Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_Method	Precision	Date
45304	4980336	18564	Stylidium aceratum	3	Annual herb. Corolla dark-pink. No retrorse tooth on column bend.	Grows in sandy soils.	On swamp heathland.			Along Great Northern Highway N of Bullsbrook, 1 km S of Wandena Road (S end) on E side of the highway	MAN	0	9/11/1991
45305	8640645	18564	Stylidium aceratum	3	Annual herb, pink/white flowers.	Winter wet swamp. White/brown sand.	Low shrubland. With Actinostrobus sp., Kunzea sp., Myrtaceae sp., Restionaceae sp., Stylidium inundatum.	> 1000.		Bullsbrook Nature Reserve, just E of Brand Highway on internal track, N of Bullsbrook	GPS	1	21/11/2012
45311	2959143	18564	Stylidium aceratum	3	Erect herb, 3 cm high. Flowers pink and white.	Swamp. White clayey sand. In low sedgeland.			Abundance: abundant.	8 km N of Bullsbrook	MAN	0	1/11/1984
45313	8505306	18564	Stylidium aceratum	3	Erect herb to 100 mm high and 25 mm wide. Petals vertical paired, pink to pale pink (white). Spur at back poorly developed. Appendage on upper petals narrow. Column without spur or lump at bend.	Black damp sand.	Growing near Melaleuca sp., Centrolepis aristata and C. polygyna. Some salt tolerant plants growing nearby.	many.		Bullsbrook Nature Reserve, Great Northern Highway	GPS	1	7/11/2003
45320	8893322	18564	Stylidium aceratum	3	Small annual herb.	Seasonally wet poorly drained flat. Grey sand.	Melaleuca uncinata, M. bracteosa shrubland over sedges.		Vegetation condition: excellent. Claypan TEC, communities 7 & 8.	Plot Bull 06. Bullsbrook Nature Reserve	GPS	1	28/10/2013
45995	2694263	7756	Stylidium longitubum	4	Erect leafless herb with red succulent stems and pink flowers.	Recently dried muddy depression in swamp.				Twin Swamps Wildlife Sanctuary (Reserve No. A 27621) Ellen Brook - Bullsbrook area	TOPO	2	28/12/1971
46185	7838204	25800	Stylidium paludicola	3	Herb to 1 m tall.	Peat based mound spring. Permanently wet site with water oozing from entire surface. Dips and mounds occur in peat layer.	With forest - woodland of Melaleuca preissiana over dense shrubland of Cyclosorrus interruptus, Pteridium esculentum, Agonis linearifolia, Astartea fascicularis, Isolepis prolifera, Lobelia alata, Burchardia sp.	occasional.		ca 950 m W of western end of Gaston Road in Bullsbrook	GPS	1	26/11/2007
46619	2949210	7801	Stylidium squamellosum	2	Corollas yellow, marked brown on reverse. Forming clumps close to the soil, not stalked on proproots as in other populations of this species; leaves slightly longer than typical.	Low wet area.	Drosera heteromera, D. menziesii, Verticordia, Grevillea.		Not infraspecifically different from typical S. squamellosum, however.	37 mile peg on Northern Highway near Bullsbrook	MAN	3	27/10/1967

FID	Sheet	NameID	Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_Method	Precision	Date
47299	4543602	16867	Synaphea grandis	4	Shrub with many stems; scapes to 1 m; flowers yellow.	On lateritic hill.	In Wandoo woodland.			ca 1 mile E of Muchea crossroads	MAN	0	1/11/1971
47300	4543599	16867	Synaphea grandis	4	Shrub with many stems; scapes to 1 m; flowers yellow.	On lateritic hill.	In Wandoo woodland.			ca 1 mile E of Muchea crossroads	MAN	0	1/11/1971
48561	4864743	35581	Tetraria sp. Chandala (G.J. Keighery 17055)	2	Rhizomatous herb 1.6 m high, 1 m wide; flowers brown; fruits brown.	Mound spring, black peat over clay & humic sand.	Assoc. vegn.: Melaleuca rhaphiophylla forest over sedges.		Abundance: very common.	Property on W side of Neaves Road, Wanneroo	TOPO	2	4/02/1997
50713	2841886	32658	Trithuria occidentalis	T	Reddish annual herb.	Slightly submerged clay pan, open.			Abundance: common	Warbrook Siding, Upper Swan	AUTO	3	18/10/1978
52431	8329281	12460	Verticordia serrata var. linearis	3	30-80 cm compact shrub.	Grey sand, lichen crust in places. Eastern end of valley that opens to the W. Site in middle of 'U' valley.	Woodland of Eucalyptus marginata subsp. thalassica, C. calophylla (scattered E. accedens). Open low shrubland. Acacia pulchella subsp. glaberrima, Alexgeorgia nitens, Caustis dioica, Desmocladius fasciculatus, Dryandra lindleyana subsp. sylvestris, Hakea			Lots to the immediate N of the formed part of Powderbark Road, Lower Chittering. Plot 9	GPS	3	7/12/2007
52434	1894544	12460	Verticordia serrata var. linearis	3	Slender shrub to 80 cm.	On sandy flat.	In Jarrah-Marri open forest.			E of Muchea	AUTO	3	9/07/1988
52436	1557866	12460	Verticordia serrata var. linearis	3	3 ft high, yellow flowers.					Muchea	AUTO	3	18/12/1963
52440	7159072	12460	Verticordia serrata var. linearis	3		Slope. Laterite. Brown loam.	Eucalyptus marginata over Dryandra sessilis, Daviesia nodiflora, Banksia grandis, Dryandra sessilis, Petrophile linearis.			Road verge Jenkins Road extension; Bullsbrook	GPS	1	31/01/2005
52446	2033747	12460	Verticordia serrata var. linearis	3	To 90 cm high, to 45 cm wide. Flowers bright yellow. Erect shrubs with blooms in 4-8 cm heads.	Gravelly soil.				Muchea	AUTO	3	15/10/1979
52447	2033720	12460	Verticordia serrata var. linearis	3	80 cm high x 15 cm wide. Flowers golden yellow.	White sand and gravel on road verge.	Growing in association with Adenanthos cygnorum.		This specimen was collected for painting.	N of Bullsbrook	AUTO	3	22/10/1987
52448	2033739	12460	Verticordia serrata var. linearis	3	150 cm high, 30 cm wide. Flowers yellow.	White sand.				NE of Muchea	AUTO	3	15/10/1981

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76	98390	3219	Acacia anomala	T	VU	1	A	PERTH HILLS	PRI		3/09/2013 0:00	ACT_IND	8	0	0	0	PLANTS	100	Y	MODERATE	GOOD		MOIST	SLOPE	LATERITE	GRVL_10	SAND	BROWN	WLL_DRND	SE	Marianthus sp, Lambertia sp, Banksia sp
77	98391	3219	Acacia anomala	T	VU	1	B	PERTH HILLS	PRI		5/09/2013 0:00	ACT_IND	0	0	0	0	PLANTS	0			GOOD	Some rubbish dumping . Area may also have been gravel pit									Marianthus sp, Lambertia sp, Banksia sp
78	98392	3219	Acacia anomala	T	VU	1	C	PERTH HILLS	PRI		4/09/2017 0:00	ACT_IND	0	0	0	26	PLANTS	1300	N	POOR	VRY_GOOD	Open woodland, tall open scrub, very open sedgeland.	DRY	SLOPE	LATERITE	GRVL_50	SAND	RED_BRWN	WLL_DRND	NW	Corymbia callophyla, Acacia pulchella, Astroloma glaucescens, Babingtonia camphorosmae, Banksia dallanneyi var. dallanneyi, Bossiaea eriocarpa, Eucalyptus marginata subsp. thalassica, Grevillea synapheae subsp. synapheae, Hakea stenocarpa, Hakea undulata
79	86254	3219	Acacia anomala	T	VU	2	A	PERTH HILLS	PRI		11/09/2013 0:00	ACT_IND	0	0	0	0	PLANTS	400		SENSCNT	GOOD		MOIST	RIDGE	LATERITE	GRVL_30	SAND	BROWN	WLL_DRND	SE	Xanthorrhoea pressi, Hakea lissocarpa, Lechenaultia sp?, Caladenia flava
80	107945	3219	Acacia anomala	T	VU	2	B	PERTH HILLS	LGA	VER	10/09/2013 0:00	ACT_IND	1	0	0	0	PLANTS	2	Y	POOR	DEGRADED	Weeds are encroachihng along road verge providing fuel to any fire (increased intensity, increased frequency)	MOIST	FLAT	LATERITE	GRVL_10	CLAY_SND	BROWN	WLL_DRND	SE	Xanthorrhoea gracilis Lechenaultia sp?, Veldt grass
81	98403	3219	Acacia anomala	T	VU	3	A	PERTH HILLS	PRI		26/09/2013 0:00	ACT_IND	14	11	14	0	PLANTS	10	Y	MODERATE	GOOD	Edge of small laterite ridge (old gravel pit??)	DRY	RIDGE	LATERITE	GRVL_100	SAND	GREY	WLL_DRND	NW	Hibbertia hypericoides, Conostylis sp?,Banksia sp?,Hakea sp?
82	98404	3219	Acacia anomala	T	VU	3	B	PERTH HILLS	LGA	REC	27/09/2013 0:00	ACT_IND	0	0	0	0	PLANTS	0			GOOD	2 star pickets (quadrat?) were found in area of TPFL cords but no plants.This pop not found but also pop 9 of Gre cur cur not found (result of PC maybe ???)	MOIST	FLAT			SAND	BROWN	WLL_DRND	N	Astroloma sp, Kennedia sp, Acacia applanata, Acacia willdenowiana, Adenanthos sp, Grevillea sp, Calytrix sp, Stirlingia latifolia, Sowerbaea laxiflora, Lysinema ciliatum, Leptospermum erubescens, Scaevola sp
83	86255	3219	Acacia anomala	T	VU	4		PERTH HILLS	PRI		24/09/1994 0:00	ESTMT	1	0	0	1		0	Y				DRY	SLOPE	LATERITE	GRVL_30	SAND	BROWN			Eucalyptus wandoo,Eucalyptus marginata,Xanthorrhoea preissii
84	86256	3219	Acacia anomala	T	VU	5		PERTH HILLS	PRI		25/09/2013 0:00	ACT_IND	3	0	0	0	PLANTS	2	Y	MODERATE	GOOD		DRY	FLAT	LATERITE	GRVL_10	SAND	GREY	WLL_DRND	WSW	Xanthorroeae sp?, Hibbertia hypericoides, Conostylis sp?, HAkea sp? Grevillea sp, Drosera sp
92	98414	3219	Acacia anomala	T	VU	8	A	PERTH HILLS	CC	NRE	24/09/2013 0:00	ACT_IND	0	0	0	0	PLANTS	0			GOOD		DRY	SLOPE	LATERITE	GRVL_10	SAND	GREY	WLL_DRND	SW	Hakea sp,Grevileea sp,Xanthoroeaea sp, Banksia sp, Hibbertia sp
93	98415	3219	Acacia anomala	T	VU	8	B	PERTH HILLS	PRI		19/09/2013 0:00	ACT_IND	0	0	0	0	PLANTS	0			GOOD		DRY	SLOPE	LATERITE	GRVL_30	SAND	GREY	WLL_DRND	SW	Conostylis sp, Banksia sessilis, Grevillea spp, Hakea spp, Haemodorum sp,Glisrocaryon sp, Xanthorroeae sp
94	98416	3219	Acacia anomala	T	VU	8	C	PERTH HILLS	LGA	VER	20/09/2013 0:00	ACT_IND	10	0	0	0	PLANTS	700	Y		GOOD	Gravel extrasction has occurred in the area in past; no signs of fire									Xanthorroeae sp, Conostylis sp, Banksia sessilis, Grevillea spp, Hakea spp, Haemodorum sp.

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95	98417	3219	Acacia anomala	T	VU	8	D	PERTH HILLS	LGA	VER	17/09/2013 0:00	ACT_IND	0	0	0	0	PLANTS	0			GOOD	Signs of disturbance, modified understorey, weeds. No signs of fire.	DRY	FLAT	LATERITE	GRVL_10	SAND	GREY	WLL_DRND	SW	Xanthorrhoea preissii, Dryandra sessilis, Acacia applanata, Hibbertia hypericiodes, Amphipogon turbinatus
96	98418	3219	Acacia anomala	T	VU	8	E	PERTH HILLS	LGA	VER	15/08/1987 0:00		0	0	0	0		0	Y												
101	86251	3219	Acacia anomala	T	VU	10	A	PERTH HILLS	PRI		23/09/2013 0:00	ACT_IND	53	3	16	0	PLANTS	####	Y	HEALTHY			DRY	SLOPE	LATERITE	GRVL_10	SND_LOAM	GREY	WLL_DRND	SW	Xanthorroeaea sp, Hibbertia sp, Hakea sp, Grevliiea sp Drosera sp, Scaevola sp
102	107963	3219	Acacia anomala	T	VU	10	B	PERTH HILLS	PRI		20/09/2013 0:00	ACT_IND	10	0	0	0	PLANTS	####	Y	MODERATE	GOOD		DRY	SLOPE	LATERITE	GRVL_10	SND_LOAM	BROWN	WLL_DRND	SW	Jarrah, Marri, Xanthorroeae preissii, Hakea sp, Grevillea sp, Acacia spp, Banksia spp?,Stylidium sp?
103	107964	3219	Acacia anomala	T	VU	10	C	PERTH HILLS	PRI		20/09/2013 0:00	ACT_IND	10	0	0	0	PLANTS	####	Y	MODERATE	GOOD		DRY	SLOPE	LATERITE	GRVL_10	SND_LOAM	BROWN	WLL_DRND	SW	Jarrah, Marri, Xanthorroeae preissii, Hakea sp, Grevillea sp, Acacia spp, Banksia spp?,Stylidium sp?
109	86252	3219	Acacia anomala	T	VU	12		PERTH HILLS	LGA	VER	20/09/2013 0:00	ACT_IND	0	0	0	0	PLANTS	0			GOOD	Pop is between road and fence so in precarious location.	DRY	SLOPE	LATERITE	GRVL_10	SND_LOAM	BROWN	WLL_DRND	W	Xanthorroeae sp, Conostylis sp, Banksia sessilis, Grevillea spp, Hakea spp,Drosera sp, Hibbertia sp
110	98400	3219	Acacia anomala	T	VU	13	A	PERTH HILLS	LGA	VER	13/09/2013 0:00	ACT_IND	0	0	0	0	PLANTS	0			GOOD		DRY	SLOPE	LATERITE	GRVL_10	SAND	GREY	WLL_DRND	S	Banksia sessilis Hakea sp, Drosera sp,
111	98401	3219	Acacia anomala	T	VU	13	B	PERTH HILLS	PRI		14/10/2013 0:00	ACT_IND	20	0	0	0	PLANTS	1000	Y	MODERATE	GOOD	Habitat in good condition some staghorns in trees may indicate PC	DRY	SLOPE	LATERITE	GRVL_10	SAND	GREY	WLL_DRND	SW	Jarrah, Marri, Banksia sessilis, B.spp?, Stylidium spp, Drosera spp, Caladenia sp,
112	86253	3219	Acacia anomala	T	VU	14		PERTH HILLS	PRI		7/12/2007 0:00		0	0	0	0		0	N	HEALTHY		Surrounding vegetation healthy. Part of poorly reserved Dandaragan - South vegetation.	DRY	SLOPE	LATERITE	GRVL_30	SAND	GREY			Eucalyptus marginata subsp. thalassica,Corymbia calophylla,Allocasuarina huegeliana
662	89611	11229	Acacia drummondii subsp. affinis	3		7		SWAN COASTAL	UNKNOWN	UNKNOWN	23/11/1976 0:00		0	0	0	0		0	Y					SLOPE	LATERITE						
1101	91854	14129	Acacia oncinophylla subsp. oncinophylla	3		13		PERTH HILLS	CC	NPK	5/09/1996 0:00		0	0	0	0		0	N			DomSp:Hibbertia hypericodes, Phyllanthus calyinus		SLOPE		GRVL_30	CLAY	BROWN		W	Eucalyptus calophylla,Acacia saligna,Leptospermum erubescens,Xanthorrhoea preissii
1618	89664	11336	Adenanthos cygnorum subsp. chamaephyton	3		5		PERTH HILLS	LGA	VER	26/10/1996 0:00	ESTMT	70	0	0	70		0	N			Soil: Red-brown clay loam with > 90 % laterite.					CLA_LOAM	RED_BRWN			
1619	89665	11336	Adenanthos cygnorum subsp. chamaephyton	3		6		PERTH HILLS	LGA	VER	26/10/1996 0:00	ESTMT	120	0	0	120		0	N			Soil: yellow-brown clat loam with about 80% laterite. Original vegetation possibly Marri woodland.					CLA_LOAM	BROWN			

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1629	89654	11336	Adenanthos cygnorum subsp. chamaephyton	3		14		PERTH HILLS	LGA	VER	9/09/2004 0:00		0	0	0	0		0	N				DRY	FLAT	LATERITE		LOAM	BROWN			Dryandra sessilis,Xanthorrhoea preissii,Hakea undulata
6301	93213	16245	Cyathochaeta teretifolia	3		4		SWAN COASTAL	NON	UCL	16/11/1994 0:00		0	0	0	0		0	N												
6307	93194	16245	Cyathochaeta teretifolia	3		10		SWAN COASTAL	LGA	VER	13/11/2007 0:00	ACT_IND	1	0	0	1		0	N			Open forest over tall open scrub over sedgeland. Meeboldina sp. Ground wet all year. 90% litter coverage.		FLAT			LOAM	BROWN	PERMINUN		Melaleuca preissiana,Astartea scoparia,Lepidosperma effusum
6308	93195	16245	Cyathochaeta teretifolia	3		11		SWAN COASTAL	CC	CFF	17/11/1994 0:00		0	0	0	0		0	N			VegClass:Low Forest A		CD_SMPLD			PEAT	BLACK	SEASINUN		Melaleuca rhaphiophylla,Banksia littoralis
6506	105271	34773	Darwinia foetida	T	EN	1	A	SWAN COASTAL	CC	CFF	19/11/2008 0:00	ESTMT	250	0	0	250		0	Y			Open scrub over low heath C over open low sedges over herbs.	DRY	FL_PLAIN			SAND	GREY			Xanthorrhoea preissii,Banksia menziesii,Viminaria juncea,Melaleuca scabra
6507	105272	34773	Darwinia foetida	T	EN	1	B	SWAN COASTAL	LGA	VER	3/11/2009 0:00	ACT_IND	0	0	469	0		0	N			Dense low heath C dominated by Regelia sp.	DRY	FL_PLAIN			SAND	GREY			Xanthorrhoea preissii,Allocasuarina humilis,Hibbertia hypericoides,Patersonia occidentalis
6508	96622	34773	Darwinia foetida	T	EN	2		SWAN COASTAL	NON	UCL	14/11/2008 0:00	ESTMT	500	0	0	500		0	Y			Low Forest A over Low Woodland B over Low Scrub B over Open Herbs.	MOIST	SLOPE			PEAT	GREY			Xanthorrhoea preissii,Banksia menziesii,Allocasuarina fraseriana,Corymbia calophylla
6509	105274	34773	Darwinia foetida	T	EN	3	A	SWAN COASTAL	PRI		2/07/2010 0:00	ESTMT	1000	0	0	1000		####	N			Open low woodland over Heath B over Dwarf scrub D.	DRY	FL_PLAIN			SAND	GREY			Xanthorrhoea preissii,Banksia menziesii,Hakea varia,Stirlingia latifolia
6510	105275	34773	Darwinia foetida	T	EN	3	B	SWAN COASTAL	PRI		18/11/2008 0:00	ESTMT	100	0	0	100		0	Y			Low Woodland A over Heath B over Dwarf Scrub D over Open Herbs.	DRY	FL_PLAIN			SAND	GREY			Banksia menziesii,Acacia saligna,Xanthorrhoea preissii,Banksia dallanneyi
6511	96623	34773	Darwinia foetida	T	EN	4		SWAN COASTAL	PRI		9/03/2007 0:00	ESTMT	25	0	0	25		0	N			Palusplain multiple use wetland.					SAND	GRY_BLCK			Corymbia calophylla,Melaleuca rhaphiophylla,Hypocalymma angustifolium
6512	113549	34773	Darwinia foetida	T	EN	5	A	SWAN COASTAL	LGA	VER	9/09/2015 0:00	ACT_IND	166	12	0	0	PLANTS	500	Y	HEALTHY	GOOD	Habitat 1. Corymbia calophylla Open Woodland over Jacksonia sternbergiana Tall Open Shrubland over Regelia ciliata, Acacia pulchella, Xanthorrhoea preissii Open Shrubland over Hypocalymma angustifolia, Hibbertia hypericoides, Melaleuca seriata Low Shrubl	MOIST	FL_PLAIN			SND_LOAM	BROWN	WLL_DRND		Phlebocarya ciliata, Patersonia occidentalis, Hypolaena exsulca, Conostylis juncea, Dasypogon bromeliifolius, Cyathochaeta avenacea, Schoenus subfascicularis, Desmocladus fascicularis, Adenanthos obovatus, Burchardia congesta, Stirlingia latifolia, Alexg

FID	PopId	Nameid	Taxon	ConsStatus	WARank	PopNumber	SubPopCode	District	Vesting	Purpose1	CountDate	Method	MatCount	JuvCount	SeedlCount	LiveTotal	CountType	AreaOccupy	InFlower	PopConditi	HabConditi	HabNotes	SoilCondit	Landform	RockType	Gravel	SoilType	SoilColor	Drainage	Aspect	AssSpecies
6513	113551	34773	Darwinia foetida	T	EN	5	B	SWAN COASTAL	RAI	RRE	3/09/2015 0:00	ACT_IND	18	0	0	0	PLANTS	100	Y	HEALTHY	GOOD	Tall Open Shrubland of Acacia saligna,Jacksonia furcellata, occ. Nuytsia floribunda & Banksia attenuata over Shrubland of Melaleuca seriata, Acacia pulchella, Xanthorrhoea preissii, Regelia ciliata, Pericalymma ellipticum over Low Shrubland of Calot	MOIST	FL_PLAIN			SND_LOAM	BROWN	WLL_DRND		
6514	113552	34773	Darwinia foetida	T	EN	6	A	SWAN COASTAL	LGA	VER	22/10/2015 0:00	ACT_IND	10	1	0	0	PLANTS	600	Y	HEALTHY	DEGRADED	Tall Shrubland of Acacia saligna, Jacksonia sternbergiana (both species have 50% senescence) over Open Shrubland of Xanthorrhoea preissii, Regelia ciliata over Open Sedgland of Desmocladus virgatus and Lyginia barbata and Grassland of *Agrostis curvula a	MOIST	FL_PLAIN			SND_LOAM	BROWN	WLL_DRND		Other weed species along the road reserve are detailed in Population 5A Report Form.
6515	113554	34773	Darwinia foetida	T	EN	6	B	SWAN COASTAL	RAI	RRE	22/10/2015 0:00	ACT_IND	2	0	0	0	PLANTS	70	Y	HEALTHY	GOOD	Tall Shrubland of Acacia saligna, Jacksonia sternbergiana (both species have 50% senescence) over Open Shrubland of Xanthorrhoea preissii, Regelia ciliata over Open Sedgland of Desmocladus virgatus and Lyginia barbata and Grassland of *Agrostis curvula a	MOIST	FL_PLAIN			SND_LOAM	BROWN	WLL_DRND		

FID	PopId	Nameid	Taxon	ConsStatus	WARank	PopNumber	SubPopCode	District	Vesting	Purpose1	CountDate	Method	MatCount	JuvCount	SeedlCount	LiveTotal	CountType	Area Occupy	InFlower	PopConditi	HabConditi	HabNotes	SoilCondit	Landform	RockType	Gravel	SoilType	SoilColor	Drainage	Aspect	AssSpecies
6516	117269	34773	Darwinia foetida	T	EN	7		PERTH HILLS	MRD	VER	26/11/2018 0:00	ACT_IND	0	32	0	0	PLANTS	1		HEALTHY	DEGRADED	No actual Darwinia foetida habitat exists at this site. The fragmented area so far retained on the road verge, is basically a sumpland that has retained some native species amongst dense Watsonia. Regelia ciliata, Hypocalymma angustifolium, Verticordia	DRY	CD_DMPLD			SND_LOAM	BROWN	SEASINUN	W	
6517	117270	34773	Darwinia foetida	T	EN	8		SWAN COASTAL	MRD	VER	7/12/2018 0:00	ACT_IND	25	5	0	0	PLANTS	1502	Y	HEALTHY	DEGRADED	Soil is sand over sandy loam. A large proportion of the site is Completely Degraded with 100% *Eragrostis curvula and *Ehrharta calycina. At the best condition habitat, the vegetation was <2% Xanthorrhoea preissii and Allocasuarina humilis over Low Op	DRY	FLAT			SAND	GREY	WLL_DRND		Planted species included Hakea prostrata, Grevillea crithmifolia, G. preissii, Allocasuarina humilis, Calothamnus quadrifidus, Leptospermum erubescens. Other weeds included *Vicia sativa and *Euphorbia terracina.
7516	90820	3115	Drosera occidentalis	4		1		PERTH HILLS	LGA	REC	6/01/1986 0:00	ESTMT	0	0	0	####		0	N												
7604	94007	17605	Eleocharis keigheryi	T	VU	7		SWAN COASTAL	COM	AIR	17/09/2007 0:00	ESTMT	0	0	0	0		0	Y			Open tall sedges.	DRY	FLAT			CLA_LOAM	BROWN			Cotula coronopifolia
####	96526	33559	Grevillea althoferorum subsp. fragilis	T	CR	1		PERTH HILLS	CC	CFF	24/02/2011 0:00	EXT_GRQD	0	0	0	0	PLANTS	0	N	HEALTHY	EXCELENT	Some minor weeds noted lining the track but they are not present in significant numbers	DRY	SLOPE			SAND				[veg class] Layer 1: Banksia attenuata, occasional Eucalyptus marginata and Corymbia calophylla Banksia grandsi, Hibbertia hypericoides, Petrophile macrostachya, Allocasuarina humilis
####	102713	14408	Grevillea curviloba subsp. curviloba	T	CR	1	A	SWAN COASTAL	RAI	RRE	6/11/2013 0:00	ACT_IND	0	0	0	289	PLANTS	0	N		GOOD		DRY	OD_DRGLN			SAND				

FID	PopId	Nameid	Taxon	ConsStatus	WARank	PopNumber	SubPopCode	District	Vesting	Purpose1	CountDate	Method	MatCount	JuvCount	SeedlCount	LiveTotal	CountType	AreaOccupy	InFlower	PopConditi	HabConditi	HabNotes	SoilCondit	Landform	RockType	Gravel	SoilType	SoilColor	Drainage	Aspect	AssSpecies
####	106261	14408	Grevillea curviloba subsp. curviloba	T	CR	1	C	SWAN COASTAL	LGA	VER	30/08/2011 0:00	ACT_CLMP	17	0	0	0	CLUMPS	600			GOOD	Sand over clay. Weeds: Ehrharta calycina, Hypochaeris glabra, Watsonia, Eragrostis curvula, Asparagus asparagoides.	MOIST	OD_DRGLN		GRVL_10	SND_LOAM	GREY	SEASINUN		Herbland: Acanthocarpus preissii, Thysanotus ?manglesianus, Burchardia bairdiae, Drosera glanduligera, Dianella revoluta, Drosera stolonifera, banksia dallanneyi, Lepidisperma squamatum, Stirlingia latifolia, Tricoryne elatior, Conostylis festucacea, Bau
####	109321	14408	Grevillea curviloba subsp. curviloba	T	CR	1	D	SWAN COASTAL	LGA	VER	6/11/2013 0:00		0	0	0	52		0	N		GOOD		DRY	OD_DRGLN			SAND				
####	102719	14408	Grevillea curviloba subsp. curviloba	T	CR	5	A	SWAN COASTAL	RAI	RRE	2/12/2015 0:00	ACT_IND	135	0	0	0	PLANTS	0	N	HEALTHY	DEGRADED	Degraded grassland (Eragrostis curvula, Cynodon dactylon, Avena barbata)	DRY	FLAT			SND_LOAM	GREY	WLL_DRND		Isolated individuals of Nuytsia floribunda and Jacksonia sternbergiana
####	102720	14408	Grevillea curviloba subsp. curviloba	T	CR	5	B	SWAN COASTAL	RAI	RRE	2/12/2015 0:00	ACT_IND	198	0	0	0	PLANTS	0	N	HEALTHY	DEGRADED	Degraded grassland, Eragrostis curvula, with patches of Watsonia meriana	DRY	FLAT			SND_LOAM	GREY	SEASINUN		Isolated individuals of Acacia saligna, Nuytsia fluribunda, Xanthorrhoea preissii and Jacksonia sternbergiana
####	102721	14408	Grevillea curviloba subsp. curviloba	T	CR	5	C	SWAN COASTAL	LGA	VER	3/09/2004 0:00	ACT_IND	2	0	5	7		0	Y			Acacia sp., weeds-grasses.	DRY	FLAT			LOAM	BROWN			
####	102722	14408	Grevillea curviloba subsp. curviloba	T	CR	5	D	SWAN COASTAL	RAI	RRE	2/12/2015 0:00	ACT_IND	0	0	0	0		0	N		DEGRADED	Degraded grassland - Eragrostis curvula, Cenchrus clandestinus	DRY	FLAT		GRVL_10	SND_LOAM	GREY	WLL_DRND		
####	109315	14408	Grevillea curviloba subsp. curviloba	T	CR	5	E	SWAN COASTAL	RAI	RRE	30/08/2012 0:00	ESTMT	44	0	0	0	CLUMPS	1800	Y	HEALTHY	DEGRADED	Tall open scrub (Acacia saligna, Jacksonia sp.), over open heath (Grevillea curviloba ssp curviloba with occasional Xanthorrea preissii). Weeds: Eragrostis curvula, Watsonia sp, various Poa spp On top of drain embankment - Locally modified environment.		FLAT		GRVL_10	SAND	GREY	WLL_DRND		
####	109316	14408	Grevillea curviloba subsp. curviloba	T	CR	5	F	SWAN COASTAL	RAI	RRE	3/12/2015 0:00	ACT_IND	165	0	0	0	PLANTS	0	N	HEALTHY	DEGRADED	Degraded grassland (Eragrostis curvula, Ehrharta calycina, Cenchrus clandestinus)	DRY	FLAT		GRVL_10	SND_LOAM	GREY	WLL_DRND		

FID	PopId	Nameid	Taxon	ConsStatus	WARank	PopNumber	SubPopCode	District	Vesting	Purpose1	CountDate	Method	MatCount	JuvCount	SeedlCount	LiveTotal	CountType	AreaOccupy	InFlower	PopConditi	HabConditi	HabNotes	SoilCondit	Landform	RockType	Gravel	SoilType	SoilColor	Drainage	Aspect	AssSpecies
####	109318	14408	Grevillea curviloba subsp. curviloba	T	CR	5	G	SWAN COASTAL	LGA	VER	1/08/2012 0:00	ESTMT	10	0	0	0	CLUMPS	20	Y	HEALTHY	DEGRADED	Tall open scrub (Acacia saligna) with occasional Banksia littoralis, Hakea varia, Banksia sessilis over open heath (Grevilliea curviloba subsp. curviloba, with occasional Xanothorrhoea preissii). Occasional Sterlingia latifolia and Dianella revoluta. We		FLAT		GRVL_10	SND_LOAM	BROWN			
####	92203	14408	Grevillea curviloba subsp. curviloba	T	CR	6		SWAN COASTAL	CC	CFF	6/11/2013 0:00	ACT_IND	0	0	0	30	PLANTS	0	N												
####	102736	14409	Grevillea curviloba subsp. incurva	T	EN	2	A	SWAN COASTAL	LGA	VER	17/08/2011 0:00	ACT_CLMP	2	0	0	0	CLUMPS	2	N	MODERATE	COM_DEGR	Occasional Acacia saligna and occasional Grevillea curviloba subsp. incurva over perrenial veldt and other weeds. Mowed road verge	MOIST	FLAT			LOAM_SND	GREY	WLL_DRND		
####	102737	14409	Grevillea curviloba subsp. incurva	T	EN	2	B	SWAN COASTAL	RAI	RRE	2/12/2015 0:00	ACT_IND	9	0	0	0	PLANTS	0	N	HEALTHY	DEGRADED		DRY	FLAT	LIMESTN		SAND	GREY	WLL_DRND		Hyparrhenia hirta
####	102739	14409	Grevillea curviloba subsp. incurva	T	EN	3	A	SWAN COASTAL	CC	CFF	3/11/2013 0:00	ACT_IND	0	0	0	24		0	Y	HEALTHY	GOOD	Weeds: Hypochaeris glabra, Ehrharta longiflora, Ursinia anthemoides, Ehrharta calycina, Schinus terebinthifolius	MOIST	FLAT		GRVL_10	SAND	GREY	WLL_DRND		Melaleuca low woodland,Xanthorrhoea preissii,Banksia menziesii,Acacia saligna
####	102740	14409	Grevillea curviloba subsp. incurva	T	EN	3	B	SWAN COASTAL	CC	CFF	31/08/2011 0:00	ACT_CLMP	9	0	0	0	CLUMPS	450	Y	MODERATE	GOOD	Weeds - Ursinia anthemoides, Ehrharta calycina, Hypochaeris glabra, Watsonia sp., Romulea roseae. Habitat appears to be in decline	MOIST	OD_DRGLN			SAND	GREY	WLL_DRND		Luginia barbata, Calytrix flavescens, Bossiaea eriocarpa, Melaleuca sp., Xanthorrhoeae preissii, Lyginia imberbis, Tricoryne elatior, Corynotheca micrantha, Nytsia floribunda, Calytrix angulata, Stirlingia latifolia.

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####	102741	14409	Grevillea curviloba subsp. incurva	T	EN	3	C	SWAN COASTAL	CC	CFF	31/08/2011 0:00	ACT_CLMP	60	21	0	0	CLUMPS	1100	Y	MODERATE	EXCELENT		MOIST	OD_DRGLN		GRVL_10	SAND	GREY	WLL_DRND		Jacksonia sternbergiana, Banksia dallanneyi var. dallanneyi, tricoryne elatior, Lepidosperma longitudinale, Desmocladus fasciculatus, Opercularia vaginata, Kennedia prostrata, Drosera pallida, Hypochaeris glabra
####	102742	14409	Grevillea curviloba subsp. incurva	T	EN	3	D	SWAN COASTAL	CC	CFF	31/08/2011 0:00	ACT_CLMP	5	0	0	0	CLUMPS	130	N	MODERATE	DEGRADED	Weeds (Hypochaeris glabra, Erharta longiflora, Ursinia anthemoides, Arctotheca calendula, Vicia sativa, Schinus terebinthifolius) Greater than 70% cover of weeds.	MOIST	OD_DRGLN			SND_LOAM	GREY	WLL_DRND		Lyginia imberba
####	109326	14409	Grevillea curviloba subsp. incurva	T	EN	3	E	SWAN COASTAL	CC	NRE	13/04/2012 0:00	ACT_CLMP	37	3	0	0	CLUMPS	3000		HEALTHY	VRY_GOOD	1. Melaleuca rhapiophylla. Weeds: Ehrharta calycina, Pennisetum clandestinum, Schinus terebinthifolius, Briza maxima Minimal weed invasion.	DRY	SLOPE		GRVL_10	SAND	GREY	WLL_DRND		Weeds (*E
####	109327	14409	Grevillea curviloba subsp. incurva	T	EN	3	F	SWAN COASTAL	CC	NRE	13/04/2012 0:00	ACT_IND	0	0	0	0	CLUMPS	3000	N	HEALTHY	VRY_GOOD	2. Anthocarpus preissii. Weeds: Ehrharta calycina, Pennisetum clandestinum, Schinus terebinthifolius, Briza maxima. Minimal weed invasion	DRY	SLOPE		GRVL_10	SAND	GREY	WLL_DRND		
####	102748	14409	Grevillea curviloba subsp. incurva	T	EN	5	A	PERTH HILLS	MRD	VER	7/09/2011 0:00	ACT_CLMP	10	1	0	0	CLUMPS	100	Y	MODERATE	GOOD	Weed layer - Wild oats, Veldt grass, Love grass, Pennisetum clandestinum Site very weedy	MOIST	FLAT			LOAM_SND	BROWN		
####	102749	14409	Grevillea curviloba subsp. incurva	T	EN	5	B	PERTH HILLS	RAI	RRE	19/11/2015 0:00	ACT_IND	73	0	0	0	PLANTS	0	N	HEALTHY	DEGRADED	Weed/Herb layer with Oxalis, Wild oats, Veldt grass, Love grass.	DRY	FLAT			SND_LOAM	GREY	SEASINUN		

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####	102730	14409	Grevillea curviloba subsp. incurva	T	EN	12	A	SWAN COASTAL	LGA	VER	7/09/2004 0:00	ESTMT	50	0	30	50		0	N			Xanthorrhoea, Banksia littoralis, Anigozanthos manglesii, Watsonia, Cape Tulip & very dense grasses.	INUNDATE	FLAT	LIMESTN		LOAM	BROWN			Acacia saligna,Jacksonia furcellata,Melaleuca sp.,Adenanthos cygnorum
####	102731	14409	Grevillea curviloba subsp. incurva	T	EN	12	B	SWAN COASTAL	RAI	RRE	2/12/2015 0:00	ACT_IND	68	0	0	0	PLANTS	0	N	HEALTHY	DEGRADED		DRY	FLAT			SND_LOAM	GREY	SEASINUN		
####	92208	14409	Grevillea curviloba subsp. incurva	T	EN	16	A	SWAN COASTAL	LGA	PAR	21/09/2011 0:00	ACT_CLMP	40	18	0	0	CLUMPS	150	N	MODERATE	GOOD	Weeds(Watsonia, Eragrostis curvula, Briza maxima, Briza minor, Ursinia anthemoides, Moraea sp., Hypochaeris glabra)					SAND	GREY			
####	110250	14409	Grevillea curviloba subsp. incurva	T	EN	16	B	SWAN COASTAL	LGA	VER	21/09/2011 0:00	ACT_CLMP	8	2	0	0	CLUMPS	1000	N		DEGRADED	Weeds (Watsonia spp., Ergrastis curvula, Briza maxima, Briza minor, Ursinia anthemoides, Moraea sp., Hypochaeris glabra)		FLAT	IRONSTN		SAND	GREY			
####	92206	14409	Grevillea curviloba subsp. incurva	T	EN	18	A	PERTH HILLS	LGA	REC	23/11/2002 0:00		0	0	0	0		0	N						LATERITE		SAND				
####	110270	14409	Grevillea curviloba subsp. incurva	T	EN	18	B	PERTH HILLS	PRI	REC	7/09/2011 0:00	ESTMT	35	0	0	0	CLUMPS	6000	Y	HEALTHY	EXCELENT	Signs of disturbance, very scattered weeds	DRY	FLAT	LATERITE		SAND	WHITE			Conostylis sp., Xanthorrohoea preissii, Lechenaultia biloba, Burchardia sp, Astroloma marcocalyx, Banksia sessilis, Hypocalymma anagustifolium
####	110271	14409	Grevillea curviloba subsp. incurva	T	EN	18	C	PERTH HILLS	PRI	REC	20/10/2015 0:00	ACT_IND	0	0	0	2	PLANTS	0	N	HEALTHY	GOOD		MOIST	FLAT	LATERITE	GRVL_30	SAND	GREY	WLL_DRND		Banksia sessilis, Xanthorrhoea preissii, Hakea stenocarpa, Lepidosperma squamatum, Leptospermum erubescens.
####	110289	14409	Grevillea curviloba subsp. incurva	T	EN	18	D	PERTH HILLS	LGA	VER	20/10/2015 0:00	ACT_IND	0	0	0	22	PLANTS	0		HEALTHY	GOOD		MOIST	FLAT	LATERITE	GRVL_30	SAND	GREY	WLL_DRND		Banksia sessilis, Xanthorrhoea preissii, Hakea stenocarpa, Lepidosperma squamatum, Leptospermum erubescens.
####	110229	14409	Grevillea curviloba subsp. incurva	T	EN	19	A	SWAN COASTAL	LGA	VER	22/10/2015 0:00	ESTMT	0	0	0	10	PLANTS	150	Y	POOR	DEGRADED	Occasional Acacia saligna over Shrubland of Grevillea curviloba subsp. incurva and Xanthorrhoea preissii over Closed Grassland of mixed weed species dominated by *Agrostis curvula and *Ehrharta calycina.		FLAT			LOAM_SND	GREY	WLL_DRND		Corynotheca micrantha, *Avena sp., *Briza spp., *Lolium sp., *Cenchrus clandestinus, Burchardia congesta, Jacksonia furcellata, Stirlingia latifolia, *Zantedeschia aethiopica.

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####	110231	14409	Grevillea curviloba subsp. incurva	T	EN	19	B	SWAN COASTAL	RAI	RRE	22/10/2015 0:00	ESTMT	0	0	0	15	PLANTS	350	Y	POOR	DEGRADED	Occasional Acacia saligna over Shrubland of Grevillea curviloba subsp. incurva and Xanthorrhoea preissii over Closed Grassland of mixed weed species dominated by *Agrostis curvula and *Ehrharta calycina.		FLAT			LOAM_SND	GREY	WLL_DRND		Corynotheca micrantha, *Avena sp., *Briza spp., *Lolium sp., *Cenchrus clandestinus, Burchardia congesta, Jacksonia furcellata, Stirlingia latifolia, *Zantedeschia aethiopica.
####	94924	19775	Hibbertia glomerata subsp. ginginensis	2		8		PERTH HILLS	LGA	VER	9/09/2004 0:00	UNKNOWN	20	0	0	20		0	N			VegClass:Woodland E.marginata over D.sessilis		SLOPE	LATERITE		LOAM				Eucalyptus marginata,Dryandra sessilis,Conostephium pendulum,Corymbia calophylla
####	96636	34843	Oxymyrrhine coronata	4		2		PERTH HILLS	PRI		14/01/1994 0:00	ESTMT	400	0	0	400		0	Y			On lateritic caprock & pisolytic gravel, esp. scraped substrate (edge of gravel pit).			LATERITE	GRVL_30					
####	96640	34843	Oxymyrrhine coronata	4		7		PERTH HILLS	CC	CFF	9/01/2002 0:00	UNKNOWN	460	0	0	460		0	Y			DomSp: Jarrah, Marri.	DRY	SLOPE	LATERITE	GRVL_30		YEL_BRWN			Dryandra sessilis,Dryandra squarrosa,Adenanthos cygnorum subsp. chamaephyton,Hakea ruscifolia
####	96629	34843	Oxymyrrhine coronata	4		13		PERTH HILLS	PRI	VER	9/09/2004 0:00	UNKNOWN	50	0	0	50		0	N			Other DomSp illegible		SLOPE	LATERITE		LOAM	BROWN			Eucalyptus marginata,Dryandra sessilis,Corymbia calophylla,Xanthorrhoea preissii
####	85959	2271	Persoonia rudis	3		10		PERTH HILLS	CC	CFF	12/08/1993 0:00		0	0	0	0		0	N								SAND	YELLOW			Eucalyptus marginata
####	89591	11132	Platysace ramosissima	3		3		PERTH HILLS	CC	CFF	8/12/1994 0:00		0	0	0	0		0	N					FLAT			SAND				
####	84520	980	Schoenus capillifolius	3		6		SWAN COASTAL	COM	AIR	20/09/1994 0:00		0	0	0	0		0	N			Hypocalymma angustifolium, Eragrotis elongata, Hesperantha falcata, Chorizandra enodis, Leptocarpus roycei		FLAT	LATERITE		CLAY	BROWN	SEASINUN		Eucalyptus wandoo,Viminaria juncea,Kunzea,Verticordia densiflora
####	89302	7756	Stylidium longitubum	4		2		SWAN COASTAL	CC	CFA	28/12/1971 0:00		0	0	0	0		0	N				MOIST	OD_SWAMP							
####	89532	10862	Thelymitra stellata	T	EN	19		PERTH HILLS	LGA	VER	15/11/1975 0:00		0	0	0	0		0	N						LATERITE						Eucalyptus marginata,Eucalyptus calophylla
####	89543	10862	Thelymitra stellata	T	EN	31		PERTH HILLS	PRI		15/11/2005 0:00		0	0	0	2		0	Y												
####	90123	12460	Verticordia serrata var. linearis	3		4		PERTH HILLS	LGA	VER	9/07/1988 0:00		0	0	0	0		0	N					FLAT			SAND				Eucalyptus marginata,Eucalyptus calophylla
####	90127	12460	Verticordia serrata var. linearis	3		8		PERTH HILLS	PRI	VER	31/01/2005 0:00		0	0	0	0		0	N			DomSp:Perrophile linearis		SLOPE	LATERITE		LOAM	BROWN			Eucalyptus marginata,Dryandra sessilis,Daviesia nudiflora,Banksia grandis

APPENDIX 2

Atlas of Living Australia Report

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name
https://id.biodiversity.org.au/node/apni/2905053	Acacia alata	R.Br.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Winged Wattle
https://id.biodiversity.org.au/node/apni/2914483	Acacia anomala	C.A.Gardner ex Court	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Grass Wattle
https://id.biodiversity.org.au/node/apni/2912980	Acacia applanata	Maslin	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Grass Wattle
https://id.biodiversity.org.au/node/apni/2901429	Acacia barbinervis	Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	
https://id.biodiversity.org.au/node/apni/2918954	Acacia decurrens	Willd.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Black Wattle
https://id.biodiversity.org.au/node/apni/2890261	Acacia drewiana	W.Fitzg.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	
https://id.biodiversity.org.au/node/apni/2888428	Acacia drummondii	Lindl.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Drummonds Wattle
https://id.biodiversity.org.au/taxon/apni/51286923	Acacia huegelii	Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	
https://id.biodiversity.org.au/node/apni/2919200	Acacia iteaphylla	F.Muell. ex Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Flinders Ranges Wattle
https://id.biodiversity.org.au/node/apni/2911850	Acacia lasiocalyx	C.R.P.Andrews	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Wilyoor-waar
https://id.biodiversity.org.au/node/apni/2893109	Acacia lasiocarpa	Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	
https://id.biodiversity.org.au/node/apni/2917803	Acacia latericticola	Maslin	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	
https://id.biodiversity.org.au/taxon/apni/51286955	Acacia longifolia	(Andrews) Willd.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Golden Wattle
https://id.biodiversity.org.au/node/apni/2920375	Acacia nervosa	DC.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Rib Wattle
https://id.biodiversity.org.au/node/apni/2886042	Acacia oncinophylla	Lindl.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Hook-leaved Acacia
https://id.biodiversity.org.au/taxon/apni/51287044	Acacia pulchella	R.Br.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Prickly Moses
https://id.biodiversity.org.au/node/apni/2908376	Acacia restiacea	Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	
https://id.biodiversity.org.au/node/apni/2918704	Acacia saligna	(Labill.) H.L.Wendl.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Golden Wreath Wattle
https://id.biodiversity.org.au/node/apni/2895373	Acacia sessilis	Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	
https://id.biodiversity.org.au/node/apni/2916036	Acacia willdenowiana	H.L.Wendl.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Grass Wattle
https://id.biodiversity.org.au/node/apni/2917353	Acaena echinata	Nees	species	Plantae	Charophyta	Equisetopsida	Rosales	Rosaceae	Acaena	Sheep's Burr
https://id.biodiversity.org.au/node/apni/2920909	Acanthocarpus canaliculatus	A.S.George	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Acanthocarpus	
https://id.biodiversity.org.au/node/apni/2915895	Actinotus leucocephalus	Benth.	species	Plantae	Charophyta	Equisetopsida	Apiales	Apiaceae	Actinotus	Flannel Flower
https://id.biodiversity.org.au/node/apni/2893408	Adenanthos cygnorum	Diels	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Adenanthos	
https://id.biodiversity.org.au/node/apni/2917940	Adenanthos drummondii	Meisn.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Adenanthos	
https://id.biodiversity.org.au/node/apni/2897492	Adenanthos obovatus	Labill.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Adenanthos	Basket Flower
https://id.biodiversity.org.au/node/apni/2896402	Agrostocrinum hirsutum	(Lindl.) Keighery	species	Plantae	Charophyta	Equisetopsida	Asparagales	Hemerocallidaceae	Agrostocrinum	
https://id.biodiversity.org.au/node/apni/2899616	Agrostocrinum scabrum	(R.Br.) Baill.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Hemerocallidaceae	Agrostocrinum	Blue Grass Lily
https://id.biodiversity.org.au/node/apni/2888611	Aira caryophyllea	L.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Aira	Silvery Hairgrass
https://id.biodiversity.org.au/node/apni/2915129	Aira cupaniana	Guss.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Aira	Silvery Hairgrass
https://id.biodiversity.org.au/node/apni/2913741	Aira praecox	L.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Aira	Early Hairgrass
https://id.biodiversity.org.au/node/apni/2894004	Alexgeorgea nitens	(Nees) L.A.S.Johnson & B.G.Briggs	species	Plantae	Charophyta	Equisetopsida	Poales	Restionaceae	Alexgeorgea	
https://id.biodiversity.org.au/node/apni/2915089	Allocasuarina fraseriana	(Miq.) L.A.S.Johnson	species	Plantae	Charophyta	Equisetopsida	Fagales	Casuarinaceae	Allocasuarina	Western Sheoak
https://id.biodiversity.org.au/node/apni/2893218	Allocasuarina humilis	(Otto & A.Dietr.) L.A.S.Johnson	species	Plantae	Charophyta	Equisetopsida	Fagales	Casuarinaceae	Allocasuarina	Dwarf Sheoak
https://id.biodiversity.org.au/node/apni/2894708	Allocasuarina microstachya	(Miq.) L.A.S.Johnson	species	Plantae	Charophyta	Equisetopsida	Fagales	Casuarinaceae	Allocasuarina	
https://id.biodiversity.org.au/node/apni/2889740	Alternanthera nodiflora	R.Br.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Amaranthaceae	Alternanthera	Common Joyweed
https://id.biodiversity.org.au/node/apni/2915024	Amphibromus nervosus	(Hook.f.) Baill.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Amphibromus	Swamp Wallaby Grass
https://id.biodiversity.org.au/node/apni/2908502	Amphipogon amphipogonoides	(Steud.) Vickery	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Amphipogon	
https://id.biodiversity.org.au/node/apni/2896899	Amphipogon laguroides	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Amphipogon	
https://id.biodiversity.org.au/node/apni/2912443	Amphipogon strictus	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Amphipogon	Greybeard Grass
https://id.biodiversity.org.au/node/apni/2913426	Amphipogon turbinatus	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Amphipogon	
https://id.biodiversity.org.au/node/apni/2916759	Amyema linophylla	(Fenzl) Tiegh.	species	Plantae	Charophyta	Equisetopsida	Santalales	Loranthaceae	Amyema	Buloke Mistletoe
https://id.biodiversity.org.au/node/apni/2899172	Amyema miquelii	(Lehm. ex Miq.) Tiegh.	species	Plantae	Charophyta	Equisetopsida	Santalales	Loranthaceae	Amyema	Box Mistletoe
https://id.biodiversity.org.au/node/apni/2917351	Anarthria laevis	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Anarthriaceae	Anarthria	
https://id.biodiversity.org.au/node/apni/2891026	Andersonia heterophylla	Sond.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Andersonia	
https://id.biodiversity.org.au/node/apni/2903772	Andersonia lehmanniana	Sond.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Andersonia	
https://id.biodiversity.org.au/node/apni/2903116	Angianthus preissianus	(Steetz) Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Angianthus	Salt Angianthus
https://id.biodiversity.org.au/node/apni/2910850	Angianthus tomentosus	J.C.Wendl.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Angianthus	Hairy Angianthus
https://id.biodiversity.org.au/node/apni/2921092	Anigozanthos bicolor	Endl.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Anigozanthos	Little Kangaroo Paw
https://id.biodiversity.org.au/node/apni/2900204	Anigozanthos humilis	Lindl.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Anigozanthos	Common Catspaw
https://id.biodiversity.org.au/node/apni/2900921	Anigozanthos manglesii	D.Don	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Anigozanthos	Red And Green Kangaroo Paw
https://id.biodiversity.org.au/node/apni/2909298	Anigozanthos viridis	Endl.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Anigozanthos	Green Kangaroo Paw
https://id.biodiversity.org.au/node/apni/2893357	Anthocercis anisantha	Endl.	species	Plantae	Charophyta	Equisetopsida	Solanales	Solanaceae	Anthocercis	
https://id.biodiversity.org.au/node/apni/2889532	Anthotium junciforme	(de Vriese) D.A.Morrison	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Anthotium	Rush-like Anthotium
https://id.biodiversity.org.au/taxon/apni/51299839	Aotus cordifolia	Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Aotus	
https://id.biodiversity.org.au/node/apni/2900645	Aotus gracillima	Meisn.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Aotus	
https://id.biodiversity.org.au/node/apni/2889615	Aotus intermedia	Meisn.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Aotus	
https://id.biodiversity.org.au/node/apni/2890176	Aphelia brizula	F.Muell.	species	Plantae	Charophyta	Equisetopsida	Poales	Centrolepidaceae	Aphelia	
https://id.biodiversity.org.au/node/apni/2891037	Aphelia cyperoides	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Centrolepidaceae	Aphelia	
https://id.biodiversity.org.au/node/apni/2919295	Aphelia drummondii	(Hieron.) Benth.	species	Plantae	Charophyta	Equisetopsida	Poales	Centrolepidaceae	Aphelia	
https://id.biodiversity.org.au/taxon/apni/51267241	Arctotheca calendula	(L.) K.Lewin	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Arctotheca	African Marigold
https://id.biodiversity.org.au/node/apni/2899222	Arnocrinum preissii	Lehm.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Hemerocallidaceae	Arnocrinum	

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name
https://id.biodiversity.org.au/node/apni/2912193	Arundo donax	L.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Arundo	Elephant Grass
https://id.biodiversity.org.au/node/apni/2895570	Astartea affinis	(Endl.) Rye	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Astartea	West-coast Astartea
https://id.biodiversity.org.au/node/apni/2887401	Astartea fascicularis	(Labill.) DC.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Astartea	Recherche Astartea
https://id.biodiversity.org.au/node/apni/2886742	Astartea scoparia	Schauer	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Astartea	Common Astartea
https://id.biodiversity.org.au/node/apni/2918187	Asteridea pulverulenta	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Asteridea	
https://id.biodiversity.org.au/node/apni/2915781	Astroloma macrocalyx	Sond.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Astroloma	Swan Berry
https://id.biodiversity.org.au/node/apni/2909103	Astroloma pallidum	R.Br.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Astroloma	Kick Bush
https://id.biodiversity.org.au/node/apni/2889536	Astroloma stomarrhena	Sond.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Astroloma	Red Swamp Cranberry
https://id.biodiversity.org.au/node/apni/2897217	Astroloma xerophyllum	(DC.) Sond.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Astroloma	
https://id.biodiversity.org.au/node/apni/2886962	Atriplex prostrata	Boucher ex DC.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Chenopodiaceae	Atriplex	Orache
https://id.biodiversity.org.au/node/apni/2911947	Austrostipa campylachne	(Nees) S.W.L.Jacobs & J.Everett	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Austrostipa	
https://id.biodiversity.org.au/node/apni/2914252	Austrostipa compressa	(R.Br.) S.W.L.Jacobs & J.Everett	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Austrostipa	
https://id.biodiversity.org.au/node/apni/2886511	Austrostipa elegantissima	(Labill.) S.W.L.Jacobs & J.Everett	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Austrostipa	Feather Spear-grass
https://id.biodiversity.org.au/node/apni/2902954	Austrostipa flavescens	(Labill.) S.W.L.Jacobs & J.Everett	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Austrostipa	
https://id.biodiversity.org.au/node/apni/2899873	Austrostipa macalpinei	(Reader) S.W.L.Jacobs & J.Everett	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Austrostipa	Annual Spear-grass
https://id.biodiversity.org.au/node/apni/2907658	Austrostipa mollis	(R.Br.) S.W.L.Jacobs & J.Everett	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Austrostipa	Soft Spear-grass
https://id.biodiversity.org.au/node/apni/2902759	Austrostipa semibarbata	(R.Br.) S.W.L.Jacobs & J.Everett	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Austrostipa	Fibrous Spear-grass
https://id.biodiversity.org.au/node/apni/2893736	Austrostipa tenuifolia	(Steud.) S.W.L.Jacobs & J.Everett	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Austrostipa	Long-awn Spear-grass
https://id.biodiversity.org.au/node/apni/2915032	Avellinia michelii	(Savi) Parl.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Avellinia	Avellinia
https://id.biodiversity.org.au/node/apni/2906546	Avena barbata	Pott ex Link	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Avena	Bearded Oats
https://id.biodiversity.org.au/node/apni/2908422	Avena fatua	L.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Avena	Wild Oat
https://id.biodiversity.org.au/node/apni/2911836	Babingtonia camphorosmae	(Endl.) Lindl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Babingtonia	
https://id.biodiversity.org.au/name/apni/4555092	Babingtonia grandiflora	(Benth.) Rye	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Babingtonia	Large-flowered Babingtonia
https://id.biodiversity.org.au/node/apni/2901018	Baeometra uniflora	(Jacq.) G.J.Lewis	species	Plantae	Charophyta	Equisetopsida	Liliales	Colchicaceae	Baeometra	
https://id.biodiversity.org.au/node/apni/2899939	Banksia armata	(R.Br.) A.R.Mast & K.R.Thiele	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	
https://id.biodiversity.org.au/node/apni/2913234	Banksia attenuata	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	Coast Banksia
https://id.biodiversity.org.au/node/apni/2916921	Banksia bipinnatifida	(R.Br.) A.R.Mast & K.R.Thiele	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	
https://id.biodiversity.org.au/node/apni/5040372	Banksia dallanneyi	A.R.Mast & K.R.Thiele	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	
https://id.biodiversity.org.au/node/apni/2914160	Banksia fraseri	(R.Br.) A.R.Mast & K.R.Thiele	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	
https://id.biodiversity.org.au/node/apni/2896043	Banksia grandis	Willd.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	Giant Banksia
https://id.biodiversity.org.au/node/apni/2905735	Banksia ilicifolia	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	Holly Leaved Banksia
https://id.biodiversity.org.au/node/apni/2887354	Banksia incana	A.S.George	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	
https://id.biodiversity.org.au/node/apni/2892579	Banksia integrifolia	L.f.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	Honeysuckle
https://id.biodiversity.org.au/node/apni/2913977	Banksia littoralis	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	Swamp Banksia
https://id.biodiversity.org.au/node/apni/2897960	Banksia menziesii	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	Firewood Banksia
https://id.biodiversity.org.au/node/apni/2892278	Banksia micrantha	A.S.George	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	
https://id.biodiversity.org.au/node/apni/2894027	Banksia nivea	Labill.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	
https://id.biodiversity.org.au/node/apni/2905445	Banksia sessilis	(Knight) A.R.Mast & K.R.Thiele	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	
https://id.biodiversity.org.au/node/apni/2900926	Banksia telmatiaea	A.S.George	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	Swamp Fox Banksia
https://id.biodiversity.org.au/node/ausmoss/10059274	Barbula calycina	SchwÃ¤gr.	species	Plantae	Bryophyta	Bryopsida	Pottiales	Pottiaceae	Barbula	
https://id.biodiversity.org.au/node/ausmoss/10060148	Bartramia pseudostricta	Catches.	species	Plantae	Bryophyta	Bryopsida	Bartramiales	Bartramiaceae	Bartramia	
https://id.biodiversity.org.au/node/apni/2890775	Baumea arthrophylla	(Nees) Boeckeler	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Baumea	
https://id.biodiversity.org.au/node/apni/2896041	Baumea articulata	(R.Br.) S.T.Blake	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Baumea	Jointed Rush
https://id.biodiversity.org.au/node/apni/2903349	Baumea juncea	(R.Br.) Palla	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Baumea	Bare Twig-rush
https://id.biodiversity.org.au/node/apni/2899756	Baumea rubiginosa	(Spreng.) Boeckeler	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Baumea	Soft Twig-rush
https://id.biodiversity.org.au/taxon/apni/51288833	Beaufortia elegans	Schauer	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Beaufortia	Elegant Beaufortia
https://id.biodiversity.org.au/taxon/apni/51288894	Beaufortia purpurea	Lindl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Beaufortia	Purple Beaufortia
https://id.biodiversity.org.au/taxon/apni/51291052	Bellardia trixago	(L.) All.	species	Plantae	Charophyta	Equisetopsida	Lamiales	Orobanchaceae	Bellardia	Bellardia
https://id.biodiversity.org.au/taxon/apni/51291059	Bellardia viscosa	(L.) Fisch. & C.A.Mey.	species	Plantae	Charophyta	Equisetopsida	Lamiales	Orobanchaceae	Bellardia	
https://id.biodiversity.org.au/taxon/apni/51267518	Bidens pilosa	L.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Bidens	Kamu (seeds)
https://id.biodiversity.org.au/node/apni/2920256	Billardiera fraseri	(Hook.) L.Cayzer, Crisp & I.Telford	species	Plantae	Charophyta	Equisetopsida	Apiales	Pittosporaceae	Billardiera	
https://id.biodiversity.org.au/node/apni/2910549	Billardiera variifolia	DC.	species	Plantae	Charophyta	Equisetopsida	Apiales	Pittosporaceae	Billardiera	
https://id.biodiversity.org.au/node/apni/2920511	Blancoa canescens	Lindl.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Blancoa	Winter Bell
https://id.biodiversity.org.au/node/apni/2889067	Bolboschoenus caldwellii	(V.J.Cook) SojÃ¡k	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Bolboschoenus	Marsh Club-rush

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name
https://id.biodiversity.org.au/node/apni/2905053	Acacia alata	R.Br.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Winged Wattle
https://id.biodiversity.org.au/node/apni/2914483	Acacia anomala	C.A.Gardner ex Court	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Grass Wattle
https://id.biodiversity.org.au/node/apni/2912980	Acacia applanata	Maslin	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Grass Wattle
https://id.biodiversity.org.au/node/apni/2901429	Acacia barbinervis	Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	
https://id.biodiversity.org.au/node/apni/2918954	Acacia decurrens	Willd.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Black Wattle
https://id.biodiversity.org.au/node/apni/2890261	Acacia drewiana	W.Fitzg.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	
https://id.biodiversity.org.au/node/apni/2888428	Acacia drummondii	Lindl.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Drummonds Wattle
https://id.biodiversity.org.au/taxon/apni/51286923	Acacia huegelii	Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	
https://id.biodiversity.org.au/node/apni/2919200	Acacia iteaphylla	F.Muell. ex Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Flinders Ranges Wattle
https://id.biodiversity.org.au/node/apni/2911850	Acacia lasiocalyx	C.R.P.Andrews	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Wilyoor-waar
https://id.biodiversity.org.au/node/apni/2893109	Acacia lasiocarpa	Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	
https://id.biodiversity.org.au/node/apni/2917803	Acacia lateriticola	Maslin	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	
https://id.biodiversity.org.au/taxon/apni/51286955	Acacia longifolia	(Andrews) Willd.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Golden Wattle
https://id.biodiversity.org.au/node/apni/2920375	Acacia nervosa	DC.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Rib Wattle
https://id.biodiversity.org.au/node/apni/2886042	Acacia oncinophylla	Lindl.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Hook-leaved Acacia
https://id.biodiversity.org.au/taxon/apni/51287044	Acacia pulchella	R.Br.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Prickly Moses
https://id.biodiversity.org.au/node/apni/2908376	Acacia restiacea	Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	
https://id.biodiversity.org.au/node/apni/2918704	Acacia saligna	(Labill.) H.L.Wendl.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Golden Wreath Wattle
https://id.biodiversity.org.au/node/apni/2895373	Acacia sessilis	Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	
https://id.biodiversity.org.au/node/apni/2916036	Acacia willdenowiana	H.L.Wendl.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Acacia	Grass Wattle
https://id.biodiversity.org.au/node/apni/2917353	Acaena echinata	Nees	species	Plantae	Charophyta	Equisetopsida	Rosales	Rosaceae	Acaena	Sheep's Burr
https://id.biodiversity.org.au/node/apni/2920909	Acanthocarpus canaliculatus	A.S.George	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Acanthocarpus	
https://id.biodiversity.org.au/node/apni/2915895	Actinotus leucocephalus	Benth.	species	Plantae	Charophyta	Equisetopsida	Apiales	Apiaceae	Actinotus	Flannel Flower
https://id.biodiversity.org.au/node/apni/2893408	Adenanthos cygnorum	Diels	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Adenanthos	
https://id.biodiversity.org.au/node/apni/2917940	Adenanthos drummondii	Meisn.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Adenanthos	
https://id.biodiversity.org.au/node/apni/2897492	Adenanthos obovatus	Labill.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Adenanthos	Basket Flower
https://id.biodiversity.org.au/node/apni/2896402	Agrostocrinum hirsutum	(Lindl.) Keighery	species	Plantae	Charophyta	Equisetopsida	Asparagales	Hemerocallidaceae	Agrostocrinum	
https://id.biodiversity.org.au/node/apni/2899616	Agrostocrinum scabrum	(R.Br.) Baill.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Hemerocallidaceae	Agrostocrinum	Blue Grass Lily
https://id.biodiversity.org.au/node/apni/2888611	Aira caryophyllea	L.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Aira	Silvery Hairgrass
https://id.biodiversity.org.au/node/apni/2915129	Aira cupaniana	Guss.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Aira	Silvery Hairgrass
https://id.biodiversity.org.au/node/apni/2913741	Aira praecox	L.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Aira	Early Hairgrass
https://id.biodiversity.org.au/node/apni/2894004	Alexgeorgea nitens	(Nees) L.A.S.Johnson & B.G.Briggs	species	Plantae	Charophyta	Equisetopsida	Poales	Restionaceae	Alexgeorgea	
https://id.biodiversity.org.au/node/apni/2915089	Allocasuarina fraseriana	(Miq.) L.A.S.Johnson	species	Plantae	Charophyta	Equisetopsida	Fagales	Casuarinaceae	Allocasuarina	Western Sheoak
https://id.biodiversity.org.au/node/apni/2893218	Allocasuarina humilis	(Otto & A.Dietr.) L.A.S.Johnson	species	Plantae	Charophyta	Equisetopsida	Fagales	Casuarinaceae	Allocasuarina	Dwarf Sheoak
https://id.biodiversity.org.au/node/apni/2894708	Allocasuarina microstachya	(Miq.) L.A.S.Johnson	species	Plantae	Charophyta	Equisetopsida	Fagales	Casuarinaceae	Allocasuarina	
https://id.biodiversity.org.au/node/apni/2889740	Alternanthera nodiflora	R.Br.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Amaranthaceae	Alternanthera	Common Joyweed
https://id.biodiversity.org.au/node/apni/2915024	Amphibromus nervosus	(Hook.f.) Baill.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Amphibromus	Swamp Wallaby Grass
https://id.biodiversity.org.au/node/apni/2908502	Amphipogon amphipogonoides	(Steud.) Vickery	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Amphipogon	
https://id.biodiversity.org.au/node/apni/2896899	Amphipogon laguroides	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Amphipogon	
https://id.biodiversity.org.au/node/apni/2912443	Amphipogon strictus	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Amphipogon	Greybeard Grass
https://id.biodiversity.org.au/node/apni/2913426	Amphipogon turbinatus	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Amphipogon	
https://id.biodiversity.org.au/node/apni/2916759	Amyema linophylla	(Fenzl) Tiegh.	species	Plantae	Charophyta	Equisetopsida	Santalales	Loranthaceae	Amyema	Buloke Mistletoe
https://id.biodiversity.org.au/node/apni/2899172	Amyema miquelii	(Lehm. ex Miq.) Tiegh.	species	Plantae	Charophyta	Equisetopsida	Santalales	Loranthaceae	Amyema	Box Mistletoe
https://id.biodiversity.org.au/node/apni/2917351	Anarthria laevis	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Anarthriaceae	Anarthria	
https://id.biodiversity.org.au/node/apni/2891026	Andersonia heterophylla	Sond.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Andersonia	
https://id.biodiversity.org.au/node/apni/2903772	Andersonia lehmanniana	Sond.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Andersonia	
https://id.biodiversity.org.au/node/apni/2903116	Angianthus preissianus	(Steetz) Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Angianthus	Salt Angianthus
https://id.biodiversity.org.au/node/apni/2910850	Angianthus tomentosus	J.C.Wendl.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Angianthus	Hairy Angianthus
https://id.biodiversity.org.au/node/apni/2921092	Anigozanthos bicolor	Endl.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Anigozanthos	Little Kangaroo Paw
https://id.biodiversity.org.au/node/apni/2900204	Anigozanthos humilis	Lindl.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Anigozanthos	Common Catspaw
https://id.biodiversity.org.au/node/apni/2900921	Anigozanthos manglesii	D.Don	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Anigozanthos	Red And Green Kangaroo Paw
https://id.biodiversity.org.au/node/apni/2909298	Anigozanthos viridis	Endl.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Anigozanthos	Green Kangaroo Paw
https://id.biodiversity.org.au/node/apni/2893357	Anthocercis anisantha	Endl.	species	Plantae	Charophyta	Equisetopsida	Solanales	Solanaceae	Anthocercis	
https://id.biodiversity.org.au/node/apni/2889532	Anthotium junciforme	(de Vriese) D.A.Morrison	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Anthotium	Rush-like Anthotium
https://id.biodiversity.org.au/taxon/apni/51299839	Aotus cordifolia	Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Aotus	
https://id.biodiversity.org.au/node/apni/2900645	Aotus gracillima	Meisn.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Aotus	
https://id.biodiversity.org.au/node/apni/2889615	Aotus intermedia	Meisn.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Aotus	
https://id.biodiversity.org.au/node/apni/2890176	Aphelia brizula	F.Muell.	species	Plantae	Charophyta	Equisetopsida	Poales	Centrolepidaceae	Aphelia	
https://id.biodiversity.org.au/node/apni/2891037	Aphelia cyperoides	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Centrolepidaceae	Aphelia	
https://id.biodiversity.org.au/node/apni/2919295	Aphelia drummondii	(Hieron.) Benth.	species	Plantae	Charophyta	Equisetopsida	Poales	Centrolepidaceae	Aphelia	
https://id.biodiversity.org.au/taxon/apni/51267241	Arctotheca calendula	(L.) K.Lewin	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Arctotheca	African Marigold
https://id.biodiversity.org.au/node/apni/2899222	Arnocrinum preissii	Lehm.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Hemerocallidaceae	Arnocrinum	

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name
https://id.biodiversity.org.au/node/apni/2912193	Arundo donax	L.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Arundo	Elephant Grass
https://id.biodiversity.org.au/node/apni/2895570	Astartea affinis	(Endl.) Rye	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Astartea	West-coast Astartea
https://id.biodiversity.org.au/node/apni/2887401	Astartea fascicularis	(Labill.) DC.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Astartea	Recherche Astartea
https://id.biodiversity.org.au/node/apni/2886742	Astartea scoparia	Schauer	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Astartea	Common Astartea
https://id.biodiversity.org.au/node/apni/2918187	Asteridea pulverulenta	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Asteridea	
https://id.biodiversity.org.au/node/apni/2915781	Astroloma macrocalyx	Sond.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Astroloma	Swan Berry
https://id.biodiversity.org.au/node/apni/2909103	Astroloma pallidum	R.Br.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Astroloma	Kick Bush
https://id.biodiversity.org.au/node/apni/2889536	Astroloma stomarrhena	Sond.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Astroloma	Red Swamp Cranberry
https://id.biodiversity.org.au/node/apni/2897217	Astroloma xerophyllum	(DC.) Sond.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Astroloma	
https://id.biodiversity.org.au/node/apni/2886962	Atriplex prostrata	Boucher ex DC.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Chenopodiaceae	Atriplex	Orache
https://id.biodiversity.org.au/node/apni/2911947	Austrostipa campylachne	(Nees) S.W.L.Jacobs & J.Everett	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Austrostipa	
https://id.biodiversity.org.au/node/apni/2914252	Austrostipa compressa	(R.Br.) S.W.L.Jacobs & J.Everett	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Austrostipa	
https://id.biodiversity.org.au/node/apni/2886511	Austrostipa elegantissima	(Labill.) S.W.L.Jacobs & J.Everett	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Austrostipa	Feather Spear-grass
https://id.biodiversity.org.au/node/apni/2902954	Austrostipa flavescens	(Labill.) S.W.L.Jacobs & J.Everett	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Austrostipa	
https://id.biodiversity.org.au/node/apni/2899873	Austrostipa macalpinei	(Reader) S.W.L.Jacobs & J.Everett	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Austrostipa	Annual Spear-grass
https://id.biodiversity.org.au/node/apni/2907658	Austrostipa mollis	(R.Br.) S.W.L.Jacobs & J.Everett	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Austrostipa	Soft Spear-grass
https://id.biodiversity.org.au/node/apni/2902759	Austrostipa semibarbata	(R.Br.) S.W.L.Jacobs & J.Everett	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Austrostipa	Fibrous Spear-grass
https://id.biodiversity.org.au/node/apni/2893736	Austrostipa tenuifolia	(Steud.) S.W.L.Jacobs & J.Everett	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Austrostipa	Long-awn Spear-grass
https://id.biodiversity.org.au/node/apni/2915032	Avellinia michelii	(Savi) Parl.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Avellinia	Avellinia
https://id.biodiversity.org.au/node/apni/2906546	Avena barbata	Pott ex Link	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Avena	Bearded Oats
https://id.biodiversity.org.au/node/apni/2908422	Avena fatua	L.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Avena	Wild Oat
https://id.biodiversity.org.au/node/apni/2911836	Babingtonia camphorosmae	(Endl.) Lindl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Babingtonia	
https://id.biodiversity.org.au/name/apni/4555092	Babingtonia grandiflora	(Benth.) Rye	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Babingtonia	Large-flowered Babingtonia
https://id.biodiversity.org.au/node/apni/2901018	Baeometra uniflora	(Jacq.) G.J.Lewis	species	Plantae	Charophyta	Equisetopsida	Liliales	Colchicaceae	Baeometra	
https://id.biodiversity.org.au/node/apni/2899939	Banksia armata	(R.Br.) A.R.Mast & K.R.Thiele	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	
https://id.biodiversity.org.au/node/apni/2913234	Banksia attenuata	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	Coast Banksia
https://id.biodiversity.org.au/node/apni/2916921	Banksia bipinnatifida	(R.Br.) A.R.Mast & K.R.Thiele	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	
https://id.biodiversity.org.au/node/apni/5040372	Banksia dallanneyi	A.R.Mast & K.R.Thiele	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	
https://id.biodiversity.org.au/node/apni/2914160	Banksia fraseri	(R.Br.) A.R.Mast & K.R.Thiele	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	
https://id.biodiversity.org.au/node/apni/2896043	Banksia grandis	Willd.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	Giant Banksia
https://id.biodiversity.org.au/node/apni/2905735	Banksia ilicifolia	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	Holly Leaved Banksia
https://id.biodiversity.org.au/node/apni/2887354	Banksia incana	A.S.George	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	
https://id.biodiversity.org.au/node/apni/2892579	Banksia integrifolia	L.f.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	Honeysuckle
https://id.biodiversity.org.au/node/apni/2913977	Banksia littoralis	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	Swamp Banksia
https://id.biodiversity.org.au/node/apni/2897960	Banksia menziesii	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	Firewood Banksia
https://id.biodiversity.org.au/node/apni/2892278	Banksia micrantha	A.S.George	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	
https://id.biodiversity.org.au/node/apni/2894027	Banksia nivea	Labill.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	
https://id.biodiversity.org.au/node/apni/2905445	Banksia sessilis	(Knight) A.R.Mast & K.R.Thiele	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	
https://id.biodiversity.org.au/node/apni/2900926	Banksia telmatiaea	A.S.George	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Banksia	Swamp Fox Banksia
https://id.biodiversity.org.au/node/ausmoss/10059274	Barbula calycina	SchwÃ¤gr.	species	Plantae	Bryophyta	Bryopsida	Pottiales	Pottiaceae	Barbula	
https://id.biodiversity.org.au/node/ausmoss/10060148	Bartramia pseudostricta	Catches.	species	Plantae	Bryophyta	Bryopsida	Bartramiales	Bartramiaceae	Bartramia	
https://id.biodiversity.org.au/node/apni/2890775	Baumea arthrophylla	(Nees) Boeckeler	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Baumea	
https://id.biodiversity.org.au/node/apni/2896041	Baumea articulata	(R.Br.) S.T.Blake	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Baumea	Jointed Rush
https://id.biodiversity.org.au/node/apni/2903349	Baumea juncea	(R.Br.) Palla	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Baumea	Bare Twig-rush
https://id.biodiversity.org.au/node/apni/2899756	Baumea rubiginosa	(Spreng.) Boeckeler	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Baumea	Soft Twig-rush
https://id.biodiversity.org.au/taxon/apni/51288833	Beaufortia elegans	Schauer	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Beaufortia	Elegant Beaufortia
https://id.biodiversity.org.au/taxon/apni/51288894	Beaufortia purpurea	Lindl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Beaufortia	Purple Beaufortia
https://id.biodiversity.org.au/taxon/apni/51291052	Bellardia trixago	(L.) All.	species	Plantae	Charophyta	Equisetopsida	Lamiales	Orobanchaceae	Bellardia	Bellardia
https://id.biodiversity.org.au/taxon/apni/51291059	Bellardia viscosa	(L.) Fisch. & C.A.Mey.	species	Plantae	Charophyta	Equisetopsida	Lamiales	Orobanchaceae	Bellardia	
https://id.biodiversity.org.au/taxon/apni/51267518	Bidens pilosa	L.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Bidens	Kamu (seeds)
https://id.biodiversity.org.au/node/apni/2920256	Billardiera fraseri	(Hook.) L.Cayzer, Crisp & I.Telford	species	Plantae	Charophyta	Equisetopsida	Apiales	Pittosporaceae	Billardiera	
https://id.biodiversity.org.au/node/apni/2910549	Billardiera variifolia	DC.	species	Plantae	Charophyta	Equisetopsida	Apiales	Pittosporaceae	Billardiera	
https://id.biodiversity.org.au/node/apni/2920511	Blancoa canescens	Lindl.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Blancoa	Winter Bell
https://id.biodiversity.org.au/node/apni/2889067	Bolboschoenus caldwellii	(V.J.Cook) SojÃ¡k	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Bolboschoenus	Marsh Club-rush

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name
https://id.biodiversity.org.au/node/apni/2901123	Boronia ovata	Lindl.	species	Plantae	Charophyta	Equisetopsida	Sapindales	Rutaceae	Boronia	
https://id.biodiversity.org.au/node/apni/2886946	Boronia purdieana	Diels	species	Plantae	Charophyta	Equisetopsida	Sapindales	Rutaceae	Boronia	Winter Boronia
https://id.biodiversity.org.au/node/apni/2893194	Boronia ramosa	(Lindl.) Benth.	species	Plantae	Charophyta	Equisetopsida	Sapindales	Rutaceae	Boronia	
https://id.biodiversity.org.au/node/apni/2897463	Borya scirpoidea	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Boryaceae	Borya	
https://id.biodiversity.org.au/node/apni/2906592	Borya sphaerocephala	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Boryaceae	Borya	Pincushions
https://id.biodiversity.org.au/node/apni/2915386	Bossiaea eriocarpa	Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Bossiaea	Common Brown Pea
https://id.biodiversity.org.au/node/apni/2891017	Bossiaea spinescens	Meisn.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Bossiaea	
https://id.biodiversity.org.au/taxon/apni/51299910	Brachypodium distachyon	(L.) P.Beauv.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Brachypodium	False Brome
https://id.biodiversity.org.au/node/apni/2911349	Brachyscome bellidioides	Steetz	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Brachyscome	
https://id.biodiversity.org.au/node/apni/2897264	Brachyscome glandulosa	(Steetz) Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Brachyscome	Sticky Daisy
https://id.biodiversity.org.au/taxon/apni/51267823	Brachyscome iberidifolia	Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Brachyscome	Swan River Daisy
https://id.biodiversity.org.au/node/apni/2908064	Briza maxima	L.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Briza	Great Quaking Grass
https://id.biodiversity.org.au/node/apni/2920944	Briza minor	L.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Briza	Small Shivery Grass
https://id.biodiversity.org.au/node/apni/2891835	Bromus diandrus	Roth	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Bromus	Giant Brome
https://id.biodiversity.org.au/node/apni/2917716	Burchardia bairdiae	Keighery	species	Plantae	Charophyta	Equisetopsida	Liliales	Colchicaceae	Burchardia	
https://id.biodiversity.org.au/node/apni/2912917	Burchardia congesta	Lindl.	species	Plantae	Charophyta	Equisetopsida	Liliales	Colchicaceae	Burchardia	
https://id.biodiversity.org.au/node/apni/2899048	Burchardia multiflora	Lindl.	species	Plantae	Charophyta	Equisetopsida	Liliales	Colchicaceae	Burchardia	Lesser Burchardia
https://id.biodiversity.org.au/node/apni/2890796	Burchardia umbellata	R.Br.	species	Plantae	Charophyta	Equisetopsida	Liliales	Colchicaceae	Burchardia	Milkmaids
https://id.biodiversity.org.au/node/apni/2904117	Caesia micrantha	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Hemerocallidaceae	Caesia	Pale Grass Lily
https://id.biodiversity.org.au/taxon/apni/51398952	Caladenia discoidea	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Caladenia	Dancing Spider Orchid
https://id.biodiversity.org.au/taxon/apni/51399012	Caladenia flava	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Caladenia	Cowslip Orchid
https://id.biodiversity.org.au/taxon/apni/51399140	Caladenia longicauda	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Caladenia	White Spider Orchid
https://id.biodiversity.org.au/taxon/apni/51399190	Caladenia marginata	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Caladenia	White Fairy Orchid
https://id.biodiversity.org.au/taxon/apni/51399243	Caladenia paludosa	Hopper & A.P.Br.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Caladenia	Swamp Spider Orchid
https://id.biodiversity.org.au/name/apni/51345848	Caladenia varians	Hopper & A.P.Br.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Caladenia	
https://id.biodiversity.org.au/taxon/apni/51291760	Calandrinia calyptrata	Hook.f.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Portulacaceae	Calandrinia	Pink Purslane
https://id.biodiversity.org.au/node/apni/2920220	Calandrinia liniflora	Fenzl	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Portulacaceae	Calandrinia	Parakeelya
https://id.biodiversity.org.au/taxon/apni/51283232	Calectasia grandiflora	L.Preiss	species	Plantae	Charophyta	Equisetopsida	Dasypogonales	Dasypogonaceae	Calectasia	Blue Tinsel Lily
https://id.biodiversity.org.au/node/apni/2918220	Calectasia narragara	R.L.Barrett & K.W.Dixon	species	Plantae	Charophyta	Equisetopsida	Dasypogonales	Dasypogonaceae	Calectasia	
https://id.biodiversity.org.au/taxon/apni/51271041	Callitris pyramidalis	(Miq.) J.E.Piggin & J.J.Bruhl	species	Plantae	Charophyta	Equisetopsida	Pinales	Cupressaceae	Callitris	
https://id.biodiversity.org.au/taxon/apni/51302262	Calothamnus quadrifidus	R.Br.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Calothamnus	One-sided Bottlebrush
https://id.biodiversity.org.au/taxon/apni/51289286	Calothamnus sanguineus	Labill.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Calothamnus	Silky-leaved Bloodflower
https://id.biodiversity.org.au/taxon/apni/51299925	Calytrix angulata	Lindl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Calytrix	
https://id.biodiversity.org.au/taxon/apni/51299930	Calytrix aurea	Lindl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Calytrix	
https://id.biodiversity.org.au/node/apni/2913902	Calytrix flavescens	A.Cunn.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Calytrix	Summer Starflower
https://id.biodiversity.org.au/node/apni/2919519	Calytrix fraseri	A.Cunn.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Calytrix	Pink Summer Calytrix
https://id.biodiversity.org.au/node/apni/2913117	Calytrix sapphirina	Lindl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Calytrix	
https://id.biodiversity.org.au/node/apni/2898371	Calytrix strigosa	A.Cunn.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Calytrix	
https://id.biodiversity.org.au/taxon/apni/51299938	Calytrix sylvana	Craven	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Calytrix	
https://id.biodiversity.org.au/taxon/apni/51299942	Calytrix variabilis	Lindl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Calytrix	
https://id.biodiversity.org.au/node/ausmoss/10065820	Campylopus australis	Catches. & J.-P.Frahm	species	Plantae	Bryophyta	Bryopsida	Dicranales	Leucobryaceae	Campylopus	
https://id.biodiversity.org.au/node/ausmoss/10066620	Campylopus introflexus	(Hedw.) Brid.	species	Plantae	Bryophyta	Bryopsida	Dicranales	Leucobryaceae	Campylopus	
https://id.biodiversity.org.au/node/apni/2886785	Carpobrotus edulis	(L.) N.E.Br.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Aizoaceae	Carpobrotus	Hottentot Fig
https://id.biodiversity.org.au/node/apni/2891903	Carthamus lanatus	L.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Carthamus	Saffron Thistle
https://id.biodiversity.org.au/node/apni/2920619	Cartonema philydroides	F.Muell.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Commelinaceae	Cartonema	
https://id.biodiversity.org.au/node/apni/2905168	Cassytha aurea	J.Z.Weber	species	Plantae	Charophyta	Equisetopsida	Laurales	Lauraceae	Cassytha	Dodder Laurel
https://id.biodiversity.org.au/node/apni/2899088	Cassytha flava	Nees	species	Plantae	Charophyta	Equisetopsida	Laurales	Lauraceae	Cassytha	Dodder Laurel
https://id.biodiversity.org.au/node/apni/2907668	Cassytha glabella	R.Br.	species	Plantae	Charophyta	Equisetopsida	Laurales	Lauraceae	Cassytha	Smooth Cassytha
https://id.biodiversity.org.au/node/apni/2889785	Cassytha pomiformis	Nees	species	Plantae	Charophyta	Equisetopsida	Laurales	Lauraceae	Cassytha	Dodder Laurel
https://id.biodiversity.org.au/node/apni/2906672	Cassytha racemosa	Nees	species	Plantae	Charophyta	Equisetopsida	Laurales	Lauraceae	Cassytha	Dodder Laurel
https://id.biodiversity.org.au/node/apni/2893176	Casuarina obesa	Miq.	species	Plantae	Charophyta	Equisetopsida	Fagales	Casuarinaceae	Casuarina	Swamp Sheoak
https://id.biodiversity.org.au/node/apni/2888871	Caustis dioica	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Caustis	
https://id.biodiversity.org.au/taxon/apni/51268021	Centaurea melitensis	L.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Centaurea	Star Thistle
https://id.biodiversity.org.au/node/apni/2912379	Centaurium erythraea	Rafn	species	Plantae	Charophyta	Equisetopsida	Gentianales	Gentianaceae	Centaurium	Common Centaury
https://id.biodiversity.org.au/node/apni/7385749	Centaurium tenuiflorum	(Hoffmanns. & Link) Fritsch	species	Plantae	Charophyta	Equisetopsida	Gentianales	Gentianaceae	Centaurium	Common Centaury
https://id.biodiversity.org.au/node/apni/2915591	Centrolepis alepyroides	(Nees) Walp.	species	Plantae	Charophyta	Equisetopsida	Poales	Centrolepidaceae	Centrolepis	
https://id.biodiversity.org.au/taxon/apni/51270456	Centrolepis aristata	(R.Br.) Roem. & Schult.	species	Plantae	Charophyta	Equisetopsida	Poales	Centrolepidaceae	Centrolepis	Pointed Centrolepis
https://id.biodiversity.org.au/node/apni/2912795	Centrolepis caespitosa	D.A.Cooke	species	Plantae	Charophyta	Equisetopsida	Poales	Centrolepidaceae	Centrolepis	
https://id.biodiversity.org.au/node/apni/2920474	Centrolepis drummondiana	(Nees) Walp.	species	Plantae	Charophyta	Equisetopsida	Poales	Centrolepidaceae	Centrolepis	
https://id.biodiversity.org.au/node/apni/2904382	Centrolepis glabra	(F.Muell. ex Sond.) Hieron.	species	Plantae	Charophyta	Equisetopsida	Poales	Centrolepidaceae	Centrolepis	Smooth Centrolepis
https://id.biodiversity.org.au/node/apni/2910915	Centrolepis humillima	Benth.	species	Plantae	Charophyta	Equisetopsida	Poales	Centrolepidaceae	Centrolepis	Dwarf Centrolepis
https://id.biodiversity.org.au/node/apni/2913655	Centrolepis inconspicua	W.Fitzg.	species	Plantae	Charophyta	Equisetopsida	Poales	Centrolepidaceae	Centrolepis	
https://id.biodiversity.org.au/node/apni/2905657	Centrolepis mutica	(R.Br.) Hieron.	species	Plantae	Charophyta	Equisetopsida	Poales	Centrolepidaceae	Centrolepis	

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name
https://id.biodiversity.org.au/node/apni/2915383	Centrolepis pilosa	Hieron.	species	Plantae	Charophyta	Equisetopsida	Poales	Centrolepidaceae	Centrolepis	
https://id.biodiversity.org.au/node/apni/2899294	Centrolepis polygyna	(R.Br.) Hieron.	species	Plantae	Charophyta	Equisetopsida	Poales	Centrolepidaceae	Centrolepis	Wiry Centrolepis
https://id.biodiversity.org.au/node/apni/2886603	Chaetanthus aristatus	(R.Br.) B.G.Briggs & L.A.S.Johnson	species	Plantae	Charophyta	Equisetopsida	Poales	Restionaceae	Chaetanthus	Bearded Twinerush
https://id.biodiversity.org.au/node/apni/2920316	Chamaescilla corymbosa	(R.Br.) F.Muell. ex Benth.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Chamaescilla	Blue Stars
https://id.biodiversity.org.au/node/apni/2915369	Chamaescilla gibsonii	Keighery	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Chamaescilla	
https://id.biodiversity.org.au/node/apni/2894284	Chamaescilla versicolor	(Lindl.) Ostenf.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Chamaescilla	
https://id.biodiversity.org.au/node/apni/2917183	Chamaexeros macranthera	Kuchel	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Chamaexeros	
https://id.biodiversity.org.au/node/apni/2914702	Chamelaucium uncinatum	Schauer	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Chamelaucium	Geraldton Wax
https://id.biodiversity.org.au/node/apni/2915986	Cheilanthes austrotenuifolia	H.M.Quirk & T.C.Chambers	species	Plantae	Charophyta	Equisetopsida		Pteridaceae	Cheilanthes	Rock Fern
https://id.biodiversity.org.au/node/apni/2893990	Cheiranthera preissiana	Putt.	species	Plantae	Charophyta	Equisetopsida	Apiales	Pittosporaceae	Cheiranthera	
https://id.biodiversity.org.au/node/apni/2895180	Chloris gayana	Kunth	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Chloris	Rhodes Grass
https://id.biodiversity.org.au/node/apni/2911170	Chordifex microcodon	B.G.Briggs & L.A.S.Johnson	species	Plantae	Charophyta	Equisetopsida	Poales	Restionaceae	Chordifex	
https://id.biodiversity.org.au/node/apni/2910427	Chordifex sinuosus	B.G.Briggs & L.A.S.Johnson	species	Plantae	Charophyta	Equisetopsida	Poales	Restionaceae	Chordifex	
https://id.biodiversity.org.au/node/apni/2906496	Chorizandra enodis	Nees	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Chorizandra	Black Bristlesedge
https://id.biodiversity.org.au/node/apni/2904661	Cicendia filiformis	(L.) Delarbre	species	Plantae	Charophyta	Equisetopsida	Gentianales	Gentianaceae	Cicendia	Slender Cicendia
NZOR-6-61826	Citrullus lanatus	(Thunb.) Matsum. & Nakai	species	Plantae	Charophyta	Equisetopsida	Cucurbitales	Cucurbitaceae	Citrullus	Ngayuum
https://id.biodiversity.org.au/node/apni/2919145	Comesperma calymega	Labill.	species	Plantae	Charophyta	Equisetopsida	Fabales	Polygalaceae	Comesperma	Blue-spike Milkwort
https://id.biodiversity.org.au/node/apni/2905500	Comesperma ciliatum	Steetz	species	Plantae	Charophyta	Equisetopsida	Fabales	Polygalaceae	Comesperma	
https://id.biodiversity.org.au/node/apni/2897625	Comesperma virgatum	Labill.	species	Plantae	Charophyta	Equisetopsida	Fabales	Polygalaceae	Comesperma	Milkwort
https://id.biodiversity.org.au/node/apni/2894435	Comesperma volubile	Labill.	species	Plantae	Charophyta	Equisetopsida	Fabales	Polygalaceae	Comesperma	Love Creeper
https://id.biodiversity.org.au/node/apni/2891504	Conospermum acerosum	Lindl.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Conospermum	Needle-leaved Smokebush
https://id.biodiversity.org.au/node/apni/2909633	Conospermum canaliculatum	Meisn.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Conospermum	
https://id.biodiversity.org.au/node/apni/2895009	Conospermum huegelii	R.Br. ex Endl.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Conospermum	Slender Smokebush
https://id.biodiversity.org.au/node/apni/2896102	Conospermum polycephalum	Meisn.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Conospermum	
https://id.biodiversity.org.au/node/apni/2893312	Conospermum stoechadis	Endl.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Conospermum	Common Smokebush
https://id.biodiversity.org.au/node/apni/2889175	Conospermum triplinervium	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Conospermum	Tree Smokebush
https://id.biodiversity.org.au/node/apni/2887617	Conostephium minus	Lindl.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Conostephium	Pink-tipped Pearl Flower
https://id.biodiversity.org.au/node/apni/2919207	Conostephium pendulum	Benth.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Conostephium	Pearl Flower
https://id.biodiversity.org.au/node/apni/2888982	Conostephium preissii	Sond.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Conostephium	
https://id.biodiversity.org.au/node/apni/6283310	Conostylis aculeata	R.Br.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Conostylis	Prickly Conostylis
https://id.biodiversity.org.au/node/apni/2895339	Conostylis androstemma	F.Muell.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Conostylis	Trumpets
https://id.biodiversity.org.au/node/apni/2887259	Conostylis aurea	Lindl.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Conostylis	
https://id.biodiversity.org.au/node/apni/6285445	Conostylis candicans	Endl.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Conostylis	Grey Cottonhead
https://id.biodiversity.org.au/node/apni/6286726	Conostylis caricina	Lindl.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Conostylis	
https://id.biodiversity.org.au/node/apni/6289292	Conostylis festucacea	Endl.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Conostylis	
https://id.biodiversity.org.au/node/apni/2886783	Conostylis juncea	Endl.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Conostylis	
https://id.biodiversity.org.au/node/apni/2912492	Conostylis setigera	R.Br.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Conostylis	Bristly Cottonhead
https://id.biodiversity.org.au/node/apni/2906396	Conostylis setosa	Lindl.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Conostylis	White Cottonhead
https://id.biodiversity.org.au/node/apni/2907019	Corrigiola litoralis	L.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Caryophyllaceae	Corrigiola	Strapwort
https://id.biodiversity.org.au/node/apni/2892673	Corymbia calophylla	(Lindl.) K.D.Hill & L.A.S.Johnson	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Corymbia	Marri
https://id.biodiversity.org.au/name/apni/51399299	Corynotheca elongata	(R.J.F.Hend.) R.L.Barrett & T.Macfarlane	species	Plantae	Charophyta	Equisetopsida	Asparagales	Hemerocallidaceae	Corynotheca	Spreading Sand Lily
https://id.biodiversity.org.au/node/apni/2904465	Corynotheca micrantha	(Lindl.) Druce	species	Plantae	Charophyta	Equisetopsida	Asparagales	Hemerocallidaceae	Corynotheca	Sand Lily
https://id.biodiversity.org.au/node/apni/2888413	Cotula australis	(Sieber ex Spreng.) Hook.f.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Cotula	Common Cotula
https://id.biodiversity.org.au/taxon/apni/51268414	Cotula coronopifolia	L.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Cotula	Water-buttons
https://id.biodiversity.org.au/taxon/apni/51300007	Cotula cotuloides	(Steetz) Druce	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Cotula	Smooth Cotula
https://id.biodiversity.org.au/node/apni/2898239	Cotula turbinata	L.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Cotula	Ferny Cotula
https://id.biodiversity.org.au/node/apni/6979038	Craspedia variabilis	J.Everett & Doust	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Craspedia	Billy-buttons
https://id.biodiversity.org.au/node/apni/2897232	Crassula colorata	(Nees) Ostenf.	species	Plantae	Charophyta	Equisetopsida	Saxifragales	Crassulaceae	Crassula	Stonecrop
https://id.biodiversity.org.au/node/apni/2889646	Crassula decumbens	Thunb.	species	Plantae	Charophyta	Equisetopsida	Saxifragales	Crassulaceae	Crassula	Rufous Stonecrop
https://id.biodiversity.org.au/node/apni/2892410	Crassula natans	Thunb.	species	Plantae	Charophyta	Equisetopsida	Saxifragales	Crassulaceae	Crassula	Swamp Stonecrop
https://id.biodiversity.org.au/node/apni/2913574	Crepis foetida	L.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Crepis	Foetid Hawk's-beard
https://id.biodiversity.org.au/node/apni/2907581	Cristonia biloba	(Benth.) J.H.Ross	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Cristonia	
https://id.biodiversity.org.au/node/apni/2898550	Croninia kingiana	(F.Muell.) J.M.Powell	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Croninia	
https://id.biodiversity.org.au/node/apni/2888967	Cryptandra arbutiflora	Fenzl	species	Plantae	Charophyta	Equisetopsida	Rosales	Rhamnaceae	Cryptandra	Waxy Cryptandra
https://id.biodiversity.org.au/taxon/apni/51270683	Cuscuta epithymum	(L.) L.	species	Plantae	Charophyta	Equisetopsida	Solanales	Convolvulaceae	Cuscuta	Common Dodder

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name
https://id.biodiversity.org.au/taxon/apni/51401270	Cyanicula gemmata	(Lindl.) Hopper & A.P.Br.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Cyanicula	Blue China Orchid
https://id.biodiversity.org.au/taxon/apni/51401282	Cyanicula sericea	(Lindl.) Hopper & A.P.Br.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Cyanicula	Silky Blue Orchid
https://id.biodiversity.org.au/taxon/apni/51300013	Cyathea cooperi	(Hook. ex F.Muell.) Domin	species	Plantae	Charophyta	Equisetopsida	Cyatheales	Cyatheaceae	Cyathea	Tree Fern
https://id.biodiversity.org.au/node/apni/2906808	Cyathochaeta avenacea	(R.Br.) Benth.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Cyathochaeta	
https://id.biodiversity.org.au/node/apni/2914378	Cyathochaeta teretifolia	W.Fitzg.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Cyathochaeta	
https://id.biodiversity.org.au/node/apni/2906665	Cyclosorus interruptus	(Willd.) H.Ito	species	Plantae	Charophyta	Equisetopsida	Polypodiales	Thelypteridaceae	Cyclosorus	Swamp Shield-fern
https://id.biodiversity.org.au/node/apni/2891901	Cycnogeton lineare	(Endl.) Sond.	species	Plantae	Charophyta	Equisetopsida	Alismatales	Juncaginaceae	Cycnogeton	
https://id.biodiversity.org.au/node/apni/2914668	Cycnogeton procerum	(R.Br.) Buchenau	species	Plantae	Charophyta	Equisetopsida	Alismatales	Juncaginaceae	Cycnogeton	Gabirr
https://id.biodiversity.org.au/node/apni/2915319	Cynodon dactylon	(L.) Pers.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Cynodon	Star Grass
https://id.biodiversity.org.au/taxon/apni/51283097	Cyperus congestus	Vahl	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Cyperus	Dense Flat-sedge
https://id.biodiversity.org.au/node/apni/2920306	Cyperus polystachyos	Rottb.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Cyperus	Bunchy Flat-sedge
https://id.biodiversity.org.au/node/apni/2894949	Cyperus tenuiflorus	Rottb.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Cyperus	Scaly Sedge
https://id.biodiversity.org.au/node/apni/2891874	Cyrtomium falcatum	(L.f.) C.Presl	species	Plantae	Charophyta	Equisetopsida	Polypodiales	Dryopteridaceae	Cyrtomium	Holly Fern
https://id.biodiversity.org.au/node/apni/2891057	Cytogonidium leptocarpoides	(Benth.) B.G.Briggs & L.A.S.Johnson	species	Plantae	Charophyta	Equisetopsida	Poales	Restionaceae	Cytogonidium	
https://id.biodiversity.org.au/node/apni/2898701	Dampiera coronata	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Dampiera	Wedge-leaved Dampiera
https://id.biodiversity.org.au/node/apni/2888259	Dampiera linearis	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Dampiera	Wedge-leaved Dampiera
https://id.biodiversity.org.au/node/apni/2901505	Dampiera teres	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Dampiera	
https://id.biodiversity.org.au/node/apni/2910216	Darwinia foetida	Keighery	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Darwinia	Muchea Bell
https://id.biodiversity.org.au/node/apni/2918988	Darwinia oederoides	(Turcz.) Benth.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Darwinia	
https://id.biodiversity.org.au/taxon/apni/51289630	Darwinia thymoides	(Lindl.) Benth.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Darwinia	
https://id.biodiversity.org.au/node/apni/2918606	Dasypogon bromeliifolius	R.Br.	species	Plantae	Charophyta	Equisetopsida	Dasypogonales	Dasypogonaceae	Dasypogon	Pineapple Bush
https://id.biodiversity.org.au/node/apni/2901796	Daucus glochidiatus	(Labill.) Fisch., C.A.Mey. & Ave-Lall.	species	Plantae	Charophyta	Equisetopsida	Apiales	Apiaceae	Daucus	Wild Carrot
https://id.biodiversity.org.au/node/apni/2888613	Daviesia angulata	Benth. ex Lindl.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Daviesia	
https://id.biodiversity.org.au/node/apni/2911922	Daviesia brachyphylla	Meisn.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Daviesia	
https://id.biodiversity.org.au/node/apni/8504994	Daviesia cordata	Sm.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Daviesia	Bookleaf
https://id.biodiversity.org.au/node/apni/2910555	Daviesia decurrens	Meisn.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Daviesia	Thorny Bitter-pea
https://id.biodiversity.org.au/node/apni/2917673	Daviesia divaricata	Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Daviesia	Marno
https://id.biodiversity.org.au/node/apni/2900659	Daviesia epiphyllum	Meisn.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Daviesia	
https://id.biodiversity.org.au/node/apni/2899364	Daviesia horrida	Preiss ex Meisn.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Daviesia	Prickly Bitter-pea
https://id.biodiversity.org.au/node/apni/2905466	Daviesia longifolia	Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Daviesia	
https://id.biodiversity.org.au/taxon/apni/51251009	Daviesia nudiflora	Meisn.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Daviesia	
https://id.biodiversity.org.au/node/apni/2895473	Daviesia physodes	A.Cunn. ex G.Don	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Daviesia	
https://id.biodiversity.org.au/node/apni/2907933	Daviesia preissii	Meisn.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Daviesia	
https://id.biodiversity.org.au/node/apni/2889771	Daviesia triflora	Crisp	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Daviesia	
https://id.biodiversity.org.au/node/apni/2891726	Desmocladus asper	(Nees) B.G.Briggs & L.A.S.Johnson	species	Plantae	Charophyta	Equisetopsida	Poales	Restionaceae	Desmocladus	
https://id.biodiversity.org.au/node/apni/2887451	Desmocladus fasciculatus	(R.Br.) B.G.Briggs & L.A.S.Johnson	species	Plantae	Charophyta	Equisetopsida	Poales	Restionaceae	Desmocladus	
https://id.biodiversity.org.au/node/apni/2900824	Desmocladus flexuosus	(R.Br.) B.G.Briggs & L.A.S.Johnson	species	Plantae	Charophyta	Equisetopsida	Poales	Restionaceae	Desmocladus	
https://id.biodiversity.org.au/taxon/apni/51293717	Desmocladus lateriflorus	(W.Fitzg.) B.G.Briggs	species	Plantae	Charophyta	Equisetopsida	Poales	Restionaceae	Desmocladus	
https://id.biodiversity.org.au/taxon/apni/51287560	Dianella revoluta	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Hemerocallidaceae	Dianella	Black-anther Flax-lily
https://id.biodiversity.org.au/node/apni/2901294	Dichelachne crinita	(L.f.) Hook.f.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Dichelachne	Longhair Plumegrass
https://id.biodiversity.org.au/node/apni/2890358	Dichopogon capillipes	(Endl.) Brittan	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Dichopogon	
https://id.biodiversity.org.au/node/apni/2896616	Dichopogon preissii	(Endl.) Brittan	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Dichopogon	Nodding Chocolate Lily
https://id.biodiversity.org.au/node/ausmoss/10071480	Didymodon australasiae	(Hook. & Grev.) R.H.Zander	species	Plantae	Bryophyta	Bryopsida	Pottiales	Pottiaceae	Didymodon	
https://id.biodiversity.org.au/node/apni/2886311	Dielsia stenostachya	(W.Fitzg.) B.G.Briggs & L.A.S.Johnson	species	Plantae	Charophyta	Equisetopsida	Poales	Restionaceae	Dielsia	
https://id.biodiversity.org.au/node/apni/2887457	Digitaria aequiglumis	(Hack. & Arechav.) Parodi	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Digitaria	
https://id.biodiversity.org.au/taxon/apni/51291262	Digitaria ciliaris	(Retz.) Koeler	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Digitaria	Summer Grass
https://id.biodiversity.org.au/node/apni/2891153	Digitaria sanguinalis	(L.) Scop.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Digitaria	Crab Grass
https://id.biodiversity.org.au/node/apni/2920072	Dillwynia cinerascens	R.Br.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Dillwynia	Grey Parrot-pea
https://id.biodiversity.org.au/node/apni/2898257	Dioscorea hastifolia	Nees	species	Plantae	Charophyta	Equisetopsida	Dioscoreales	Dioscoreaceae	Dioscorea	Warrine
https://id.biodiversity.org.au/node/apni/2920309	Diplolaena andrewsii	Ostenf.	species	Plantae	Charophyta	Equisetopsida	Sapindales	Rutaceae	Diplolaena	
https://id.biodiversity.org.au/node/apni/2896829	Diplopeltis huegelii	Endl.	species	Plantae	Charophyta	Equisetopsida	Sapindales	Sapindaceae	Diplopeltis	
https://id.biodiversity.org.au/taxon/apni/51403416	Disa bracteata	Sw.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Disa	South African Orchid
https://id.biodiversity.org.au/node/apni/2910721	Dischisma capitatum	Choisy	species	Plantae	Charophyta	Equisetopsida	Lamiales	Scrophulariaceae	Dischisma	
https://id.biodiversity.org.au/node/apni/2900966	Dittrichia graveolens	(L.) Greuter	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Dittrichia	Stinkwort
https://id.biodiversity.org.au/taxon/apni/51404199	Diuris corymbosa	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Diuris	Common Donkey Orchid

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name
https://id.biodiversity.org.au/taxon/apni/51404213	Diuris drummondii	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Diuris	Tall Donkey Orchid
https://id.biodiversity.org.au/taxon/apni/51404251	Diuris laxiflora	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Diuris	Bee Orchid
https://id.biodiversity.org.au/taxon/apni/51404255	Diuris longifolia	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Diuris	Common Donkey Orchid
https://id.biodiversity.org.au/taxon/apni/51404261	Diuris magnifica	D.L.Jones	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Diuris	Pansy Orchid
https://id.biodiversity.org.au/taxon/apni/51404281	Diuris ostrina	D.L.Jones & C.J.French	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Diuris	
https://id.biodiversity.org.au/node/apni/2914561	Dodonaea pinifolia	Miq.	species	Plantae	Charophyta	Equisetopsida	Sapindales	Sapindaceae	Dodonaea	
https://id.biodiversity.org.au/node/apni/2894523	Drosera callistos	N.G.Marchant & Lowrie	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	
https://id.biodiversity.org.au/taxon/apni/51283527	Drosera collina	(N.G.Marchant & Lowrie) Lowrie	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	
https://id.biodiversity.org.au/taxon/apni/51283539	Drosera drummondii	Planch.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	
https://id.biodiversity.org.au/taxon/apni/51283549	Drosera erythrorhiza	Lindl.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	Red Ink Sundew
https://id.biodiversity.org.au/taxon/apni/51283561	Drosera gigantea	Lindl.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	Giant Sundew
https://id.biodiversity.org.au/node/apni/2894215	Drosera glanduligera	Lehm.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	Pimpernel Sundew
https://id.biodiversity.org.au/node/apni/2900694	Drosera helodes	N.G.Marchant & Lowrie	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	
https://id.biodiversity.org.au/node/apni/2907926	Drosera heterophylla	Lindl.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	Swamp Rainbow
https://id.biodiversity.org.au/node/apni/2919881	Drosera hyperostigma	N.G.Marchant & Lowrie	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	
https://id.biodiversity.org.au/node/apni/2890819	Drosera leucoblasta	Benth.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	Wheel Sundew
https://id.biodiversity.org.au/taxon/apni/51283580	Drosera macrantha	Endl.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	Bridal Rainbow
https://id.biodiversity.org.au/taxon/apni/51283588	Drosera magna	(N.G.Marchant & Lowrie) Lowrie	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	
https://id.biodiversity.org.au/taxon/apni/51298315	Drosera menziesii	R.Br. ex DC.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	Pink Rainbow
https://id.biodiversity.org.au/taxon/apni/51283612	Drosera minutiflora	Planch.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	
https://id.biodiversity.org.au/taxon/apni/51283626	Drosera neesii	Lehm.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	Jewel Rainbow
https://id.biodiversity.org.au/node/apni/2903272	Drosera nitidula	Planch.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	Shining Sundew
https://id.biodiversity.org.au/taxon/apni/51283630	Drosera occidentalis	Morrison	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	Minute Pygmy Sundew
https://id.biodiversity.org.au/taxon/apni/51283608	Drosera paleacea	DC.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	Dwarf Sundew
https://id.biodiversity.org.au/node/apni/2889387	Drosera pallida	Lindl.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	Pale Rainbow
https://id.biodiversity.org.au/node/apni/2888954	Drosera platystigma	Lehm.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	Black-eyed Sundew
https://id.biodiversity.org.au/node/apni/2906572	Drosera porrecta	Lehm.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	
https://id.biodiversity.org.au/node/apni/2903335	Drosera pulchella	Lehm.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	Pretty Sundew
https://id.biodiversity.org.au/node/apni/2912077	Drosera rosulata	Lehm.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	
https://id.biodiversity.org.au/node/apni/2897533	Drosera sewelliae	Diels	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	Red Woolly Sundew
https://id.biodiversity.org.au/name/apni/51346839	Drosera sp. Branched styles (S.C.Coffey 193)	WA Herbarium	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	
https://id.biodiversity.org.au/node/apni/2901175	Drosera spilos	N.G.Marchant & Lowrie	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	
https://id.biodiversity.org.au/node/apni/2916692	Drosera stolonifera	Endl.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	Leafy Sundew
https://id.biodiversity.org.au/node/apni/2905969	Drosera walyunga	N.G.Marchant & Lowrie	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Droseraceae	Drosera	
https://id.biodiversity.org.au/node/apni/2897578	Dysphania ambrosioides	(L.) Mosyakin & Clemants	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Chenopodiaceae	Dysphania	
https://id.biodiversity.org.au/node/apni/2889451	Echium plantagineum	L.	species	Plantae	Charophyta	Equisetopsida		Boraginaceae	Echium	Paterson's Curse
https://id.biodiversity.org.au/node/apni/2921246	Ehrharta calycina	Sm.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Ehrharta	Perennial Veldt Grass
https://id.biodiversity.org.au/node/apni/2899357	Ehrharta longiflora	Sm.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Ehrharta	Annual Veldt Grass
https://id.biodiversity.org.au/node/apni/2911021	Eleocharis acuta	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Eleocharis	Common Spike-rush
https://id.biodiversity.org.au/node/apni/3588334	Eleocharis keigheryi	K.L.Wilson	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Eleocharis	Keighery's Eleocharis
https://id.biodiversity.org.au/node/apni/2904956	Eleusine indica	(L.) Gaertn.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Eleusine	Crow's-foot Grass
https://id.biodiversity.org.au/taxon/apni/51405028	Elythranthera brunonis	(Endl.) A.S.George	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Elythranthera	Purple Enamel Orchid
https://id.biodiversity.org.au/taxon/apni/51405030	Elythranthera emarginata	(Lindl.) A.S.George	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Elythranthera	Pink Enamel Orchid
https://id.biodiversity.org.au/node/apni/2886420	Epilobium billardiereanum	Ser.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Onagraceae	Epilobium	Smooth Willow Herb
https://id.biodiversity.org.au/node/apni/2906406	Eragrostis cilianensis	(All.) Vignolo ex Janch.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Eragrostis	Stinkgrass
https://id.biodiversity.org.au/node/apni/2889922	Eragrostis curvula	(Schrad.) Nees	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Eragrostis	African Love Grass
https://id.biodiversity.org.au/node/apni/2904310	Eragrostis dielsii	Pilg.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Eragrostis	Mallee Lovegrass
https://id.biodiversity.org.au/node/apni/7766887	Eragrostis elongata	(Willd.) J.Jacq.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Eragrostis	Clustered Lovegrass
https://id.biodiversity.org.au/taxon/apni/51289696	Eremaea asterocarpa	Hnatiuk	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Eremaea	
https://id.biodiversity.org.au/taxon/apni/51302276	Eremaea pauciflora	(Endl.) Druce	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Eremaea	
https://id.biodiversity.org.au/taxon/apni/51289799	Eremaea purpurea	C.A.Gardner	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Eremaea	
https://id.biodiversity.org.au/node/apni/6990396	Erigeron sumatrensis	Retz.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Erigeron	
https://id.biodiversity.org.au/taxon/apni/51405072	Eriochilus dilatatus	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Eriochilus	White Bunny Orchid
https://id.biodiversity.org.au/node/apni/2921084	Erodium botrys	(Cav.) Bertol.	species	Plantae	Charophyta	Equisetopsida	Geraniales	Geraniaceae	Erodium	Big Heron's-bill
https://id.biodiversity.org.au/node/apni/2899692	Eryngium pinnatifidum	Bunge	species	Plantae	Charophyta	Equisetopsida	Apiales	Apiaceae	Eryngium	Blue Devils
https://id.biodiversity.org.au/node/apni/2905557	Eucalyptus accedens	W.Fitzg.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Eucalyptus	Powder Bark Wandoo
https://id.biodiversity.org.au/node/apni/2909951	Eucalyptus erythrocorys	F.Muell.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Eucalyptus	Red-capped Gum
https://id.biodiversity.org.au/taxon/apni/51302290	Eucalyptus marginata	Donn ex Sm.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Eucalyptus	Jarrah
https://id.biodiversity.org.au/node/apni/2891670	Eucalyptus rudis	Endl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Eucalyptus	Flooded Gum
https://id.biodiversity.org.au/node/apni/2900959	Eucalyptus todtiana	F.Muell.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Eucalyptus	Blackbutt
https://id.biodiversity.org.au/node/apni/2914079	Eucalyptus wandoo	Blakely	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Eucalyptus	White Gum
https://id.biodiversity.org.au/node/apni/2886043	Euchilopsis linearis	(Benth.) F.Muell.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Euchilopsis	Swamp Pea

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name
https://id.biodiversity.org.au/node/apni/2919170	Euphorbia peplus	L.	species	Plantae	Charophyta	Equisetopsida	Malpighiales	Euphorbiaceae	Euphorbia	Petty Spurge
https://id.biodiversity.org.au/node/apni/2918542	Euphorbia terracina	L.	species	Plantae	Charophyta	Equisetopsida	Malpighiales	Euphorbiaceae	Euphorbia	Terracine Spurge
https://id.biodiversity.org.au/node/apni/2909747	Ficinia nodosa	(Rottb.) Goetgh., Muasya & D.A.Simpson	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Ficinia	Knobby Club-rush
https://id.biodiversity.org.au/node/apni/2904959	Ficus carica	L.	species	Plantae	Charophyta	Equisetopsida	Rosales	Moraceae	Ficus	Brown Turkey Fig
https://id.biodiversity.org.au/node/ausmoss/10081260	Fissidens megalotis	Schimp. ex MÃ¼ll.Hal.	species	Plantae	Bryophyta	Bryopsida	Dicranales	Fissidentaceae	Fissidens	
https://id.biodiversity.org.au/taxon/apni/51291098	Fumaria capreolata	L.	species	Plantae	Charophyta	Equisetopsida	Ranunculales	Papaveraceae	Fumaria	White Fumitory
https://id.biodiversity.org.au/node/ausmoss/10085108	Funaria hygrometrica	Hedw.	species	Plantae	Bryophyta	Bryopsida	Funariales	Funariaceae	Funaria	
https://id.biodiversity.org.au/node/apni/2902321	Gahnia aristata	Benth.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Gahnia	
https://id.biodiversity.org.au/node/apni/2911613	Gahnia trifida	Labill.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Gahnia	Cutting Sedge
https://id.biodiversity.org.au/node/apni/2910232	Galium divaricatum	Pourr. ex Lam.	species	Plantae	Charophyta	Equisetopsida	Gentianales	Rubiaceae	Galium	Slender Bedstraw
https://id.biodiversity.org.au/node/apni/2896883	Gastrolobium acutum	Benth. ex Lindl.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Gastrolobium	
https://id.biodiversity.org.au/node/apni/2894800	Gastrolobium capitatum	(Benth.) G.Chandler & Crisp	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Gastrolobium	
https://id.biodiversity.org.au/node/apni/2920172	Gastrolobium ebracteolatum	G.Chandler & Crisp	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Gastrolobium	
https://id.biodiversity.org.au/node/apni/2919924	Gastrolobium linearifolium	G.Chandler & Crisp	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Gastrolobium	
https://id.biodiversity.org.au/node/apni/2892377	Gastrolobium nudum	G.Chandler & Crisp	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Gastrolobium	
https://id.biodiversity.org.au/node/apni/2905887	Gastrolobium praemorsum	(Meisn.) G.Chandler & Crisp	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Gastrolobium	
https://id.biodiversity.org.au/node/apni/2886839	Gastrolobium spathulatum	Benth. ex Lindl.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Gastrolobium	
https://id.biodiversity.org.au/node/apni/2915131	Gastrolobium spinosum	Benth. ex Lindl.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Gastrolobium	Prickly Poison
https://id.biodiversity.org.au/node/ausmoss/10129376	Gemmabryum pachytheca	(MÃ¼ll.Hal.) J.R.Spence & H.P.Ramsay	species	Plantae	Bryophyta	Bryopsida	Bryales	Bryaceae	Gemmabryum	
https://id.biodiversity.org.au/node/apni/2898292	Gladiolus caryophyllaceus	(Burm.f.) Poir.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Iridaceae	Gladiolus	Wild Gladiolus
https://id.biodiversity.org.au/node/apni/2886948	Gladiolus undulatus	L.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Iridaceae	Gladiolus	Wild Gladiolus
https://id.biodiversity.org.au/node/apni/2919407	Glischrocaryon aureum	(Lindl.) Orchard	species	Plantae	Charophyta	Equisetopsida	Saxifragales	Haloragaceae	Glischrocaryon	Common Popflower
https://id.biodiversity.org.au/taxon/apni/51268502	Gnephosis drummondii	(A.Gray) P.S.Short	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Gnephosis	Slender Cup-flower
https://id.biodiversity.org.au/node/ausmoss/2907672	Goebelobryum unguiculatum	(Hook.f. & Taylor) Grolle	species	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Acrobolbaceae	Goebelobryum	
https://id.biodiversity.org.au/node/apni/4092442	Gomphocarpus fruticosus	(L.) W.T.Aiton	species	Plantae	Charophyta	Equisetopsida	Gentianales	Apocynaceae	Gomphocarpus	Swan Plant
https://id.biodiversity.org.au/node/apni/2886600	Gompholobium confertum	(DC.) Crisp	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Gompholobium	
https://id.biodiversity.org.au/node/apni/2919212	Gompholobium knightianum	Lindl.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Gompholobium	Handsome Wedge Pea
https://id.biodiversity.org.au/node/apni/2914365	Gompholobium marginatum	R.Br.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Gompholobium	
https://id.biodiversity.org.au/node/apni/2918887	Gompholobium preissii	Meisn.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Gompholobium	
https://id.biodiversity.org.au/node/apni/2894425	Gompholobium scabrum	Sm.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Gompholobium	Painted Lady
https://id.biodiversity.org.au/node/apni/2920604	Gompholobium tomentosum	Labill.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Gompholobium	Hairy Yellow Pea
https://id.biodiversity.org.au/node/apni/2918358	Gonocarpus cordiger	(Fenzl) Nees	species	Plantae	Charophyta	Equisetopsida	Saxifragales	Haloragaceae	Gonocarpus	
https://id.biodiversity.org.au/node/apni/2902615	Gonocarpus nodulosus	Nees	species	Plantae	Charophyta	Equisetopsida	Saxifragales	Haloragaceae	Gonocarpus	
https://id.biodiversity.org.au/node/apni/2908654	Gonocarpus pithyoides	Nees	species	Plantae	Charophyta	Equisetopsida	Saxifragales	Haloragaceae	Gonocarpus	
https://id.biodiversity.org.au/node/apni/2902221	Goodenia claytoniacea	F.Muell. ex Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Goodenia	
https://id.biodiversity.org.au/node/apni/2891141	Goodenia coerulea	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Goodenia	
https://id.biodiversity.org.au/node/apni/2918109	Goodenia micrantha	Hemsl. ex Carolin	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Goodenia	
https://id.biodiversity.org.au/node/apni/2904130	Goodenia pulchella	Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Goodenia	
https://id.biodiversity.org.au/name/apni/51360300	Goodenia reinwardtii	(de Vriese) K.A.Sheph.	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Goodenia	
https://id.biodiversity.org.au/name/apni/51360312	Goodenia trinervis	(Labill.) K.A.Sheph.	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Goodenia	
https://id.biodiversity.org.au/node/apni/2904884	Grammatotheca bergiana	(Cham.) C.Presl	species	Plantae	Charophyta	Equisetopsida	Asterales	Campanulaceae	Grammatotheca	
https://id.biodiversity.org.au/node/apni/2914831	Gratiola peruviana	L.	species	Plantae	Charophyta	Equisetopsida	Lamiales	Plantaginaceae	Gratiola	Austral Brooklime
https://id.biodiversity.org.au/node/apni/2911719	Gratiola pubescens	R.Br.	species	Plantae	Charophyta	Equisetopsida	Lamiales	Plantaginaceae	Gratiola	Hairy Brooklime
https://id.biodiversity.org.au/node/apni/2917534	Grevillea althoferorum	Olde & Marriott	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Grevillea	
https://id.biodiversity.org.au/node/apni/2894796	Grevillea bipinnatifida	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Grevillea	Fuchsia Grevillea
https://id.biodiversity.org.au/node/apni/2888740	Grevillea candolleana	Meisn.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Grevillea	Toodyay Grevillea
https://id.biodiversity.org.au/node/apni/7814427	Grevillea curviloba	McGill.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Grevillea	
https://id.biodiversity.org.au/node/apni/2915725	Grevillea flexuosa	(Lindl.) Meisn.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Grevillea	Zig Zag Grevillea
https://id.biodiversity.org.au/node/apni/2906561	Grevillea obtusifolia	Meisn.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Grevillea	
https://id.biodiversity.org.au/node/apni/2906510	Grevillea pilulifera	(Lindl.) Druce	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Grevillea	Woolly-flowered Grevillea
https://id.biodiversity.org.au/node/apni/2913517	Grevillea pinaster	Meisn.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Grevillea	
https://id.biodiversity.org.au/node/apni/2897654	Grevillea quercifolia	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Grevillea	Oak-leaf Grevillea
https://id.biodiversity.org.au/node/apni/2911382	Grevillea speciosa	(Knight) McGill.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Grevillea	Red Spider Flower
https://id.biodiversity.org.au/node/apni/6766971	Grevillea synapheae	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Grevillea	Catkin Grevillea
https://id.biodiversity.org.au/node/apni/2916418	Grevillea vestita	(Endl.) Meisn.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Grevillea	
https://id.biodiversity.org.au/node/ausmoss/10086346	Grimmia pulvinata	(Hedw.) Sm.	species	Plantae	Bryophyta	Bryopsida	Grimmiales	Grimmiaceae	Grimmia	
https://id.biodiversity.org.au/node/apni/2890112	Guichenotia tuberculata	C.F.Wilkins	species	Plantae	Charophyta	Equisetopsida	Malvales	Malvaceae	Guichenotia	
https://id.biodiversity.org.au/node/apni/2897326	Haemodorum discolor	T.D.Macfarl.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Haemodorum	Kwerdiny

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name
https://id.biodiversity.org.au/node/apni/2891615	Haemodorum laxum	R.Br.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Haemodorum	
https://id.biodiversity.org.au/node/apni/2917465	Haemodorum paniculatum	Lindl.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Haemodorum	Mardja
https://id.biodiversity.org.au/node/apni/2908227	Haemodorum simplex	Lindl.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Haemodorum	
https://id.biodiversity.org.au/node/apni/2914146	Haemodorum sparsiflorum	F.Muell.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Haemodorum	Mardja
https://id.biodiversity.org.au/node/apni/2895963	Haemodorum spicatum	R.Br.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Haemodorum	
https://id.biodiversity.org.au/node/apni/2918977	Haemodorum venosum	T.D.Macfarl.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Haemodorum	
https://id.biodiversity.org.au/node/apni/2903987	Hakea cristata	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Hakea	
https://id.biodiversity.org.au/node/apni/2911414	Hakea erinacea	Meisn.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Hakea	Hedgehog Hakea
https://id.biodiversity.org.au/node/apni/2910680	Hakea incrassata	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Hakea	Marble Hakea
https://id.biodiversity.org.au/node/apni/2916495	Hakea lissocarpha	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Hakea	Honey Bush
https://id.biodiversity.org.au/taxon/apni/51293452	Hakea neospathulata	I.M.Turner	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Hakea	
https://id.biodiversity.org.au/node/apni/2893007	Hakea prostrata	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Hakea	Harsh Hakea
https://id.biodiversity.org.au/node/apni/2900733	Hakea ruscifolia	Labill.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Hakea	Candle Hakea
https://id.biodiversity.org.au/node/apni/2908115	Hakea stenocarpa	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Hakea	
https://id.biodiversity.org.au/node/apni/2909026	Hakea sulcata	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Hakea	Furrowed Hakea
https://id.biodiversity.org.au/node/apni/2921182	Hakea undulata	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Hakea	
https://id.biodiversity.org.au/node/apni/2889848	Hakea varia	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Hakea	Variable-leaved Hakea
https://id.biodiversity.org.au/node/apni/2912367	Hardenbergia comptoniana	(Andrews) Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Hardenbergia	Native Wisteria
https://id.biodiversity.org.au/node/apni/2918338	Heliophila pusilla	L.f.	species	Plantae	Charophyta	Equisetopsida	Brassicales	Brassicaceae	Heliophila	
https://id.biodiversity.org.au/node/apni/2900200	Hemarthria uncinata	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Hemarthria	Mat Grass
https://id.biodiversity.org.au/node/apni/2896403	Hemiandra linearis	Benth.	species	Plantae	Charophyta	Equisetopsida	Lamiales	Lamiaceae	Hemiandra	Speckled Snakebush
https://id.biodiversity.org.au/node/apni/2904766	Hemiandra pungens	R.Br.	species	Plantae	Charophyta	Equisetopsida	Lamiales	Lamiaceae	Hemiandra	Snakebush
https://id.biodiversity.org.au/node/apni/2908024	Hemigenia barbata	Bartl.	species	Plantae	Charophyta	Equisetopsida	Lamiales	Lamiaceae	Hemigenia	
https://id.biodiversity.org.au/node/apni/2891192	Hesperantha falcata	(L.f.) Ker Gawl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Iridaceae	Hesperantha	
https://id.biodiversity.org.au/node/apni/2920953	Hibbertia acerosa	(R.Br. ex DC.) Benth.	species	Plantae	Charophyta	Equisetopsida		Dilleniaceae	Hibbertia	Needle Leaved Guinea Flower
https://id.biodiversity.org.au/node/apni/2906779	Hibbertia aurea	Steud.	species	Plantae	Charophyta	Equisetopsida		Dilleniaceae	Hibbertia	
https://id.biodiversity.org.au/node/apni/2900479	Hibbertia commutata	Steud.	species	Plantae	Charophyta	Equisetopsida		Dilleniaceae	Hibbertia	
https://id.biodiversity.org.au/node/apni/2914756	Hibbertia desmophylla	(Benth.) F.Muell.	species	Plantae	Charophyta	Equisetopsida		Dilleniaceae	Hibbertia	
https://id.biodiversity.org.au/node/apni/2892785	Hibbertia glomerata	Benth.	species	Plantae	Charophyta	Equisetopsida		Dilleniaceae	Hibbertia	
https://id.biodiversity.org.au/node/apni/2921158	Hibbertia huegelii	(Endl.) F.Muell.	species	Plantae	Charophyta	Equisetopsida		Dilleniaceae	Hibbertia	
https://id.biodiversity.org.au/taxon/apni/51298304	Hibbertia hypericoides	(DC.) Benth.	species	Plantae	Charophyta	Equisetopsida		Dilleniaceae	Hibbertia	Yellow Buttercups
https://id.biodiversity.org.au/node/apni/2890923	Hibbertia lasiopus	Benth.	species	Plantae	Charophyta	Equisetopsida		Dilleniaceae	Hibbertia	Large Hibbertia
https://id.biodiversity.org.au/name/apni/51345882	Hibbertia prolata	K.R.Thiele	species	Plantae	Charophyta	Equisetopsida		Dilleniaceae	Hibbertia	
https://id.biodiversity.org.au/node/apni/2896141	Hibbertia racemosa	(Endl.) Gilg	species	Plantae	Charophyta	Equisetopsida		Dilleniaceae	Hibbertia	Stalked Guinea Flower
https://id.biodiversity.org.au/node/apni/2908255	Hibbertia stellaris	Endl.	species	Plantae	Charophyta	Equisetopsida		Dilleniaceae	Hibbertia	Guinea Flower
https://id.biodiversity.org.au/name/apni/9303805	Hibbertia striata	(Steud.) K.R.Thiele	species	Plantae	Charophyta	Equisetopsida		Dilleniaceae	Hibbertia	
https://id.biodiversity.org.au/node/apni/2916623	Hibbertia subvaginata	(Steud.) F.Muell.	species	Plantae	Charophyta	Equisetopsida		Dilleniaceae	Hibbertia	
https://id.biodiversity.org.au/node/apni/2903289	Histiopteris incisa	(Thunb.) J.Sm.	species	Plantae	Charophyta	Equisetopsida	Polypodiales	Dennstaedtiaceae	Histiopteris	Bat's-wing Fern
https://id.biodiversity.org.au/node/apni/2907479	Holcus lanatus	L.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Holcus	Yorkshire Fog
https://id.biodiversity.org.au/node/apni/2896173	Holcus setiger	Nees	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Holcus	Annual Fog
https://id.biodiversity.org.au/node/apni/2898345	Homalosciadium homalocarpum	(F.Muell.) H.Eichler	species	Plantae	Charophyta	Equisetopsida	Apiales	Apiaceae	Homalosciadium	
https://id.biodiversity.org.au/node/apni/2906152	Hordeum marinum	Huds.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Hordeum	Barley Grass
https://id.biodiversity.org.au/node/apni/2890986	Hovea pungens	Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Hovea	Devils Pins
https://id.biodiversity.org.au/node/apni/2895730	Hovea trisperma	Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Hovea	Common Hovea
https://id.biodiversity.org.au/node/apni/2887643	Hyalosperma cotula	(Benth.) Paul G.Wilson	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Hyalosperma	
https://id.biodiversity.org.au/node/apni/2918736	Hybanthus calycinus	(DC.) F.Muell.	species	Plantae	Charophyta	Equisetopsida	Malpighiales	Violaceae	Hybanthus	Wild Violet
https://id.biodiversity.org.au/node/apni/2913361	Hydrocotyle alata	A.Rich.	species	Plantae	Charophyta	Equisetopsida	Apiales	Araliaceae	Hydrocotyle	
https://id.biodiversity.org.au/node/apni/2894173	Hydrocotyle callicarpa	Bunge	species	Plantae	Charophyta	Equisetopsida	Apiales	Araliaceae	Hydrocotyle	Tiny Pennywort
https://id.biodiversity.org.au/node/apni/2908930	Hydrocotyle diantha	DC.	species	Plantae	Charophyta	Equisetopsida	Apiales	Araliaceae	Hydrocotyle	Kangaroo Island Pennywort
https://id.biodiversity.org.au/node/apni/2909154	Hydrocotyle lemnoides	Benth.	species	Plantae	Charophyta	Equisetopsida	Apiales	Araliaceae	Hydrocotyle	Aquatic Pennywort
https://id.biodiversity.org.au/node/apni/2894412	Hydrocotyle striata	Benth.	species	Plantae	Charophyta	Equisetopsida	Apiales	Araliaceae	Hydrocotyle	
https://id.biodiversity.org.au/node/apni/2895692	Hypocalymma angustifolium	(Endl.) Schauer	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Hypocalymma	White Myrtle
https://id.biodiversity.org.au/node/apni/2918204	Hypocalymma robustum	(Endl.) Lindl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Hypocalymma	Swan River Myrtle
https://id.biodiversity.org.au/node/apni/2898251	Hypocalymma sylvestre	Strid & Keighery	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Hypocalymma	
https://id.biodiversity.org.au/node/apni/2907367	Hypochaeris glabra	L.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Hypochaeris	Smooth Catsear
https://id.biodiversity.org.au/node/apni/2902062	Hypolaena exsulca	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Restionaceae	Hypolaena	
https://id.biodiversity.org.au/node/apni/2920854	Isolepis cernua	(Vahl) Roem. & Schult.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Isolepis	Nodding Club-rush
https://id.biodiversity.org.au/node/apni/2911372	Isolepis cyperoides	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Isolepis	
https://id.biodiversity.org.au/node/apni/2918875	Isolepis hystrix	(Thunb.) Nees	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Isolepis	Awned Club-rush
https://id.biodiversity.org.au/node/apni/2920942	Isolepis levynsiana	Muasya & D.A.Simpson	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Isolepis	
https://id.biodiversity.org.au/node/apni/2898995	Isolepis marginata	(Thunb.) A.Dietr.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Isolepis	Coarse Club-rush
https://id.biodiversity.org.au/node/apni/2899734	Isolepis oldfieldiana	(S.T.Blake) K.L.Wilson	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Isolepis	
https://id.biodiversity.org.au/node/apni/2888198	Isolepis producta	(C.B.Clarke) K.L.Wilson	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Isolepis	Nutty Club-rush
https://id.biodiversity.org.au/node/apni/2910941	Isopogon asper	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Isopogon	
https://id.biodiversity.org.au/taxon/apni/51294830	Isopogon dubius	(R.Br.) Druce	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Isopogon	Pincushion Coneflower

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name
https://id.biodiversity.org.au/node/apni/2917276	Isotoma hypocrateriformis	(R.Br.) Druce	species	Plantae	Charophyta	Equisetopsida	Asterales	Campanulaceae	Isotoma	Woodbridge Poison
https://id.biodiversity.org.au/node/apni/9442728	Isotropis cuneifolia	(Sm.) Walp.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Isotropis	Granny Bonnets
https://id.biodiversity.org.au/node/apni/2903059	Ixiolaena viscosa	Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Ixiolaena	Sticky Ixiolaena
https://id.biodiversity.org.au/node/apni/2911572	Jacaranda mimosifolia	D.Don	species	Plantae	Charophyta	Equisetopsida	Lamiales	Bignoniaceae	Jacaranda	Jacaranda
https://id.biodiversity.org.au/node/apni/2907698	Jacksonia floribunda	Endl.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Jacksonia	
https://id.biodiversity.org.au/node/apni/2896509	Jacksonia furcellata	(Bonpl.) DC.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Jacksonia	Grey Stinkwood
https://id.biodiversity.org.au/node/apni/2889195	Jacksonia sternbergiana	HÃ¼gel ex Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Jacksonia	Stinkwood
https://id.biodiversity.org.au/node/apni/2899114	Johnsonia pubescens	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Hemerocallidaceae	Johnsonia	Pipe Lily
https://id.biodiversity.org.au/node/apni/2893716	Juncus acutus	L.	species	Plantae	Charophyta	Equisetopsida	Poales	Juncaceae	Juncus	Sharp Rush
https://id.biodiversity.org.au/node/apni/2904997	Juncus bufonius	L.	species	Plantae	Charophyta	Equisetopsida	Poales	Juncaceae	Juncus	Toad Rush
https://id.biodiversity.org.au/taxon/apni/51300244	Juncus caespiticius	E.Mey.	species	Plantae	Charophyta	Equisetopsida	Poales	Juncaceae	Juncus	Grassy Rush
https://id.biodiversity.org.au/node/apni/2915626	Juncus capitatus	Weigel	species	Plantae	Charophyta	Equisetopsida	Poales	Juncaceae	Juncus	Capitate Rush
https://id.biodiversity.org.au/node/apni/2886982	Juncus holoschoenus	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Juncaceae	Juncus	Joint-leaved Rush
https://id.biodiversity.org.au/node/apni/2920283	Juncus pallidus	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Juncaceae	Juncus	Pale Rush
https://id.biodiversity.org.au/node/apni/2910276	Juncus planifolius	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Juncaceae	Juncus	Broad-leaf Rush
https://id.biodiversity.org.au/node/apni/2908460	Juncus subsecundus	N.A.Wakef.	species	Plantae	Charophyta	Equisetopsida	Poales	Juncaceae	Juncus	Finger Rush
https://id.biodiversity.org.au/node/apni/7238218	Kennedia coccinea	(Curtis) Vent.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Kennedia	Coral Vine
https://id.biodiversity.org.au/node/apni/2889334	Kennedia nigricans	Lindl.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Kennedia	Waalyaraak
https://id.biodiversity.org.au/node/apni/2893022	Kennedia prostrata	R.Br.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Kennedia	Running Postman
https://id.biodiversity.org.au/node/apni/2918865	Kickxia elatine	(L.) Dumort.	species	Plantae	Charophyta	Equisetopsida	Lamiales	Plantaginaceae	Kickxia	Pointed Toadflax
https://id.biodiversity.org.au/node/apni/2910179	Kunzea baxteri	(Klotzsch) Schauer	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Kunzea	
https://id.biodiversity.org.au/node/apni/7692612	Kunzea ericifolia	(Sm.) Rchb. ex Heynh.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Kunzea	Spearwood
https://id.biodiversity.org.au/node/apni/2893570	Kunzea glabrescens	Toelken	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Kunzea	
https://id.biodiversity.org.au/node/apni/2898644	Kunzea micrantha	Schauer	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Kunzea	
https://id.biodiversity.org.au/node/apni/2895225	Kunzea pulchella	(Lindl.) A.S.George	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Kunzea	Granite Kunzea
https://id.biodiversity.org.au/node/apni/2907129	Kunzea recurva	Schauer	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Kunzea	
https://id.biodiversity.org.au/node/apni/2897039	Labichea lanceolata	Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Labichea	
https://id.biodiversity.org.au/node/apni/2892328	Labichea punctata	Benth. ex Lindl.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Labichea	Lance-leaved Cassia
https://id.biodiversity.org.au/node/apni/2919217	Lachnagrostis filiformis	(G.Forst.) Trin.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Lachnagrostis	Perehia
https://id.biodiversity.org.au/node/apni/2889912	Lachnostachys verbascifolia	F.Muell.	species	Plantae	Charophyta	Equisetopsida	Lamiales	Lamiaceae	Lachnostachys	Lambstail
https://id.biodiversity.org.au/node/apni/2893469	Lagenophora huegelii	Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Lagenophora	Coarse Bottle-daisy
https://id.biodiversity.org.au/node/apni/2895622	Lambertia multiflora	Lindl.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Lambertia	Many-flowered Honeysuckle
https://id.biodiversity.org.au/node/apni/2902376	Lasiopetalum floribundum	Benth.	species	Plantae	Charophyta	Equisetopsida	Malvales	Malvaceae	Lasiopetalum	Free Flowering Lasiopetalum
https://id.biodiversity.org.au/node/apni/2905499	Lasiopetalum glabratum	Paust	species	Plantae	Charophyta	Equisetopsida	Malvales	Malvaceae	Lasiopetalum	
https://id.biodiversity.org.au/taxon/apni/51288522	Lasiopetalum glutinosum	(Lindl.) F.Muell.	species	Plantae	Charophyta	Equisetopsida	Malvales	Malvaceae	Lasiopetalum	
https://id.biodiversity.org.au/taxon/apni/51285685	Latrobea tenella	(Meisn.) Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Latrobea	
https://id.biodiversity.org.au/node/apni/2893435	Lawrencella rosea	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Lawrencella	
https://id.biodiversity.org.au/node/apni/2906470	Lawrencia squamata	Nees	species	Plantae	Charophyta	Equisetopsida	Malvales	Malvaceae	Lawrencia	Thorny Lawrencia
https://id.biodiversity.org.au/node/apni/2897034	Laxmannia grandiflora	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Laxmannia	
https://id.biodiversity.org.au/node/apni/2916029	Laxmannia ramosa	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Laxmannia	
https://id.biodiversity.org.au/node/apni/2910089	Laxmannia sessiliflora	Decne.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Laxmannia	Nodding Lily
https://id.biodiversity.org.au/node/apni/2890836	Laxmannia squarrosa	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Laxmannia	
https://id.biodiversity.org.au/node/apni/2920735	Lechenaultia biloba	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Lechenaultia	Blue Leschenaultia
https://id.biodiversity.org.au/node/apni/2891198	Lechenaultia expansa	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Lechenaultia	
https://id.biodiversity.org.au/node/apni/2918533	Lechenaultia floribunda	Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Lechenaultia	
https://id.biodiversity.org.au/node/apni/2897938	Lemna disperma	Hegelm.	species	Plantae	Charophyta	Equisetopsida	Alismatales	Araceae	Lemna	Duckweed
https://id.biodiversity.org.au/node/apni/2917704	Leontodon saxatilis	Lam.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Leontodon	Hairy Hawkbit
https://id.biodiversity.org.au/node/apni/2903460	Lepidobolus preissianus	Nees	species	Plantae	Charophyta	Equisetopsida	Poales	Restionaceae	Lepidobolus	
https://id.biodiversity.org.au/node/apni/2907847	Lepidosperma angustatum	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Lepidosperma	
https://id.biodiversity.org.au/node/apni/2890095	Lepidosperma asperatum	(KÃ¼k.) R.L.Barrett	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Lepidosperma	
https://id.biodiversity.org.au/node/apni/2895560	Lepidosperma leptostachyum	Benth.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Lepidosperma	
https://id.biodiversity.org.au/node/apni/2891531	Lepidosperma longitudinale	Labill.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Lepidosperma	Pithy Sword-sedge
https://id.biodiversity.org.au/node/apni/2890930	Lepidosperma obtusum	KÃ¼k.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Lepidosperma	
https://id.biodiversity.org.au/node/apni/2914806	Lepidosperma pubisquameum	Steud.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Lepidosperma	
https://id.biodiversity.org.au/node/apni/2895283	Lepidosperma scabrum	Nees	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Lepidosperma	
https://id.biodiversity.org.au/node/apni/2919436	Lepidosperma squamatum	Labill.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Lepidosperma	
https://id.biodiversity.org.au/node/apni/2897441	Lepidosperma tenue	Benth.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Lepidosperma	
https://id.biodiversity.org.au/taxon/apni/51406461	Leporella fimbriata	(Lindl.) A.S.George	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Leporella	Hare Orchid
https://id.biodiversity.org.au/taxon/apni/51293734	Leptocarpus canus	Nees	species	Plantae	Charophyta	Equisetopsida	Poales	Restionaceae	Leptocarpus	Hoary Twine-rush
https://id.biodiversity.org.au/taxon/apni/51293740	Leptocarpus coangustatus	Nees	species	Plantae	Charophyta	Equisetopsida	Poales	Restionaceae	Leptocarpus	
https://id.biodiversity.org.au/taxon/apni/51293786	Leptocarpus roycei	B.G.Briggs	species	Plantae	Charophyta	Equisetopsida	Poales	Restionaceae	Leptocarpus	
https://id.biodiversity.org.au/node/apni/2889404	Leptomeria cunninghamii	Miq.	species	Plantae	Charophyta	Equisetopsida	Santalales	Santalaceae	Leptomeria	
https://id.biodiversity.org.au/node/apni/2913186	Leptomeria empetriformis	Miq.	species	Plantae	Charophyta	Equisetopsida	Santalales	Santalaceae	Leptomeria	
https://id.biodiversity.org.au/node/apni/2909476	Leptomeria pauciflora	R.Br.	species	Plantae	Charophyta	Equisetopsida	Santalales	Santalaceae	Leptomeria	Sparse-flowered Currant Bush

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name
https://id.biodiversity.org.au/node/apni/2919646	Leptomeria preissiana	(Miq.) A.DC.	species	Plantae	Charophyta	Equisetopsida	Santalales	Santalaceae	Leptomeria	
https://id.biodiversity.org.au/node/apni/2895169	Leptospermum erubescens	Schauer	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Leptospermum	Roadside Teatree
https://id.biodiversity.org.au/node/apni/2905839	Leptospermum laevigatum	(Gaertn.) F.Muell.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Leptospermum	Coast Tea Tree
https://id.biodiversity.org.au/node/apni/2915842	Leptospermum spinescens	Endl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Leptospermum	
https://id.biodiversity.org.au/node/apni/2914355	Lepyrodia macra	Nees	species	Plantae	Charophyta	Equisetopsida	Poales	Restionaceae	Lepyrodia	Large Scale Rush
https://id.biodiversity.org.au/node/ausmoss/2920390	Lethocolea pansa	(Taylor) G.A.M.Scott & K.G.Beckm.	species	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Acrobolbaceae	Lethocolea	
https://id.biodiversity.org.au/node/apni/2896873	Leucopogon australis	R.Br.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Leucopogon	Spike Beard-heath
https://id.biodiversity.org.au/node/apni/2905459	Leucopogon conostephioides	DC.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Leucopogon	
https://id.biodiversity.org.au/node/apni/2907901	Leucopogon nutans	E.Pritz.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Leucopogon	Drooping Leucopogon
https://id.biodiversity.org.au/node/apni/2917718	Leucopogon oxycedrus	Sond.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Leucopogon	
https://id.biodiversity.org.au/node/apni/2910503	Leucopogon plumuliflorus	(F.Muell.) F.Muell. ex Benth.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Leucopogon	
https://id.biodiversity.org.au/node/apni/2914068	Leucopogon polymorphus	Sond.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Leucopogon	
https://id.biodiversity.org.au/node/apni/2905202	Leucopogon propinquus	R.Br.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Leucopogon	
https://id.biodiversity.org.au/node/apni/2915810	Leucopogon pulchellus	Sond.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Leucopogon	Beard Heath
https://id.biodiversity.org.au/node/apni/2894972	Levenhookia octomaculata	F.L.Erickson & J.H.Willis	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Levenhookia	Eight-spotted Stylewort
https://id.biodiversity.org.au/node/apni/2918409	Levenhookia preissii	(Sond.) F.Muell.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Levenhookia	Preiss's Stylewort
https://id.biodiversity.org.au/node/apni/2891342	Levenhookia pusilla	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Levenhookia	Midget Stylewort
https://id.biodiversity.org.au/node/apni/2909279	Levenhookia stipitata	(Benth.) F.Muell. ex Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Levenhookia	Common Stylewort
https://id.biodiversity.org.au/node/apni/2911936	Linum trigynum	L.	species	Plantae	Charophyta	Equisetopsida	Malpighiales	Linaceae	Linum	French Flax
https://id.biodiversity.org.au/node/apni/2902607	Liparophyllum capitatum	(Nees ex Lehm.) Tippery & Les	species	Plantae	Charophyta	Equisetopsida	Asterales	Menyanthaceae	Liparophyllum	
https://id.biodiversity.org.au/node/apni/2909260	Lobelia anceps	L.f.	species	Plantae	Charophyta	Equisetopsida	Asterales	Campanulaceae	Lobelia	Lobelia
https://id.biodiversity.org.au/node/apni/2892738	Lobelia rhombifolia	de Vriese	species	Plantae	Charophyta	Equisetopsida	Asterales	Campanulaceae	Lobelia	Tufted Lobelia
https://id.biodiversity.org.au/node/apni/2912729	Lobelia rhytidosperma	Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Campanulaceae	Lobelia	Wrinkle-seeded Lobelia
https://id.biodiversity.org.au/node/apni/2915025	Lobelia tenuior	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asterales	Campanulaceae	Lobelia	Slender Lobelia
https://id.biodiversity.org.au/node/apni/2892858	Lolium perenne	L.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Lolium	Rye Grass
https://id.biodiversity.org.au/node/apni/2919175	Lolium rigidum	Gaudin	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Lolium	Wimmera Rye Grass
https://id.biodiversity.org.au/node/apni/2911396	Lomandra brittanii	T.S.Choo	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Lomandra	
https://id.biodiversity.org.au/node/apni/2888174	Lomandra caespitosa	(F.Muell. ex Benth.) Ewart	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Lomandra	Tufted Mat Rush
https://id.biodiversity.org.au/node/apni/2908142	Lomandra hermaphrodita	(C.R.P.Andrews) C.A.Gardner	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Lomandra	
https://id.biodiversity.org.au/node/apni/2910980	Lomandra micrantha	(Endl.) Ewart	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Lomandra	Small-flowered Mat-rush
https://id.biodiversity.org.au/node/apni/2911793	Lomandra nigricans	T.D.Macfarl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Lomandra	
https://id.biodiversity.org.au/node/apni/2894254	Lomandra preissii	(Endl.) Ewart	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Lomandra	
https://id.biodiversity.org.au/node/apni/2893609	Lomandra sericea	(Endl.) Ewart	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Lomandra	Silky Mat Rush
https://id.biodiversity.org.au/node/apni/2886123	Lomandra suaveolens	(Endl.) Ewart	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Lomandra	
https://id.biodiversity.org.au/node/apni/2886127	Lotus angustissimus	L.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Lotus	Slender Birds-foot Trefoil
https://id.biodiversity.org.au/node/apni/2893373	Lotus subbiflorus	Lag.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Lotus	
https://id.biodiversity.org.au/node/apni/2904899	Lupinus angustifolius	L.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Lupinus	Narrow-leaved Lupin
https://id.biodiversity.org.au/node/apni/2903399	Lupinus cosentinii	Guss.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Lupinus	Sandplain Lupin
https://id.biodiversity.org.au/node/apni/2895436	Lyginia barbata	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Anarthriaceae	Lyginia	
https://id.biodiversity.org.au/node/apni/2910246	Lyginia imberbis	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Anarthriaceae	Lyginia	
https://id.biodiversity.org.au/taxon/apni/51291824	Lysimachia arvensis	(L.) U.Manns & Anderb.	species	Plantae	Charophyta	Equisetopsida	Ericales	Primulaceae	Lysimachia	
https://id.biodiversity.org.au/node/apni/2904201	Lysinema ciliatum	R.Br.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Lysinema	Curry Flower
https://id.biodiversity.org.au/node/apni/2902747	Lysinema pentapetalum	R.Br.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Lysinema	
https://id.biodiversity.org.au/taxon/apni/51300296	Lythrum hyssopifolia	L.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Lythraceae	Lythrum	Hyssop Loosestrife
https://id.biodiversity.org.au/node/apni/2909229	Macarthuria apetala	Harv.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Limeaceae	Macarthuria	
https://id.biodiversity.org.au/node/apni/2908167	Macarthuria australis	HÃ¼gel ex Endl.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Limeaceae	Macarthuria	
https://id.biodiversity.org.au/node/apni/2921285	Macropidia fuliginosa	(Hook.) Druce	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Macropidia	Black Kangaroo Paw
https://id.biodiversity.org.au/node/apni/2919475	Macrozamia fraseri	Miq.	species	Plantae	Charophyta	Equisetopsida	Cycadales	Zamiaceae	Macrozamia	
https://id.biodiversity.org.au/node/apni/2915937	Macrozamia riedlei	(Fisch. ex Gaudich.) C.A.Gardner	species	Plantae	Charophyta	Equisetopsida	Cycadales	Zamiaceae	Macrozamia	Zamia Palm
https://id.biodiversity.org.au/node/apni/2914187	Marianthus candidus	HÃ¼gel ex Endl.	species	Plantae	Charophyta	Equisetopsida	Apiales	Pittosporaceae	Marianthus	White Marianthus
https://id.biodiversity.org.au/node/apni/2917475	Marianthus coeruleopunctatus	Klotzsch	species	Plantae	Charophyta	Equisetopsida	Apiales	Pittosporaceae	Marianthus	
https://id.biodiversity.org.au/node/apni/2907634	Medicago polymorpha	L.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Medicago	Burr Medic
https://id.biodiversity.org.au/node/apni/2891660	Melaleuca acutifolia	(Benth.) Craven & Lepschi	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Melaleuca	
https://id.biodiversity.org.au/node/apni/2920447	Melaleuca brevifolia	Turcz.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Melaleuca	Mallee Honey-myrtle
https://id.biodiversity.org.au/node/apni/2903724	Melaleuca concreta	F.Muell.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Melaleuca	
https://id.biodiversity.org.au/node/apni/2891485	Melaleuca cuticularis	Labill.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Melaleuca	Western Swamp-paperbark

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name
https://id.biodiversity.org.au/node/apni/2906952	Melaleuca hnatiukii	Craven	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Melaleuca	
https://id.biodiversity.org.au/node/apni/2915205	Melaleuca huegelii	Endl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Melaleuca	Chenille Honeymyrtle
https://id.biodiversity.org.au/node/apni/2903285	Melaleuca lateritia	A.Dietr.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Melaleuca	Robin Redbreast Bush
https://id.biodiversity.org.au/node/apni/2887796	Melaleuca nesophila	F.Muell.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Melaleuca	
https://id.biodiversity.org.au/node/apni/2919437	Melaleuca parviceps	Lindl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Melaleuca	
https://id.biodiversity.org.au/node/apni/2896656	Melaleuca preissiana	Schauer	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Melaleuca	Moonah
https://id.biodiversity.org.au/node/apni/2913714	Melaleuca radula	Lindl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Melaleuca	Graceful Honeymyrtle
https://id.biodiversity.org.au/node/apni/2905837	Melaleuca rhaphiophylla	Schauer	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Melaleuca	Swamp Paperbark
https://id.biodiversity.org.au/node/apni/2904860	Melaleuca ryeae	Craven	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Melaleuca	
https://id.biodiversity.org.au/node/apni/2908483	Melaleuca scabra	R.Br.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Melaleuca	Rough Honeymyrtle
https://id.biodiversity.org.au/node/apni/2900212	Melaleuca seriata	Lindl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Melaleuca	
https://id.biodiversity.org.au/node/apni/2898405	Melaleuca teretifolia	Endl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Melaleuca	Banbar
https://id.biodiversity.org.au/node/apni/2904420	Melaleuca trichophylla	Lindl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Melaleuca	
https://id.biodiversity.org.au/node/apni/2903945	Melaleuca uncinata	R.Br.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Melaleuca	Broombush
https://id.biodiversity.org.au/node/apni/2910304	Melaleuca viminea	Lindl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Melaleuca	Mohan
https://id.biodiversity.org.au/node/apni/2886103	Melilotus indicus	(L.) All.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Melilotus	Hexham Scent
https://id.biodiversity.org.au/node/apni/2900575	Mesomelaena pseudostygia	(KÃ¼k.) K.L.Wilson	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Mesomelaena	
https://id.biodiversity.org.au/node/apni/2903256	Mesomelaena tetragona	(R.Br.) Benth.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Mesomelaena	Semaphore Sedge
https://id.biodiversity.org.au/node/apni/2899991	Microcorys longifolia	(Benth.) Benth.	species	Plantae	Charophyta	Equisetopsida	Lamiales	Lamiaceae	Microcorys	
https://id.biodiversity.org.au/node/apni/2916956	Microlaena stipoides	(Labill.) R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Microlaena	Rice Grass
https://id.biodiversity.org.au/taxon/apni/51406612	Microtis atrata	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Microtis	Yellow Onion-orchid
https://id.biodiversity.org.au/taxon/apni/51406614	Microtis brownii	Rchb.f.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Microtis	Sweet Mignonette Orchid
https://id.biodiversity.org.au/taxon/apni/51406630	Microtis media	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Microtis	Common Mignonette Orchid
https://id.biodiversity.org.au/node/apni/2906267	Millotia myosotidifolia	(Benth.) Steetz	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Millotia	Broad-leaf Millotia
https://id.biodiversity.org.au/node/apni/2904122	Millotia tenuifolia	Cass.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Millotia	Soft Millotia
https://id.biodiversity.org.au/node/apni/2920702	Misopates orontium	(L.) Raf.	species	Plantae	Charophyta	Equisetopsida	Lamiales	Plantaginaceae	Misopates	Lesser Snapdragon
https://id.biodiversity.org.au/node/apni/2920927	Monoculus monstrosus	(Burm.f.) B.Nord.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Monoculus	
https://id.biodiversity.org.au/node/apni/2915226	Monopsis debilis	(L.f.) C.Presl	species	Plantae	Charophyta	Equisetopsida	Asterales	Campanulaceae	Monopsis	
https://id.biodiversity.org.au/node/apni/6475313	Monotaxis grandiflora	Endl.	species	Plantae	Charophyta	Equisetopsida	Malpighiales	Euphorbiaceae	Monotaxis	Diamond Of The Desert
https://id.biodiversity.org.au/node/apni/2894669	Moraea flaccida	(Sweet) Steud.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Iridaceae	Moraea	One-leaved Cape Tulip
https://id.biodiversity.org.au/node/apni/2901268	Moraea miniata	Andrews	species	Plantae	Charophyta	Equisetopsida	Asparagales	Iridaceae	Moraea	Two-leaved Cape Tulip
https://id.biodiversity.org.au/name/apni/51401860	Morelotia octandra	(Nees) R.L.Barrett & J.J.Bruhl	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Morelotia	
https://id.biodiversity.org.au/node/apni/4750977	Muehlenbeckia adpressa	(Labill.) Meisn.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Polygonaceae	Muehlenbeckia	Climbing Lignum
https://id.biodiversity.org.au/node/apni/2898538	Myoporum caprarioides	Benth.	species	Plantae	Charophyta	Equisetopsida	Lamiales	Scrophulariaceae	Myoporum	Slender Myoporum
https://id.biodiversity.org.au/node/apni/2917189	Myriocephalus appendiculatus	Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Myriocephalus	
https://id.biodiversity.org.au/node/apni/2888384	Myriocephalus helichrysoides	A.Gray	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Myriocephalus	
https://id.biodiversity.org.au/node/apni/2888587	Myriocephalus occidentalis	(F.Muell.) P.S.Short	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Myriocephalus	
https://id.biodiversity.org.au/node/apni/2886131	Myriophyllum drummondii	Benth.	species	Plantae	Charophyta	Equisetopsida	Saxifragales	Haloragaceae	Myriophyllum	
NZOR-6-135288	Myriophyllum propinquum	A.Cunn.	species	Plantae	Charophyta	Equisetopsida	Saxifragales	Haloragaceae	Myriophyllum	
https://id.biodiversity.org.au/taxon/apni/51291410	Neurachne alopecuroidea	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Neurachne	Fox-tail Mulga-grass
NZOR-6-24030	Nitella tasmanica	(O.F. MÃ¼ll. ex. A. Braun) R.D. Wood	species	Plantae	Chlorophyta	Charophyceae	Charales	Characeae	Nitella	
https://id.biodiversity.org.au/node/apni/2889663	Nuytsia floribunda	(Labill.) R.Br. ex G.Don	species	Plantae	Charophyta	Equisetopsida	Santalales	Loranthaceae	Nuytsia	Western Australian Christmas Tree
https://id.biodiversity.org.au/node/apni/2898016	Olearia elaeophila	(A.Cunn. ex DC.) F.Muell. ex Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Olearia	
https://id.biodiversity.org.au/node/apni/2921012	Olearia lehmanniana	(Steetz) Lander	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Olearia	
https://id.biodiversity.org.au/node/apni/2903906	Olearia paucidentata	(Steetz) F.Muell. ex Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Olearia	Autumn Scrub Daisy
https://id.biodiversity.org.au/node/apni/2893649	Opercularia vaginata	Labill. ex Juss.	species	Plantae	Charophyta	Equisetopsida	Gentianales	Rubiaceae	Opercularia	Dog Weed
https://id.biodiversity.org.au/node/apni/2910937	Ornduffia albiflora	(F.Muell.) Tippery & Les	species	Plantae	Charophyta	Equisetopsida	Asterales	Menyanthaceae	Ornduffia	
https://id.biodiversity.org.au/node/apni/2910308	Ornduffia submersa	(Aston) Tippery & Les	species	Plantae	Charophyta	Equisetopsida	Asterales	Menyanthaceae	Ornduffia	
https://id.biodiversity.org.au/node/apni/2902165	Ornithopus compressus	L.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Ornithopus	Yellow Serradella
https://id.biodiversity.org.au/node/apni/2903083	Orobanche minor	Sm.	species	Plantae	Charophyta	Equisetopsida	Lamiales	Orobanchaceae	Orobanche	Broomrape
https://id.biodiversity.org.au/node/apni/2889830	Orthrosanthus laxus	(Endl.) Benth.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Iridaceae	Orthrosanthus	Morning Iris
https://id.biodiversity.org.au/node/apni/2902331	Oxalis glabra	Thunb.	species	Plantae	Charophyta	Equisetopsida	Oxalidales	Oxalidaceae	Oxalis	
https://id.biodiversity.org.au/node/apni/2894269	Oxalis perennans	Haw.	species	Plantae	Charophyta	Equisetopsida	Oxalidales	Oxalidaceae	Oxalis	
https://id.biodiversity.org.au/node/apni/2897244	Oxalis pes-caprae	L.	species	Plantae	Charophyta	Equisetopsida	Oxalidales	Oxalidaceae	Oxalis	Oxalis
https://id.biodiversity.org.au/node/apni/2896226	Oxalis purpurea	L.	species	Plantae	Charophyta	Equisetopsida	Oxalidales	Oxalidaceae	Oxalis	Large-flower Wood-sorrel
https://id.biodiversity.org.au/node/apni/2886172	Oxymyrrhine coronata	Rye & Trudgen	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Oxymyrrhine	
https://id.biodiversity.org.au/node/apni/2919990	Parapholis incurva	(L.) C.E.Hubb.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Parapholis	Curley Barb Grass
https://id.biodiversity.org.au/taxon/apni/51291069	Parentucellia latifolia	(L.) Caruel	species	Plantae	Charophyta	Equisetopsida	Lamiales	Orobanchaceae	Parentucellia	Red Bartsia
https://id.biodiversity.org.au/node/apni/2891356	Patersonia juncea	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Iridaceae	Patersonia	Rush Leaved Patersonia
https://id.biodiversity.org.au/node/apni/2904580	Patersonia occidentalis	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Iridaceae	Patersonia	Purple Flag

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name
https://id.biodiversity.org.au/node/apni/7455751	Pauridia glabella	(R.Br.) Snijman & Kocyan	species	Plantae	Charophyta	Equisetopsida	Asparagales	Hypoxidaceae	Hypoxis	
https://id.biodiversity.org.au/node/apni/7458101	Pauridia occidentalis	(Benth.) Snijman & Kocyan	species	Plantae	Charophyta	Equisetopsida	Asparagales	Hypoxidaceae	Pauridia	
https://id.biodiversity.org.au/node/apni/2892299	Pentameris airoides	Nees	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Pentameris	
https://id.biodiversity.org.au/node/apni/2903990	Pentameris pallida	(Thunb.) Galley & H.P.Linder	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Pentameris	
https://id.biodiversity.org.au/node/apni/2913819	Pericalymma crassipes	Lehm. ex Schauer	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Pericalymma	
https://id.biodiversity.org.au/node/apni/2900436	Pericalymma ellipticum	(Endl.) Schauer	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Pericalymma	Swamp Teatree
https://id.biodiversity.org.au/taxon/apni/51291672	Persicaria decipiens	(R.Br.) K.L.Wilson	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Polygonaceae	Persicaria	Slender Knotweed
https://id.biodiversity.org.au/node/apni/2915136	Persoonia rudis	Meisn.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Persoonia	
https://id.biodiversity.org.au/node/apni/2900173	Persoonia saccata	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Persoonia	Snottygobble
https://id.biodiversity.org.au/node/apni/2916194	Petrophile juncifolia	Lindl.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Petrophile	
https://id.biodiversity.org.au/node/apni/2896832	Petrophile linearis	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Petrophile	Pixie Mops
https://id.biodiversity.org.au/taxon/apni/51294849	Petrophile macrostachya	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Petrophile	
https://id.biodiversity.org.au/node/apni/2920781	Petrophile seminuda	Lindl.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Petrophile	
https://id.biodiversity.org.au/taxon/apni/51295029	Petrophile shuttleworthiana	Meisn.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Petrophile	
https://id.biodiversity.org.au/taxon/apni/51312315	Petrophile striata	R.Br.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Petrophile	
https://id.biodiversity.org.au/node/apni/2900642	Petrorhagia dubia	(Raf.) G.Lopez & Romo	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Caryophyllaceae	Petrorhagia	Wild Pink
https://id.biodiversity.org.au/node/apni/7859298	Philotheca nodiflora	(Lindl.) Paul G.Wilson	species	Plantae	Charophyta	Equisetopsida	Sapindales	Rutaceae	Philotheca	
https://id.biodiversity.org.au/node/apni/2886300	Philotheca spicata	(A.Rich.) Paul G.Wilson	species	Plantae	Charophyta	Equisetopsida	Sapindales	Rutaceae	Philotheca	Pepper And Salt
https://id.biodiversity.org.au/node/apni/2915837	Philydrella pygmaea	(R.Br.) Caruel	species	Plantae	Charophyta	Equisetopsida	Commelinales	Philydraceae	Philydrella	Lesser Butterfly Flowers
https://id.biodiversity.org.au/node/apni/2903217	Phlebocarya ciliata	R.Br.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Phlebocarya	
https://id.biodiversity.org.au/node/apni/2907440	Phlebocarya filifolia	(F.Muell.) Benth.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Phlebocarya	
https://id.biodiversity.org.au/node/apni/2910499	Phyllangium paradoxum	(R.Br.) Dunlop	species	Plantae	Charophyta	Equisetopsida	Gentianales	Loganiaceae	Phyllangium	Wiry Mitrewort
https://id.biodiversity.org.au/node/apni/2893288	Phyllanthus calycinus	Labill.	species	Plantae	Charophyta	Equisetopsida	Malpighiales	Phyllanthaceae	Phyllanthus	False Boronia
https://id.biodiversity.org.au/node/apni/2909854	Physopsis spicata	Turcz.	species	Plantae	Charophyta	Equisetopsida	Lamiales	Lamiaceae	Physopsis	Hill River Lambstail
https://id.biodiversity.org.au/node/apni/2905369	Pilularia novae-hollandiae	A.Braun	species	Plantae	Charophyta	Equisetopsida	Salviniales	Marsileaceae	Pilularia	Austral Pillwort
https://id.biodiversity.org.au/node/apni/2912207	Pimelea argentea	R.Br.	species	Plantae	Charophyta	Equisetopsida	Malvales	Thymelaeaceae	Pimelea	Silver-leaved Pimelea
https://id.biodiversity.org.au/node/apni/2894606	Pimelea floribunda	Meisn.	species	Plantae	Charophyta	Equisetopsida	Malvales	Thymelaeaceae	Pimelea	
https://id.biodiversity.org.au/node/apni/2890451	Pimelea imbricata	R.Br.	species	Plantae	Charophyta	Equisetopsida	Malvales	Thymelaeaceae	Pimelea	
https://id.biodiversity.org.au/node/apni/2910320	Pimelea suaveolens	Meisn.	species	Plantae	Charophyta	Equisetopsida	Malvales	Thymelaeaceae	Pimelea	Scented Banjine
https://id.biodiversity.org.au/node/apni/2891583	Pisum sativum	L.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Pisum	Pea
https://id.biodiversity.org.au/node/apni/2891369	Platysace ramosissima	(Benth.) C.Norman	species	Plantae	Charophyta	Equisetopsida	Apiales	Apiaceae	Platysace	
https://id.biodiversity.org.au/node/apni/2915188	Platytheca galioides	Steetz	species	Plantae	Charophyta	Equisetopsida	Oxalidales	Elaeocarpaceae	Platytheca	
https://id.biodiversity.org.au/node/ausmoss/10104031	Pleuridium ecklonii	(Mitt.) Snider	species	Plantae	Bryophyta	Bryopsida	Dicranales	Ditrichaceae	Pleuridium	
https://id.biodiversity.org.au/node/apni/2897487	Pleurosorus rutifolius	(R.Br.) FÃ©e	species	Plantae	Charophyta	Equisetopsida	Polypodiales	Aspleniaceae	Pleurosorus	Blanket Fern
https://id.biodiversity.org.au/node/apni/2901115	Poa annua	L.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Poa	Winter Grass
https://id.biodiversity.org.au/node/apni/2886180	Poa drummondiana	Nees	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Poa	Knotted Poa
https://id.biodiversity.org.au/node/apni/2914796	Poa homomalla	Nees	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Poa	
https://id.biodiversity.org.au/node/apni/2902063	Poa poiformis	(Labill.) Druce	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Poa	Coast Tussock Grass
https://id.biodiversity.org.au/taxon/apni/51268825	Podolepis aristata	Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Podolepis	
https://id.biodiversity.org.au/node/apni/2891893	Podolepis gracilis	Graham	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Podolepis	Slender Podolepis
https://id.biodiversity.org.au/node/apni/2890292	Podolepis lessonii	(Cass.) Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Podolepis	
https://id.biodiversity.org.au/node/apni/2891952	Podolepis nutans	Steetz	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Podolepis	
https://id.biodiversity.org.au/node/apni/2886928	Podotheca angustifolia	(Labill.) Less.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Podotheca	Sticky Longheads
https://id.biodiversity.org.au/node/apni/2886637	Podotheca chrysantha	(Steetz) Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Podotheca	Yellow Podotheca
https://id.biodiversity.org.au/node/apni/2889330	Podotheca gnaphalioides	Graham	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Podotheca	
https://id.biodiversity.org.au/taxon/apni/51268901	Pogonolepis stricta	Steetz	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Pogonolepis	
https://id.biodiversity.org.au/node/apni/2895392	Polygala myrtifolia	L.	species	Plantae	Charophyta	Equisetopsida	Fabales	Polygalaceae	Polygala	Cascade Curse
https://id.biodiversity.org.au/node/apni/7772838	Polypogon monspeliensis	(L.) Desf.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Polypogon	Annual Beardgrass
https://id.biodiversity.org.au/node/apni/2914852	Polypogon tenellus	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Polypogon	
https://id.biodiversity.org.au/node/apni/2905928	Poranthera microphylla	Brongn.	species	Plantae	Charophyta	Equisetopsida	Malpighiales	Phyllanthaceae	Poranthera	Small Poranthera
https://id.biodiversity.org.au/taxon/apni/51409741	Prasophyllum cyphochilum	Benth.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Prasophyllum	Pouched Leek Orchid
https://id.biodiversity.org.au/taxon/apni/51409749	Prasophyllum elatum	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Prasophyllum	Tall Leek Orchid
https://id.biodiversity.org.au/taxon/apni/51409759	Prasophyllum fimbria	Rchb.f.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Prasophyllum	Fringed Leek Orchid
https://id.biodiversity.org.au/node/apni/7061040	Pseudognaphalium luteoalbum	(L.) Hilliard & B.L.Burtt	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Pseudognaphalium	Jersey Cudweed
ALA_DR652_1075	Pseudolycopodiella serpentina	(Kunze) Holub	species	Plantae	Charophyta	Equisetopsida	Lycopodiales	Lycopodiaceae	Pseudolycopodiella	
https://id.biodiversity.org.au/node/apni/2917235	Pterochaeta paniculata	Steetz	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Pterochaeta	
https://id.biodiversity.org.au/taxon/apni/51412314	Pterostylis sanguinea	D.L.Jones & M.A.Clem.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Pterostylis	Banded Greenhood
https://id.biodiversity.org.au/taxon/apni/51412440	Pterostylis vittata	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Pterostylis	Banded Greenhood
https://id.biodiversity.org.au/node/apni/2914798	Ptilotus declinatus	Nees	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Amaranthaceae	Ptilotus	Curved Mulla-mulla
https://id.biodiversity.org.au/node/apni/2920050	Ptilotus drummondii	(Moq.) F.Muell.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Amaranthaceae	Ptilotus	Narrowleaf Mulla Mulla
https://id.biodiversity.org.au/node/apni/2902418	Ptilotus esquamatus	(Benth.) F.Muell.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Amaranthaceae	Ptilotus	

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name
https://id.biodiversity.org.au/node/apni/2901052	Ptilotus manglesii	(Lindl.) F.Muell.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Amaranthaceae	Ptilotus	Pom Poms
https://id.biodiversity.org.au/node/apni/2888651	Pultenaea ericifolia	Benth. ex Lindl.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Pultenaea	
https://id.biodiversity.org.au/taxon/apni/51285711	Pultenaea reticulata	(Sm.) Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Pultenaea	
https://id.biodiversity.org.au/taxon/apni/51412478	Pyrorchis nigricans	(R.Br.) D.L.Jones & M.A.Clem.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Pyrorchis	Red Beaks
https://id.biodiversity.org.au/node/apni/2915299	Quercus robur	L.	species	Plantae	Charophyta	Equisetopsida	Fagales	Fagaceae	Quercus	English Oak
https://id.biodiversity.org.au/node/apni/2912739	Quinetia urvillei	Cass.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Quinetia	Grey Zig-zag
https://id.biodiversity.org.au/node/ausmoss/10108619	Racopilum cuspidigerum	(SchwÃ¤gr.) Ã...ngstr.	species	Plantae	Bryophyta	Bryopsida	Hypnodendrales	Racopilaceae	Racopilum	
https://id.biodiversity.org.au/node/apni/2907093	Ranunculus muricatus	L.	species	Plantae	Charophyta	Equisetopsida	Ranunculales	Ranunculaceae	Ranunculus	Sharp Buttercup
https://id.biodiversity.org.au/node/apni/2888495	Raphanus raphanistrum	L.	species	Plantae	Charophyta	Equisetopsida	Brassicales	Brassicaceae	Raphanus	Wild Radish
https://id.biodiversity.org.au/taxon/apni/51290266	Regelia ciliata	Schauer	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Regelia	
https://id.biodiversity.org.au/node/ausmoss/10130154	Rhaphidorrhynchium amoenum	(Hedw.) M.Fleisch.	species	Plantae	Bryophyta	Bryopsida	Hypnales	Sematophyllaceae	Rhaphidorrhynchium	
https://id.biodiversity.org.au/node/apni/2912853	Rhodanthe corymbosa	(A.Gray) Paul G.Wilson	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Rhodanthe	
https://id.biodiversity.org.au/node/apni/2913336	Rhodanthe pyrethrum	(Steetz) Paul G.Wilson	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Rhodanthe	
https://id.biodiversity.org.au/node/apni/2919250	Ricinus communis	L.	species	Plantae	Charophyta	Equisetopsida	Malpighiales	Euphorbiaceae	Ricinus	Maple Weed
https://id.biodiversity.org.au/taxon/apni/51311452	Roepera glauca	(F.Muell.) Beier & Thulin	species	Plantae	Charophyta	Equisetopsida	Zygophyllales	Zygophyllaceae	Roepera	
https://id.biodiversity.org.au/node/apni/2896357	Romulea rosea	(L.) Eckl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Iridaceae	Romulea	Guildford Grass
https://id.biodiversity.org.au/node/ausmoss/10110398	Rosulabryum campylothecium	(Taylor) J.R.Spence	species	Plantae	Bryophyta	Bryopsida	Bryales	Bryaceae	Rosulabryum	
https://id.biodiversity.org.au/node/apni/2904728	Rumex conglomeratus	Murray	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Polygonaceae	Rumex	Clustered Dock
https://id.biodiversity.org.au/node/apni/2889814	Rumex crispus	L.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Polygonaceae	Rumex	Dock
https://id.biodiversity.org.au/node/apni/2892855	Rytidosperma occidentale	(Vickery) Connor & Edgar	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Rytidosperma	
https://id.biodiversity.org.au/node/apni/2911607	Rytidosperma pilosum	(R.Br.) Connor & Edgar	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Rytidosperma	
https://id.biodiversity.org.au/node/apni/2915685	Rytidosperma setaceum	(R.Br.) Connor & Edgar	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Rytidosperma	
https://id.biodiversity.org.au/node/apni/2904031	Samolus junceus	R.Br.	species	Plantae	Charophyta	Equisetopsida	Ericales	Primulaceae	Samolus	
https://id.biodiversity.org.au/node/apni/2908785	Sarcocornia blackiana	(Ulbr.) A.J.Scott	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Chenopodiaceae	Sarcocornia	Thick-head Glasswort
https://id.biodiversity.org.au/node/apni/2906539	Scaevola anchusifolia	Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Scaevola	
https://id.biodiversity.org.au/node/apni/7392107	Scaevola canescens	Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Scaevola	Grey Scaevola
https://id.biodiversity.org.au/node/apni/2917770	Scaevola glandulifera	DC.	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Scaevola	Viscid Hand-flower
https://id.biodiversity.org.au/node/apni/2889062	Scaevola lanceolata	Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Scaevola	Long-leaved Scaevola
https://id.biodiversity.org.au/node/apni/2895029	Scaevola phlebopetala	F.Muell.	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Scaevola	Velvet Fanflower
https://id.biodiversity.org.au/node/apni/2895364	Scaevola repens	de Vriese	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Scaevola	
https://id.biodiversity.org.au/node/apni/7386160	Schenkia australis	(R.Br.) G.Mans.	species	Plantae	Charophyta	Equisetopsida	Gentianales	Gentianaceae	Schenkia	Spike Centaury
https://id.biodiversity.org.au/node/apni/2904192	Schoenus asperocarpus	F.Muell.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Schoenus	Poison Sedge
https://id.biodiversity.org.au/node/apni/2906905	Schoenus breviculmis	Benth.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Schoenus	Matted Bog-rush
https://id.biodiversity.org.au/node/apni/2918921	Schoenus brevisetis	(R.Br.) Poir.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Schoenus	
https://id.biodiversity.org.au/node/apni/2889691	Schoenus capillifolius	D.A.Cooke	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Schoenus	
https://id.biodiversity.org.au/node/apni/2900052	Schoenus clandestinus	S.T.Blake	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Schoenus	
https://id.biodiversity.org.au/node/apni/2893349	Schoenus curvifolius	(R.Br.) Poir.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Schoenus	
https://id.biodiversity.org.au/node/apni/2910693	Schoenus discifer	Tate	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Schoenus	Tiny Bog-rush
https://id.biodiversity.org.au/node/apni/2917430	Schoenus efoliatus	F.Muell.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Schoenus	
https://id.biodiversity.org.au/node/apni/2920458	Schoenus elegans	S.T.Blake	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Schoenus	
https://id.biodiversity.org.au/node/apni/2916373	Schoenus grammatophyllus	F.Muell.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Schoenus	
https://id.biodiversity.org.au/node/apni/2891795	Schoenus humilis	Benth.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Schoenus	
https://id.biodiversity.org.au/node/apni/2917246	Schoenus maschalinus	Roem. & Schult.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Schoenus	Leafy Bog-rush
https://id.biodiversity.org.au/node/apni/2919321	Schoenus nanus	(Nees ex Lehm.) Benth.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Schoenus	Tiny Bog-sedge
https://id.biodiversity.org.au/node/apni/2903489	Schoenus odontocarpus	F.Muell.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Schoenus	
https://id.biodiversity.org.au/node/apni/2906198	Schoenus plumosus	Rye	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Schoenus	
https://id.biodiversity.org.au/node/apni/2888386	Schoenus rigens	S.T.Blake	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Schoenus	
https://id.biodiversity.org.au/node/apni/2903833	Schoenus sculptus	(Nees) Boeckeler	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Schoenus	Gimlet Bog-rush
https://id.biodiversity.org.au/node/apni/2918415	Schoenus subbulbosus	Benth.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Schoenus	
https://id.biodiversity.org.au/node/apni/2918512	Schoenus tenellus	Benth.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Schoenus	
https://id.biodiversity.org.au/node/apni/2896299	Schoenus unispiculatus	F.Muell. ex Benth.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Schoenus	
https://id.biodiversity.org.au/taxon/apni/51290326	Scholtzia involucrata	(Endl.) Druce	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Scholtzia	Spiked Scholtzia
https://id.biodiversity.org.au/node/apni/2916443	Selaginella gracillima	(Kunze) Spring ex Salomon	species	Plantae	Charophyta	Equisetopsida	Selaginellales	Selaginellaceae	Selaginella	Tiny Clubmoss
https://id.biodiversity.org.au/node/apni/2888279	Senecio multicaulis	A.Rich.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Senecio	
https://id.biodiversity.org.au/node/apni/2900859	Silene gallica	L.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Caryophyllaceae	Silene	French Catchfly
https://id.biodiversity.org.au/node/apni/2892966	Siloxerus filifolius	(Benth.) Ostenf.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Siloxerus	
https://id.biodiversity.org.au/node/apni/2893765	Siloxerus humifusus	Labill.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Siloxerus	Procumbent Siloxerus
https://id.biodiversity.org.au/node/apni/2904104	Siloxerus multiflorus	Nees	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Siloxerus	Small Wrinklewort
NZOR-6-136058	Solanum americanum	Mill.	species	Plantae	Charophyta	Equisetopsida	Solanales	Solanaceae	Solanum	PÅ¤oro
https://id.biodiversity.org.au/node/apni/2906399	Solanum hoplopetalum	Bitter & Summerh.	species	Plantae	Charophyta	Equisetopsida	Solanales	Solanaceae	Solanum	Thorny Solanum

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name
https://id.biodiversity.org.au/node/apni/2912741	Solanum nigrum	L.	species	Plantae	Charophyta	Equisetopsida	Solanales	Solanaceae	Solanum	Nightshade
https://id.biodiversity.org.au/taxon/apni/51268996	Sonchus asper	(L.) Hill	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Sonchus	Kautara
https://id.biodiversity.org.au/node/apni/2895772	Sonchus oleraceus	L.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Sonchus	Sow Thistle
https://id.biodiversity.org.au/node/apni/2896184	Sowerbaea laxiflora	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Sowerbaea	Vanilla Lily
https://id.biodiversity.org.au/node/apni/2911314	Spergularia brevifolia	(Bartl.) Walp.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Caryophyllaceae	Spergularia	
https://id.biodiversity.org.au/node/apni/2902673	Sphaerolobium drummondii	Turcz.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Sphaerolobium	Globe Pea
https://id.biodiversity.org.au/node/apni/2906694	Sphaerolobium linophyllum	(HÃ¼gel ex Benth.) Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Sphaerolobium	
https://id.biodiversity.org.au/node/apni/2908591	Sphaerolobium vimineum	Sm.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Sphaerolobium	Leafless Globe-pea
https://id.biodiversity.org.au/node/apni/2920067	Sporobolus virginicus	(L.) Kunth	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Sporobolus	Seashore Dropseed
https://id.biodiversity.org.au/node/apni/2900655	Stachys arvensis	(L.) L.	species	Plantae	Charophyta	Equisetopsida	Lamiales	Lamiaceae	Stachys	Stagger Weed
https://id.biodiversity.org.au/node/apni/2912060	Stackhousia monogyna	Labill.	species	Plantae	Charophyta	Equisetopsida	Celastrales	Celastraceae	Stackhousia	Creamy Candles
https://id.biodiversity.org.au/node/apni/2916496	Stackhousia pubescens	A.Rich.	species	Plantae	Charophyta	Equisetopsida	Celastrales	Celastraceae	Stackhousia	
https://id.biodiversity.org.au/node/apni/2896776	Stellaria media	(L.) Vill.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Caryophyllaceae	Stellaria	Kohukohu
https://id.biodiversity.org.au/node/apni/2895916	Stenanthemum emarginatum	Rye	species	Plantae	Charophyta	Equisetopsida	Rosales	Rhamnaceae	Stenanthemum	
https://id.biodiversity.org.au/node/apni/2919543	Stirlingia abrotanoides	Meisn.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Stirlingia	
https://id.biodiversity.org.au/node/apni/2920210	Stirlingia latifolia	(R.Br.) Steud.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Stirlingia	Blueboy
https://id.biodiversity.org.au/node/apni/2910954	Stylidium aceratum	Lowrie & Kenneally	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	
https://id.biodiversity.org.au/node/apni/2915741	Stylidium adpressum	Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Trigger-on-stilits
https://id.biodiversity.org.au/taxon/apni/51311308	Stylidium affine	Sond.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Queen Triggerplant
https://id.biodiversity.org.au/node/apni/2890427	Stylidium albolilacinum	(F.L.Erickson & J.H.Willis) Lowrie & Carlquist	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	
https://id.biodiversity.org.au/node/apni/2917156	Stylidium amoenum	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Lovely Triggerplant
https://id.biodiversity.org.au/node/apni/2888659	Stylidium androsaceum	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	
https://id.biodiversity.org.au/taxon/apni/51294359	Stylidium araeophyllum	Wege	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Stilt Walker
https://id.biodiversity.org.au/name/apni/9630743	Stylidium bindoon	Lowrie & Kenneally	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Bindoon Triggerplant
https://id.biodiversity.org.au/node/apni/2899520	Stylidium breviscapum	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Boomerang Triggerplant
https://id.biodiversity.org.au/node/apni/2908469	Stylidium brunonianum	Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Pink Fountain Triggerplant
https://id.biodiversity.org.au/node/apni/2919963	Stylidium bulbiferum	Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Circus Triggerplant
https://id.biodiversity.org.au/node/apni/2890360	Stylidium calcaratum	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Book Triggerplant
https://id.biodiversity.org.au/taxon/apni/51310737	Stylidium caricifolium	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Milkmaids
https://id.biodiversity.org.au/node/apni/2917124	Stylidium cygnorum	W.Fitzg.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	
https://id.biodiversity.org.au/node/apni/7984728	Stylidium despectum	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Small Triggerplant
https://id.biodiversity.org.au/node/apni/2899931	Stylidium dichotomum	DC.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Pins And Needles
https://id.biodiversity.org.au/node/apni/2907010	Stylidium diuroides	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Donkey Triggerplant
https://id.biodiversity.org.au/node/apni/2888893	Stylidium divaricatum	Sond.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Daddy-long-legs
https://id.biodiversity.org.au/node/apni/2887024	Stylidium ecorne	(F.Muell. ex F.L.Erickson & J.H.Willis) P.G.Farrell & S.H.James	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Foot Triggerplant
https://id.biodiversity.org.au/node/apni/2911209	Stylidium guttatum	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Dotted Triggerplant
https://id.biodiversity.org.au/node/apni/7988035	Stylidium inundatum	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Hundreds And Thousands
https://id.biodiversity.org.au/node/apni/2901489	Stylidium junceum	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Reed Triggerplant
https://id.biodiversity.org.au/node/apni/2919505	Stylidium longitubum	Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Jumping Jacks
https://id.biodiversity.org.au/node/apni/2915396	Stylidium obtusatum	Sond.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Pinafore Triggerplant
https://id.biodiversity.org.au/node/apni/7993433	Stylidium petiolare	Sond.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Horn Triggerplant
https://id.biodiversity.org.au/node/apni/2892900	Stylidium piliferum	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Common Butterfly Triggerplant
https://id.biodiversity.org.au/node/apni/2916697	Stylidium pubigerum	Sond.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Yellow Butterfly Triggerplant
https://id.biodiversity.org.au/taxon/apni/51294409	Stylidium purpureum	Wege	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Purple Fountain Triggerplant
https://id.biodiversity.org.au/node/apni/2903293	Stylidium recurvum	Graham	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	
https://id.biodiversity.org.au/node/apni/2916661	Stylidium repens	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Matted Triggerplant
https://id.biodiversity.org.au/node/apni/2905038	Stylidium rigidulum	Sond.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	
https://id.biodiversity.org.au/node/apni/7990061	Stylidium roseoalatum	F.L.Erickson & J.H.Willis	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Pink-winged Triggerplant
https://id.biodiversity.org.au/taxon/apni/51294414	Stylidium scariosum	DC.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	
https://id.biodiversity.org.au/node/apni/2919672	Stylidium schoenoides	DC.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Cow Kicks
https://id.biodiversity.org.au/node/apni/2888567	Stylidium squamellosum	DC.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Maize Triggerplant
https://id.biodiversity.org.au/taxon/apni/51311315	Stylidium tenue	Sond.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	
https://id.biodiversity.org.au/node/apni/2901397	Stylidium thesioides	DC.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Delicate Triggerplant
https://id.biodiversity.org.au/node/apni/7992083	Stylidium utricularioides	Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Pink Fan Triggerplant
https://id.biodiversity.org.au/node/apni/7993055	Stylidium xanthellum	Wege	species	Plantae	Charophyta	Equisetopsida	Asterales	Stylidiaceae	Stylidium	Little Yellow Triggerplant
https://id.biodiversity.org.au/node/apni/2893552	Stylobasium australe	(Hook.) Prance	species	Plantae	Charophyta	Equisetopsida	Fabales	Surianaceae	Stylobasium	
https://id.biodiversity.org.au/node/apni/2892177	Stypandra glauca	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Hemerocallidaceae	Stypandra	Blind Grass
https://id.biodiversity.org.au/name/apni/51358801	Styphelia discolor	(Hislop & A.J.G.Wilson) Hislop, Crayn & Puente-Lel.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Styphelia	

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name
https://id.biodiversity.org.au/name/apni/51359061	Styphelia glaucifolia	(W.Fitzg.) Hislop, Crayn & Puente-Lel.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Styphelia	
https://id.biodiversity.org.au/node/apni/2907115	Styphelia tenuiflora	Lindl.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Styphelia	Common Pinheath
https://id.biodiversity.org.au/name/apni/51358880	Styphelia tortifolia	Hislop, Crayn & Puente-Lel.	species	Plantae	Charophyta	Equisetopsida	Ericales	Ericaceae	Styphelia	
https://id.biodiversity.org.au/node/apni/2914091	Synaphea acutiloba	Meisn.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Synaphea	Granite Synaphea
https://id.biodiversity.org.au/node/apni/2886071	Synaphea grandis	A.S.George	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Synaphea	
https://id.biodiversity.org.au/node/apni/2921305	Synaphea spinulosa	(Burm.f.) Merr.	species	Plantae	Charophyta	Equisetopsida	Proteales	Proteaceae	Synaphea	
https://id.biodiversity.org.au/node/ausmoss/10114913	Syntrichia laevipila	Brid.	species	Plantae	Bryophyta	Bryopsida	Pottiales	Pottiaceae	Syntrichia	
https://id.biodiversity.org.au/node/apni/2907597	Tamarix parviflora	DC.	species	Plantae	Charophyta	Equisetopsida	Caryophyllales	Tamaricaceae	Tamarix	
https://id.biodiversity.org.au/node/apni/2894898	Taxandria linearifolia	(DC.) J.R.Wheeler & N.G.Marchant	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Taxandria	
https://id.biodiversity.org.au/node/apni/2915119	Templetonia drummondii	Benth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Templetonia	
https://id.biodiversity.org.au/node/apni/2914196	Tetraria capillaris	(F.Muell.) J.M.Black	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Tetraria	Hair-sedge
https://id.biodiversity.org.au/taxon/apni/51283213	Tetraria octandra	(Nees) KÃ¼k.	species	Plantae	Charophyta	Equisetopsida	Poales	Cyperaceae	Tetraria	
https://id.biodiversity.org.au/node/apni/2902391	Tetrarrhena laevis	R.Br.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Tetrarrhena	Forest Ricegrass
https://id.biodiversity.org.au/node/apni/2896026	Tetratheca hirsuta	Lindl.	species	Plantae	Charophyta	Equisetopsida	Oxalidales	Elaeocarpaceae	Tetratheca	Black-eyed Susan
https://id.biodiversity.org.au/node/apni/2891848	Tetratheca nuda	Lindl.	species	Plantae	Charophyta	Equisetopsida	Oxalidales	Elaeocarpaceae	Tetratheca	
https://id.biodiversity.org.au/taxon/apni/51414226	Thelymitra antennifera	(Lindl.) Hook.f.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Thelymitra	Lemon-scented Sun Orchid
https://id.biodiversity.org.au/taxon/apni/51414264	Thelymitra crinita	Lindl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Thelymitra	Blue Lady Orchid
https://id.biodiversity.org.au/taxon/apni/51414280	Thelymitra flexuosa	Endl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Thelymitra	Twisted Sun-orchid
https://id.biodiversity.org.au/taxon/apni/51414378	Thelymitra pauciflora	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Thelymitra	Slender Sun Orchid
https://id.biodiversity.org.au/taxon/apni/51414440	Thelymitra vulgaris	Jeanes	species	Plantae	Charophyta	Equisetopsida	Asparagales	Orchidaceae	Thelymitra	Slender Sun Orchid
https://id.biodiversity.org.au/node/apni/2913839	Thomasia foliosa	J.Gay	species	Plantae	Charophyta	Equisetopsida	Malvales	Malvaceae	Thomasia	
https://id.biodiversity.org.au/node/apni/2893885	Thomasia grandiflora	Lindl.	species	Plantae	Charophyta	Equisetopsida	Malvales	Malvaceae	Thomasia	Large-flowered Thomasia
https://id.biodiversity.org.au/node/apni/2886492	Thryptomene denticulata	(F.Muell.) Benth.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Thryptomene	
https://id.biodiversity.org.au/node/apni/2895348	Thysanotus arbuscula	Baker	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Thysanotus	
https://id.biodiversity.org.au/node/apni/2912118	Thysanotus arenarius	Brittan	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Thysanotus	
https://id.biodiversity.org.au/node/apni/2891757	Thysanotus dichotomus	(Labill.) R.Br.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Thysanotus	Branching Fringe Lily
https://id.biodiversity.org.au/node/apni/2898215	Thysanotus manglesianus	Kunth	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Thysanotus	Fringed Lily
https://id.biodiversity.org.au/taxon/apni/51267100	Thysanotus multiflorus	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Thysanotus	Many-flowered Fringe
https://id.biodiversity.org.au/node/apni/2915505	Thysanotus patersonii	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Thysanotus	Twining Fringe Lily
https://id.biodiversity.org.au/node/apni/2894065	Thysanotus rectantherus	Brittan	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Thysanotus	
https://id.biodiversity.org.au/node/apni/2902563	Thysanotus scaber	Endl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Thysanotus	
https://id.biodiversity.org.au/node/apni/2909343	Thysanotus sparteus	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Thysanotus	
https://id.biodiversity.org.au/node/apni/2907538	Thysanotus tenellus	Endl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Thysanotus	Grassy Fringe-lily
https://id.biodiversity.org.au/node/apni/2890488	Thysanotus thyrsoideus	Baker	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Thysanotus	
https://id.biodiversity.org.au/node/apni/2900679	Thysanotus triandrus	(Labill.) R.Br.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Asparagaceae	Thysanotus	
https://id.biodiversity.org.au/node/apni/2906006	Tolpis barbata	(L.) Gaertn.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Tolpis	Yellow Hawkweed
https://id.biodiversity.org.au/node/apni/2916273	Trachymene pilosa	Sm.	species	Plantae	Charophyta	Equisetopsida	Apiales	Araliaceae	Trachymene	Dwarf Trachymene
https://id.biodiversity.org.au/node/apni/2895152	Tribonanthes australis	Endl.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Tribonanthes	Southern Tiurndin
https://id.biodiversity.org.au/node/apni/2889378	Tribonanthes longipetala	Lindl.	species	Plantae	Charophyta	Equisetopsida	Commelinales	Haemodoraceae	Tribonanthes	Branching Tiurndin
https://id.biodiversity.org.au/taxon/apni/51269051	Trichocline spathulata	(A.Cunn. ex DC.) J.H.Willis	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Trichocline	Native Gerbera
https://id.biodiversity.org.au/node/apni/2893374	Tricoryne elatior	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Hemerocallidaceae	Tricoryne	Yellow Rush Lily
https://id.biodiversity.org.au/node/apni/2911927	Tricoryne humilis	Endl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Hemerocallidaceae	Tricoryne	
https://id.biodiversity.org.au/node/apni/2904101	Tricoryne tenella	R.Br.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Hemerocallidaceae	Tricoryne	Mallee Rush Lily
https://id.biodiversity.org.au/node/apni/2893355	Trifolium angustifolium	L.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Trifolium	Narrow-leaved Clover
https://id.biodiversity.org.au/node/apni/2919872	Trifolium arvense	L.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Trifolium	Haresfoot Clover
https://id.biodiversity.org.au/node/apni/2886977	Trifolium campestre	Schreb.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Trifolium	Hop Clover
https://id.biodiversity.org.au/node/apni/2919692	Trifolium cernuum	Brot.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Trifolium	Drooping-flowered Clover
https://id.biodiversity.org.au/node/apni/2894036	Trifolium dubium	Sibth.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Trifolium	Lesser Yellow Trefoil
https://id.biodiversity.org.au/node/apni/2888841	Trifolium hirtum	All.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Trifolium	Rose Clover
https://id.biodiversity.org.au/node/apni/2896929	Triglochin bulbosa	L.	species	Plantae	Charophyta	Equisetopsida	Alismatales	Juncaginaceae	Triglochin	
https://id.biodiversity.org.au/node/apni/2906966	Triglochin calcitrapa	Hook.	species	Plantae	Charophyta	Equisetopsida	Alismatales	Juncaginaceae	Triglochin	Spurred Arrowgrass
https://id.biodiversity.org.au/node/apni/2919554	Triglochin mucronata	R.Br.	species	Plantae	Charophyta	Equisetopsida	Alismatales	Juncaginaceae	Triglochin	Prickly Arrowgrass
https://id.biodiversity.org.au/node/apni/2908282	Triglochin muelleri	Buchenau	species	Plantae	Charophyta	Equisetopsida	Alismatales	Juncaginaceae	Triglochin	
https://id.biodiversity.org.au/node/apni/2894260	Triglochin nana	F.Muell.	species	Plantae	Charophyta	Equisetopsida	Alismatales	Juncaginaceae	Triglochin	
https://id.biodiversity.org.au/node/apni/2905647	Triglochin stowardii	N.E.Br.	species	Plantae	Charophyta	Equisetopsida	Alismatales	Juncaginaceae	Triglochin	
https://id.biodiversity.org.au/node/apni/2891336	Triglochin trichophora	Nees	species	Plantae	Charophyta	Equisetopsida	Alismatales	Juncaginaceae	Triglochin	Torpedo Arrowgrass
https://id.biodiversity.org.au/node/apni/2896447	Tripterococcus brunonis	Endl.	species	Plantae	Charophyta	Equisetopsida	Celastrales	Celastraceae	Tripterococcus	Winged Stackhousia
https://id.biodiversity.org.au/node/ausmoss/10122689	Triquetrella tasmanica	(Broth.) Granzow	species	Plantae	Bryophyta	Bryopsida	Pottiales	Pottiaceae	Triquetrella	
https://id.biodiversity.org.au/node/apni/2914405	Trithuria bibracteata	Stapf ex D.A.Cooke	species	Plantae	Charophyta	Equisetopsida	Nymphaeales	Hydatellaceae	Trithuria	
https://id.biodiversity.org.au/node/apni/2894037	Trymalium angustifolium	Reissek	species	Plantae	Charophyta	Equisetopsida	Rosales	Rhamnaceae	Trymalium	
https://id.biodiversity.org.au/name/apni/140372_0	Trymalium floribundum		species	Plantae	Charophyta	Equisetopsida	Rosales	Rhamnaceae	Trymalium	
https://id.biodiversity.org.au/node/apni/2913192	Trymalium ledifolium	Fenzl	species	Plantae	Charophyta	Equisetopsida	Rosales	Rhamnaceae	Trymalium	

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name
https://id.biodiversity.org.au/node/apni/2891523	Trymalium odoratissimum	Lindl.	species	Plantae	Charophyta	Equisetopsida	Rosales	Rhamnaceae	Trymalium	
https://id.biodiversity.org.au/node/apni/2894677	Typha orientalis	C.Presl	species	Plantae	Charophyta	Equisetopsida	Poales	Typhaceae	Typha	Cumbungi
https://id.biodiversity.org.au/taxon/apni/51269054	Ursinia anthemoides	(L.) Poir.	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Ursinia	Ursinia
https://id.biodiversity.org.au/node/apni/2896451	Utricularia multifida	R.Br.	species	Plantae	Charophyta	Equisetopsida	Lamiales	Lentibulariaceae	Utricularia	Pink Petticoats
https://id.biodiversity.org.au/node/apni/8453517	Utricularia tenella	R.Br.	species	Plantae	Charophyta	Equisetopsida	Lamiales	Lentibulariaceae	Utricularia	Pink Bladderwort
https://id.biodiversity.org.au/node/apni/2905984	Utricularia violacea	R.Br.	species	Plantae	Charophyta	Equisetopsida	Lamiales	Lentibulariaceae	Utricularia	Violet Bladderwort
https://id.biodiversity.org.au/node/apni/2904675	Vellereophyton dealbatum	(Thunb.) Hilliard & B.L.Burtt	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Vellereophyton	White Cudweed
https://id.biodiversity.org.au/node/apni/2899887	Verreauxia reinwardtii	(de Vriese) Benth.	species	Plantae	Charophyta	Equisetopsida	Asterales	Goodeniaceae	Verreauxia	Common Verreauxia
https://id.biodiversity.org.au/node/apni/2917455	Verticordia acerosa	Lindl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Verticordia	
https://id.biodiversity.org.au/node/apni/2898520	Verticordia densiflora	Lindl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Verticordia	Compacted Featherflower
https://id.biodiversity.org.au/node/apni/2905076	Verticordia huegelii	Endl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Verticordia	Variegated Featherflower
https://id.biodiversity.org.au/node/apni/2910351	Verticordia insignis	Endl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Verticordia	
https://id.biodiversity.org.au/node/apni/2888856	Verticordia lindleyi	Schauer	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Verticordia	
https://id.biodiversity.org.au/node/apni/2894848	Verticordia nitens	(Lindl.) Endl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Verticordia	Yellow Morrison
https://id.biodiversity.org.au/node/apni/2913644	Verticordia ovalifolia	Meisn.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Verticordia	Oval-leaved Featherflower
https://id.biodiversity.org.au/node/apni/2900996	Verticordia pennigera	Endl.	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Verticordia	Native Tea
https://id.biodiversity.org.au/node/apni/7910981	Verticordia plumosa	(Desf.) Druce	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Verticordia	Plumed Featherflower
https://id.biodiversity.org.au/taxon/apni/51300380	Verticordia serrata	(Lindl.) Schauer	species	Plantae	Charophyta	Equisetopsida	Myrtales	Myrtaceae	Verticordia	
https://id.biodiversity.org.au/taxon/apni/51285764	Vicia sativa	L.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Vicia	Common Vetch
https://id.biodiversity.org.au/node/apni/2904505	Viminaria juncea	(Schrad. & J.C.Wendl.) Hoffmanns.	species	Plantae	Charophyta	Equisetopsida	Fabales	Fabaceae	Viminaria	Native Broom
https://id.biodiversity.org.au/node/apni/2907819	Vitis vinifera	L.	species	Plantae	Charophyta	Equisetopsida	Vitales	Vitaceae	Vitis	Grape Vine
https://id.biodiversity.org.au/node/apni/2918032	Vulpia bromoides	(L.) Gray	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Vulpia	Silver Grass
https://id.biodiversity.org.au/node/apni/2889203	Vulpia myuros	(L.) C.C.Gmel.	species	Plantae	Charophyta	Equisetopsida	Poales	Poaceae	Vulpia	Rat's Tail Fescue
https://id.biodiversity.org.au/node/apni/2889040	Wahlenbergia capensis	(L.) A.DC.	species	Plantae	Charophyta	Equisetopsida	Asterales	Campanulaceae	Wahlenbergia	Cape Bluebell
https://id.biodiversity.org.au/node/apni/2920110	Wahlenbergia preissii	de Vriese	species	Plantae	Charophyta	Equisetopsida	Asterales	Campanulaceae	Wahlenbergia	
https://id.biodiversity.org.au/node/apni/2918789	Waitzia suaveolens	(Benth.) Druce	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Waitzia	Fragrant Waitzia
https://id.biodiversity.org.au/node/apni/2915872	Watsonia meriana	(L.) Mill.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Iridaceae	Watsonia	Wild Watsonia
https://id.biodiversity.org.au/node/ausmoss/10125240	Weissia controversa	Hedw.	species	Plantae	Bryophyta	Bryopsida	Pottiales	Pottiaceae	Weissia	
https://id.biodiversity.org.au/node/apni/2892003	Wurmbea dioica	(R.Br.) F.Muell.	species	Plantae	Charophyta	Equisetopsida	Liliales	Colchicaceae	Wurmbea	Early Nancy
https://id.biodiversity.org.au/node/apni/2915284	Xanthorrhoea acanthostachya	D.J.Bedford	species	Plantae	Charophyta	Equisetopsida	Asparagales	Xanthorrhoeaceae	Xanthorrhoea	
https://id.biodiversity.org.au/node/apni/2902442	Xanthorrhoea drummondii	Harv.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Xanthorrhoeaceae	Xanthorrhoea	
https://id.biodiversity.org.au/node/apni/2901354	Xanthorrhoea gracilis	Endl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Xanthorrhoeaceae	Xanthorrhoea	Graceful Grass Tree
https://id.biodiversity.org.au/node/apni/2905888	Xanthorrhoea preissii	Endl.	species	Plantae	Charophyta	Equisetopsida	Asparagales	Xanthorrhoeaceae	Xanthorrhoea	Grass Tree
https://id.biodiversity.org.au/node/apni/2910279	Xanthosia candida	(Benth.) Steud.	species	Plantae	Charophyta	Equisetopsida	Apiales	Apiaceae	Xanthosia	
https://id.biodiversity.org.au/node/apni/2895938	Xanthosia ciliata	Hook.	species	Plantae	Charophyta	Equisetopsida	Apiales	Apiaceae	Xanthosia	
https://id.biodiversity.org.au/node/apni/2903638	Xanthosia fruticulosa	Benth.	species	Plantae	Charophyta	Equisetopsida	Apiales	Apiaceae	Xanthosia	
https://id.biodiversity.org.au/node/apni/2894397	Xanthosia huegelii	(Benth.) Steud.	species	Plantae	Charophyta	Equisetopsida	Apiales	Apiaceae	Xanthosia	Heath Xanthosia
https://id.biodiversity.org.au/taxon/apni/51311057	Xerochrysum macranthum	(Benth.) Paul G.Wilson	species	Plantae	Charophyta	Equisetopsida	Asterales	Asteraceae	Xerochrysum	
https://id.biodiversity.org.au/node/apni/6917219	Zantedeschia aethiopica	(L.) Spreng.	species	Plantae	Charophyta	Equisetopsida	Alismatales	Araceae	Zantedeschia	Arum Lily
https://id.biodiversity.org.au/node/fungi/60092165	Amanita ananiceps	(Berk.) Sacc.	species	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Amanitaceae	Amanita	
https://id.biodiversity.org.au/node/fungi/60092185	Amanita austroviridis	O.K.Mill.	species	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Amanitaceae	Amanita	
https://id.biodiversity.org.au/node/fungi/60096309	Austroboletus lacunosus	(Kuntze) T.W.May & A.E.Wood	species	Fungi	Basidiomycota	Agaricomycetes	Boletales	Boletaceae	Austroboletus	
NZOR-6-94580	Austroparmelina conlabrosa	(Hale) A. Crespo, Divakar & Elix	species	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Austroparmelina	
https://id.biodiversity.org.au/name/apni/227242	Austroparmelina endoleuca	(Taylor) A.Crespo, Divakar & Elix	species	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Austroparmelina	
https://id.biodiversity.org.au/node/fungi/60096985	Austropaxillus infundibuliformis	(Cleland) Bresinsky & Jarosch	species	Fungi	Basidiomycota	Agaricomycetes	Boletales	Serpulaceae	Austropaxillus	
83c4059b6fa52f1108634b8b19039cec	Banksiamyces toomansis	(Berk. & Broome) G. W. Beaton, 1982	species	Fungi	Ascomycota	Leotiomycetes	Helotiales	Helotiaceae	Banksiamyces	
https://id.biodiversity.org.au/node/fungi/60102877	Batrachochytrium dendrobatidis	Longcore, Pessier & D.K.Nichols	species	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales		Batrachochytrium	
https://id.biodiversity.org.au/node/fungi/60097225	Cantharellus concinnus	Berk.	species	Fungi	Basidiomycota	Agaricomycetes	Cantharellales	Cantharellaceae	Cantharellus	
https://id.biodiversity.org.au/node/fungi/60097563	Coltricia cinnamomea	(Jacq.) Murrill	species	Fungi	Basidiomycota	Agaricomycetes	Hymenochaetales	Hymenochaetaceae	Coltricia	
https://id.biodiversity.org.au/node/fungi/60097573	Coltriciella dependens	(Berk. & M.A.Curtis) Murrill	species	Fungi	Basidiomycota	Agaricomycetes	Hymenochaetales	Hymenochaetaceae	Coltriciella	
https://id.biodiversity.org.au/node/fungi/60092723	Cortinarius archeri	Berk.	species	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Cortinariaceae	Cortinarius	
NZOR-6-99607	Flavoparmelia rutidota	(Hook.f. & Taylor) Hale	species	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Flavoparmelia	
https://id.biodiversity.org.au/node/fungi/60095389	Gymnopilus allantopus	(Berk.) Pegler	species	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Strophariaceae	Gymnopilus	
https://id.biodiversity.org.au/node/fungi/60094197	Henningsomyces candidus	(Pers. ex Schleich.) Kuntze	species	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Marasmiaceae	Henningsomyces	
https://id.biodiversity.org.au/node/fungi/60093467	Laccaria lateritia	MalenÃ§on	species	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Hydnangiaceae	Laccaria	

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name
NZOR-6-124027	Lecidea ochroleuca	Pers.	species	Fungi	Ascomycota	Lecanoromycetes	Lecideales	Lecideaceae	Lecidea	
https://id.biodiversity.org.au/node/lichen/30086919	Melanelixia piliferella	(Essl.) A.Crespo, Divakar & Elix	species	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Melanelixia	
https://id.biodiversity.org.au/node/fungi/60098897	Panus fasciatus	(Berk.) Pegler	species	Fungi	Basidiomycota	Agaricomycetes	Polyporales	Polyporaceae	Panus	
https://id.biodiversity.org.au/node/lichen/30087580	Pertusaria subarida	A.W.Archer & Elix	species	Fungi	Ascomycota	Lecanoromycetes	Pertusariales	Pertusariaceae	Pertusaria	
NZOR-6-40879	Phlebiopsis crassa	(LÃ©v.) D. Floudas & Hibbett	species	Fungi	Basidiomycota	Agaricomycetes	Polyporales	Phanerochaetaceae	Phlebiopsis	
https://id.biodiversity.org.au/node/fungi/60096727	Phlebopus marginatus	(J.Drumm. ex Berk.) Watling & N.M.Greg.	species	Fungi	Basidiomycota	Agaricomycetes	Boletales	Boletinellaceae	Phlebopus	
https://id.biodiversity.org.au/node/fungi/60096573	Phylloporus hyperion	(Cooke & Massee) Singer	species	Fungi	Basidiomycota	Agaricomycetes	Boletales	Boletaceae	Phylloporus	
https://id.biodiversity.org.au/node/fungi/60098073	Piptoporus australiensis	(Wakef.) G.Cunn.	species	Fungi	Basidiomycota	Agaricomycetes	Polyporales	Fomitopsidaceae	Piptoporus	
https://id.biodiversity.org.au/node/fungi/60101497	Puccinia sorghi	Schwein.	species	Fungi	Basidiomycota	Pucciniomycetes	Pucciniales	Pucciniaceae	Puccinia	
https://id.biodiversity.org.au/node/fungi/60099129	Pycnoporus coccineus	(Fr.) Singer & Bondartsev	species	Fungi	Basidiomycota	Agaricomycetes	Polyporales	Polyporaceae	Pycnoporus	
https://id.biodiversity.org.au/node/fungi/60100321	Ramaria ochraceosalmonicolor	(Cleland) Corner	species	Fungi	Basidiomycota	Agaricomycetes	Gomphales	Gomphaceae	Ramaria	
NZOR-6-128446	Ramularia grevilleana	(Oudem.) JÃ¸rst.	species	Fungi	Ascomycota	Dothideomycetes	Capnodiales	Mycosphaerellaceae	Ramularia	
https://id.biodiversity.org.au/node/fungi/60096875	Rhizopogon luteolus	Fr.	species	Fungi	Basidiomycota	Agaricomycetes	Boletales	Rhizopogonaceae	Rhizopogon	
https://id.biodiversity.org.au/node/fungi/60096879	Rhizopogon roseolus	(Corda) Th.Fr.	species	Fungi	Basidiomycota	Agaricomycetes	Boletales	Rhizopogonaceae	Rhizopogon	
https://id.biodiversity.org.au/node/fungi/60096945	Scleroderma cepa	Pers.	species	Fungi	Basidiomycota	Agaricomycetes	Boletales	Sclerodermataceae	Scleroderma	
https://id.biodiversity.org.au/node/fungi/60099241	Trametes versicolor	(L.) Lloyd	species	Fungi	Basidiomycota	Agaricomycetes	Polyporales	Polyporaceae	Trametes	
NZOR-6-25217	Tubulicrinis calothrix	(Pat.) Donk	species	Fungi	Basidiomycota	Agaricomycetes	Hymenochaetales	Hymenochaetaceae	Tubulicrinis	

APPENDIX 3

Protected Matters Search Tool Report

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

EPBC Act Protected Matters Report

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

Report created: 25-Nov-2022

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	41
Listed Migratory Species:	8

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	130
Commonwealth Heritage Places:	None
Listed Marine Species:	12
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	4
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	3
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Assemblages of plants and invertebrate animals of tumulus (organic mound) springs of the Swan Coastal Plain	Endangered	Community known to occur within area	In buffer area only
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area	In feature area
Clay Pans of the Swan Coastal Plain	Critically Endangered	Community likely to occur within area	In buffer area only
Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands of the Swan Coastal Plain	Endangered	Community known to occur within area	In buffer area only
Shrublands and Woodlands on Muchea Limestone of the Swan Coastal Plain	Endangered	Community known to occur within area	In buffer area only
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community may occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calyptorhynchus banksii naso			
Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area	In feature area
Leipoa ocellata			
Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis			
Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Zanda baudinii listed as Calyptorhynchus baudinii			
Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Zanda latirostris listed as Calyptorhynchus latirostris			
Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Species or species habitat known to occur within area	In feature area
FISH			
Galaxiella nigrostriata			
Blackstriped Dwarf Galaxias, Black-stripe Minnow [88677]	Endangered	Species or species habitat likely to occur within area	In buffer area only
INSECT			
Hesperocolletes douglasi			
Douglas' Broad-headed Bee, Rottnest Bee [66734]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
MAMMAL			
Bettongia penicillata ogilbyi			
Woylie [66844]	Endangered	Species or species habitat may occur within area	In buffer area only
Dasyurus geoffroii			
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area	In feature area
Petrogale lateralis lateralis			
Black-flanked Rock-wallaby, Mororong, Black-footed Rock Wallaby [66647]	Endangered	Translocated population known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
OTHER			
Westralunio carteri			
Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat may occur within area	In buffer area only
PLANT			
Acacia anomala			
Grass Wattle, Chittering Grass Wattle [8153]	Vulnerable	Species or species habitat known to occur within area	In feature area
Acacia aphylla			
Leafless Rock Wattle [13553]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Andersonia gracilis			
Slender Andersonia [14470]	Endangered	Species or species habitat likely to occur within area	In feature area
Anigozanthos viridis subsp. terraspectans			
Dwarf Green Kangaroo Paw [3435]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Anthocercis gracilis			
Slender Tailflower [11103]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Caleana dixonii listed as Paracaleana dixonii			
Sandplain Duck Orchid [87944]	Endangered	Species or species habitat may occur within area	In buffer area only
Chamelaucium lullfitzii listed as Chamelaucium sp. Gingin (N.G.Marchant 6)			
Gingin Wax [92777]	Endangered (listed as Chamelaucium sp. Gingin	Species or species habitat may occur within area	In feature area
Conospermum densiflorum subsp. unicephalatum			
One-headed Smokebush [64871]	Endangered	Species or species habitat may occur within area	In feature area
Darwinia foetida			
Muchea Bell [83190]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Diplolaena andrewsii			
[6601]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diuris micrantha			
Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diuris purdiei			
Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area	In buffer area only
Drakaea elastica			
Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Eleocharis keigheryi			
Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Eucalyptus leprophloia			
Scaly Butt Mallee, Scaly-butt Mallee [56712]	Endangered	Species or species habitat may occur within area	In feature area
Eucalyptus x balanites			
Cadda Road Mallee, Cadda Mallee [87816]	Endangered	Species or species habitat may occur within area	In buffer area only
Grevillea althoferorum			
[64906]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Grevillea christineae			
Christine's Grevillea [64520]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Grevillea corrugata			
a shrub [65445]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Grevillea curviloba subsp. curviloba			
Curved-leaf Grevillea [64908]	Endangered	Species or species habitat known to occur within area	In feature area
Grevillea curviloba subsp. incurva			
Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat likely to occur within area	In feature area
Grevillea flexuosa			
Zig Zag Grevillea [2957]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Macarthuria keigheryi			
Keighery's Macarthuria [64930]	Endangered	Species or species habitat may occur within area	In buffer area only
Synaphea sp. Fairbridge Farm (D. Papenfus 696)			
Selena's Synaphea [82881]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Thelymitra dedmaniarum			
Cinnamon Sun Orchid [65105]	Endangered	Species or species habitat may occur within area	In feature area
Thelymitra stellata			
Star Sun-orchid [7060]	Endangered	Species or species habitat likely to occur within area	In feature area
REPTILE			
Pseudemydura umbrina			
Western Swamp Tortoise [1760]	Critically Endangered	Species or species habitat may occur within area	In buffer area only

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Motacilla cinerea			
Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

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

Commonwealth Land Name	State	Buffer Status
Defence		
Defence - PEARCE - AP11OBSTRUCTION BEACON NO.5 [50244]	WA	In buffer area only
Defence - PEARCE - AP15 WATER TREATMENT PLANT [50245]	WA	In buffer area only
Defence - PEARCE - AP15 WATER TREATMENT PLANT [50247]	WA	In buffer area only
Defence - PEARCE - AP15 WATER TREATMENT PLANT [50246]	WA	In buffer area only
Defence - PEARCE - AP17 WATER SUPPLY TANKS [50004]	WA	In feature area
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50029]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50047]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50048]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50050]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50051]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50032]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50031]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50030]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50037]	WA	In buffer area only
Defence - PEARCE - AP2 OBSTRUCTION BEACON NO.2 [50240]	WA	In buffer area only
Defence - PEARCE - AP3 RADAR STATION BULLSBROOK [50194]	WA	In buffer area only
Defence - PEARCE - AP4 AERIAL FARM [50248]	WA	In buffer area only
Defence - PEARCE - AP4 AERIAL FARM [50249]	WA	In buffer area only
Defence - PEARCE - AP4 AERIAL FARM [50250]	WA	In buffer area only
Defence - PEARCE - AP4 AERIAL FARM [50251]	WA	In buffer area only
Defence - PEARCE - AP4 AERIAL FARM [50252]	WA	In buffer area only
Defence - PEARCE - AP4 AERIAL FARM [50253]	WA	In buffer area only
Defence - PEARCE - AP5 OPERATIONS SITE [50018]	WA	In feature area
Defence - PEARCE - AP6 OBSTRUCTION BEACON NO.3 [50241]	WA	In buffer area only
Defence - PEARCE - AP7 OBSTRUCTION BEACON NO.1 [50242]	WA	In feature area
Defence - PEARCE - AP8 BORE SITES [50005]	WA	In buffer area only
Defence - PEARCE - AP9 OBSTRUCTION BEACON NO.4 [50243]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50015]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50014]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50017]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50016]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50011]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50013]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50010]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50012]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Defence - PEARCE - RAAF BASE [50006]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50007]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50009]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50008]	WA	In buffer area only
Defence - VACANT LAND - BULLSBROOK AP102 [50255]	WA	In buffer area only
Unknown		
Commonwealth Land - [50898]	WA	In buffer area only
Commonwealth Land - [50895]	WA	In buffer area only
Commonwealth Land - [50897]	WA	In buffer area only
Commonwealth Land - [50892]	WA	In buffer area only
Commonwealth Land - [50893]	WA	In feature area
Commonwealth Land - [50890]	WA	In buffer area only
Commonwealth Land - [50891]	WA	In buffer area only
Commonwealth Land - [50899]	WA	In buffer area only
Commonwealth Land - [50908]	WA	In buffer area only
Commonwealth Land - [50284]	WA	In buffer area only
Commonwealth Land - [50928]	WA	In feature area
Commonwealth Land - [50285]	WA	In buffer area only
Commonwealth Land - [50929]	WA	In buffer area only
Commonwealth Land - [50924]	WA	In buffer area only
Commonwealth Land - [50925]	WA	In buffer area only
Commonwealth Land - [50926]	WA	In feature area
Commonwealth Land - [50927]	WA	In feature area
Commonwealth Land - [50283]	WA	In buffer area only
Commonwealth Land - [50282]	WA	In buffer area only
Commonwealth Land - [50280]	WA	In buffer area only
Commonwealth Land - [50904]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50909]	WA	In buffer area only
Commonwealth Land - [50907]	WA	In feature area
Commonwealth Land - [50900]	WA	In buffer area only
Commonwealth Land - [50905]	WA	In buffer area only
Commonwealth Land - [50906]	WA	In buffer area only
Commonwealth Land - [50290]	WA	In buffer area only
Commonwealth Land - [50931]	WA	In buffer area only
Commonwealth Land - [50297]	WA	In buffer area only
Commonwealth Land - [50930]	WA	In buffer area only
Commonwealth Land - [50292]	WA	In buffer area only
Commonwealth Land - [50932]	WA	In buffer area only
Commonwealth Land - [50291]	WA	In buffer area only
Commonwealth Land - [50939]	WA	In buffer area only
Commonwealth Land - [50935]	WA	In buffer area only
Commonwealth Land - [50937]	WA	In buffer area only
Commonwealth Land - [50936]	WA	In buffer area only
Commonwealth Land - [50938]	WA	In buffer area only
Commonwealth Land - [50293]	WA	In buffer area only
Commonwealth Land - [50298]	WA	In buffer area only
Commonwealth Land - [50281]	WA	In buffer area only
Commonwealth Land - [50299]	WA	In buffer area only
Commonwealth Land - [50287]	WA	In buffer area only
Commonwealth Land - [50286]	WA	In buffer area only
Commonwealth Land - [50302]	WA	In buffer area only
Commonwealth Land - [50300]	WA	In buffer area only
Commonwealth Land - [51383]	WA	In buffer area only
Commonwealth Land - [50273]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50275]	WA	In buffer area only
Commonwealth Land - [50940]	WA	In feature area
Commonwealth Land - [50274]	WA	In buffer area only
Commonwealth Land - [50941]	WA	In buffer area only
Commonwealth Land - [50277]	WA	In buffer area only
Commonwealth Land - [51385]	WA	In buffer area only
Commonwealth Land - [50276]	WA	In buffer area only
Commonwealth Land - [51384]	WA	In buffer area only
Commonwealth Land - [50295]	WA	In buffer area only
Commonwealth Land - [50296]	WA	In buffer area only
Commonwealth Land - [50279]	WA	In buffer area only
Commonwealth Land - [50294]	WA	In buffer area only
Commonwealth Land - [51377]	WA	In buffer area only
Commonwealth Land - [50288]	WA	In buffer area only
Commonwealth Land - [50278]	WA	In buffer area only
Commonwealth Land - [50289]	WA	In buffer area only
Commonwealth Land - [50945]	WA	In feature area
Commonwealth Land - [51386]	WA	In buffer area only
Commonwealth Land - [50313]	WA	In buffer area only
Commonwealth Land - [50888]	WA	In buffer area only
Commonwealth Land - [50887]	WA	In buffer area only
Commonwealth Land - [50886]	WA	In buffer area only
Commonwealth Land - [50942]	WA	In buffer area only
Commonwealth Land - [50944]	WA	In buffer area only
Commonwealth Land - [50889]	WA	In buffer area only
Commonwealth Land - [50943]	WA	In buffer area only
Commonwealth Land - [50921]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50920]	WA	In feature area
Commonwealth Land - [50923]	WA	In buffer area only
Commonwealth Land - [50922]	WA	In buffer area only
Commonwealth Land - [50910]	WA	In buffer area only
Commonwealth Land - [50911]	WA	In buffer area only
Commonwealth Land - [50916]	WA	In buffer area only
Commonwealth Land - [50912]	WA	In buffer area only
Commonwealth Land - [50913]	WA	In buffer area only
Commonwealth Land - [50915]	WA	In buffer area only
Commonwealth Land - [50917]	WA	In buffer area only
Commonwealth Land - [50918]	WA	In buffer area only
Commonwealth Land - [50919]	WA	In buffer area only
Commonwealth Land - [50903]	WA	In buffer area only
Commonwealth Land - [50901]	WA	In buffer area only
Commonwealth Land - [50902]	WA	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area overfly marine area	In buffer area only

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Bullsbrook	Nature Reserve	WA	In buffer area only
Unnamed WA46564	Nature Reserve	WA	In buffer area only
Unnamed WA53453	Nature Reserve	WA	In feature area
Walyunga	National Park	WA	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

RFA Name	State	Buffer Status
South West WA RFA	Western Australia	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Perth-Darwin National Highway alignment (Swan Valley Section), WA	2013/7042	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Eradication of the European House Borer, Perth metropolitan area, WA	2009/5027	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

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

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

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

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APPENDIX 4

Conservation Codes

Conservation Codes for Western Australian Flora and Fauna

Specially protected fauna or flora are species* which have been adequately searched for and are deemed to be, in the wild, either rare, at risk of extinction, or otherwise in need of special protection, and have been gazetted as such. Conservation codes have been transitioned under regulations 170, 171 and 172 of the *Biodiversity Conservation Regulations 2018.*

T Threatened species – Schedules 1-4

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

- **Threatened fauna** is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.
- **Threatened flora** is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR Critically endangered species

Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN Endangered species

Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU Vulnerable species

Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife*

Conservation (Specially Protected Fauna) Notice 2018 for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

EX Presumed extinct species

Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW Extinct in the wild species

Species that "*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018.*

CD Species of special conservation interest (conservation dependent fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P Priority species

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

Priority 1: Poorly-known species

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

Priority 2: Poorly-known species

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

Priority 3: Poorly-known species

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

Priority 4: Rare, Near Threatened and other species in need of monitoring

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

*Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies or variety, or a distinct population).

Western Australian Ecological Communities

Threatened Ecological Communities

The BC Act provides for the statutory listing of threatened ecological communities (TECs) by the Minister.

Presumed Totally Destroyed (PD)

An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.

Critically Endangered (CR)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.

Endangered (EN)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

Vulnerable (VU)

An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

Priority Ecological Communities

Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community List under priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community. Ecological communities that are adequately known, and are rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

Priority One: Poorly-known ecological communities

Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤ 100ha).

Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.

Priority Two: Poorly-known ecological communities

Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

Priority Three: Poorly known ecological communities

(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:

(ii) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or;

(iii) munities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc.

Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.

Priority Four: Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.

(i) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands.

(ii) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for a higher threat category.

(iii) Ecological communities that have been removed from the list of threatened communities during the past five years.

Priority Five: Conservation Dependent ecological communities

Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Commonwealth of Australia Conservation Codes

Threatened Flora and Fauna

Threatened fauna and flora may be listed under Section 178 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in any one of the following six categories:

Extinct

A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.

Extinct in the wild

A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time:

a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.

Critically endangered

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing an extremely high risk of extinction in the wild.

Endangered

A taxon is Endangered when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing a very high risk of extinction in the wild.

Vulnerable

A taxon is Vulnerable when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing a high risk of extinction in the wild.

Conservation dependent

A native species is eligible to be included in the conservation dependent category at a particular time if, at that time:

a) the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or
b) the following subparagraphs are satisfied:
   i. the species is a species of fish;

ii. the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised;
iii. the plan of management is in force under a law of the Commonwealth or of a State or Territory;
iv. cessation of the plan of management would adversely affect the conservation status of the species.

The EPBC Act does not provide for listing in a data deficient category. Where sufficient data (evidence) is unavailable to allow assessment by the Threatened Species Scientific Committee against the criteria for listing, the species are found to be ineligible. A recommendation is made to the Minister to not include the species in any category under the EPBC Act. For reasons of transparency and to inform future research, the Threatened Species Scientific Committee publishes the names of those species found to be data deficient. As data deficient is not a listing category under the EPBC Act, this has no statutory implications and the species is not considered to be listed under the EPBC Act.

Threatened Ecological Communities

Threatened Ecological communities under the EPBC Act are listed in three categories.

Critically endangered

If, at that time, an ecological community is facing an extremely high risk of extinction in the wild in the immediate future (indicative timeframe being the next 10 years).

Endangered

If, at that time, an ecological community is not critically endangered but is facing a very high risk of extinction in the wild in the near future (indicative timeframe being the next 20 years).

Vulnerable

If, at that time, an ecological community is not critically endangered or endangered, but is facing a high risk of extinction in the wild in the medium–term future (indicative timeframe being the next 50 years).

APPENDIX 5

DBCA TEC/PEC Database Search

OCC_UNIQUE	COM_ID	COM_NAME	STATE_CATG	COMM_CATG	S_ID_COUNT	FIRST_S_ID	LAST_S_ID	BUFFER	BDY_ID	ORIG_FID
217	SCP07	Herb rich saline shrublands in clay pans (floristic community type 7 as originally described in Gibson et al. (1994))	Vulnerable	Critically Endangered	2	BULL06	BULL08	500	216	120
1832	SCP3a	Corymbia calophylla - Kingia australis woodlands on heavy soils, Swan Coastal Plain (floristic community type 3a as originally described in Gibson et al. (1994))	Critically Endangered	Endangered	2	CHITTERING PLOT1	CHITTERING01	500	222	126
933	Muchea Limestone	Shrublands and woodlands on Muchea Limestone of the Swan Coastal Plain	Endangered	Endangered	2	mypearce01	mypearce08	2000	227	130
114	SCP3c	Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in in Gibson et al. (1994))	Critically Endangered	Endangered	1	PEARCE02		500	230	133
509	SCP3c	Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in in Gibson et al. (1994))	Critically Endangered	Endangered	1	MYPEARCE05		500	231	134
507	SCP3c	Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in in Gibson et al. (1994))	Critically Endangered	Endangered	1	MYPEARCE03		500	232	135
508	SCP3c	Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in in Gibson et al. (1994))	Critically Endangered	Endangered	1	MYPEARCE04		500	233	136
932	SCP08	Herb rich shrublands in clay pans (floristic community type 8 as originally described in Gibson et al. (1994))	Vulnerable	Critically Endangered	2	mypearce07	xPearce02	500	234	137

OCC_UNIQUE	COM_ID	COM_NAME	STATE_CATG	COMM_CATG	S_ID_COUNT	FIRST_S_ID	LAST_S_ID	BUFFER	BDY_ID	ORIG_FID
506	SCP3c	Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in in Gibson et al. (1994))	Critically Endangered	Endangered	1	MYPEARCE02		500	235	138
1923	SCP3c	Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in in Gibson et al. (1994))	Critically Endangered	Endangered	1	MYPEARCE09		500	578	446
1924	SCP3c	Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in in Gibson et al. (1994))	Critically Endangered	Endangered	1	MYPEARCE10		500	579	447
2556	Mound Springs SCP	Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain)	Critically Endangered	Endangered	2	GastonRd	Nursery01	2000	1159	939
2512	Mound Springs SCP	Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain)	Critically Endangered	Endangered	1	Alpaca01		2000	1160	940
5060	SCP3c	Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in in Gibson et al. (1994))	Critically Endangered	Endangered	1	PearceSth01		500	3002	2589
113908	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld08190		200	110907	23101
113909	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld08191		200	110908	23102
113944	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld08226		200	110943	23137

OCC_UNIQUE	COM_ID	COM_NAME	STATE_CATG	COMM_CATG	S_ID_COUNT	FIRST_S_ID	LAST_S_ID	BUFFER	BDY_ID	ORIG_FID
114943	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld09225		200	111942	24136
114944	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld09226		200	111943	24137
118873	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13155		200	115872	28061
118874	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13156		200	115873	28062
118875	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13157		200	115874	28063
118876	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13158		200	115875	28064
118880	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13162		200	115879	28068
118881	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13163		200	115880	28069
118882	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13164		200	115881	28070
118883	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13165		200	115882	28071
118893	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13175		200	115892	28081
118894	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13176		200	115893	28082
118898	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13180		200	115897	28086
118899	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13181		200	115898	28087
118900	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13182		200	115899	28088
118901	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13183		200	115900	28089

OCC_UNIQUE	COM_ID	COM_NAME	STATE_CATG	COMM_CATG	S_ID_COUNT	FIRST_S_ID	LAST_S_ID	BUFFER	BDY_ID	ORIG_FID
118902	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13184		200	115901	28090
118903	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13185		200	115902	28091
118904	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13186		200	115903	28092
118905	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13187		200	115904	28093
118906	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13188		200	115905	28094
118907	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13189		200	115906	28095
118908	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13190		200	115907	28096
118909	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13191		200	115908	28097
118910	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13192		200	115909	28098
118911	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13193		200	115910	28099
118912	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13194		200	115911	28100
118913	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13195		200	115912	28101
118914	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13196		200	115913	28102
118915	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13197		200	115914	28103
118916	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13198		200	115915	28104
118917	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13199		200	115916	28105

OCC_UNIQUE	COM_ID	COM_NAME	STATE_CATG	COMM_CATG	S_ID_COUNT	FIRST_S_ID	LAST_S_ID	BUFFER	BDY_ID	ORIG_FID
118918	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13200		200	115917	28106
118919	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13201		200	115918	28107
118920	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13202		200	115919	28108
118921	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13203		200	115920	28109
118922	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13204		200	115921	28110
118923	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13205		200	115922	28111
118924	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13206		200	115923	28112
118925	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13207		200	115924	28113
118926	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13208		200	115925	28114
118927	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13209		200	115926	28115
118933	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13215		200	115932	28121
118941	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13223		200	115940	28129
118947	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13229		200	115946	28135
118951	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13233		200	115950	28139
118952	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13234		200	115951	28140
118953	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13235		200	115952	28141

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118954	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13236		200	115953	28142
118955	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13237		200	115954	28143
118956	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13238		200	115955	28144
118957	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13239		200	115956	28145
118958	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13240		200	115957	28146
118959	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13241		200	115958	28147
118960	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13242		200	115959	28148
118961	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13243		200	115960	28149
118962	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13244		200	115961	28150
118964	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13246		200	115963	28152
118965	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13247		200	115964	28153
118966	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13248		200	115965	28154
118967	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13249		200	115966	28155
118968	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13250		200	115967	28156
118970	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13252		200	115969	28158
118971	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13253		200	115970	28159

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118972	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13254		200	115971	28160
118975	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13257		200	115974	28163
118982	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13264		200	115981	28170
118983	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13265		200	115982	28171
118993	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13275		200	115992	28181
118994	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13276		200	115993	28182
118995	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13277		200	115994	28183
118996	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13278		200	115995	28184
118997	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13279		200	115996	28185
118999	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13281		200	115998	28187
119000	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13282		200	115999	28188
119001	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13283		200	116000	28189
119002	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13284		200	116001	28190
119003	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13285		200	116002	28191
119004	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13286		200	116003	28192
119022	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13304		200	116021	28210

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119023	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13305		200	116022	28211
119025	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13307		200	116024	28213
119026	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13308		200	116025	28214
119027	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13309		200	116026	28215
119036	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13318		200	116035	28224
119037	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13319		200	116036	28225
119038	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13320		200	116037	28226
119039	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13321		200	116038	28227
119040	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13322		200	116039	28228
119042	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13324		200	116041	28230
119044	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13326		200	116043	28232
119046	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13328		200	116045	28234
119047	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13329		200	116046	28235
119048	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13330		200	116047	28236
119050	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13332		200	116049	28238
119051	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13333		200	116050	28239

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119052	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13334		200	116051	28240
119053	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13335		200	116052	28241
119054	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13336		200	116053	28242
119055	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13337		200	116054	28243
119056	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13338		200	116055	28244
119057	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13339		200	116056	28245
119058	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13340		200	116057	28246
119059	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13341		200	116058	28247
119060	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13342		200	116059	28248
119061	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13343		200	116060	28249
119062	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13344		200	116061	28250
119063	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13345		200	116062	28251
119064	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13346		200	116063	28252
119079	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13361		200	116078	28267
119225	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13507		200	116224	28413
119228	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13510		200	116227	28416

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119229	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13511		200	116228	28417
119230	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13512		200	116229	28418
119231	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13513		200	116230	28419
119234	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13516		200	116233	28422
122086	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16368		200	119085	31272
122087	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16369		200	119086	31273
122260	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16542		200	119259	31446
122261	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16543		200	119260	31447
122262	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16544		200	119261	31448
122263	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16545		200	119262	31449
122264	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16546		200	119263	31450
122265	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16547		200	119264	31451
122266	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16548		200	119265	31452
122267	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16549		200	119266	31453
122268	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16550		200	119267	31454
122269	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16551		200	119268	31455

OCC_UNIQUE	COM_ID	COM_NAME	STATE_CATG	COMM_CATG	S_ID_COUNT	FIRST_S_ID	LAST_S_ID	BUFFER	BDY_ID	ORIG_FID
122270	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16552		200	119269	31456
122282	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16564		200	119281	31468
122283	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16565		200	119282	31469
122502	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16784		200	119501	31688
122503	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld16785		200	119502	31689
118963	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13245		200	115962	28151
118969	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13251		200	115968	28157
119041	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13323		200	116040	28229
119043	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13325		200	116042	28231
119045	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13327		200	116044	28233
119049	Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	1	BanksiaWld13331		200	116048	28237
5054	SCP08	Herb rich shrublands in clay pans (floristic community type 8 as originally described in Gibson et al. (1994))	Vulnerable	Critically Endangered	1	xpearce01		500	0	804

APPENDIX 6

Flora Species List

SPECIES LIST – Bullsbrook North Stage 1

*Denotes introduced species

GYMNOSPERMS

CUPRESSACEAE
**Callitris preissii*

ZAMIACEAE
Macrozamia fraseri

MONOCOTYLEDONS

ANARTHRIACEAE
Lyginia barbata

ARACEAE
**Zantedeschia aethiopica*

ASPARAGACEAE
Laxmannia squarrosa
Lomandra hermaphrodita
Sowerbaea laxiflora
Thysanotus manglesianus

CENTROLEPIDACEAE
Centrolepis drummondiana

COLCHICACEAE
Burchardia congesta

CYPERACEAE
Lepidosperma squamatum
Mesomelaena pseudostygia
Morelotia octandra

HAEMODORACEAE
Anigozanthos manglesii
Conostylis aculeata
Haemodorum laxum
Haemodorum spicatum

HEMEROCALLIDACEAE
Caesia micrantha
Dianella revoluta var. *divaricata*
Stypandra glauca
Tricoryne elatior

IRIDACEAE
**Gladiolus caryophyllaceus*
Patersonia occidentalis
**Romulea rosea*

ORCHIDACEAE
Caladenia flava
Diuris corymbosa
Pterostylis vittata

POACEAE
**Avena fatua*
Austrostipa flavescens
**Briza maxima*
**Cynodon dactylon*
**Ehrharta calycina*
**Ehrharta longiflora*
**Lolium perenne*
Neurachne alopecuroidea
**Poaceae sp.*

RESTIONACEAE
Alexgeorgea nitens
Desmocladus flexuosus
Lepidobolus preissianus

XANTHORRHOEACEAE
Xanthorrhoea brunonis
Xanthorrhoea preissii

DICOTYLEDONS

AMARANTHACEAE
Ptilotus polystachyus

ARALIACEAE
Trachymene pilosa

ASTERACEAE
**Arctotheca calendula*
Asteridea pulverulenta

Brachyscome iberidifolia
Hyalosperma cotula
**Hypochaeris glabra*
Millotia myosotidifolia
Podotheca angustifolia
Podotheca gnaphalioides
**Sonchus oleraceus*
**Taraxacum officinale*
**Urospermum picroides*
**Ursinia anthemoides*
Waitzia suaveolens

CAMPANULACEAE
**Wahlenbergia capensis*

CARYOPHYLLACEAE
**Silene gallica*

CELASTRACEAE
Tripterococcus brunonis

CRASSULACEAE
Crassula colorata

DILLENIACEAE
Hibbertia huegelii
Hibbertia hypericoides
Hibbertia racemosa

DROSERACEAE
Drosera erythrorhiza
Drosera glanduligera
Drosera menziesii

ERICACEAE
Leucopogon sp
Styphelia conostephioides
Styphelia macrocalyx

FABACEAE
**Acacia iteaphylla*
Acacia pulchella
Acacia saligna
Bossiaea eriocarpa
Daviesia preissii
Gompholobium tomentosum
Hovea trisperma
Isotropis cuneifolia
Jacksonia sternbergiana
Kennedia prostrata
**Lupinus cosentinii*
**Trifolium campestre*

GOODENIACEAE
Lechenaultia biloba
Scaevola canescens

LAURACEAE
Cassytha racemosa

LOGANIACEAE
Phyllangium paradoxum

LORANTHACEAE
Amyema miquelii
Nuytsia floribunda

MONTIACEAE
Calandrinia liniflora

MYRTACEAE
Babbingtonia camphorosmae
Calytrix angulata
Corymbia calophylla
Eucalyptus marginata
Leptospermum erubescens
Scholtzia involucrata
Verticordia densiflora

OLEACEAE
**Olea europaea*

OXALIDACEAE
**Oxalis purpurea*
**Oxalis sp.*

PHYLLANTHACEAE
Phyllanthus calycinus
Poranthera microphylla

PITTOSPORACEAE
Billardiera fraseri

POLYGALACEAE
Comesperma calymega

PROTEACEAE
Banksia dallanneyi
Banksia sessilis
Hakea prostrata

SCROPHULARIACEAE
**Dischisma arenarium*

STYLIDIACEAE
Stylidium affine
Stylidium brunonianum
Stylidium piliferum
Stylidium scariosum

THYMELEACEAE
Pimelea floribunda
Pimelea imbricata

VIOLACEAE
Hybanthus calycinus

APPENDIX 7

Quadrat Data

QUADRAT AR 1

50 408495 E 6498027 N

Vegetation: *Corymbia calophylla* Woodland over *Xanthorrhoea preissii* Low Shrubland
Condition: Good
Soil Type: Dark brown sand
Landform: Gentle slope
Date: 4 October 2022
Recorder: Paul van der Moezel



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Corymbia calophylla	8	25
Banksia sessilis	1.7	1
**Gladiolus caryophyllaceus*	1.1	<1
Xanthorrhoea preissii	0.9	10
**Ehrharta calycina*	0.8	<1
**Olea europaea*	0.8	<1
Leptospermum erubescens	0.6	<1
Mesomelaena pseudostygia	0.5	<1
Phyllanthus calycinus	0.5	<1
**Ehrharta longiflora*	0.4	20
Diuris corymbosa	0.4	<1
Morelotia octandra	0.4	<1
Patersonia occidentalis	0.4	<1
Burchardia congesta	0.4	<1
Tricoryne elatior	0.3	2
Anigozanthos manglesii	0.3	1
**Ursinia anthemoides*	0.3	1

SPECIES	HEIGHT (m)	COVER (%)
**Briza maxima*	0.3	1
Sowerbaea laxiflora	0.3	<1
Pterostylis vittata	0.3	<1
Lomandra hermaphrodita	0.3	<1
Conostylis aculeata	0.3	<1
Lepidosperma squamatum	0.3	<1
Caesia micrantha	0.3	<1
**Urospermum picroides*	0.3	<1
Desmocladus flexuosus	0.2	1
Bossiaea eriocarpa	0.2	<1
Isotropis cuneifolia	0.2	<1
Gompholobium tomentosum	0.2	<1
**Lupinus cosentinii*	0.2	<1
Alexgeorgea nitens	0.1	<1
Hyalosperma cotula	0.1	<1
**Sonchus oleraceus*	0.1	<1
Caladenia flava	0.1	<1
Thysanotus manglesianus	Climber	<1
Billardiera fraseri	Climber	<1
Drosera erythrorhiza	Flat	<1

* introduced species

QUADRAT AR 2

50 408537 E 6497981 N

Vegetation: *Banksia sessilis* Closed Tall Scrub over *Xanthorrhoea preissii* Low Shrubland
Condition: Good
Soil Type: Greyish brown sand
Landform: Gentle slope
Date: 4 October 2022
Recorder: Paul van der Moezel



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Banksia sessilis	3.5	30
Leptospermum erubescens	2	20
Xanthorrhoea preissii	1	15
**Gladiolus caryophyllaceus*	1	<1
Hibbertia hypericoides	0.5	<1
Mesomelaena pseudostygia	0.4	5
Tricoryne elatior	0.4	2
**Ehrharta calycina*	0.4	<1
**Ehrharta longiflora*	0.4	<1
**Briza maxima*	0.3	1
**Ursinia anthemoides*	0.3	1
Hybanthus calycinus	0.3	<1
Conostylis aculeata	0.2	<1
Stylidium piliferum	0.2	<1
Waitzia suaveolens	0.2	<1
Podotheca gnaphalioides	0.2	<1
Scaevola canescens	0.1	<1
Podotheca angustifolia	0.1	<1
Trachymene pilosa	0.1	<1

SPECIES	HEIGHT (m)	COVER (%)
Caladenia flava	0.1	<1
Hyalosperma cotula	0.1	<1
Poranthera microphylla	<0.1	<1
**Hypochaeris glabra*	Flat	<1
**Taraxacum officinale*	Flat	<1
Cassytha racemosa	Climber	<1

* introduced species

QUADRAT AR 3

50 408734 E 6497753 N

Vegetation: *Corymbia calophylla* Woodland over *Banksia sessilis* Shrubland
Condition: Good
Soil Type: Orange brown sand, some lateritic gravel
Landform: Gentle slope
Date: 4 October 2022
Recorder: Paul van der Moezel



Quadrat (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Corymbia calophylla	15	25
Banksia sessilis	0.3-2.2	1
Phyllanthus calycinus	0.4	2
**Ehrharta calycina*	0.3	1
Austrostipa flavescens	0.3	<1
Waitzia suaveolens	0.3	<1
Hibbertia racemosa	0.3	<1
Sowerbaea laxiflora	0.3	<1
Acacia pulchella	0.3	<1
**Gladiolus caryophyllaceus*	0.3	<1
**Silene gallica*	0.3	<1
**Ursinia anthemoides*	0.2	2
**Romulea rosea*	0.2	1
Asteridea pulverulenta	0.2	<1
Desmocladus flexuosus	0.2	<1
Conostylis aculeata	0.1	<1
Brachyscome ciliata	0.1	<1
Babbingtonia camphorosmae	0.1	<1

Kennedia prostrata	0.1	<1
Trachymene pilosa	0.1	<1
Scaevola canescens	0.1	<1
Caladenia flava	0.1	<1
Podotheca gnaphalioides	0.1	<1
Millotia myosotidifolia	<0.1	<1
Hyalosperma cotula	<0.1	<1
**Lysimachia arvensis*	<0.1	<1
**Hypochaeris glabra*	Flat	5
Stylidium piliferum	Flat	<1

* introduced species

QUADRAT AR 4

50 408773 E 6497830 N

Vegetation: *Banksia sessilis* Tall Open Shrubland over *Xanthorrhoea preissii* Low Shrubland
Condition: Degraded
Soil Type: Light orange-brown sand
Landform: Gentle slope
Date: 4 October 2022
Recorder: Paul van der Moezel



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Banksia sessilis	2.1	5
Xanthorrhoea preissii	1.1	10
Haemodorum spicatum	0.9	<1
Xanthorrhoea brunonis	0.7	<1
**Gladiolus caryophyllaceus*	0.6	<1
**Ehrharta calycina*	0.4	1
Mesomelaena pseudostygia	0.4	<1
Phyllanthus calycinus	0.4	<1
Calytrix angulata	0.4	<1
**Briza maxima*	0.4	<1
**Ursinia anthemoides*	0.3	10
Desmocladus flexuosus	0.3	5
Podotheca gnaphalioides	0.3	1
Conostylis aculeata	0.3	1
Acacia pulchella	0.3	<1
Morelotia octandra	0.3	<1
Austrostipa flavescens	0.3	<1

SPECIES	HEIGHT (m)	COVER (%)
Lepidobolus preissianus	0.3	<1
Burchardia congesta	0.3	<1
Caesia micrantha	0.3	<1
Waitzia suaveolens	0.2	<1
**Cynodon dactylon*	0.1	1
Banksia dallanneyi	0.1	1
Podotheca angustifolia	0.1	1
Hyalosperma cotula	0.1	1
Laxmannia squarrosa	0.1	<1
Caladenia flava	0.1	<1
Alexgeorgea nitens	0.1	<1
Scholtzia involucrata	0.1	<1
**Romulea rosea*	0.1	<1
Scaevola canescens	0.1	<1
Gompholobium tomentosum	0.1	<1
Centrolepis drummondiana	0.1	<1
Trachymene pilosa	<0.1	1
Crassula colorata	<0.1	<1
Kennedia prostrata	<0.1	<1
Phyllangium paradoxum	<0.1	<1
**Hypochaeris glabra*	Flat	1

* introduced species

QUADRAT AR 5

50 408798 E 6497987 N

Vegetation: *Banksia sessilis* Tall Open Shrubland over *Xanthorrhoea preissii* Open Heath
Condition: Good
Soil Type: Dark grey sand
Landform: Gentle slope
Date: 4 October 2022
Recorder: Paul van der Moezel



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Banksia sessilis	2-3	5
Xanthorrhoea preissii	1-1.6	25
Haemodorum laxum	1	<1
**Ehrharta calycina*	0.8	1
**Gladiolus caryophyllaceus*	0.7	<1
Haemodorum laxum	0.6	<1
Calytrix angulata	0.5	2
Lepidosperma squamatum	0.4	1
Austrostipa flavescens	0.4	<1
Acacia pulchella	0.4	<1
Sowerbaea laxiflora	0.4	<1
**Ursinia anthemoides*	0.3	5
Podotheca gnaphalioides	0.2	<1
**Lysimachia arvensis*	0.2	<1
Patersonia occidentalis	0.2	<1
*Poaceae sp	0.1	10
Podotheca angustifolia	0.1	5

SPECIES	HEIGHT (m)	COVER (%)
Styphelia conostephioides	0.1	<1
Trachymene pilosa	0.1	<1
Crassula colorata	0.1	<1
Asteridea pulverulenta	0.1	<1
Conostylis aculeata	0.1	<1
Styphelia macrocalyx	0.1	<1
Kennedia prostrata	<0.1	<1
Phyllangium paradoxum	<0.1	<1
Stylidium piliferum	Flat	<1

* introduced species

QUADRAT AR 6

50 408960 E 6497946 N

Vegetation: *Eucalyptus marginata* Woodland over weeds
Condition: Degraded
Soil Type: Greyish black sand
Landform: Gentle Slope
Date: 4 October 2022
Recorder: Paul van der Moezel



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Eucalyptus marginata	14	20
**Ehrharta calycina*	0.6	25
**Gladiolus caryophyllaceus*	0.6	<1
Haemodorum spicatum	0.5	<1
Dianella revoluta var. *divaricata*	0.5	<1
Desmocladus flexuosus	0.3	2
Sowerbaea laxiflora	0.3	<1
**Wahlenbergia capensis*	0.3	<1
Lyginia barbata	0.3	<1
Conostylis aculeata	0.3	<1
**Ursinia anthemoides*	0.2	4
**Briza maxima*	0.2	1
Podotheca gnaphalioides	0.2	1
Burchardia congesta	0.2	<1
**Cynodon dactylon*	0.1	10
Trachymene pilosa	0.1	1
Banksia dallanneyi	0.1	1
Poranthera microphylla	0.1	1

SPECIES	HEIGHT (m)	COVER (%)
Podotheca angustifolia	0.1	<1
Phyllangium paradoxum	<0.1	<1
Crassula colorata	<0.1	<1
Kennedia prostrata	<0.1	<1
**Hypochaeris glabra*	Flat	2
Drosera erythrorhiza	Flat	<1
Stylidium piliferum	Flat	<1

* introduced species

QUADRAT AR 7

50 409123 E 6497764 N

Vegetation: *Corymbia calophylla* Woodland over *Xanthorrhoea preissii* Low Open Shrubland
Condition: Good-Degraded
Soil Type: Dark brown sand
Landform: Gentle slope
Date: 4 October 2022
Recorder: Paul van der Moezel



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Corymbia calophylla	18	30
Xanthorrhoea preissii	0.7	5
**Ehrharta calycina*	0.6	25
**Gladiolus caryophyllaceus*	0.6	<1
**Acacia iteaphylla*	0.5	1
**Briza maxima*	0.4	5
Lepidosperma squamatum	0.4	1
Phyllanthus calycinus	0.4	<1
Sowerbaea laxiflora	0.4	<1
Macrozamia fraseri	0.4	<1
Caesia micrantha	0.4	<1
Burchardia congesta	0.4	<1
Morelotia octandra	0.3	2
**Ursinia anthemoides*	0.3	<1
Gompholobium tomentosum	0.3	<1
**Petrorhagia dubia*	0.3	<1
**Ehrharta longiflora*	0.2	5
Desmocladus flexuosus	0.2	5

SPECIES	HEIGHT (m)	COVER (%)
Banksia dallanneyi	0.2	<1
**Trifolium sp*	0.1	<1
Kennedia prostrata	0.1	<1
**Romulea rosea*	0.1	<1
**Arctotheca calendula*	0.1	<1
Poranthera microphylla	<0.1	<1
**Taraxacum officinale*	Flat	<1
**Hypochaeris glabra*	Flat	<1

* introduced species

APPENDIX 5

Basic Fauna Survey
(PGV Environmental, 2023)

BULLSBROOK NORTH
DISTRICT STRUCTURE PLAN

BASIC FAUNA SURVEY

Prepared for:	WPG Landholdings No. 5 Pty Ltd
	Bullsbrook Investment Company Pty Ltd
Report Date:	10 May 2023
Version:	1
Report No.	2023-746



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Table 2: Preferred Habitat of Conservation Significant Fauna Species

Plates

Plate 1: Aerial Photograph 1965 (Landgate, 2020)

Plate 2: Open Woodland Habitat

Plate 3: Shrubland Habitat

Plate 4: Creekline Habitat

Plate 5: Parkland Cleared Habitat

Plate 6: Cleared Habitat

Plate 7: Evidence of Foraging by Carnaby's Black Cockatoo on the Subject Land

Figures

Figure 1: Site Location

Figure 2: Site Boundary and Topography

Figure 3: Fauna Habitats

Appendices

Appendix 1: DBCA Fauna Database Search

Appendix 2: Naturemap Report

Appendix 3: Atlas of Living Australia Report

Appendix 4: Protected Matters Search Tool Report

Appendix 5: Conservation Codes

1 INTRODUCTION

1.1 Background

The Bullsbrook North District Structure Plan (DSP) area is located on various lots on Morrissey Road, Ashton Road, Kimberley Street, Great Northern Highway and Chittering Road, Bullsbrook in the City of Swan (hereafter referred to as the 'subject land'). The subject land is approximately 40km north-north-east of the Perth Central Business District (Figure 1). The DSP area is approximately 355ha in size and is bounded by Morrissey Road to the north, Great Northern Highway, Kimberley Street to the south and Ashton Road and Chittering Road to the east (Figure 2).

The subject land is currently zoned 'Rural' under the Metropolitan Region Scheme and 'General Rural' under the City of Swan Local Planning Scheme No. 17. The land is designated Urban Expansion under the North-East Sub Regional Planning Framework. The proposed amended DSP has been designed to facilitate the future residential development of the subject land.

WPG Landholdings No. 5 Pty Ltd and Bullsbrook Investment Company Pty Ltd commissioned PGV Environmental to undertake a Basic Fauna Survey on the subject land to evaluate the fauna habitat values and the potential impacts of development in accordance with the proposed DSP.

1.2 Scope of Works

The Basic Fauna Survey was undertaken in accordance with EPA Technical Guidance *Fauna Surveys for Environmental Impact Assessment* (EPA, 2020). The survey included the following:

- A search of the DBCA Threatened and Priority Fauna Database for the general area for Threatened and Priority Species;
- A search of Atlas of Living Australia database for fauna records in the area;
- A search of the Commonwealth Government's Protected Matters Search Tool to identify species potentially occurring within the area that are protected under the Environment Protection and Biodiversity Conservation (EPBC) Act 1999 or international migratory bird agreements (JAMBA/CAMBA);
- A review of studies previously undertaken in the vicinity of the subject land;
- A description of the fauna habitats present on the subject land from field surveys;
- An assessment of the significance of the subject land for conservation significant species in a local and regional context; and
- Identify processes for further assessments at the Structure Planning and subdivision stages.

2 EXISTING ENVIRONMENT

2.1 Land Use

Earliest available aerial photography for the subject land from 1965 shows that a large proportion of land has been cleared for agricultural purposes with scattered trees and pockets of remnant native vegetation remaining (Plate 1) (Landgate, 2023).

Plate 1: Historical Aerial Photograph from 1965 (Landgate, 2021)



2.2 Topography

The subject land is undulating with a ridge in the north-eastern portion and more gently undulating land in the southern half. The land slopes gently down from the ridge to the north-west and more steeply from the ridge down to the south-east corner. Elevations range between approximately 144m Australian Height Datum (AHD) in the northeastern corner down to 44m at the southwestern corner (Figure 2).

2.3 Geology and Soils

2.3.1 Geology

The subject land is mapped as part of the Dandaragan Plateau which is a gently undulating plateau with areas of sandplain and some laterite capping on Cretaceous sediments (McArthur and Bettenay, 1960). The plateau has broad u-shaped valleys 80-150 m deep and smaller v-shaped east of the Gingin Scarp in the south (National Map, 2023). Soils are formed in colluvium and weathered rock (DPIRD, 2023).

There is an area in the south-west, adjoining the Great Northern Highway that is mapped in the Yanga System which are poorly drained plains with pale sands and deep sandy duplex, wet, semi-wet and saline wet soils (DPIRD, 2023).

The south-western corner is on the Pinjarra Plain system which consists of broad low relief plain west of the foothills, comprising predominantly Pleistocene fluvial sediments and some Holocene alluvium associated with major current drainage systems. The major soils are naturally poorly drained and many swamps occur (DPIRD, 2023).

2.3.2 Soils

The soils subsystems mapped on the subject land are described as follows:

- Reagan 1 Subsystem (222Re_1) which are on gentle slopes (<10%) with deep, rapidly drained loose brownish or pale sands with a sandy fabric;
- Reagan 2 Subsystem (222Re_2)located on gentle slopes (<10%) with deep, well drained brownish or earthy sands situated below 222Re_1;
- Reagan 3 Subsystem (222Re_3) are on gentle slopes (<10%) and spurs (<20% slope) with shallow gravelly sands and few areas of lateritic outcrop;
- Reagan 5 Subsystem (222Re_5) are level to very gently inclined swampy drainage lines with poorly drained grey siliceous and pale yellow-brown sands;
- Reagan 6 Subsystem (222Re_6) are grey siliceous sands, pale yellow-brown sands and some yellow deep sands;
- Reagan 7 Subsystem (222Re_7) are level to very gently inclined outwash fans with deep, well drained grey siliceous sands or bleached sands overlying clay at depths greater than 1m;
- Yanga, Phase Ya1 (213Ya_Ya1) which is described as plain with moderately deep poorly drained pale yellow brown sands underlain by mottled clay; and
- Pinjarra, Phase Gf1 (213Pj_Gf1) which is a very gently undulating plain with moderately well drained yellow duplex or gradational soils with sand to sandy loam topsoil (DPIRD, 2023).

2.4 Hydrology

Groundwater under the subject land is at depth at approximately 37m AHD (DWER, 2020), which is greater than 30m below ground level. There are no mapped wetlands on the subject land.

An ephemeral creekline runs through the subject land from east to west. The creek is mostly on Lot 3 Ashton Road, with a small area in Lot 802 Morrissey Road. The creekline runs to Ellen Brook approximately 2.5km to the west of the subject land. The creekline has a series of dams, one on the eastern side and one on the western side. The largest dam in the western side appears to contain water year-round while the other dams appear to be dry most summers as evidenced from historical aerial photography (Landgate, 2021).

2.5 Vegetation

A Detailed Flora and Vegetation Survey was undertaken on the northern part of the subject land in 2021 (PGV Environmental, 2021) and in the southern part of the subject land in 2022 (PGV Environmental, 2022) and included the mapping of vegetation types and condition and compilation of flora species lists.

A total of twelve vegetation types were mapped on the subject land (PGV Environmental 2021 and 2022) as follows:

CcEm[1]	*Corymbia calophylla* (Marri)/*Eucalyptus marginata* (Jarrah) Woodland over *Xanthorrhoea preissii* Low Shrubland on laterite
CcEm[2]	*Corymbia calophylla* (Marri)/*Eucalyptus marginata* (Jarrah) Woodland over *Xanthorrhoea preissii* Open Low Heath on sand
CcEm[3]	*Corymbia calophylla* (Marri)/*Eucalyptus marginata* (Jarrah) Parkland Cleared over pasture
Cc	*Corymbia calophylla* (Marri) Woodland over *Xanthorrhoea preissii*/*Hibbertia hypericoides*/*Caustis dioica* Open Low Heath
Em	*Eucalyptus marginata* (Jarrah) Woodland over weeds
Xp	*Xanthorrhoea preissii* Open Heath over weeds
Ew	*Eucalyptus wandoo* (Wandoo) Woodland over bare ground
EwBs	*Eucalyptus wandoo* (Wandoo) Woodland over *Banksia sessilis* Shrubland over bare ground
ErCc	*Eucalyptus rudis* (Flooded Gum)/*Corymbia calophylla* (Marri) Woodland over weeds
Ex	Exotic trees
P	Pines
Bs	*Banksia sessilis* Shrubland over *Xanthorrhoea preissii* Open Heath

The condition of the native vegetation was mostly rated in Degraded and Completely Degraded condition due to the past clearing and long history of grazing under the trees. Two areas containing vegetation in Very Good condition were mapped, one small area on Lot 802 and a larger area in the north-west corner of Lot 3. Two areas in Good condition were recorded on Lot 3 Ashton Road and an additional five scattered areas of Good vegetation occurred in the southern part of the subject land. These areas had abundant weeds mixed with native understorey species (PGV Environmental, 2021 and 2022). There was one area of Good to Degraded in Lot 18 Ashton Road (PGV Environmental, 2022) and one area of Good vegetation associated with the creekline (PGV Environmental, 2021).

No areas were recorded in Excellent condition (PGV Environmental, 2021 and 2022).

3 METHODOLOGY

3.1 Database Searches

Searches of the following databases were undertaken for a 5km radius around the central point of the subject land prior to the subject land survey:

- Department of Biodiversity, Conservation and Attractions (DBCA) Threatened Fauna database for a radius of 10km (Appendix 1);
- DBCA Naturemap Database for a radius of 10km (DBCA, 2020) (Appendix 2);
- Atlas of Living Australia (ALA, 2023) for a radius of 10km (Appendix 3);
- The Commonwealth Government's Protected Matters Search Tool to identify species potentially occurring within the area that are protected under the *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999* for a radius of 5km (DCCEEW, 2023) (Appendix 4).

Other available information such as the Atlas of Living Australia Database (ALA, 2021) was also researched to determine any additional studies that had been completed on or near the subject land.

3.2 Subject Land Survey

A habitat survey of the subject land was conducted by Dr Paul van der Moezel of PGV Environmental on 2 September 2021 and 21 October 2021 in the northern part of the District Structure Plan Area and 4 October 2022 in the southern part.

4 RESULTS

4.1 Database Searches

Desktop studies were undertaken to identify conservation significant species potentially present on the subject land. A search of the DBCA Fauna Database (Appendix 1), Naturemap database (Appendix 2), Atlas of Living Australia (Appendix 3) and the EPBC Act Protected Matters Search Tool (Appendix 4) identified threatened species of fauna listed as potentially occurring within a 5km radius of the District Structure Plan Area (Table 1).

Table 1: List of Fauna Species Identified from Fauna Database Searches

Scientific Name	Common Name	Conservation Status (WA)	Status under EPBC Act
Bettongia penicillata ogilbyi (Bettongia penicillata)	Woylie, Brush-tailed Bettong	Schedule 1 - CR	Endangered
Calidris ferruginea	Curlew Sandpiper	Schedule 1 - CR	Critically Endangered
Hesperocolletes douglasi	Douglas's Broad-headed Bee	Schedule 1 - CR	Critically Endangered
Numenius madagascariensis	Eastern Curlew	Schedule 1 - CR	Critically Endangered
Pseudemydura umbrina	Western Swamp Tortoise	Schedule 1 - CR	Critically Endangered
Botaurus poiciloptilus	Australasian bittern	Schedule 2 - EN	Endangered
Calyptorhynchus (Zanda)baudinii	Baudin's Black Cockatoo	Schedule 2 - EN	Endangered
Calyptorhynchus (Zanda) latirostris	Carnaby's Black Cockatoo	Schedule 2 - EN	Endangered
Galaxiella nigrostriata	Black-stripe Minnow	Schedule 2 - EN	Endangered
Leioproctus douglasiellus	A Short-tongued Bee	Schedule 2 - EN	Critically Endangered
Petrogale lateralis lateralis	Black-flanked Rock-wallaby, Black-footed Rock-wallaby, Moororong	Schedule 2 - EN	Vulnerable
Rostratula australis (Rostratula benghalensis australis)	Australian Painted Snipe	Schedule 2 - EN	Endangered Marine/ Migratory
Calyptorhynchus banksii naso	Forest Red-tailed Black-Cockatoo	Schedule 3 - VU	Vulnerable
Dasyurus geoffroii	Chuditch, Western Quoll	Schedule 3 - VU	Vulnerable
Leipoa ocellata	Mallee Fowl	Schedule 3 - VU	Vulnerable
Macrotis lagotis	Bilby, Dalgyte, Ninu	Schedule 3 - VU	Vulnerable
Westralunio carteri	Carter's Freshwater Mussel	Schedule 3 - VU	Vulnerable
Actitis hypoleucos	Common Sandpiper	Schedule 5 - IA	Marine/ Migratory
Apus pacificus	Fork-tailed Swift	Schedule 5 - IA	Marine/Migratory
Calidris acuminata	Sharp-tailed Sandpiper	Schedule 5 - IA	Marine/ Migratory

Scientific Name	Common Name	Conservation Status (WA)	Status under EPBC Act
Calidris melanotos	Pectoral Sandpiper	Schedule 5 - IA	Marine/ Migratory
Motacilla cinerea	Grey Wagtail	Schedule 5 - IA	Migratory/ Marine
Tringa nebularia	Common Greenshank	Schedule 5 - IA	Marine/ Migratory
Phascogale tapoatafa wambenger	South-western Brush-tailed Phascogale, Wambenger	Schedule 6 - CD	
Falco peregrinus	Peregrine Falcon	Schedule 7 - OS	Marine/ Migratory
Ardea alba	Great Egret, White Egret		Marine
Ardea ibis	Cattle Egret		Marine
Haliaeetus leucogaster	White-bellied Sea-eagle		Marine
Merops ornatus	Rainbow Bee-eater		Marine
Euoplos inornatus	Inornate Trapdoor Spider (northern Jarrah Forest)	Priority 3	
Leioproctus contrarius	A Short-tongued Bee	Priority 3	
Neelaps calonotos	Black-striped Snake	Priority 3	
Isoodon fusciventer	Southern Brown Bandicoot, Quenda	Priority 4	
Notamacropus irma	Western Brush Wallaby	Priority 4	
Synemon gratiosa	Graceful Sun-moth	Priority 4	

Fauna are classified under five different Priority codes and rare and endangered fauna are classified under the *Wildlife Conservation (Specially Protected Fauna) Notice 2014* into five schedules of taxa. These are outlined in Appendix 5.

4.2 Fauna Habitat

There were five fauna habitats were described during the reconnaissance visits including:

- Open Woodland Habitat with a total area of 46.7ha (Plate 2). The Open Woodland habitat has an overstorey of trees with some native species in the understorey however there are also a large number of weeds;
- Shrubland Habitat with a total area of 3.24 ha (Plate 3). The shrubland habitat does not have an overstorey but is dominated by shrubs. This fauna habitat also contains a large number of weeds;
- Creekline habitat mapped over 6.36 ha (Plate 4). The creekline habitat has an overstorey of trees with a high coverage of weeds and contains some open water in dams;
- Parkland Habitat which is the dominant habitat type over 132.76 ha (Plate 5). This habitat consists of trees over pasture weeds; and
- Cleared Habitat 159.63 ha (Plate 6). This habitat is made up of cropping areas and other areas that contain no vegetation other than an herbaceous weedy understorey.

The fauna habitats are shown in Figure 3.

Plate 2: Open Woodland Habitat



Plate 3: Shrubland Habitat



Plate 4: Creekline Habitat with Dam



Plate 5: Parkland Cleared Habitat



Plate 6: Cleared Habitat



Fauna habitat can be assessed using a number of factors including, the size of the habitat, the level of habitat connectivity, availability of specific resources (e.g. tree hollows) and overall vegetation quality. The habitat was assessed according to the following categories:

High Quality Fauna Habitat – These areas closely approximate the vegetation mix and quality that would have been in the area prior to any disturbance. The habitat has connectivity with other habitats and is likely to contain the most natural vertebrate fauna assemblage.

Very Good Fauna Habitat - These areas show minimal signs of disturbance (e.g. grazing, clearing, fragmentation, weeds) and generally retain many of the characteristics of the habitat if it had not been disturbed. The habitat has connectivity with other habitats and fauna assemblages in these areas are likely to be minimally affected by disturbance.

Good Fauna Habitat – These areas showed signs of disturbance (e.g. grazing, clearing, fragmentation, weeds) but generally retain many of the characteristics of the habitat if it had not been disturbed. The habitat has connectivity with other habitats and fauna assemblages in these areas are likely to be affected by disturbance.

Disturbed Fauna Habitat – These areas showed signs of significant disturbance. Many of the trees, shrubs and undergrowth are cleared. These areas may be in the early succession and regeneration stages. Areas may show signs of significant grazing, contain weeds or have been damaged by vehicle or machinery. Habitats are fragmented or have limited connectivity with other fauna habitats. Fauna assemblages in these areas are likely to differ significantly from what might be expected in the area had the disturbance not occurred.

Highly Degraded Fauna Habitat – These areas often have a significant loss of vegetation, an abundance of weeds, and a large number of vehicle tracks or are completely cleared. Limited or

no fauna habitat connectivity. Faunal assemblages in these areas are likely to be significantly different to what might have been in the area pre-disturbance. (Coffey Environments, 2009).

The subject land contains many areas that have been significantly impacted by historical clearing and two small areas that are in Very Good Condition and seven in Good condition. Native vegetation in very good condition occurs in a Bush Forever site to the west of the subject land. However, there is little to no ground connectivity between the vegetation to the west, vegetation on the subject land and other areas of vegetation further east. Any connectivity that exists is provided by the tree canopies and would be primarily used by birds. The subject land is therefore considered to be Highly Degraded Fauna Habitat due to disturbance and lack of connectivity.

4.3 Conservation Significant Species

Table 2 identifies the likelihood of species listed in Table 1 to occur on the subject land based on their habitat preferences and the fauna habitat on the subject land.

Table 2: Likelihood of Conservation Significant Species being Present on the Subject Land

Scientific Name	Common Name	Habitat*	Likelihood to occur on the subject land
Schedule 1 – Critically Endangered			
Bettongia penicillata ogilbyi (Bettongia penicillata)	Woylie, Brush-tailed Bettong	The Woylie habitat types ranged from forest to grassland, coastal and inland. During the day the Woylie shelters under patches of dense undergrowth, logs and rock-cavities and occasionally in burrows.	No – no dense habitat the subject land is too disturbed
Calidris ferruginea	Curlew Sandpiper	Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms.	No – not suitable habitat
Hesperocolletes douglasi	Douglas's Broad-headed Bee	Douglas's Broad-headed Bee was recorded on Rottnest and rediscovered in Pinjar in Banksia Woodland with pollen from *Philotheca spicata*, *Patersonia occidentalis*, two species of *Stylidium*, a species of *Scaevola* and species from Fabaceae and Myrtaceae (DBCA, 2018).	Highly Unlikely – not recorded in the area and not suitable habitat
Numenius madagascariensis	Eastern Curlew	The Eastern Curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets.	No – not suitable habitat

Scientific Name	Common Name	Habitat*	Likelihood to occur on the subject land
Pseudemydura umbrina	Western Swamp Tortoise	The Western Swamp Tortoise is restricted to very few wild populations. During winter and spring, the tortoises live in the water. This species is carnivorous feeding on insects, larvae and tadpoles (Burbidge and Kuchling, 1994). In the drier, hotter months they shelter under leaf litter and in holes and aestivate (sleep).	No – no suitable habitat
Schedule 2 – Endangered			
Botaurus poiciloptilus	Australasian bittern	The Australasian Bittern occurs mainly in densely vegetated freshwater wetlands and, rarely, in estuaries or tidal wetlands.	No – not coastal or wetland habitat
Calyptorhynchus (Zanda) baudinii	Baudin's Black Cockatoo	Baudin's Black-Cockatoo mainly occurs in eucalypt forests, especially Jarrah (*Eucalyptus marginata*), Marri (*Corymbia calophylla*), also Karri (*Eucalyptus diversicolor*) forest, often feeding in the understorey on proteaceous trees and shrubs, especially banksias (SEWPaC, 2012).	The subject land is outside the mapped range for this species and is only likely to be a vagrant visitor
Calyptorhynchus (Zanda) latirostris	Carnaby's Black Cockatoo	Carnaby's Cockatoo is found in the south-west of Australia from Kalbarri through to Ravensthorpe. It has a preference for feeding on the seeds of *Banksia, Hakea, Eucalyptus, Grevillea, Pinus a*nd *Allocasuarina* spp. Nesting mostly occurs in smooth-barked trees (e.g. Salmon Gum, Wandoo, Red Morrell) (SEWPaC, 2012).	Likely to occur on the subject land intermittently
Leioproctus douglasiellus	A Short-tongued Bee	The short-tongued bee species is only known from three locations within the Perth metropolitan area ranging from Cannington to Forrestdale. Specimens have been collected on two plant species, *Goodenia filiformis* and *Anthotium junciforme* (TSSC, 2013).	No – no suitable habitat
Petrogale lateralis lateralis	Black-flanked Rock-wallaby, Black-footed Rock-wallaby, Moororong	The preferred habitat of the Black-flanked Rock-wallaby varies between colonies but always involves grassland feeding habitat for feeding in close proximity to cliff, rock-pile, talus or escarpment refuge habitat.	No – no suitable habitat and has never been recorded in the area

Scientific Name	Common Name	Habitat*	Likelihood to occur on the subject land
Rostratula australis (Rostratula benghalensis australis)	Australian Painted Snipe	The Australian Painted Snipe has been recorded at wetlands in all states of Australia but is most common in eastern Australia. It generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. It also uses inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains.	No – not wetland habitat
Schedule 3 – Vulnerable			
Calyptorhynchus banksii naso	Forest Red-tailed Black-Cockatoo	Forest Red-tailed Black Cockatoos frequent the humid to sub-humid south-west of Western Australia from Gingin in the north, to Albany in the south and west to Cape Leeuwin and Bunbury (SEWPaC, 2012). It nests in tree hollows with a depth of 1-5m, that are predominately Marri (Corymbia calophylla), Jarrah (Eucalyptus marginata) and Karri (Eucalyptus diversicolor) and it feeds primarily on the seeds of Marri.	Likely to occur on the subject land intermittently
Dasyurus geoffroii	Chuditch, Western Quoll	The Chuditch have been known to occupy a wide range of habitats including woodlands, dry sclerophyll forests, riparian vegetation, beaches and deserts. They are opportunistic feeders, and forage on the ground at night, feeding on invertebrates, small mammals, birds and reptiles.	No – no suitable habitat
Leipoa ocellata	Mallee Fowl	Mallee fowl have been found in mallee regions of southern Australia from approximately the 26th parallel of latitude southwards in mallee bushland.	No – not mallee habitat
Macrotis lagotis	Bilby, Dalgyte, Ninu	The greater Bilby is a nocturnal omnivorous marsupial that shrub species, such as *Acacia kempeana* and *A. hilliana*, which have root-dwelling larvae that provide a constant food source for the Greater Bilby. They also utilise Spinifex hummocks which are quite uniform and discrete, providing runways between hummocks, enabling easier movement and foraging.	No – No suitable habitat and not recorded locally

Scientific Name	Common Name	Habitat*	Likelihood to occur on the subject land
Westralunio carteri	Carter's Freshwater Mussel	Carter's Freshwater Mussel is South-West Western Australia's only freshwater mussel (Murdoch University & SERCUL, 2012). Carter's Freshwater Mussel occurs in freshwater streams, rivers, reservoirs and lakes (ICUN, 2015b) and is intolerant to dehydration for more than three days and salinity (Murdoch University & SERCUL, 2012).	No – no suitable permanent freshwater habitat – the dams are too degraded
Schedule 5 – International Agreement			
Actitis hypoleucos	Common Sandpiper	The Common Sandpiper is mostly found around muddy margins or rocky shores. Generally the species forages in shallow water and on bare soft mud at the edges of wetlands.	No – not suitable habitat
Apus pacificus	Fork-tailed Swift	The Fork-tailed Swift is almost exclusively aerial and is not known to breed in Australia. They are seen in inland plains but sometimes above foothills or in coastal areas. They often occur over cliffs and beaches and also over islands and sometimes well out to sea. They also occur over settled areas, including towns, urban areas and cities. Apus pacificus subsp. pacificus is the only subspecies to migrate to Australia.	No – may fly over the subject land but unlikely to land
Calidris acuminata	Sharp-tailed Sandpiper	The Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	No – no suitable habitat
Calidris melanotos	Pectoral Sandpiper	The Pectoral Sandpiper prefers shallow fresh to saline wetlands and is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	No – no suitable habitat
Motacilla cinerea	Grey Wagtail	The Grey Wagtail is mostly recorded in coastal areas in Western Australia (ALA, 2015) however is widespread. There is non-breeding habitat only in Australia and the species has a strong association with water, particularly rocky substrates along water courses but also lakes and marshes.	No – not coastal habitat and not recorded in the area

Scientific Name	Common Name	Habitat*	Likelihood to occur on the subject land
Tringa nebularia	Common Greenshank	The Common Greenshank is a wader and does not breed in Australia. This species can be found in many types of wetlands and has the widest distribution of any shorebird in Australia. This species typically feeds on molluscs, crustaceans, insects, and occasionally fish and frogs.	
Phascogale tapoatafa wambenger	South-western Brush-tailed Phascogale, Wambenger	Southern Brush-tailed Phascogales are arboreal marsupials which require tree hollows in suitable woodland or forest and rely on abundant invertebrate prey to sustain populations (Pescott, 2012).	No – no suitable habitat
Other Specially Protected Species			
Falco peregrinus	Peregrine Falcon	The Peregrine Falcon is found in a variety of habitats but nests on high cliff ledges or artificial structures. It feeds primarily on small-medium sized birds, but occasionally taking insects, such as moths, cicadas and locusts (Birdlife Australia, 2012).	No – no suitable habitat
Marine			
Ardea alba	Great Egret, White Egret	The Eastern Great Egret has been reported in a wide range of wetland habitats and usually frequents shallow waters. This species feeds on fish, insects, crustaceans, molluscs, frogs, lizards, snakes and small birds and mammals.	No – no suitable habitat
Ardea (Bubulcus) ibis	Cattle Egret	The Cattle Egret occurs in tropical and temperate grasslands, wooded lands and terrestrial wetlands with breeding in Western Australia recorded in the far north This species forages away from water on low lying grasslands, improved pastures and croplands generally in areas that have livestock eating insects, frog, lizards and small mammals.	Highly Unlikely – has not been recorded locally
Haliaeetus leucogaster	White-bellied Sea-eagle	The White-bellied Sea-Eagle is found in coastal habitats with large areas of open water, especially those close to the sea-shore. This species feeds opportunistically on a variety of fish, birds, reptiles, mammals and crustaceans, and on carrion and offal.	No – not coastal habitat
Merops ornatus	Rainbow Bee-eater	The Rainbow Bee-eater nests in a burrow dug in the ground. It is found across the better-watered parts of WA including islands preferring lightly wooded, sandy country near water.	Possible intermittent visitor but unlikely to rely on the subject land for survival

Scientific Name	Common Name	Habitat*	Likelihood to occur on the subject land
Priority 3			
Euoplos inornatus	Inornate Trapdoor Spider (northern Jarrah Forest)	The Inornate Trapdoor Spider is recorded from clay creek banks (ALA, 2019).	No – no suitable habitat
Leioproctus contrarius	A Short-tongued Bee	*Leioproctus contrarius* is apparently dependent on flowers of Goodeniaceae and possibly *Lechenaultia stenosepala*. It was found at Forrestdale Lake in 1952 and 1954 (PES, 2011).	No – no suitable habitat
Neelaps calonotos	Black-striped Snake	The Black-striped snake has a limited distribution, inhabiting areas with sandy soils that support heathlands and Banksia/Eucalypt Woodlands (Nevill, 2005) on the Swan Coastal Plain generally in the lower west coast from Lancelin to Mandurah (Storr *et al*, 1999).	Unlikely – not suitable habitat in vegetated areas and the remainder of the subject land has no shelter
Priority 4			
Isoodon fusciventer	Southern Brown Bandicoot, Quenda	Southern Brown Bandicoots are small grey marsupials that prefer dense scrub (up to one metre high). Their diet includes invertebrates (including earthworms, adult beetles and their larvae), underground fungi, subterranean plant material, and very occasionally, small vertebrates (DEC, 2012a).	Possible – this species may be present but it is not likely due to the absence of a dense understorey throughout the subject land
Notamacropus eugenii derbianus	Tammar Wallaby	The Tammar Wallaby prefers dense, low vegetation for daytime shelter and open grassy areas for feeding. This species inhabits coastal scrub, heath, dry sclerophyll forest and thickets in mallee and woodland (DEC, 2012b).	No – no suitable habitat
Synemon gratiosa	Graceful Sun-moth	The Graceful Sun-moth is a diurnal moth with dull coloured brown to black forewings and brightly coloured orange hind wings. The larvae burrow into the rhizomes of *Lomandra maritima* and *Lomandra hermaphrodita* exclusively and therefore require the presence of one or both of these species to be present in an area (Bishop *et al.*, 2011).	No – no suitable habitat

* Habitat descriptions from DoEE (2018) SPRAT Database unless otherwise denoted

The subject land contains some habitat for the following two species of Black Cockatoos:

- Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) (Endangered); and
- Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksii naso*) (Vulnerable).

Habitat for these species includes foraging habitat and some potential future breeding in the Marri, Jarrah and Wandoo trees.

National Map does not record any known breeding for Black Cockatoos on the subject land. The nearest known breeding habitat is approximately 7.8km to the north-east (National Map, 2023).

The subject land is approximately 1.6km to the east of a confirmed Carnaby's Black Cockatoo roost site. Given the large amount of foraging habitat around the roost site, the subject land is unlikely to provide important foraging habitat for birds that use the roost site.

PGV Environmental identified foraging habitat on the subject land in the form of Jarrah and Marri trees and Parrot Bush. The Jarrah and Marri provide foraging habitat for Forest Red-tailed Black Cockatoos while the Jarrah, Marri and Parrot Bush provide foraging habitat for Carnaby's Black Cockatoos. There was a significant amount of foraging evidence with chew patterns typical to Carnaby's Black Cockatoos (Fleming, 2018) (Plate 7). Carnaby's Cockatoos were observed foraging on Marri trees during the 18 June 2021 assessment.

The total amount of foraging habitat is hard to estimate given the scattered trees throughout the subject land. The total area that contains foraging habitat vegetation is 209.57 ha (Figure 4), however the actual amount of foraging habitat if just the tree and shrub canopy is measured would be in the range of 89.9 ha with an average canopy cover of 25% in Parkland Cleared areas.

Plate 7: Evidence of Foraging by Carnaby's Black Cockatoo on the Subject Land



The subject land contains Jarrah, Marri and Wandoo trees that could be suitable breeding habitat for Carnaby's and Forest Red-tailed Black Cockatoos. No actual breeding has been recorded on the subject land or was observed during the PGV Environmental assessment.

Part of the subject land, Lot 801, was surveyed for Black Cockatoo habitat in 2015 (NAC, 2015). The survey recorded 94 trees on the whole lot that may be considered potential breeding habitat for Black Cockatoos based on the definition by the Department of Agriculture, Water and the Environment (DAWE) which considers trees of a certain diameter at breast height (DBH) to potentially develop a hollow and could be future breeding habitat. The 93 trees were recorded over an area of about 31ha, giving an average density of 3.0 potential breeding habitat trees/ha. Based on this average, the number of trees on the subject land (cockatoo habitat 209.57ha) would be around 630.

NAC did not record any breeding in the trees on Lot 801 but identified two trees with large hollows that may be a suitable size for cockatoo breeding.

A Priority species identified in the database searches as possibly present on the subject land is the Southern Brown Bandicoot or Quenda (*Isoodon fusciventer*) (P4). The Rainbow Bee-eater (*Merops ornatus*), listed Marine under the EPBC Act, may intermittently visit the subject land.

The database search produced records of the Western Swamp Tortoise within 5km of the site. The Western Swamp Tortoise occurs in fox-proof fenced areas in Twin Swamps Nature Reserve and Ellen Book Nature Reserve and would not occur on the subject land due to absence of suitable habitat and the prevalence of foxes. The *Environmental Protection (Western Swamp Tortoise Habitat) Policy 2011* (EPA, 2011) boundary is approximately 5km to the south-south-east and does not impact on the subject land.

4.4 Pest Fauna

Rabbits and foxes would be present on the subject land. Feral cats, rats and mice would also be present.

4.5 Biodiversity Value

The EPA's (2002) *Terrestrial Biological Surveys as an Element of Biodiversity Protection Position Statement No. 3* indicated an ecological assessment of a subject land must consider its biodiversity value at the genetic, species and ecosystem levels; and its ecological functional value at the ecosystem level.

From a fauna perspective the habitat is Highly Degraded Fauna Habitat. There is likely to be a significant decrease in native mammals and reptiles present as a result of disturbances on the subject land, introduced feral species such as foxes and rabbits and increased domestic predators such as cats.

5 SUMMARY AND CONCLUSIONS

The Fauna survey resulted in the following findings:

- The fauna habitat on the subject land has been highly modified due to clearing for rural land use;
- There are five fauna habitats on the subject land being:
  - Open Woodland Habitat (46.7 ha);
  - Shrubland Habitat (3.24 ha);
  - Creekline habitat (6.36 ha);
  - Parkland Cleared Habitat (159.63 ha); and
  - Cleared Habitat (132.76 ha).
- The fauna habitat is Highly Degraded Fauna Habitat as the subject land is Completely Degraded and the small areas of vegetation have little to no connectivity to other areas of habitat for ground-dwelling fauna and limited connectivity for birds;
- The Conservation Significant species that are identified as possibly present on the subject land are:
  - Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) (Endangered);
  - Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) (Endangered);
  - Rainbow Bee-eater (*Merops ornatus*) (Marine); and
  - Southern Brown Bandicoot, Quenda (*Isoodon fusciventer*) (Priority 4).
- The subject land contains native tall trees that could be used for roosting and or breeding by Black Cockatoos. No roosting or breeding has been recorded on the subject land. An estimate of 630 potential breeding habitat trees occurs throughout the subject land;
- Most of the vegetation on the subject land provides foraging habitat for Black Cockatoos. Approximately 89.9 ha of foraging habitat and 630 potential breeding trees occurs on the subject land;
- The remaining conservation significant fauna species are Priority species and can be managed during development using trapping and relocation program for any habitat to be cleared; and
- The most significant fauna habitat on the subject land is associated with the Black Cockatoo foraging and potential breeding habitat. Structure Planning should consider retaining as much of the Black Cockatoo habitat as possible in open space. Any areas of habitat proposed for clearing should be assessed in more detail during the Structure Planning process and consideration be made with regards to a Referral under the Commonwealth EPBC Act.

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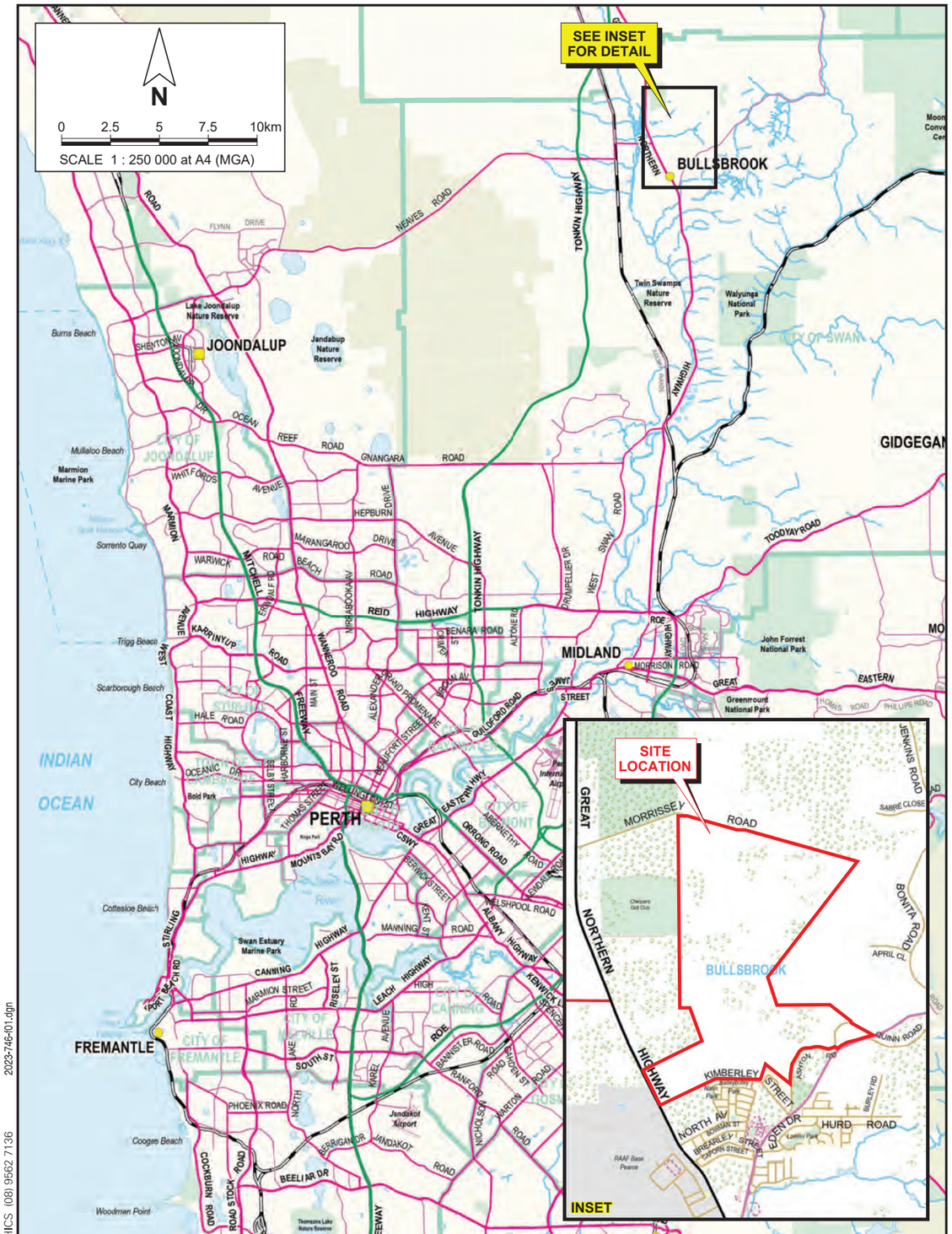
FIGURES



2023-746-f01.dgn

PINPOINT CARTOGRAPHICS (08) 9562 7136

pgv ENVIRONMENTAL

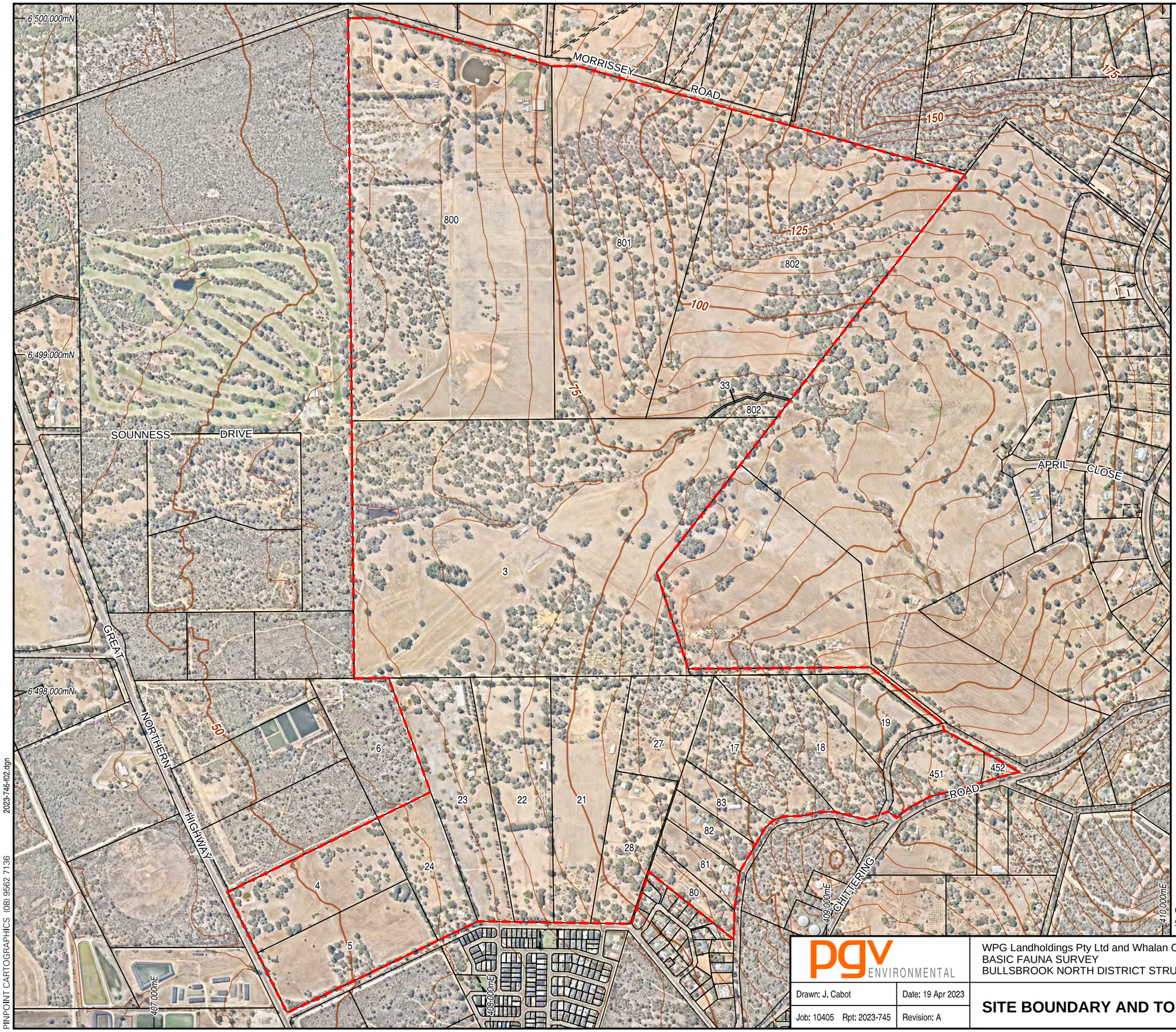
WPG Landholdings Pty Ltd and Whalan Consulting
BASIC FAUNA SURVEY
BULLSBROOK NORTH DISTRICT STRUCTURE PLAN

Drawn: J. Cabot | Date: 19 Apr 2023

Job: 10405 Rpt: 2023-745 | Revision: A

SITE LOCATION

Figure 1



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SCALE 1 : 11 000 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Easement Boundary
- Topographic Contour

CADASTRAL SOURCE: Landgate, April 2023.
AERIAL PHOTOGRAPHY SOURCE: NearMap, flown February 2023.
TOPOGRAPHIC CONTOUR SOURCE: Landgtate, 1:50,000 Topographic Mapping.

pgv ENVIRONMENTAL

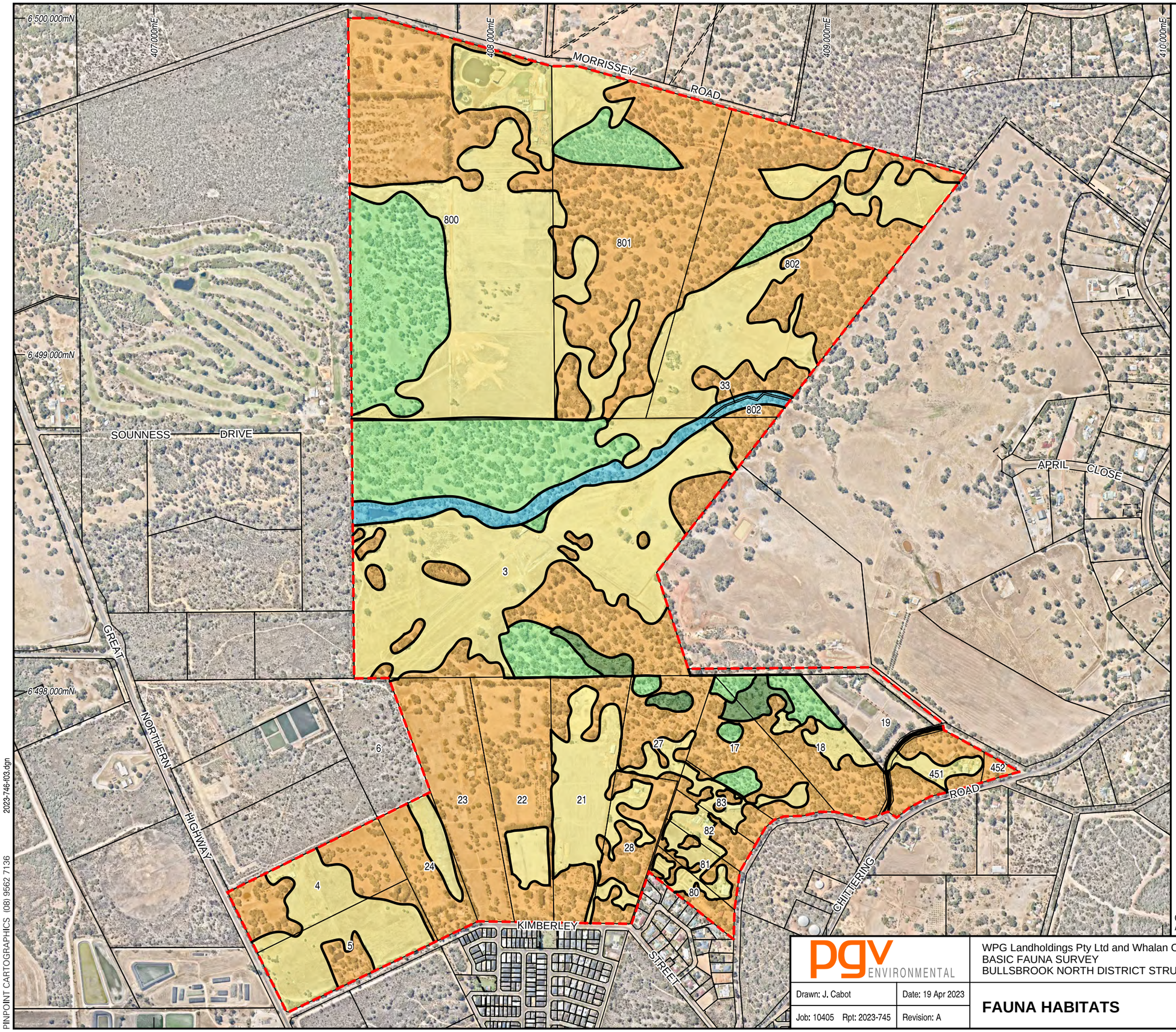
WPG Landholdings Pty Ltd and Whalan Consulting
BASIC FAUNA SURVEY
BULLSBROOK NORTH DISTRICT STRUCTURE PLAN

Drawn: J. Cabot | Date: 19 Apr 2023
Job: 10405 Rpt: 2023-745 | Revision: A

SITE BOUNDARY AND TOPOGRAPHY

Figure 2

PINPOINT CARTOGRAPHICS (08) 9562 7136 2023-746-f02.dgn



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0 100 200 300 400 500m

SCALE 1 : 11 000 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Easement Boundary

Fauna Habitats

- Open Woodland Habitat
- Shrubland Habitat
- Creekline Habitat
- Parkland Cleared Habitat
- Cleared Habitat

CADASTRAL SOURCE: Landgate, April 2023.
AERIAL PHOTOGRAPHY SOURCE: NearMap, flown February 2023.

pgv ENVIRONMENTAL

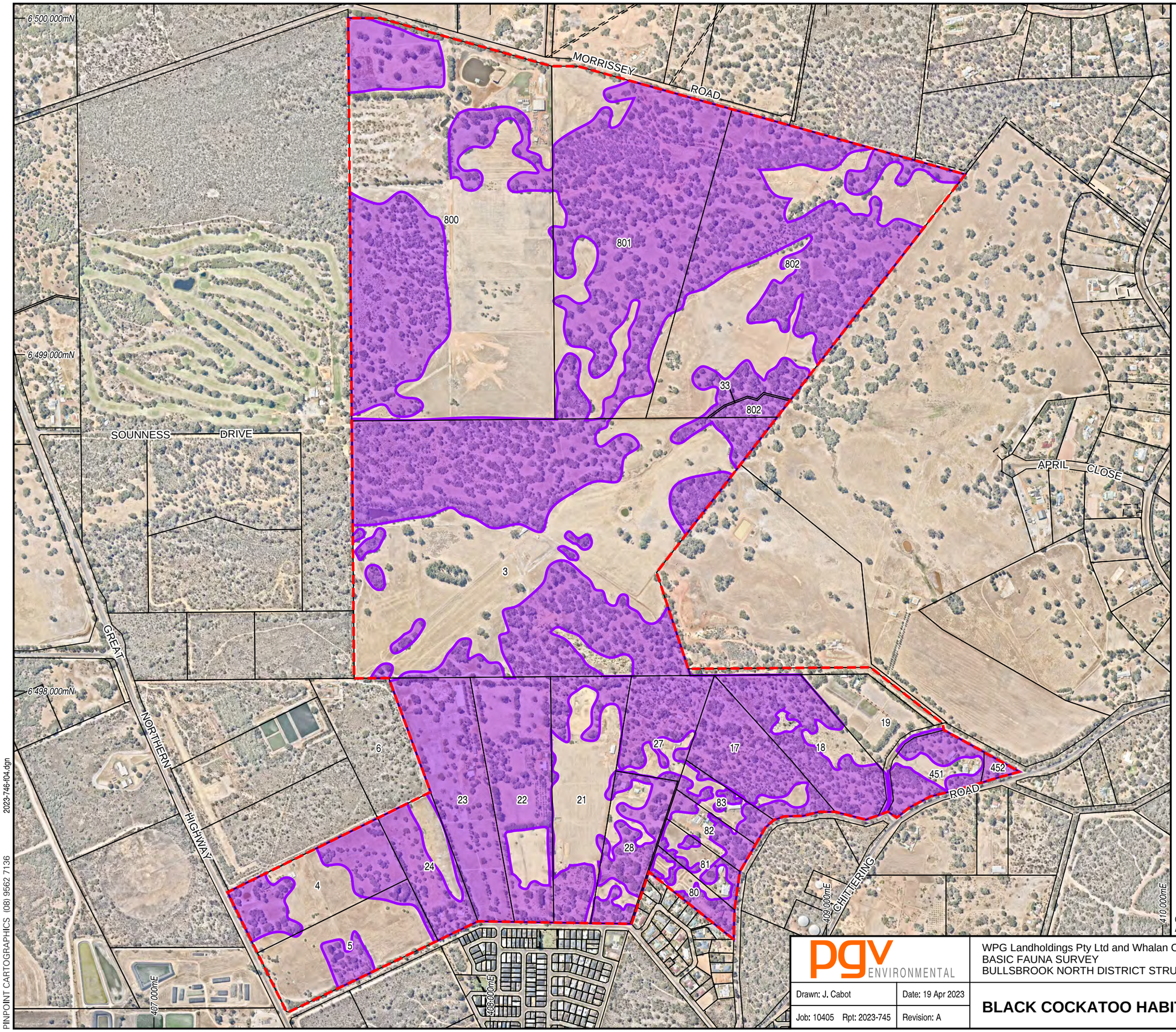
WPG Landholdings Pty Ltd and Whalan Consulting
BASIC FAUNA SURVEY
BULLSBROOK NORTH DISTRICT STRUCTURE PLAN

Drawn: J. Cabot | Date: 19 Apr 2023
Job: 10405 Rpt: 2023-745 | Revision: A

FAUNA HABITATS

Figure 6

PINPOINT CARTOGRAPHICS (08) 9562 7136 2023-746-f03.dgn



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SCALE 1 : 11 000 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Easement Boundary
- Black Cockatoo Habitat

CADASTRAL SOURCE: Landgate, April 2023.
AERIAL PHOTOGRAPHY SOURCE: NearMap, flown February 2023.

pgv ENVIRONMENTAL

WPG Landholdings Pty Ltd and Whalan Consulting
BASIC FAUNA SURVEY
BULLSBROOK NORTH DISTRICT STRUCTURE PLAN

Drawn: J. Cabot | Date: 19 Apr 2023
Job: 10405 Rpt: 2023-745 | Revision: A

BLACK COCKATOO HABITAT

Figure 4

2023-746-f04.dgn

PINPOINT CARTOGRAPHICS (08) 9562 7136

APPENDIX 1

DBCA Fauna Database Search

NAME_SCI	NAME_COM	CLASS	CONS_CODE	Date	SOURCE_ID	SOURCE	CERTAINTY	METHOD	TYPE	COUNT	LOCALITY	SITE	ACCURACY_M	NAME_ID	FAMILY
Botaurus poiciloptilus	Australasian bittern	BIRD	EN	6/04/1939	AVIF:4978	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	MUCHEA	Muchea	10000	24345	Ardeidae
Calyptorhynchus banksii naso	Forest red-tailed black cockatoo	BIRD	VU	15/09/2017	68239	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24731	Cacatuidae
Calyptorhynchus banksii naso	Forest red-tailed black cockatoo	BIRD	VU	15/11/2017	68240	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24731	Cacatuidae
Calyptorhynchus banksii naso	Forest red-tailed black cockatoo	BIRD	VU	15/01/2018	68236	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24731	Cacatuidae
Calyptorhynchus banksii naso	Forest red-tailed black cockatoo	BIRD	VU	15/02/2018	68237	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24731	Cacatuidae
Calyptorhynchus banksii naso	Forest red-tailed black cockatoo	BIRD	VU	15/03/2018	68238	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24731	Cacatuidae
Calyptorhynchus banksii naso	Forest red-tailed black cockatoo	BIRD	VU	15/09/2017	Calyptorhynchus banksii subsp. naso|||15/09/2017	WL_REG17		Survey		0		Calyptorhynchus banksii subsp. naso|||15/09/2017	200	24731	Psittacidae
Calyptorhynchus banksii naso	forest red-tailed black cockatoo	BIRD	VU	16/02/2013	80792	TFAUNA	Very certain	Community survey	Day sighting	1	Bullsbrook	Bullsbrook Bridle Trail, Chittering Road.	10000	24731	Cacatuidae
Calyptorhynchus banksii naso	forest red-tailed black cockatoo	BIRD	VU	16/05/2009	80793	TFAUNA	Very certain	Community survey	Day sighting	1	Bullsbrook	Burley Park, Corner of Chittering Rd & Quinn Rd	1000	24731	Cacatuidae
Calyptorhynchus banksii naso	forest red-tailed black cockatoo	BIRD	VU	9/04/2017	95852	TFAUNA	Moderately certain	Community survey	Sighting	43	MUCHEA	Muchea Nature Reserve, cnr Carl and Arbuckle. Site Code: CHIMUCR001	1000	24731	Cacatuidae
Calyptorhynchus banksii naso	forest red-tailed black cockatoo	BIRD	VU	13/08/2018	100272	TFAUNA	Very certain	Community survey	Sighting	26	Bullsbrook	2018 site code SWABULR002; Jess/Smith Rd Bullsbrook - reported 2012 as between Kingsford Place and Jess Road on the bridle trail	1000	24731	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	13/11/2003	218299|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Chequers Golf Club North	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	9/01/2004	218290|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Burley Park	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/02/2004	218291|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Burley Park	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/02/2004	218301|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Chequers Golf Club North	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	13/04/2004	218292|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Burley Park	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	22/05/2004	218303|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Chequers Golf Club North	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	20/06/2004	218304|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Chequers Golf Club North	100	24734	Cacatuidae

NAME_SCI	NAME_COM	CLASS	CONS_CODE	Date	SOURCE_ID	SOURCE	CERTAINTY	METHOD	TYPE	COUNT	LOCALITY	SITE	ACCURACY_M	NAME_ID	FAMILY
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	23/09/2004	218297|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Burley Park	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	26/09/2004	449715|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Neaves Rd NR & Bush Forever site	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	9/10/2004	218298|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Burley Park	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	9/10/2004	218421|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Jess Road Bushland	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	19/06/2005	456100|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Burley Park	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/06/2017	68106	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/07/2017	68107	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/08/2017	68108	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/09/2017	68109	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/10/2017	68110	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/11/2017	68111	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/12/2017	68112	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/01/2018	68102	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/02/2018	68103	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/03/2018	68104	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/04/2018	68105	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/11/2017	Calyptorhynchus latirostris|||15/11/2017	WL_REG17		Survey		0		Calyptorhynchus latirostris|||15/11/2017	200	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	11/12/2007	15210	TFAUNA	Very certain	Survey	Day sighting	2	Muchea	Site 1 Old West Rd	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	7/04/2011	24368	TFAUNA	Very certain	Community survey	Day sighting	18	Perth Hills	2013 Site code is SWABULR002	1000	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/04/2012	24369	TFAUNA	Very certain	Community survey	Day sighting	117	Perth Hills	2013 Site code is SWABULR002	1000	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	6/05/2012	24370	TFAUNA	Very certain	Community survey	Day sighting	7	Perth Hills	2013 Site code is SWABULR002	1000	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	7/04/2013	24371	TFAUNA	Very certain	Community survey	Day sighting	120	Perth Hills	2013 Site code is SWABULR002	1000	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	1/04/1978	26012	TFAUNA	Very certain	Survey	Day sighting	1	Twin Swamps Nature Reserve	Twin Swamps Reserve	30	24734	Psittacidae

NAME_SCI	NAME_COM	CLASS	CONS_CODE	Date	SOURCE_ID	SOURCE	CERTAINTY	METHOD	TYPE	COUNT	LOCALITY	SITE	ACCURACY_M	NAME_ID	FAMILY
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	30/08/2003	27370	TFAUNA	Very certain	Survey	Day sighting	1	BULLSBROOK	Pearce Aerodrome	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	23/01/1978	27371	TFAUNA	Very certain	Survey	Day sighting	9	BULLSBROOK	Pearce	30	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	9/04/2008	29693	TFAUNA	Very certain	Monitoring	Secondary sign	1	MUCHEA	Muchea, Brand Highway	30	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	19/04/2008	29697	TFAUNA	Very certain	Monitoring	Secondary sign	1	MUCHEA	Muchea South Road, Muchea	1000	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/09/2007	29698	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	19/07/2003	29699	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	25/12/2003	29700	TFAUNA	Very certain	Survey	Day sighting	57	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	25/12/2003	29701	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	19/07/2003	29702	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/12/2002	29703	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	21/10/2002	29704	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	30/09/2002	29705	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	21/09/2002	29706	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/09/2002	29707	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/09/2002	29708	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	13/09/2002	29709	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	10/09/2002	29710	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	31/08/2002	29711	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	9/06/2002	29712	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	30/05/2002	29713	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	12/05/2003	30317	TFAUNA	Very certain	Survey	Day sighting	1	LOWER CHITTERING	Lower Chittering	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	2/10/2005	31104	TFAUNA	Very certain	Survey	Day sighting	1	BULLSBROOK	Jumperkine Hill	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	3/12/2005	32532	TFAUNA	Very certain	Survey	Day sighting	50	BULLSBROOK	Great Northern Hwy, Bullsbrook	1000	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	11/08/2007	32589	TFAUNA	Very certain	Survey	Day sighting	24	BULLSBROOK	Great Northern Hwy, Bullsbrook	1000	24734	Psittacidae

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Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	1/01/2010	32683	TFAUNA	Very certain	Survey	Day sighting	1	BULLSBROOK	Gnangara	1000	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	11/07/2003	34116	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Carabooda	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	18/01/2005	34426	TFAUNA	Very certain	Survey	Day sighting	1	BULLSBROOK	Bullsbrook	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	6/05/2004	34427	TFAUNA	Very certain	Survey	Day sighting	1	BULLSBROOK	Bullsbrook	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	7/03/2004	34428	TFAUNA	Very certain	Survey	Day sighting	1	BULLSBROOK	Bullsbrook	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	21/12/2006	34524	TFAUNA	Very certain	Survey	Day sighting	30	BULLSBROOK	Brockman River	1000	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	21/12/2006	34525	TFAUNA	Very certain	Survey	Day sighting	30	BULLSBROOK	Brockman River	1000	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	19/04/2008	36225	TFAUNA	Very certain	Monitoring	Secondary sign	1	MUCHEA	Archibald Road, Muchea	1000	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	1/08/1961	36798	TFAUNA	Very certain	Historical (written)	Day sighting	6	BULLSBROOK	3 miles S of Bullsbrook	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	6/04/2014	80428	TFAUNA	Moderately certain	Community survey	Day sighting	328	Bullsbrook	Jess/Smith Rd Bullsbrook - reported 2012 as between Kingsford Place and Jess Road on the bridle trail (see comments)	1000	24734	Psittacidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	29/09/1977	4021|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	LOWER CHITTERING	LOWER CHITTERING	18000	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	10/03/1978	22405|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	LOWER CHITTERING	LOWER CHITTERING	18000	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	12/02/1980	84145|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	LOWER CHITTERING	LOWER CHITTERING	18000	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	white-tailed black cockatoo	BIRD	EN	3/04/2016	84652	TFAUNA	Moderately certain	Community survey	Dusk sighting	178	BULLSBROOK	SWABULR002	1000	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	white-tailed black cockatoo	BIRD	EN	9/04/2017	95964	TFAUNA	Moderately certain	Community survey	Sighting	5	BULLSBROOK	bush behind 36 Rosella Way, Lower Chittering. Site Code: SWABULR004	1000	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	white-tailed black cockatoo	BIRD	EN	13/08/2018	100413	TFAUNA	Very certain	Community survey	Sighting	5	Bullsbrook	2018 site code SWABULR004; bush behind 36 Rosella Way, Lower Chittering	1000	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	white-tailed black cockatoo	BIRD	EN	13/08/2018	100597	TFAUNA	Very certain	Community survey	Sighting	328	Bullsbrook	2018 site code SWABULR002; Jess/Smith Rd Bullsbrook	1000	48400	Cacatuidae

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Dasyurus geoffroii	chuditch, western quoll	MAMMAL	VU	27/11/2002	6594	TFAUNA	Not Sure	Opportunistic sighting	Secondary sign	0	Bullsbrook	Lot 24 Strachan Rd, Bullsbrook	300	24092	Dasyuridae
Dasyurus geoffroii	chuditch, western quoll	MAMMAL	VU	2/09/2006	12662	TFAUNA	Very certain	Community survey	Night sighting	1	Walyunga National Park	Walyunga National Park	300	24092	Dasyuridae
Dasyurus geoffroii	Chuditch, western quoll	MAMMAL	VU		MAMM:M56288	WAM_MAMMALS	WAM Vouchered	Collection	Specimen	1	WALYUNGA NATIONAL PARK	BRIGADOON	10000	24092	Dasyuridae
Euoplos inornatus	inornate trapdoor spider (northern Jarrah Forest)	INVERTEBRATE	P3	1/01/1950	6308	TFAUNA	Very certain	Historical (written)	Caught or trapped	1	Bullsbrook	Near Bullsbrook, 4.8km along Chittering Road.	10000	48579	Idiopidae
Falco peregrinus	Peregrine falcon	BIRD	OS	12/02/1980	84145|237	BIRDATLAS1	Moderately certain	Observational	Sighting	1	LOWER CHITTERING	LOWER CHITTERING	18000	25624	Falconidae
Falco peregrinus	Peregrine falcon	BIRD	OS	28/10/2004	435652|237	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Bullsbrook NR	500	25624	Falconidae
Isoodon fusciventer	quenda, southwestern brown bandicoot	MAMMAL	P4	12/12/2007	15211	TFAUNA	Very certain	Survey	Caught or trapped	2	Muchea	Site 1 Old West Rd	300	48588	Peramelidae
Isoodon fusciventer	quenda, southwestern brown bandicoot	MAMMAL	P4	15/05/2012	67851	TFAUNA	Moderately certain	Community survey	Dead	1	BULLSBROOK	In reserve between Kimberly St & North Ave	1000	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	25/11/2017	68203	FAUNASURVEY_WLS	Certain		motion camera	1	Bullsbrook	Bullsbrook college bushland	200	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	26/12/1993	MAMM:M46708	WAM_MAMMALS	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	BULLSBROOK	10000	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4		MAMM:M2823	WAM_MAMMALS	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	BULLSBROOK	10000	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4		MAMM:M2942	WAM_MAMMALS	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	EAST	10000	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	21/05/2008	1807GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1807GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	22/05/2008	1810GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1810GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	22/05/2008	1809GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1809GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	20/05/2008	1805GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1805GAA	30	48588	Peramelidae

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Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	23/05/2008	1819GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1819GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	20/05/2008	1779GAA	FAUNAFILE		Biological survey		0	Neaves Road NR, west of Railway Parade, cross section of Neaves Road and Kirby Road	1779GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	23/05/2008	1797GAA	FAUNAFILE		Biological survey		0	Neaves Road NR, west of Railway Parade, cross section of Neaves Road and Kirby Road	1797GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	20/05/2008	1804GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1804GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	22/05/2008	1812GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1812GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	22/05/2008	1791GAA	FAUNAFILE		Biological survey		0	Neaves Road NR, west of Railway Parade, cross section of Neaves Road and Kirby Road	1791GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	22/05/2008	1811GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1811GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	21/05/2008	1808GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1808GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	22/05/2008	1790GAA	FAUNAFILE		Biological survey		0	Neaves Road NR, west of Railway Parade, cross section of Neaves Road and Kirby Road	1790GAA	30	48588	Peramelidae

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Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	23/05/2008	1799GAA	FAUNAFILE		Biological survey		0	Neaves Road NR, west of Railway Parade, cross section of Neaves Road and Kirby Road	1799GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	23/05/2008	1798GAA	FAUNAFILE		Biological survey		0	Neaves Road NR, west of Railway Parade, cross section of Neaves Road and Kirby Road	1798GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	23/05/2008	1815GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1815GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	23/05/2008	1817GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1817GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	23/05/2008	1820GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1820GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	23/05/2008	1818GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1818GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	22/05/2008	1813GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1813GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	23/05/2008	1816GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1816GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	25/11/2017	Isoodon obesulus subsp. fusciventer|||25/11/2017	WL_REG17		Survey		0		Isoodon obesulus subsp. fusciventer|||25/11/2017	200	48588	Peramelidae
Isoodon fusciventer	quenda, southwestern brown bandicoot	MAMMAL	P4	2/01/2016	81276	TFAUNA	Moderately certain	Opportunistic sighting	Day sighting	2	Bullsbrook	143 Taylor Rd, Bullsbrook	1000	48588	Peramelidae
Isoodon fusciventer	quenda, southwestern brown bandicoot	MAMMAL	P4	1/01/1953	97100	TFAUNA	Very certain	Survey	Caught or trapped	1	Bullsbrook		10000	48588	Peramelidae

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Isoodon fusciventer	quenda, southwestern brown bandicoot	MAMMAL	P4	26/08/2019	100063	TFAUNA	Very certain	Opportunistic sighting	Sighting	1	Bullsbrook	38 Caporn Street	30	48588	Peramelidae
Isoodon fusciventer	quenda, southwestern brown bandicoot	MAMMAL	P4	7/01/2020	132855	TFAUNA	Very Certain (photo, specimen, expert)	Opportunistic sighting	Sighting	1	Blussbrook	Bowman Street	1000	48588	Peramelidae
Leioproctus contrarius	a short-tongued bee	INVERTEBRATE	P3	1/01/1954	3468	TFAUNA	Very certain	Survey	Caught or trapped	1	Bullsbrook	Bullsbrook area	10000	33982	Colletidae
Leioproctus contrarius	a short-tongued bee	INVERTEBRATE	P3	28/12/1954	6198	TFAUNA	Very certain	Historical (written)	Caught or trapped	1	Bullsbrook	Bullsbrook	50000	33982	Colletidae
Leioproctus douglasiellus	a short-tongued bee	INVERTEBRATE	EN	1/01/1954	6197	TFAUNA	Very certain	Survey	Caught or trapped	3	Pearce	Pearce, Western Australia	10000	33983	Colletidae
Leioproctus douglasiellus	a short-tongued bee	INVERTEBRATE	EN	1/10/1954	18664	TFAUNA	Very certain	Survey	Caught or trapped	1	Pearce	Pearce, Western Australia	10000	33983	Colletidae
Macrotis lagotis	bilby, dalgyte, ninu	MAMMAL	VU	1/01/1974	96536	TFAUNA	Very certain	Survey	Caught or trapped	1	Bullsbrook		10000	24168	Thylacomyidae
Neelaps calonotos	black-striped snake, black-striped burrowing snake	REPTILE	P3	8/03/1999	15121	TFAUNA	Very certain	Survey	Caught or trapped	1	Muchea	Muchea	10000	25249	Elapidae
Neelaps calonotos	black-striped snake, black-striped burrowing snake	REPTILE	P3	20/01/1960	15125	TFAUNA	Very certain	Survey	Caught or trapped	1	Bullsbrook	Pearce Aerodrome, Bullsbrook	1000	25249	Elapidae
Neelaps calonotos	Black-striped snake, black-striped burrowing snake	REPTILE	P3	20/01/1960	REPT:R13439	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	BULLSBROOK	10000	25249	Elapidae
Neelaps calonotos	Black-striped snake, black-striped burrowing snake	REPTILE	P3	8/03/1999	REPT:R136104	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	MUCHEA	MUCHEA	10000	25249	Elapidae
Phascogale tapoatafa wambenger	South-western brush-tailed phascogale, wambenger	MAMMAL	CD	8/12/1992	MAMM:M40656	WAM_MAMMALS	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	ALMERIA PARK	10000	48070	Dasyuridae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/07/1953	4040	TFAUNA	Very certain	Survey	Caught or trapped	1	Bullsbrook	Warbrook, crossing road in sub-swampy country between railway line and Great Northern Hwy	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1963	8829	TFAUNA	Very certain	Survey	Caught or trapped	1	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1964	8830	TFAUNA	Very certain	Survey	Caught or trapped	4	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1965	8831	TFAUNA	Very certain	Survey	Caught or trapped	9	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae

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Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1966	8832	TFAUNA	Very certain	Survey	Caught or trapped	65	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1967	8833	TFAUNA	Very certain	Survey	Caught or trapped	27	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1968	8834	TFAUNA	Very certain	Survey	Caught or trapped	17	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1969	8835	TFAUNA	Very certain	Survey	Caught or trapped	8	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1970	8836	TFAUNA	Very certain	Survey	Caught or trapped	26	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1970	8837	TFAUNA	Very certain	Survey	Caught or trapped	27	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1971	8838	TFAUNA	Very certain	Survey	Caught or trapped	15	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1972	8839	TFAUNA	Very certain	Survey	Caught or trapped	13	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1973	8840	TFAUNA	Very certain	Survey	Caught or trapped	8	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1974	8841	TFAUNA	Very certain	Survey	Caught or trapped	8	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1975	8842	TFAUNA	Very certain	Survey	Caught or trapped	3	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1976	8843	TFAUNA	Very certain	Survey	Caught or trapped	9	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1977	8844	TFAUNA	Very certain	Survey	Caught or trapped	9	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1978	8845	TFAUNA	Very certain	Survey	Caught or trapped	6	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1979	8846	TFAUNA	Very certain	Survey	Caught or trapped	2	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1980	8847	TFAUNA	Very certain	Survey	Caught or trapped	3	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1981	8848	TFAUNA	Very certain	Survey	Caught or trapped	3	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1982	8849	TFAUNA	Very certain	Survey	Caught or trapped	5	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1983	8850	TFAUNA	Very certain	Survey	Caught or trapped	3	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1984	8851	TFAUNA	Very certain	Survey	Caught or trapped	2	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1985	8852	TFAUNA	Very certain	Survey	Caught or trapped	2	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1990	8853	TFAUNA	Very certain	Survey	Caught or trapped	2	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1992	8854	TFAUNA	Very certain	Survey	Caught or trapped	1	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1994	8855	TFAUNA	Very certain	Survey	Caught or trapped	14	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae

NAME_SCI	NAME_COM	CLASS	CONS_CODE	Date	SOURCE_ID	SOURCE	CERTAINTY	METHOD	TYPE	COUNT	LOCALITY	SITE	ACCURACY_M	NAME_ID	FAMILY
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1995	8856	TFAUNA	Very certain	Survey	Caught or trapped	41	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1996	8857	TFAUNA	Very certain	Survey	Caught or trapped	33	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1997	8858	TFAUNA	Very certain	Survey	Caught or trapped	37	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1998	8859	TFAUNA	Very certain	Survey	Caught or trapped	32	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1999	8860	TFAUNA	Very certain	Survey	Caught or trapped	58	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/2000	8861	TFAUNA	Very certain	Survey	Caught or trapped	57	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/2001	8862	TFAUNA	Very certain	Survey	Caught or trapped	30	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/2002	8863	TFAUNA	Very certain	Survey	Caught or trapped	23	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/2003	8864	TFAUNA	Very certain	Survey	Caught or trapped	26	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	25/12/2003	8870	TFAUNA	Very certain	Survey	Caught or trapped	1	Twin Swamps Nature Reserve	Dam of NE-swamp at Twin Swamps NR	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/05/1954	11392	TFAUNA	Very certain	Survey	Caught or trapped	1	Bullsbrook	Warbrook, between railway line and Great Northern Highway	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	22/12/1994	97905	TFAUNA	Very certain	Opportunistic sighting	Sighting	3	Bullsbrook	93 Ellenbrook Road, Bullsbrook	1000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R13385	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	WARBROOK	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R13386	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	WARBROOK	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R21559	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R21560	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R21561	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R21562	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R21563	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R29346	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R29347	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	BULLSBROOK	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R29352	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	ELLENBROOK	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R29366	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS RESERVE	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	7/05/1964	REPT:R29342	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae

NAME_SCI	NAME_COM	CLASS	CONS_CODE	Date	SOURCE_ID	SOURCE	CERTAINTY	METHOD	TYPE	COUNT	LOCALITY	SITE	ACCURACY_M	NAME_ID	FAMILY
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	7/05/1964	REPT:R29343	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	2/06/1964	REPT:R29340	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMP	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	14/10/1964	REPT:R29376	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	ELLENBROOK	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	27/01/1965	REPT:R29339	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	ELLENBROOK	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	14/07/1965	REPT:R29320	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	4/08/1966	REPT:R29349	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	11/08/1966	REPT:R29350	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	2/09/1966	REPT:R29345	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	22/10/1971	REPT:R42201	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	BULLSBROOK	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	13/12/1974	REPT:R47843	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R11092	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	WARBROOK	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R11093	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	WARBROOK	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R114378	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	ELLENBROOK NATURE RESERVE	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R114379	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	ELLENBROOK NATURE RESERVE	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R114381	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS NATURE RESERV	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R114382	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	ELLENBROOK NATURE RESERVE	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R146998	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS NATURE RESERV	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R21858	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	BULLSBROOK RESERVE	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R21859	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	BULLSBROOK RESERVE	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R29337	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R29338	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	ELLENBROOK	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R29341	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R29344	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R29348	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae

NAME_SCI	NAME_COM	CLASS	CONS_CODE	Date	SOURCE_ID	SOURCE	CERTAINTY	METHOD	TYPE	COUNT	LOCALITY	SITE	ACCURACY_M	NAME_ID	FAMILY
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R95403	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	ELLEN SWAMPS RESERVE	50000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	4/11/2019	127152	TFAUNA	Not Sure	Opportunistic sighting	Sighting	2	RAAF Base Pearce	one of the sewerage ponds located at the base	30	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	28/11/1978	138569	TFAUNA	Very certain	Opportunistic sighting	Taken into care	1	Ellen Brook	Crossing Ellen Brook Road 0.7km south of Warbrook Road	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	27/10/1982	138570	TFAUNA	Very certain	Opportunistic sighting	Taken into care	1	West of Twin Swamps Nature Reserve	Railway Road 300-500 south of railway/Warbrook Road crossing	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	24/08/1990	138571	TFAUNA	Very certain	Opportunistic sighting	Caught or trapped	1	East of Twin Swamps Nature Reserve	Private property in clay pan about 1km east of TSNR	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	24/08/1990	138572	TFAUNA	Very certain	Opportunistic sighting	Caught or trapped	1	East of Twin Swamps Nature Reserve	Private property in clay pan about 1km east of TSNR	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	3/02/1994	138573	TFAUNA	Very certain	Opportunistic sighting	Dead	1	East of Twin Swamps Nature Reserve	Edge of clay pan about 1km east of TSNR	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	7/09/1994	138574	TFAUNA	Very certain	Opportunistic sighting	Caught or trapped	1	Sproxton Clay Pan	1km east of Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	7/09/1994	138575	TFAUNA	Very certain	Opportunistic sighting	Sighting	2	East of Twin Swamps Nature Reserve	Sproxton clay plan about 1km east of TSNR	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	8/06/1962	138576	TFAUNA	Very certain	Opportunistic sighting	Sighting	2	Warbrook Road		1000	25345	Cheluidae
Rostratula australis	Australian painted snipe	BIRD	EN	14/09/2012	22936	TFAUNA	Very certain		Day sighting	1	Bullsbrook	in reeds at the RAAF Base Pearce, Bullsbrook	1000	48237	Rostratulidae
Synemon gratiosa	graceful sunmoth	INVERTEBRATE	P4	12/03/2019	127296	TFAUNA	Very Certain (photo, specimen, expert)	Survey	Caught or trapped	1	Bullsbrook	Kimberley Road Bushland	1000	33992	Castniidae
Westralunio carteri	Carter's freshwater mussel	INVERTEBRATE	VU	21/11/1971	85338	TFAUNA	Very Certain (photo, specimen, expert)	Survey	Caught or trapped	1	WALYUNGA NATIONAL PARK	Wooroloo Brook, Darling Range; at bridge on road to Walyunga Lookout	10000	34113	Hyriidae
Westralunio carteri	Carter's freshwater mussel	INVERTEBRATE	VU	26/04/2010	85419	TFAUNA	Very Certain (photo, specimen, expert)	Survey	Caught or trapped	1	BULLSBROOK	Ellen Brook, Warbrook Rd	10000	34113	Hyriidae

APPENDIX 2

Naturemap Report

NatureMap Species Report

Created By Guest user on 10/07/2020

Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	116° 02' 11" E,31° 38' 17" S
Buffer	10km
Group By	Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	1057	4109
Other specially protected fauna	1	1
Priority 1	1	1
Priority 2	6	10
Priority 3	18	64
Priority 4	10	26
Rare or likely to become extinct	20	360
TOTAL	**1113**	**4571**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Rare or likely to become extinct					
1.	3219	*Acacia anomala (Grass Wattle)*		T	
2.	24345	*Botaurus poiciloptilus (Australasian Bittern)*		T	
3.	1213	*Calectasia cyanea (Blue Tinsel Lily)*		T	
4.	24731	*Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black Cockatoo)*		T	
5.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)*		T	
6.	48400	*Calyptorhynchus sp. (white-tailed black cockatoo)*		T	
7.	34773	*Darwinia foetida*		T	Y
8.	24092	*Dasyurus geoffroii (Chuditch, Western Quoll)*		T	
9.	4452	*Diplolaena andrewsii*		T	
10.	17605	*Eleocharis keigheryi*		T	
11.	33559	*Grevillea althoferorum subsp. fragilis*		T	
12.	14408	*Grevillea curviloba subsp. curviloba*		T	
13.	14409	*Grevillea curviloba subsp. incurva*		T	
14.	33983	*Leioproctus douglasiellus (a short-tongued bee)*		T	
15.	24142	*Petrogale lateralis subsp. lateralis (Black-flanked Rock-wallaby, Black-footed Rock-wallaby)*		T	
16.	25345	*Pseudemydura umbrina (Western Swamp Tortoise, Western Swamp Turtle)*		T	
17.	48237	*Rostratula australis (Australian Painted Snipe)*		T	
18.	10862	*Thelymitra stellata (Star Orchid)*		T	
19.	32658	*Trithuria occidentalis (Swan Hydatella)*		T	
20.	34113	*Westralunio carteri (Carter's Freshwater Mussel)*		T	
Other specially protected fauna					
21.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
Priority 1					
22.	11074	*Hydrocotyle striata*		P1	
Priority 2					
23.	8912	*Drosera sewelliae (Red Woolly Sundew)*		P2	
24.	1975	*Grevillea candolleana*		P2	
25.	19775	*Hibbertia glomerata subsp. ginginensis*		P2	
26.	16279	*Schoenus sp. Bullsbrook (J.J. Alford 915)*		P2	Y
27.	7801	*Stylidium squamellosum (Maize Trigger Plant)*		P2	
28.	35581	*Tetraria sp. Chandala (G.J. Keighery 17055)*		P2	
Priority 3					
29.	11229	*Acacia drummondii subsp. affinis*		P3	
30.	14129	*Acacia oncinophylla subsp. oncinophylla*		P3	
31.	11336	*Adenanthos cygnorum subsp. chamaephyton*		P3	
32.	19338	*Chamaescilla gibsonii*		P3	
33.	16245	*Cyathochaeta teretifolia*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
				P3	
34.	41801	*Eryngium pinnatifidum subsp. Palustre (G.J. Keighery 13459)*		P3	
35.	48579	*Euoplos inornatus (inornate trapdoor spider (northern Jarrah Forest))*		P3	
36.	16952	*Guichenotia tuberculata*		P3	
37.	1469	*Haemodorum loratum*		P3	
38.	16317	*Isotropis cuneifolia subsp. glabra*		P3	
39.	33982	*Leioproctus contrarius (a short-tongued bee)*		P3	
40.	25249	*Neelaps calonotos (Black-striped Snake, black-striped burrowing snake)*		P3	
41.	2271	*Persoonia rudis*		P3	
42.	11132	*Platysace ramosissima*		P3	
43.	980	*Schoenus capillifolius*		P3	
44.	18564	*Stylidium aceratum*		P3	
45.	25800	*Stylidium paludicola*		P3	
46.	12460	*Verticordia serrata var. linearis*		P3	
Priority 4					
47.	3115	*Drosera occidentalis (Western Sundew)*		P4	
48.	6233	*Hydrocotyle lemnoides (Aquatic Pennywort)*		P4	
49.	24215	*Hydromys chrysogaster (Water-rat, Rakali)*		P4	
50.	48588	*Isoodon fusciventer (Quenda, southwestern brown bandicoot)*		P4	
51.	48024	*Notamacropus eugenii subsp. derbianus (Tammar Wallaby, Tammar)*		P4	
52.	36200	*Ornduffia submersa*		P4	
53.	34843	*Oxymyrrhine coronata*		P4	
54.	7756	*Stylidium longitubum (Jumping Jacks)*		P4	
55.	16867	*Synaphea grandis*		P4	
56.	14714	*Verticordia lindleyi subsp. lindleyi*		P4	
Non-conservation taxon					
57.	15466	*Acacia applanata*			
58.	15469	*Acacia barbinervis subsp. barbinervis*			
59.	11926	*Acacia drewiana subsp. drewiana*			
60.	3374	*Acacia huegelii*			
61.	18217	*Acacia iteaphylla*	Y		
62.	3409	*Acacia lasiocarpa (Panjang)*			
63.	15721	*Acacia lasiocarpa var. sedifolia*			
64.	3410	*Acacia lateriticola*			
65.	3454	*Acacia nervosa (Rib Wattle)*			
66.	3502	*Acacia pulchella (Prickly Moses)*			
67.	15482	*Acacia pulchella var. goadbyi*			
68.	15483	*Acacia pulchella var. pulchella*			
69.	15480	*Acacia pulchella var. reflexa*			
70.	3527	*Acacia saligna (Orange Wattle, Kudjong)*			
71.	30033	*Acacia saligna subsp. lindleyi*			
72.	30032	*Acacia saligna subsp. saligna*			
73.	3541	*Acacia sessilis*			
74.	3554	*Acacia squamata*			
75.	3602	*Acacia willdenowiana (Grass Wattle)*			
76.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
77.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
78.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
79.	24262	*Acanthiza inornata (Western Thornbill)*			
80.	1205	*Acanthocarpus canaliculatus*			
81.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
82.		*Acariformes sp.*			
83.	25536	*Accipiter fasciatus (Brown Goshawk)*			
84.	6205	*Actinotus leucocephalus (Flannel Flower)*			
85.	1775	*Adenanthos cygnorum (Common Woollybush)*			
86.	1779	*Adenanthos drummondii*			
87.	1791	*Adenanthos obovatus (Basket Flower)*			
88.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
89.	23474	*Agrostocrinum hirsutum*			
90.	1261	*Agrostocrinum scabrum (Blue Grass Lily)*			
91.	23501	*Agrostocrinum scabrum subsp. scabrum*			
92.	184	*Aira caryophyllea (Silvery Hairgrass)*	Y		
93.	187	*Aira praecox (Early Hairgrass)*	Y		
94.	1056	*Alexgeorgea nitens*			
95.	1732	*Allocasuarina humilis (Dwarf Sheoak)*			
96.		*Allothereua maculata*			
97.	2652	*Alternanthera nodiflora (Common Joyweed)*			
98.	2668	*Amaranthus powellii (Powell's Amaranth)*	Y		
99.	20184	*Amphipogon laguroides subsp. laguroides*			

NatureMap
Mapping Western Australia's biodiversity

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
100.	200	*Amphipogon turbinatus*			
101.		*Amphisopodidae sp.*			
102.	2380	*Amyema miquelii (Stalked Mistletoe)*			
103.		*Aname mainae*			
104.		*Aname tepperi*			
105.	1060	*Anarthria laevis*			
106.	24312	*Anas gracilis (Grey Teal)*			
107.	24316	*Anas superciliosa (Pacific Black Duck)*			
108.		*Ancylidae sp.*			
109.	6311	*Andersonia heterophylla*			
110.	6314	*Andersonia lehmanniana*			
111.	11471	*Andersonia lehmanniana subsp. lehmanniana*			
112.	7833	*Angianthus preissianus*			
113.	11470	*Anigozanthos bicolor subsp. bicolor*			
114.	1409	*Anigozanthos humilis (Catspaw)*			
115.	11434	*Anigozanthos humilis subsp. humilis*			
116.	1411	*Anigozanthos manglesii (Mangles Kangaroo Paw, Kurulbrang)*			
117.	29487	*Anigozanthos manglesii var. x angustifolius*			
118.	1413	*Anigozanthos preissii (Albany Catspaw)*			
119.	1416	*Anigozanthos viridis (Green Kangaroo Paw, Kurulbardang)*			
120.	29436	*Anigozanthos viridis subsp. Cataby (S.D. Hopper 1786)*			
121.	11566	*Anigozanthos viridis subsp. viridis*			
122.	44629	*Anilios australis*			
123.		*Anopheles atratipes*			
124.	25241	*Antaresia stimsoni subsp. stimsoni (Stimson's Python)*			
125.	24561	*Anthochaera carunculata (Red Wattlebird)*			
126.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
127.	12724	*Anthotium junciforme*			
128.	24599	*Anthus australis subsp. australis (Australian Pipit)*			
129.	3686	*Aotus cordifolia*			
130.	3688	*Aotus gracillima*			
131.	1117	*Aphelia cyperoides*			
132.	1119	*Aphelia nutans*			
133.	43548	*Aphelia sp. Albany (B.G. Briggs 596)*			
134.	24991	*Aprasia repens (Sand-plain Worm-lizard)*			
135.	24285	*Aquila audax (Wedge-tailed Eagle)*			
136.		*Araneus cyphoxis*			
137.	7838	*Arctotheca calendula (Cape Weed, African Marigold)*	Y		
138.	1264	*Arnocrinum preissii*			
139.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
140.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
141.		*Astartea aff. fascicularis sthcst*			
142.	20350	*Astartea affinis (West-coast Astartea)*			
143.	20283	*Astartea scoparia (Common Astartea)*			
144.	6323	*Astroloma ciliatum (Candle Cranberry)*			
145.	6328	*Astroloma glaucescens*			
146.	6330	*Astroloma macrocalyx (Swan Berry)*			
147.	6334	*Astroloma pallidum (Kick Bush)*			
148.	6337	*Astroloma stomarrhena (Red Swamp Cranberry)*			
149.	6339	*Astroloma xerophyllum*			
150.	17233	*Austrostipa campylachne*			
151.	17234	*Austrostipa compressa*			
152.	17237	*Austrostipa elegantissima*			
153.	17240	*Austrostipa flavescens*			
154.	17254	*Austrostipa tenuifolia*			
155.	36441	*Babingtonia camphorosmae (Camphor Myrtle)*			
156.		*Badumna insignis*			
157.	1382	*Baeometra uniflora*	Y		
158.		*Baetidae sp.*			
159.	32681	*Banksia armata (Prickly Dryandra)*			
160.	32682	*Banksia armata var. armata*			
161.	1800	*Banksia attenuata (Slender Banksia, Piara)*			
162.	32679	*Banksia bipinnatifida subsp. multifida*			
163.	32580	*Banksia dallanneyi subsp. dallanneyi var. dallanneyi*			
164.	32577	*Banksia dallanneyi subsp. dallanneyi var. mellicula*			
165.	32523	*Banksia fraseri var. fraseri*			
166.	1822	*Banksia ilicifolia (Holly-leaved Banksia)*			
167.	1834	*Banksia menziesii (Firewood Banksia)*			
168.	1835	*Banksia micrantha*			
169.	32080	*Banksia sessilis var. sessilis*			

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170.	1852	*Banksia telmatiaea (Swamp Fox Banksia)*			
171.	32315	*Barbula calycina*			
172.		*Barnardius zonarius*			
173.	740	*Baumea arthrophylla*			
174.	741	*Baumea articulata (Jointed Rush)*			
175.	743	*Baumea juncea (Bare Twigrush)*			
176.	747	*Baumea rubiginosa*			
177.	5382	*Beaufortia elegans (Elegant Beaufortia)*			
178.	5387	*Beaufortia macrostemon (Darling Range Beaufortia)*			
179.	7046	*Bellardia trixago (Bellardia)*	Y		
180.	48868	*Bellardia viscosa*	Y		
181.	7855	*Bidens pilosa (Cobbler's Pegs)*	Y		
182.	25788	*Billardiera fraseri (Elegant Pronaya)*			
183.	3165	*Billardiera variifolia*			
184.	1417	*Blancoa canescens (Winter Bell)*			
185.	749	*Bolboschoenus caldwellii (Marsh Club-rush)*			
186.	4432	*Boronia ovata*			
187.	17665	*Boronia purdieana subsp. purdieana*			
188.	4438	*Boronia ramosa*			
189.	1272	*Borya scirpoidea*			
190.	1273	*Borya sphaerocephala (Pincushions)*			
191.	3710	*Bossiaea eriocarpa (Common Brown Pea)*			
192.		*Bostockia porosa*			
193.	8661	*Brachypodium distachyon (False Brome)*	Y		
194.	7867	*Brachyscome bellidioides*			
195.	7878	*Brachyscome iberidifolia*			
196.	42380	*Brachyurophis fasciolatus subsp. fasciolatus (Narrow-banded Shovel-nosed Snake)*			
197.	42381	*Brachyurophis semifasciatus (Southern Shovel-nosed Snake)*			
198.	244	*Briza maxima (Blowfly Grass)*	Y		
199.	245	*Briza minor (Shivery Grass)*	Y		
200.	249	*Bromus diandrus (Great Brome)*	Y		
201.	1383	*Burchardia bairdiae*			
202.	12770	*Burchardia congesta*			
203.	1385	*Burchardia multiflora (Dwarf Burchardia)*			
204.	25713	*Cacatua galerita (Sulphur-crested Cockatoo)*			
205.	24721	*Cacatua galerita subsp. galerita (Sulphur-crested Cockatoo)*	Y		
206.	25714	*Cacatua pastinator (Western Long-billed Corella)*			
207.	25715	*Cacatua roseicapilla (Galah)*			
208.	25716	*Cacatua sanguinea (Little Corella)*			
209.	24729	*Cacatua tenuirostris (Eastern Long-billed Corella)*	Y		
210.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
211.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
212.		*Caenidae sp.*			
213.	1276	*Caesia micrantha (Pale Grass Lily)*			
214.	1586	*Caladenia discoidea (Dancing Orchid)*			
215.	1592	*Caladenia flava (Cowslip Orchid)*			
216.	15348	*Caladenia flava subsp. flava*			
217.	1602	*Caladenia longicauda (Common White Spider Orchid)*			
218.	15365	*Caladenia longicauda subsp. longicauda*			
219.	1605	*Caladenia marginata (White Fairy Orchid)*			
220.	15503	*Caladenia paludosa*			
221.	18019	*Caladenia vulgata*			
222.	2846	*Calandrinia calyptrata (Pink Purslane)*			
223.	2854	*Calandrinia granulifera (Pygmy Purslane)*			
224.	2856	*Calandrinia liniflora (Parakeelya)*			
225.		*Calandrinia sp.*			
226.	16365	*Calandrinia sp. Kenwick (G.J. Keighery 10905)*			
227.	19309	*Calectasia narragara*			
228.	36600	*Callitris pyramidalis (Swamp Cypress)*			
229.	5415	*Calothamnus lateralis*			
230.	5426	*Calothamnus quadrifidus (One-sided Bottlebrush, Kwowdjard)*			
231.	5429	*Calothamnus sanguineus (Silky-leaved Blood flower, Pindak)*			
232.	25717	*Calyptorhynchus banksii (Red-tailed Black-Cockatoo)*			
233.	5439	*Calytrix angulata (Yellow Starflower)*			
234.	5458	*Calytrix flavescens (Summer Starflower)*			
235.	5479	*Calytrix strigosa*			
236.	5481	*Calytrix sylvana*			
237.	5485	*Calytrix variabilis*			
238.	19713	*Campsis radicans*	Y		
239.	1162	*Cartonema philydroides*			

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240.	2951	*Cassytha flava (Dodder Laurel)*			
241.	2952	*Cassytha glabella (Tangled Dodder Laurel)*			
242.	11211	*Cassytha glabella forma dispar*			
243.	2956	*Cassytha pomiformis (Dodder Laurel)*			
244.	2957	*Cassytha racemosa (Dodder Laurel)*			
245.	11799	*Cassytha racemosa forma racemosa*			
246.	1742	*Casuarina obesa (Swamp Sheoak, Kuli)*			
247.	760	*Caustis dioica*			
248.		*Ceinidae sp.*			
249.	258	*Cenchrus ciliaris (Buffel Grass)*	Y		
250.	6539	*Centaurium erythraea (Common Centaury)*	Y		
251.	6542	*Centaurium tenuiflorum*	Y		
252.	1120	*Centrolepis alepyroides*			
253.	1121	*Centrolepis aristata (Pointed Centrolepis)*			
254.	1123	*Centrolepis caespitosa*			
255.	1125	*Centrolepis drummondiana*			
256.	1131	*Centrolepis inconspicua*			
257.	1132	*Centrolepis mutica*			
258.	1133	*Centrolepis pilosa*			
259.	1134	*Centrolepis polygyna (Wiry Centrolepis)*			
260.		*Ceratopogonidae sp.*			
261.		*Cercophonius granulosus*			
262.	17685	*Chaetanthus aristatus*			
263.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
264.	1280	*Chamaescilla corymbosa (Blue Squill)*			
265.	11299	*Chamaescilla corymbosa var. corymbosa*			
266.	8788	*Chamaescilla versicolor*			
267.	35598	*Chamelaucium sp. Winchester (C. Chapman s.n. PERTH 07879180)*			
268.	5498	*Chamelaucium uncinatum (Geraldton Wax)*			
269.	31	*Cheilanthes austrotenuifolia*			
270.	3169	*Cheiranthera preissiana*			
271.	43380	*Chelodina colliei (South-western Snake-necked Turtle)*			
272.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
273.	2491	*Chenopodium macrospermum*	Y		
274.		*Cherax quinquecarinatus*			
275.		*Cherax sp.*			
276.		*Chironominae sp.*			
277.		*Chironomus aff. alternans (V24) (CB)*			
278.	267	*Chloris gayana (Rhodes Grass)*	Y		
279.	272	*Chloris virgata (Feathertop Rhodes Grass)*	Y		
280.	17833	*Chordifex microcodon*			
281.	24980	*Christinus marmoratus (Marbled Gecko)*			
282.	24431	*Chrysococcyx basalis (Horsfield's Bronze Cuckoo)*			
283.	24432	*Chrysococcyx lucidus subsp. plagosus (Shining Bronze Cuckoo)*			
284.	6543	*Cicendia filiformis (Slender Cicendia)*	Y		
285.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
286.	4550	*Comesperma calymega (Blue-spike Milkwort)*			
287.	4551	*Comesperma ciliatum*			
288.	4561	*Comesperma scoparium (Broom Milkwort)*			
289.	4564	*Comesperma virgatum (Milkwort)*			
290.	15607	*Conospermum acerosum subsp. acerosum*			
291.	15041	*Conospermum canaliculatum*			
292.	15516	*Conospermum canaliculatum subsp. canaliculatum*			
293.	1875	*Conospermum huegelii (Slender Smokebush)*			
294.	1880	*Conospermum polycephalum*			
295.	1882	*Conospermum stoechadis (Common Smokebush)*			
296.	15520	*Conospermum stoechadis subsp. sclerophyllum*			
297.	15611	*Conospermum stoechadis subsp. stoechadis (Common Smokebush)*			
298.	1885	*Conospermum triplinervium (Tree Smokebush)*			
299.	6347	*Conostephium minus (Pink-tipped Pearl flower)*			
300.	6348	*Conostephium pendulum (Pearl Flower)*			
301.	6349	*Conostephium preissii*			
302.	1418	*Conostylis aculeata (Prickly Conostylis)*			
303.	11826	*Conostylis aculeata subsp. aculeata*			
304.	11552	*Conostylis aculeata subsp. bromelioides*			
305.	11513	*Conostylis aculeata subsp. cygnorum*			
306.	12109	*Conostylis aculeata subsp. preissii*			
307.	1420	*Conostylis androstemma (Trumpets)*			
308.	1423	*Conostylis aurea (Golden Conostylis)*			
309.	11438	*Conostylis candicans subsp. candicans*			

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310.	1429	*Conostylis caricina*			
311.	12035	*Conostylis caricina subsp. caricina*			
312.	1436	*Conostylis juncea*			
313.	1454	*Conostylis setigera (Bristly Cottonhead)*			
314.	11597	*Conostylis setigera subsp. setigera*			
315.	1455	*Conostylis setosa (White Cottonhead)*			
316.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
317.		*Corduliidae sp.*			
318.	17700	*Coriandrum sativum (Coriander)*	Y		
319.		*Corixidae sp.*			
320.		*Cormocephalus aurantiipes*			
321.		*Cormocephalus strigosus*			
322.		*Cormocephalus turneri*			
323.	48259	*Cortaderia selloana subsp. selloana*	Y		
324.	25592	*Corvus coronoides (Australian Raven)*			
325.	24417	*Corvus coronoides subsp. perplexus (Australian Raven)*			
326.	17104	*Corymbia calophylla (Marri)*			
327.	1285	*Corynotheca micrantha (Sand Lily)*			
328.	7945	*Cotula coronopifolia (Waterbuttons)*	Y		
329.	7946	*Cotula cotuloides (Smooth Cotula)*			
330.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
331.	25595	*Cracticus tibicen (Australian Magpie)*			
332.	25596	*Cracticus torquatus (Grey Butcherbird)*			
333.	13354	*Craspedia variabilis*			
334.	17701	*Crassula closiana*			
335.	3137	*Crassula colorata (Dense Stonecrop)*			
336.	3139	*Crassula exserta*			
337.	3142	*Crassula natans*	Y		
338.	24918	*Crenadactylus ocellatus subsp. ocellatus (Clawless Gecko)*			
339.	7953	*Crepis foetida (Foetid Hawksbeard)*	Y		
340.	25398	*Crinia georgiana (Quacking Frog)*			
341.	25400	*Crinia insignifera (Squelching Froglet)*			
342.	25401	*Crinia pseudinsignifera (Bleating Froglet)*			
343.	35838	*Cristonia biloba subsp. biloba*			
344.	13470	*Cryptandra arbutiflora var. arbutiflora*			
345.	30893	*Cryptoblepharus buchananii*			
346.		*Cryptochironomus griseidorsum*			
347.	30899	*Ctenophorus adelaidensis (Southern Heath Dragon, Western Heath Dragon)*			
348.	25027	*Ctenotus australis*			
349.	25039	*Ctenotus fallens*			
350.		*Culex (Culex) australicus*			
351.		*Culicidae sp.*			
352.		*Culiseta atra*			
353.		*Curculionidae sp.*			
354.	6663	*Cuscuta epithymum (Lesser Dodder, Greater Dodder)*	Y		
355.	15404	*Cyanicula sericea*			
356.	51	*Cyathea cooperi*	Y		
357.	768	*Cyathochaeta avenacea*			
358.	54	*Cyclosorus interruptus*			
359.	40661	*Cycnogeton lineare*			
360.	24322	*Cygnus atratus (Black Swan)*			
361.	283	*Cynodon dactylon (Couch)*	Y		
362.	783	*Cyperus congestus (Dense Flat-sedge)*	Y		
363.	806	*Cyperus polystachyos (Bunchy Sedge)*			
364.	815	*Cyperus tenellus (Tiny Flatsedge)*	Y		
365.	816	*Cyperus tenuiflorus (Scaly Sedge)*	Y		
366.	17952	*Cyrtomium falcatum*	Y		
367.	17692	*Cytogonidium leptocarpoides*			
368.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*	Y		
369.	290	*Dactyloctenium radulans (Button Grass)*			
370.	7428	*Dampiera coronata (Wedge-leaved Dampiera)*			
371.	7454	*Dampiera linearis (Common Dampiera)*			
372.	7482	*Dampiera teres (Terete-leaved Dampiera)*			
373.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
374.	5531	*Darwinia thymoides*			
375.	1218	*Dasypogon bromeliifolius (Pineapple Bush)*			
376.	6218	*Daucus glochidiatus (Australian Carrot)*			
377.	3793	*Daviesia angulata*			
378.	15656	*Daviesia brachyphylla*			
379.	3805	*Daviesia decurrens (Prickly Bitter-pea)*			

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380.	18560	*Daviesia divaricata subsp. divaricata*			
381.	11879	*Daviesia hakeoides subsp. hakeoides*			
382.	3815	*Daviesia horrida (Prickly Bitter-pea)*			
383.	15505	*Daviesia incrassata subsp. incrassata*			
384.	3819	*Daviesia longifolia*			
385.	3824	*Daviesia nudiflora*			
386.	3832	*Daviesia physodes*			
387.	3835	*Daviesia preissii*			
388.	3845	*Daviesia triflora*			
389.	17663	*Desmocladus asper*			
390.	46362	*Desmocladus lateriflorus*			
391.	1259	*Dianella revoluta (Blueberry Lily)*			
392.	11636	*Dianella revoluta var. divaricata*			
393.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
394.	306	*Dichelachne crinita (Longhair Plumegrass)*			
395.	1287	*Dichopogon capillipes*			
396.	1289	*Dichopogon preissii*			
397.	17838	*Dielsia stenostachya*			
398.	320	*Digitaria sanguinalis (Crab Grass)*	Y		
399.		*Dingosa serrata*			
400.	1509	*Dioscorea hastifolia (Warrine, Wararn)*			
401.	24929	*Diplodactylus granariensis subsp. granariensis*			
402.	18589	*Diplopeltis huegelii subsp. lehmannii*			
403.	7055	*Dischisma capitatum (Woolly-headed Dischisma)*	Y		
404.	7961	*Dittrichia graveolens (Stinkwort)*	Y		
405.	11049	*Diuris corymbosa*			
406.	1638	*Diuris setacea (Bristly Donkey Orchid)*			
407.	24470	*Dromaius novaehollandiae (Emu)*			
408.	48751	*Drosera drummondii*			
409.	3095	*Drosera erythrorhiza (Red Ink Sundew)*			
410.	3097	*Drosera gigantea (Giant Sundew)*			
411.	3098	*Drosera glanduligera (Pimpernel Sundew)*			
412.	13195	*Drosera helodes*			
413.	3101	*Drosera heterophylla (Swamp Rainbow)*			
414.	13197	*Drosera hyperostigma*			
415.	3106	*Drosera macrantha (Bridal Rainbow)*			
416.	48767	*Drosera magna*			
417.	3109	*Drosera menziesii (Pink Rainbow)*			
418.	48709	*Drosera minutiflora*			
419.	3113	*Drosera neesii (Jewel Rainbow)*			
420.	3114	*Drosera nitidula (Shining Sundew)*			
421.	3118	*Drosera pallida (Pale Rainbow)*			
422.	3123	*Drosera platystigma (Black-eyed Sundew)*			
423.	3124	*Drosera pulchella (Pretty Sundew)*			
424.	13185	*Drosera spilos*			
425.	3131	*Drosera stolonifera (Leafy Sundew)*			
426.	13184	*Drosera walyunga*			
427.	19254	*Drosera zigzagia*			
428.		*Dugesiidae sp.*			
429.		*Dytiscidae sp.*			
430.	25251	*Echiopsis curta (Bardick)*			
431.	6681	*Echium plantagineum (Paterson's Curse)*	Y		
432.		*Edelia vittata*			
433.	25100	*Egernia napoleonis*			
434.		*Egretta novaehollandiae*			
435.	347	*Ehrharta calycina (Perennial Veldt Grass)*	Y		
436.	349	*Ehrharta longiflora (Annual Veldt Grass)*	Y		
437.	24290	*Elanus caeruleus subsp. axillaris (Australian Black-shouldered Kite)*			
438.	25250	*Elapognathus coronatus (Crowned Snake)*			
439.	822	*Eleocharis acuta (Common Spikerush)*			
440.	353	*Eleusine indica (Crowsfoot Grass)*	Y		
441.	1644	*Elythranthera emarginata (Pink Enamel Orchid)*			
442.		*Enchytraeidae sp.*			
443.		*Eolophus roseicapillus*			
444.	6131	*Epilobium billardiereanum (Glabrous Willow Herb)*			
445.	24567	*Epthianura albifrons (White-fronted Chat)*			
446.	374	*Eragrostis cilianensis (Stinkgrass)*	Y		
447.	376	*Eragrostis curvula (African Lovegrass)*	Y		
448.	378	*Eragrostis dielsii (Mallee Lovegrass)*			
449.	13950	*Eremaea asterocarpa subsp. asterocarpa*			

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450.	5541	*Eremaea pauciflora*			
451.	5542	*Eremaea purpurea*			
452.	17175	*Eremophila glabra subsp. albicans*			
453.	1646	*Eriochilus dilatatus (White Bunny Orchid)*			
454.	6219	*Eryngium pinnatifidum (Blue Devils)*			
455.	15446	*Eryngium pinnatifidum subsp. pinnatifidum*			
456.	5545	*Eucalyptus accedens (Powderbark Wandoo)*			
457.	5708	*Eucalyptus marginata (Jarrah, Djara)*			
458.	13548	*Eucalyptus marginata subsp. thalassica (Blue-leaved Jarrah)*			
459.	5763	*Eucalyptus rudis (Flooded Gum, Kulurda)*			
460.	5790	*Eucalyptus todtiana (Coastal Blackbutt)*			
461.	5797	*Eucalyptus wandoo (Wandoo, Wondu)*			
462.	3872	*Euchilopsis linearis (Swamp Pea)*			
463.		*Eucyclops edytae*			Y
464.	4648	*Euphorbia terracina (Geraldton Carnation Weed)*	Y		
465.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
466.	25623	*Falco longipennis (Australian Hobby)*			
467.	24041	*Felis catus (Cat)*	Y		
468.	20216	*Ficinia nodosa (Knotted Club Rush)*			
469.	1747	*Ficus carica (Common Fig)*	Y		
470.	2969	*Fumaria capreolata (Whiteflower Fumitory)*	Y		
471.	32370	*Funaria hygrometrica*			
472.	900	*Gahnia aristata*			
473.	907	*Gahnia trifida (Coast Saw-sedge)*			
474.	7321	*Galium divaricatum*	Y		
475.	25729	*Gallinula tenebrosa (Dusky Moorhen)*			
476.		*Gambusia sp.*			
477.	3895	*Gastrolobium calycinum (York Road Poison)*			
478.	20473	*Gastrolobium ebracteolatum*			
479.	20483	*Gastrolobium linearifolium*			
480.	20512	*Gastrolobium praemorsum*			
481.	19733	*Gastrolobium retusum*			
482.	3924	*Gastrolobium spinosum (Prickly Poison)*			
483.	42314	*Gavicalis virescens (Singing Honeyeater)*			
484.	24959	*Gehyra variegata*			
485.	32380	*Gemmabryum pachythecum*			
486.	4339	*Geranium molle (Dove's Foot Cranesbill)*	Y		
487.	25530	*Gerygone fusca (Western Gerygone)*			
488.	1520	*Gladiolus caryophyllaceus (Wild Gladiolus)*	Y		
489.	1524	*Gladiolus undulatus (Wild Gladiolus)*	Y		
490.	6143	*Glischrocaryon aureum (Common Popflower)*			
491.	47962	*Glyciphila melanops (Tawny-crowned Honeyeater)*			
492.	7991	*Gnephosis drummondii*			
493.		*Gnephosis tenuissima - drummondii complex*			
494.		*Gnephosis tenuissima-drummondii complex*			
495.	10909	*Gompholobium confertum*			
496.	3950	*Gompholobium knightianum*			
497.	3951	*Gompholobium marginatum*			
498.	3955	*Gompholobium preissii*			
499.	11083	*Gompholobium scabrum*			
500.	3957	*Gompholobium tomentosum (Hairy Yellow Pea)*			
501.	6149	*Gonocarpus cordiger*			
502.	6159	*Gonocarpus nodulosus*			
503.	6161	*Gonocarpus pithyoides*			
504.	29362	*Goodenia coerulea*			
505.	12551	*Goodenia micrantha*			
506.	7538	*Goodenia pulchella*			
507.	24443	*Grallina cyanoleuca (Magpie-lark)*			
508.	7394	*Grammatotheca bergiana*	Y		
509.	14282	*Gratiola pubescens*			
510.	14106	*Grevillea althoferorum*			Y
511.	19628	*Grevillea bipinnatifida subsp. bipinnatifida*			
512.	1984	*Grevillea curviloba*			
513.	8836	*Grevillea obtusifolia (Obtuse Leaved Grevillea)*			
514.	2066	*Grevillea pilulifera (Woolly-flowered Grevillea)*			
515.	2080	*Grevillea quercifolia (Oak-leaf Grevillea)*			
516.	14421	*Grevillea synapheae subsp. synapheae*			
517.	12824	*Grevillea vestita subsp. vestita*			
518.		*Gripopterygidae sp.*			
519.		*Gyrinidae sp.*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
520.	1465	*Haemodorum discolor*			
521.	1468	*Haemodorum laxum*			
522.	1470	*Haemodorum paniculatum (Mardja)*			
523.	1472	*Haemodorum simplex*			
524.	1474	*Haemodorum sparsiflorum*			
525.	1475	*Haemodorum spicatum (Mardja)*			
526.	2149	*Hakea cristata (Snail Hakea)*			
527.	2158	*Hakea erinacea (Hedge-hog Hakea)*			
528.	2166	*Hakea incrassata (Marble Hakea)*			
529.	2175	*Hakea lissocarpha (Honey Bush)*			
530.	2197	*Hakea prostrata (Harsh Hakea)*			
531.	2203	*Hakea ruscifolia (Candle Hakea)*			
532.	31413	*Hakea sp. Walyunga (B. Keighery 2599)*			
533.	2212	*Hakea sulcata (Furrowed Hakea)*			
534.	2215	*Hakea undulata (Wavy-leaved Hakea)*			
535.	2216	*Hakea varia (Variable-leaved Hakea)*			
536.	24295	*Haliastur sphenurus (Whistling Kite)*			
537.	3961	*Hardenbergia comptoniana (Native Wisteria)*			
538.		*Harpacticoida sp*			
539.		*Hebridae sp.*			
540.	25408	*Heleioporus albopunctatus (Western Spotted Frog)*			
541.	25409	*Heleioporus barycragus (Hooting Frog)*			
542.	25410	*Heleioporus eyrei (Moaning Frog)*			
543.	25411	*Heleioporus inornatus (Whooping Frog)*			
544.	3016	*Heliophila pusilla*	Y		
545.	11451	*Hemarthria uncinata var. uncinata*			
546.	6838	*Hemiandra linearis (Speckled Snakebush)*			
547.	6839	*Hemiandra pungens (Snakebush)*			
548.		*Hemicorduliidae sp.*			
549.	25115	*Hemiergis initialis subsp. initialis*			
550.	25119	*Hemiergis quadrilineata*			
551.	6842	*Hemigenia barbata*			
552.		*Henicops dentatus*			
553.	1526	*Hesperantha falcata*	Y		
554.	5108	*Hibbertia acerosa (Needle Leaved Guinea Flower)*			
555.	5112	*Hibbertia aurea*			
556.	5114	*Hibbertia commutata*			
557.	5134	*Hibbertia huegelii*			
558.	5135	*Hibbertia hypericoides (Yellow Buttercups)*			
559.	45534	*Hibbertia hypericoides subsp. hypericoides*			
560.	45533	*Hibbertia hypericoides subsp. septentrionalis*			
561.	5139	*Hibbertia lasiopus (Large Hibbertia)*			
562.	5162	*Hibbertia racemosa (Stalked Guinea Flower)*			
563.	5171	*Hibbertia spicata*			
564.	5172	*Hibbertia stellaris (Orange Stars)*			
565.	48381	*Hibbertia striata*			
566.	5173	*Hibbertia subvaginata*			
567.	47965	*Hieraaetus morphnoides (Little Eagle)*			
568.	24491	*Hirundo neoxena (Welcome Swallow)*			
569.	13758	*Histiopteris incisa*			
570.		*Holconia westralia*			
571.	444	*Holcus lanatus (Yorkshire Fog)*	Y		
572.	445	*Holcus setiger (Annual Fog)*	Y		
573.	6222	*Homalosciadium homalocarpum*			
574.	3968	*Hovea trisperma (Common Hovea)*			
575.	12907	*Hovea trisperma var. grandiflora*			
576.	12859	*Hovea trisperma var. trisperma*			
577.	12741	*Hyalosperma cotula*			
578.	5216	*Hybanthus calycinus (Wild Violet)*			
579.		*Hydridae sp.*			
580.	6223	*Hydrocotyle alata*			
581.	6226	*Hydrocotyle callicarpa (Small Pennywort)*			
582.	6229	*Hydrocotyle diantha*			
583.		*Hydroptilidae sp.*			
584.	5817	*Hypocalymma angustifolium (White Myrtle, Kudjid)*			
585.	35074	*Hypocalymma angustifolium subsp. Dandaragan plateau (S. Patrick 702A)*			
586.	35070	*Hypocalymma angustifolium subsp. Swan Coastal Plain (G.J. Keighery 16777)*			
587.	5825	*Hypocalymma robustum (Swan River Myrtle)*			
588.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
589.	1070	*Hypolaena exsulca*			

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590.		*Idiommata blackwalli*			
591.	910	*Isolepis cernua (Nodding Club-rush)*			
592.	20200	*Isolepis cernua var. setiformis*			
593.	912	*Isolepis cyperoides*			
594.	14540	*Isolepis hystrix*	Y		
595.	917	*Isolepis marginata (Coarse Club-rush)*			
596.	919	*Isolepis oldfieldiana*			
597.	921	*Isolepis producta*			
598.	2221	*Isopogon asper*			
599.	2229	*Isopogon dubius (Pincushion Coneflower)*			
600.	19996	*Isopogon sp. Darling Range (F. Hort 1662)*			
601.	7396	*Isotoma hypocrateriformis (Woodbridge Poison)*			
602.	3992	*Isotropis cuneifolia (Granny Bonnets)*			
603.	4010	*Jacksonia floribunda (Holly Pea)*			
604.	4012	*Jacksonia furcellata (Grey Stinkwood)*			
605.	4029	*Jacksonia sternbergiana (Stinkwood, Kapur)*			
606.	1298	*Johnsonia pubescens (Pipe Lily)*			
607.	19632	*Johnsonia pubescens subsp. pubescens*			
608.	1175	*Juncus acutus (Spiny Rush)*	Y		
609.	1178	*Juncus bufonius (Toad Rush)*	Y		
610.	1180	*Juncus capitatus (Capitate Rush)*	Y		
611.	1184	*Juncus holoschoenus (Jointleaf Rush)*			
612.	1188	*Juncus pallidus (Pale Rush)*			
613.	1190	*Juncus planifolius (Broadleaf Rush)*			
614.	1195	*Juncus subsecundus (Finger Rush)*			
615.	4044	*Kennedia prostrata (Scarlet Runner)*			
616.	11898	*Kickxia elatine subsp. elatine*	Y		
617.	5835	*Kunzea micrantha*			
618.	17461	*Kunzea micrantha subsp. micrantha*			
619.	17785	*Kunzea micrantha subsp. petiolata*			
620.	5841	*Kunzea recurva*			
621.	19955	*Lachnagrostis plebeia*			
622.	17209	*Lachnostachys verbascifolia var. verbascifolia*			
623.	18585	*Lagenophora huegelii*			
624.	14083	*Lambertia multiflora var. darlingensis*			
625.	5034	*Lasiopetalum glabratum*			
626.	45082	*Lasiopetalum glutinosum subsp. latifolium*			
627.	4052	*Latrobea tenella*			
628.	4959	*Lawrencia squamata*			
629.	1307	*Laxmannia ramosa (Branching Lily)*			
630.	11911	*Laxmannia ramosa subsp. ramosa*			
631.	11464	*Laxmannia sessiliflora subsp. australis*			
632.	1309	*Laxmannia squarrosa*			
633.	7568	*Lechenaultia biloba (Blue Leschenaultia)*			
634.	7572	*Lechenaultia expansa*			
635.	7574	*Lechenaultia floribunda (Free-flowering Leschenaultia)*			
636.	1051	*Lemna disperma (Duckweed)*			
637.	8099	*Leontodon saxatilis (Hairy Hawkbit)*	Y		
638.	1075	*Lepidobolus preissianus*			
639.	925	*Lepidosperma angustatum*			
640.	41620	*Lepidosperma asperatum*			
641.	936	*Lepidosperma leptostachyum*			
642.	937	*Lepidosperma longitudinale (Pithy Sword-sedge)*			
643.		*Lepidosperma sp.*			
644.	1653	*Leporella fimbriata (Hare Orchid)*			
645.	1077	*Leptocarpus canus (Hoary Twine-rush)*			
646.	1078	*Leptocarpus coangustatus*			
647.	1080	*Leptocarpus scariosus*			
648.		*Leptoceridae sp.*			
649.	2344	*Leptomeria empetriformis*			
650.	5847	*Leptospermum erubescens (Roadside Teatree)*			
651.	5850	*Leptospermum laevigatum (Coast Teatree)*	Y		
652.	5857	*Leptospermum spinescens*			
653.	1088	*Lepyrodia macra (Large Scale Rush)*			
654.	25133	*Lerista elegans*			
655.	25148	*Lerista lineopunctulata*			
656.	25165	*Lerista praepedita*			
657.		*Lethocolea pansa*			
658.	6374	*Leucopogon conostephioides*			
659.	6397	*Leucopogon glaucifolius*			

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660.	6434	*Leucopogon polymorphus*			
661.	6436	*Leucopogon propinquus*			
662.	6439	*Leucopogon pulchellus (Beard-heath)*			
663.	7672	*Levenhookia octomaculata (Eight-spotted Stylewort)*			
664.	7676	*Levenhookia pusilla (Midget Stylewort)*			
665.	7677	*Levenhookia stipitata (Common Stylewort)*			
666.	25005	*Lialis burtonis*			
667.	25661	*Lichmera indistincta (Brown Honeyeater)*			
668.	25415	*Limnodynastes dorsalis (Western Banjo Frog)*			
669.	4363	*Linum trigynum (French Flax)*	Y		
670.	36160	*Liparophyllum capitatum*			
671.	25378	*Litoria adelaidensis (Slender Tree Frog)*			
672.	9289	*Lobelia anceps (Angled Lobelia)*			
673.	7408	*Lobelia tenuior (Slender Lobelia)*			
674.	476	*Lolium perenne (Perennial Ryegrass)*	Y		
675.	478	*Lolium rigidum (Wimmera Ryegrass)*	Y		
676.		*Lolium sp.*			
677.	1222	*Lomandra brittanii*			
678.	1223	*Lomandra caespitosa (Tufted Mat Rush)*			
679.	1228	*Lomandra hermaphrodita*			
680.	1232	*Lomandra micrantha (Small-flower Mat-rush)*			
681.	1234	*Lomandra nigricans*			
682.	1239	*Lomandra preissii*			
683.	1243	*Lomandra sericea (Silky Mat Rush)*			
684.	1246	*Lomandra suaveolens*			
685.	4059	*Lotus angustissimus (Narrowleaf Trefoil)*	Y		
686.		*Lotus sp. (Bull 08)*			Y
687.	8564	*Lotus subbiflorus*	Y		
688.	4065	*Lupinus angustifolius (Narrowleaf Lupin)*	Y		
689.	12783	*Lycopodiella serpentina*			
690.	1097	*Lyginia barbata*			
691.	18049	*Lyginia imberbis*			
692.		*Lymnaeidae sp.*			
693.	36375	*Lysimachia arvensis (Pimpernel)*	Y		
694.	6456	*Lysinema ciliatum (Curry Flower)*			
695.	34736	*Lysinema pentapetalum*			
696.	5281	*Lythrum hyssopifolia (Lesser Loosestrife)*	Y		
697.	2838	*Macarthuria apetala*			
698.	2839	*Macarthuria australis*			
699.	1477	*Macropidia fuliginosa (Black Kangaroo Paw)*			
700.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
701.	24135	*Macropus robustus subsp. erubescens (Euro, Biggada)*			
702.	18119	*Macrozamia fraseri*			
703.	85	*Macrozamia riedlei (Zamia, Djiridji)*			
704.	24551	*Malurus pulcherrimus (Blue-breasted Fairy-wren)*			
705.	25654	*Malurus splendens (Splendid Fairy-wren)*			
706.	24583	*Manorina flavigula (Yellow-throated Miner)*			
707.	17637	*Marianthus candidus (White Marianthus)*			
708.	17636	*Marianthus coeruleopunctatus (Blue-spotted Marianthus)*			
709.	4079	*Medicago polymorpha (Burr Medic)*	Y		
710.	5880	*Melaleuca bracteosa*			
711.	5881	*Melaleuca brevifolia*			
712.	5893	*Melaleuca concreta*			
713.	5900	*Melaleuca cuticularis (Saltwater Paperbark)*			
714.	5920	*Melaleuca huegelii (Chenille Honeymyrtle)*			
715.	5926	*Melaleuca lateritia (Robin Redbreast Bush)*			
716.	20297	*Melaleuca osullivanii*			
717.	18394	*Melaleuca parviceps*			
718.	5952	*Melaleuca preissiana (Moonah)*			
719.	5958	*Melaleuca radula (Graceful Honeymyrtle)*			
720.	5959	*Melaleuca rhaphiophylla (Swamp Paperbark)*			
721.	19365	*Melaleuca ryeae*			
722.	5964	*Melaleuca seriata*			
723.		*Melaleuca sp. B FPR (BJK&NG 054)*			Y
724.	5978	*Melaleuca teretifolia (Banbar)*			
725.	5983	*Melaleuca trichophylla*			
726.	5984	*Melaleuca uncinata (Broom Bush, Kwidjard)*			
727.	5987	*Melaleuca viminea (Mohan)*			
728.	13280	*Melaleuca viminea subsp. viminea*			
729.	4085	*Melilotus indicus*	Y		

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730.	25184	*Menetia greyii*			
731.	24598	*Merops ornatus (Rainbow Bee-eater)*			
732.		*Mesamphisopodidae sp.*			
733.	955	*Mesomelaena pseudostygia*			
734.	957	*Mesomelaena tetragona (Semaphore Sedge)*			
735.		*Mesostigmata sp.*			
736.	6897	*Microcorys longifolia*			
737.	485	*Microlaena stipoides (Weeping Grass)*			
738.	10954	*Microtis media (Tall Mignonette Orchid)*			
739.	15419	*Microtis media subsp. media*			
740.		*Microvelia sp.*			
741.	8105	*Millotia myosotidifolia*			
742.	8106	*Millotia tenuifolia (Soft Millotia)*			
743.	7085	*Misopates orontium (Lesser Snapdragon)*	Y		
744.		*Missulena granulosa*			
745.		*Mixocyclops sp.*			
746.	7410	*Monopsis debilis*	Y		
747.	37440	*Monopsis debilis var. depressa*	Y		
748.	4662	*Monotaxis grandiflora (Diamond of the Desert)*			
749.	19585	*Monotaxis grandiflora var. grandiflora*			
750.	4666	*Monotaxis occidentalis*			
751.	19179	*Moraea flaccida (One-leaf Cape Tulip)*	Y		
752.	19180	*Moraea miniata (Two-leaf Cape Tulip)*	Y		
753.	25240	*Morelia spilota subsp. imbricata (Carpet Python)*			
754.	25192	*Morethia obscura*			
755.	2412	*Muehlenbeckia adpressa (Climbing Lignum)*			
756.	24223	*Mus musculus (House Mouse)*	Y		
757.	25610	*Myiagra inquieta (Restless Flycatcher)*			
758.	25420	*Myobatrachus gouldii (Turtle Frog)*			
759.	7289	*Myoporum caprarioides (Slender Myoporum)*			
760.	8114	*Myriocephalus appendiculatus (White-tip Myriocephalus)*			
761.	8116	*Myriocephalus guerinae*			
762.	8117	*Myriocephalus helichrysoides*			
763.	6192	*Myriophyllum drummondii*			
764.	25248	*Neelaps bimaculatus (Black-naped Snake)*			
765.		*Nematoda sp.*			
766.	25426	*Neobatrachus pelobatoides (Humming Frog)*			
767.	24738	*Neophema elegans (Elegant Parrot)*			
768.		*Nephila edulis*			
769.	492	*Neurachne alopecuroidea (Foxtail Mulga Grass)*			
770.	6974	*Nicotiana glauca (Tree Tobacco)*	Y		
771.	25252	*Notechis scutatus (Tiger Snake)*			
772.		*Notonectidae sp.*			
773.	2401	*Nuytsia floribunda (Christmas Tree, Mudja)*			
774.	48027	*Nyctophilus geoffroyi subsp. geoffroyi (Lesser Long-eared Bat)*			
775.	24195	*Nyctophilus gouldi (Gould's Long-eared Bat)*			
776.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
777.	16347	*Oenothera laciniata*	Y		
778.	8133	*Olearia elaeophila*			
779.	32716	*Olearia lehmanniana*			
780.	8143	*Olearia paucidentata (Autumn Scrub Daisy)*			
781.		*Oligochaeta sp.*			
782.		*Oniscidae sp.*			
783.		*Oribatida sp.*			
784.	36177	*Ornduffia albiflora*			
785.	4113	*Ornithopus compressus (Yellow Serradella)*	Y		
786.	7122	*Orobanche minor (Lesser Broomrape)*	Y		
787.		*Orthocladiinae sp.*			
788.	24085	*Oryctolagus cuniculus (Rabbit)*	Y		
789.	4355	*Oxalis perennans*			
790.	4358	*Oxalis purpurea (Largeflower Wood Sorrel)*	Y		
791.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
792.		*Palaemonidae sp.*			
793.		*Paracyclops intermedius*			
794.		*Paracymus pygmaeus*			
795.		*Paralimnophyes pullulus (V42)*			
796.		*Paramerina levidensis*			
797.	516	*Parapholis incurva (Coast Barbgrass)*	Y		
798.	25253	*Parasuta gouldii*			
799.	25681	*Pardalotus punctatus (Spotted Pardalote)*			

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800.	24626	*Pardalotus punctatus subsp. xanthopyge (Yellow-rumped Pardalote)*			
801.	25682	*Pardalotus striatus (Striated Pardalote)*			
802.	7089	*Parentucellia latifolia (Common Bartsia)*	Y		
803.	1546	*Patersonia juncea (Rush Leaved Patersonia)*			
804.	1550	*Patersonia occidentalis (Purple Flag, Koma)*			
805.	30471	*Patersonia occidentalis var. angustifolia*			
806.	30472	*Patersonia occidentalis var. occidentalis*			
807.	43760	*Pauridia occidentalis*			
808.		*Pedidromus velox*			Y
809.	40422	*Pentameris pallida*	Y		
810.	11109	*Pericalymma crassipes*			
811.	6006	*Pericalymma ellipticum (Swamp Teatree)*			
812.	16477	*Pericalymma ellipticum var. ellipticum*			
813.	16478	*Pericalymma ellipticum var. floridum*			
814.	13911	*Persicaria decipiens*			
815.	2258	*Persoonia comata*			
816.	2273	*Persoonia saccata (Snottygobble)*			
817.	48061	*Petrochelidon nigricans (Tree Martin)*			
818.	48066	*Petroica boodang (Scarlet Robin)*			
819.	24659	*Petroica goodenovii (Red-capped Robin)*			
820.	20391	*Petrophile juncifolia*			
821.	2299	*Petrophile linearis (Pixie Mops)*			
822.	2301	*Petrophile macrostachya*			
823.	2308	*Petrophile seminuda*			
824.	2310	*Petrophile shuttleworthiana*			
825.	2312	*Petrophile striata*			
826.	19825	*Petrorhagia dubia*	Y		
827.	24666	*Phalacrocorax melanoleucos subsp. melanoleucos (Little Pied Cormorant)*			
828.		*Phalacrocorax sp.*			
829.	25699	*Phalacrocorax varius (Pied Cormorant)*			
830.	24409	*Phaps chalcoptera (Common Bronzewing)*			
831.	18529	*Philotheca spicata (Pepper and Salt)*			
832.	1172	*Philydrella drummondii*			
833.	1173	*Philydrella pygmaea (Butterfly Flowers)*			
834.	1478	*Phlebocarya ciliata*			
835.	1479	*Phlebocarya filifolia*			
836.	48071	*Phylidonyris niger (White-cheeked Honeyeater)*			
837.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
838.	4675	*Phyllanthus calycinus (False Boronia)*			
839.	4	*Phylloglossum drummondii (Pigmy Clubmoss)*			
840.		*Physidae sp.*			
841.		*Phytophthora cinnamomi*			
842.	5244	*Pimelea floribunda*			
843.	11404	*Pimelea imbricata var. major*			
844.	11402	*Pimelea imbricata var. piligera*			
845.		*Pisum sativum*			
846.		*Planorbidae sp.*			
847.	7304	*Plantago major (Greater Plantain)*	Y		
848.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
849.	24747	*Platycercus spurius (Red-capped Parrot)*			
850.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
851.	24750	*Platycercus zonarius subsp. semitorquatus (Twenty-eight Parrot)*			
852.	24751	*Platycercus zonarius subsp. zonarius (Port Lincoln Parrot)*			
853.	4524	*Platytheca galioides*			
854.	25509	*Pletholax gracilis (Keeled Legless Lizard)*			
855.	571	*Poa annua (Winter Grass)*	Y		
856.	573	*Poa drummondiana (Knotted Poa)*			
857.	577	*Poa poiformis (Coastal Poa)*			
858.	25703	*Podargus strigoides (Tawny Frogmouth)*			
859.	8175	*Podolepis gracilis (Slender Podolepis)*			
860.	8177	*Podolepis lessonii*			
861.	8179	*Podolepis nutans (Nodding Podolepis)*			
862.	8182	*Podotheca angustifolia (Sticky Longheads)*			
863.	8183	*Podotheca chrysantha (Yellow Podotheca)*			
864.	25510	*Pogona minor (Dwarf Bearded Dragon)*			
865.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
866.	8188	*Pogonolepis stricta*			
867.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
868.	35157	*Polypogon maritimus var. subspatheaceus*	Y		
869.	582	*Polypogon monspeliensis (Annual Beardgrass)*	Y		

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
870.	583	*Polypogon tenellus*			
871.	30854	*Polytelis anthopeplus subsp. westralis (Regent Parrot)*			
872.	4691	*Poranthera microphylla (Small Poranthera)*			
873.	2884	*Portulaca oleracea (Purslane, Wakati)*			
874.	1669	*Prasophyllum cyphochilum (Pouched Leek Orchid)*			
875.	1672	*Prasophyllum fimbria (Fringed Leek Orchid)*			
876.	25261	*Pseudechis australis (Mulga Snake)*			
877.	25511	*Pseudonaja affinis (Dugite)*			
878.	25259	*Pseudonaja affinis subsp. affinis (Dugite)*			
879.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			
880.	25433	*Pseudophryne guentheri (Crawling Toadlet)*			
881.	13255	*Pterochaeta paniculata*			
882.		*Pterostylis aff. nana*			
883.	12217	*Pterostylis sanguinea*			
884.		*Pterostylis sp.*			
885.	1698	*Pterostylis vittata (Banded Greenhood)*			
886.	2716	*Ptilotus declinatus (Curved Mulla Mulla)*			
887.	11260	*Ptilotus drummondii var. drummondii (Pussytail)*			
888.	2742	*Ptilotus manglesii (Pom Poms, Mulamula)*			
889.	2751	*Ptilotus polystachyus (Prince of Wales Feather)*			
890.	4172	*Pultenaea ericifolia*			
891.	4181	*Pultenaea reticulata*			
892.		*Purpureicephalus spurius*			
893.	25008	*Pygopus lepidopodus (Common Scaly Foot)*			
894.	8195	*Quinetia urvillei*			
895.	2933	*Ranunculus muricatus (Sharp Buttercup)*	Y		
896.	24245	*Rattus rattus (Black Rat)*	Y		
897.	6012	*Regelia ciliata*			
898.	48096	*Rhipidura albiscapa (Grey Fantail)*			
899.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
900.	15035	*Rhodanthe corymbosa*			
901.	13312	*Rhodanthe pyrethrum*			
902.		*Richardsonianidae sp.*			
903.	1556	*Romulea rosea (Guildford Grass)*	Y		
904.	11544	*Romulea rosea var. australis (Guildford Grass)*	Y		
905.		*Rotifera sp.*			
906.	2432	*Rumex conglomeratus (Clustered Dock)*	Y		
907.	2433	*Rumex crispus (Curled Dock)*	Y		
908.	40425	*Rytidosperma caespitosum*			
909.	40426	*Rytidosperma occidentale*			
910.	40427	*Rytidosperma setaceum*			
911.	48433	*Salicornia blackiana*			
912.	6483	*Samolus junceus*			
913.		*Sarcocornia sp. Bull8 (#53)*			Y
914.	7595	*Scaevola anchusifolia*			
915.	7603	*Scaevola canescens (Grey Scaevola)*			
916.	7613	*Scaevola glandulifera (Viscid Hand-flower)*			
917.	7619	*Scaevola lanceolata (Long-leaved Scaevola)*			
918.	7634	*Scaevola phlebopetala (Velvet Fanflower)*			
919.	12585	*Scaevola repens*			
920.	13182	*Scaevola repens var. repens*			
921.	41660	*Schenkia australis*			
922.	24	*Schizaea fistulosa (Narrow Comb Fern)*			
923.	973	*Schoenus asperocarpus (Poison Sedge)*			
924.	978	*Schoenus brevisetis*			
925.	982	*Schoenus clandestinus*			
926.	984	*Schoenus curvifolius*			
927.	985	*Schoenus discifer*			
928.	987	*Schoenus elegans*			
929.	991	*Schoenus grammatophyllus*			
930.	994	*Schoenus humilis*			
931.	8312	*Schoenus maschalinus*			
932.	1002	*Schoenus nanus (Tiny Bog Rush)*			
933.	17614	*Schoenus plumosus*			
934.	1011	*Schoenus rigens*			
935.	1013	*Schoenus sculptus (Gimlet Bog-rush)*			
936.	16254	*Schoenus sp. G Broad Sheath (K.L. Wilson 2633)*			
937.	1017	*Schoenus subbulbosus*			
938.	1026	*Schoenus unispiculatus*			
939.	6033	*Scholtzia involucrata (Spiked Scholtzia)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
940.	6034	*Scholtzia laxiflora*			
941.		*Scolopendra laeta*			
942.	6	*Selaginella gracillima (Tiny Clubmoss)*			
943.	20663	*Senecio multicaulis subsp. multicaulis*			
944.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
945.	15972	*Silene gallica var. gallica*	Y		
946.	8224	*Siloxerus filifolius*			
947.	8225	*Siloxerus humifusus (Procumbent Siloxerus)*			
948.	25266	*Simoselaps bertholdi (Jan's Banded Snake)*			
949.		*Simuliidae sp.*			
950.	30948	*Smicrornis brevirostris (Weebill)*			
951.	6988	*Solanum americanum (Glossy Nightshade)*	Y		
952.	7013	*Solanum hoplopetalum (Thorny Solanum)*			
953.	7022	*Solanum nigrum (Black Berry Nightshade)*	Y		
954.	8230	*Sonchus asper (Rough Sowthistle)*	Y		
955.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
956.	1312	*Sowerbaea laxiflora (Purple Tassels)*			
957.	33636	*Spergularia brevifolia*			
958.	8900	*Spergularia marina*			
959.	4205	*Sphaerolobium linophyllum*			
960.	4211	*Sphaerolobium vimineum (Leafless Globe Pea)*			
961.	635	*Sporobolus virginicus (Marine Couch)*			
962.	4733	*Stackhousia monogyna*			
963.	24645	*Stagonopleura oculata (Red-eared Firetail)*			
964.		*Sternopriscus browni*			
965.	12856	*Stirlingia abrotanoides*			
966.	2316	*Stirlingia latifolia (Blueboy)*			
967.	25597	*Strepera versicolor (Grey Currawong)*			
968.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
969.	25518	*Strophurus spinigerus*			
970.	24943	*Strophurus spinigerus subsp. inornatus*			
971.	24942	*Strophurus spinigerus subsp. spinigerus*			
972.	7679	*Stylidium adpressum (Trigger-on-stilts)*			
973.	7681	*Stylidium affine (Queen Triggerplant)*			
974.	12846	*Stylidium albolilacinum*			
975.	7684	*Stylidium amoenum (Lovely Triggerplant)*			
976.	30278	*Stylidium androsaceum*			
977.	25831	*Stylidium araeophyllum (Stilt Walker)*			
978.	48457	*Stylidium bindoon*			
979.	7693	*Stylidium brunonianum (Pink Fountain Triggerplant)*			
980.	7694	*Stylidium bulbiferum (Circus Triggerplant)*			
981.	7696	*Stylidium calcaratum (Book Triggerplant)*			
982.	7698	*Stylidium caricifolium (Milkmaids)*			
983.	7709	*Stylidium crossocephalum (Posy Triggerplant)*			
984.	7710	*Stylidium cygnorum*			
985.	7712	*Stylidium despectum (Dwarf Triggerplant)*			
986.	7713	*Stylidium dichotomum (Pins-and-needles)*			
987.	7716	*Stylidium diuroides (Donkey Triggerplant)*			
988.	11808	*Stylidium diuroides subsp. diuroides*			
989.	7717	*Stylidium divaricatum (Daddy-long-legs)*			
990.	7719	*Stylidium ecorne (Foot Triggerplant)*			
991.	7734	*Stylidium guttatum (Dotted Triggerplant)*			
992.	7736	*Stylidium hispidum (White Butterfly Triggerplant)*			
993.	7742	*Stylidium inundatum (Hundreds and Thousands)*			
994.	7768	*Stylidium obtusatum (Pinafore Triggerplant)*			
995.	7773	*Stylidium petiolare (Horn Triggerplant)*			
996.	7774	*Stylidium piliferum (Common Butterfly Triggerplant)*			
997.	25837	*Stylidium purpureum (Purple Fountain Triggerplant)*			
998.	33106	*Stylidium recurvum*			
999.	7785	*Stylidium repens (Matted Triggerplant)*			
1000.	25806	*Stylidium scariosum*			
1001.	7798	*Stylidium schoenoides (Cow Kicks)*			
1002.	45594	*Stylidium tenue subsp. majusculum (Showy Fountain Triggerplant)*			
1003.	7806	*Stylidium utricularioides (Pink Fan Triggerplant)*			
1004.	3181	*Stylobasium australe*			
1005.	1260	*Stypandra glauca (Blind Grass)*			
1006.	6476	*Styphelia tenuiflora (Common Pinheath)*			
1007.	2321	*Synaphea acutiloba (Granite Synaphea)*			
1008.	2323	*Synaphea gracillima*			
1009.	2329	*Synaphea spinulosa*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1010.	15532	*Synaphea spinulosa subsp. spinulosa*			
1011.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
1012.	24207	*Tachyglossus aculeatus (Short-beaked Echidna)*			
1013.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
1014.	33020	*Tamarix parviflora*	Y		
1015.		*Tanypodinae sp.*			
1016.	24167	*Tarsipes rostratus (Honey Possum, Noolbenger)*			
1017.		*Tasmanicosa leuckartii*			
1018.	20135	*Taxandria linearifolia*			
1019.	4251	*Templetonia drummondii*			
1020.	1034	*Tetraria capillaris (Hair Sedge)*			
1021.	1036	*Tetraria octandra*			
1022.	667	*Tetrarrhena laevis (Forest Ricegrass)*			
1023.	48342	*Tetratheca hirsuta subsp. hirsuta*			
1024.	4537	*Tetratheca nuda*			
1025.		*Thelymitra aff. pauciflora*			
1026.	1701	*Thelymitra antennifera (Vanilla Orchid)*			
1027.	10856	*Thelymitra benthamiana (Leopard Orchid)*			
1028.	1705	*Thelymitra crinita (Blue Lady Orchid)*			
1029.	1707	*Thelymitra flexuosa (Twisted Sun Orchid)*			
1030.	20731	*Thelymitra vulgaris*			
1031.	5080	*Thomasia foliosa*			
1032.	5084	*Thomasia grandiflora (Large Flowered Thomasia)*			
1033.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
1034.	1318	*Thysanotus arbuscula*			
1035.	1319	*Thysanotus arenarius*			
1036.	1320	*Thysanotus asper (Hairy Fringe Lily)*			
1037.	1338	*Thysanotus manglesianus (Fringed Lily)*			
1038.		*Thysanotus manglesianus/patersonii complex*			
1039.	1339	*Thysanotus multiflorus (Many-flowered Fringe Lily)*			
1040.	1343	*Thysanotus patersonii*			
1041.	1351	*Thysanotus sparteus*			
1042.	1354	*Thysanotus tenellus*			
1043.	1357	*Thysanotus thyrsoideus*			
1044.	1358	*Thysanotus triandrus*			
1045.	25519	*Tiliqua rugosa*			
1046.	25207	*Tiliqua rugosa subsp. rugosa*			
1047.		*Tipulidae sp.*			
1048.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
1049.	8248	*Tolpis barbata (Yellow Hawkweed)*	Y		
1050.	6280	*Trachymene pilosa (Native Parsnip)*			
1051.	1481	*Tribonanthes australis (Southern Tiurndin)*			
1052.	1483	*Tribonanthes longipetala (Branching Tiurndin)*			
1053.	8251	*Trichocline spathulata (Native Gerbera)*			
1054.	25723	*Trichoglossus haematodus (Rainbow Lorikeet)*			
1055.	1361	*Tricoryne elatior (Yellow Autumn Lily)*			
1056.	1363	*Tricoryne tenella*			
1057.	4289	*Trifolium angustifolium (Narrowleaf Clover)*	Y		
1058.	17542	*Trifolium arvense var. arvense*	Y		
1059.	17763	*Trifolium campestre var. campestre (Hop Clover)*	Y		
1060.	4293	*Trifolium cernuum (Drooping Flower Clover)*	Y		
1061.	4295	*Trifolium dubium (Suckling Clover)*	Y		
1062.	4298	*Trifolium hirtum (Rose Clover)*	Y		
1063.	19039	*Triglochin bulbosa*	Y		
1064.	33676	*Triglochin calcitrapa*			
1065.	147	*Triglochin mucronata*			
1066.	148	*Triglochin muelleri*			
1067.	150	*Triglochin stowardii*			
1068.	4737	*Tripterococcus brunonis (Winged Stackhousia)*			
1069.	1139	*Trithuria bibracteata*			
1070.	4839	*Trymalium angustifolium*			
1071.	13479	*Trymalium ledifolium var. rosmarinifolium*			
1072.	33418	*Trymalium odoratissimum subsp. odoratissimum*			
1073.	99	*Typha orientalis (Bulrush, Cumbungi)*			
1074.	24852	*Tyto alba subsp. delicatula (Barn Owl)*			
1075.	24983	*Underwoodisaurus milii (Barking Gecko)*			
1076.		*Urodacus novaehollandiae*			
1077.	8255	*Ursinia anthemoides (Ursinia)*	Y		
1078.	38388	*Ursinia anthemoides subsp. anthemoides*	Y		
1079.	45906	*Ustilago tepperi*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1080.	7148	*Utricularia multifida*			
1081.	7153	*Utricularia tenella*			
1082.	7157	*Utricularia violacea (Violet Bladderwort)*			
1083.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
1084.	7665	*Velleia trinervis*			
1085.	8257	*Vellereophyton dealbatum (White Cudweed)*	Y		
1086.	7666	*Verreauxia reinwardtii (Common Verreauxia)*			
1087.	6076	*Verticordia densiflora (Compacted Featherflower)*			
1088.	15432	*Verticordia densiflora var. densiflora*			
1089.	15434	*Verticordia insignis subsp. insignis*			
1090.	6101	*Verticordia nitens (Morrison Featherflower, Kodjeningara)*			
1091.	6107	*Verticordia pennigera*			
1092.	6110	*Verticordia plumosa (Plumed Featherflower)*			
1093.	12449	*Verticordia plumosa var. brachyphylla*			
1094.	24206	*Vespadelus regulus (Southern Forest Bat)*			
1095.	4322	*Vicia sativa (Common Vetch)*	Y		
1096.	17042	*Vitis vinifera*	Y		
1097.	24040	*Vulpes vulpes (Red Fox)*	Y		
1098.	722	*Vulpia bromoides (Squirrel Tail Fescue)*	Y		
1099.	11018	*Vulpia muralis*	Y		
1100.	724	*Vulpia myuros (Rat's Tail Fescue)*	Y		
1101.	7384	*Wahlenbergia capensis (Cape Bluebell)*	Y		
1102.	7389	*Wahlenbergia preissii*			
1103.	8282	*Waitzia suaveolens (Fragrant Waitzia)*			
1104.	12072	*Wurmbea dioica subsp. alba*			
1105.	1249	*Xanthorrhoea acanthostachya*			
1106.	1252	*Xanthorrhoea drummondii*			
1107.	1253	*Xanthorrhoea gracilis (Graceful Grass Tree, Mimidi)*			
1108.	1256	*Xanthorrhoea preissii (Grass tree, Palga)*			
1109.	6284	*Xanthosia candida*			
1110.	6287	*Xanthosia fruticulosa*			
1111.	6289	*Xanthosia huegelii*			
1112.	1049	*Zantedeschia aethiopica (Arum Lily)*	Y		
1113.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

APPENDIX 3

Atlas of Living Australia Report

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/d03ef73f-d3a7-42af-be70-c61413d68718	Abantiades albofasciatus	(Swinhoe, 1892)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Hepialidae	Abantiades		1
https://biodiversity.org.au/afd/taxa/0b7ee188-ef4f-416e-8532-4826d9dc7755	Abantiades argentangulum	Moore & Edwards, 2014	species	Animalia	Arthropoda	Insecta	Lepidoptera	Hepialidae	Abantiades		1
https://biodiversity.org.au/afd/taxa/d2dac84e-c302-4ac7-9fdc-6ba4a02b476a	Abispa (Abispa) ephippium	(Fabricius, 1775)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Abispa		6
https://biodiversity.org.au/afd/taxa/8698c1d0-2079-477f-832a-0771c8df7cad	Acanthagenys rufogularis	Gould, 1838	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Acanthagenys	Spiny-cheeked Honeyeater	2
https://biodiversity.org.au/afd/taxa/500e1350-1d00-4f1c-b9d3-d02b949cdd47	Acanthiza (Acanthiza) apicalis	Gould, 1847	species	Animalia	Chordata	Aves	Passeriformes	Acanthizidae	Acanthiza	Red-rumped Tit	13
https://biodiversity.org.au/afd/taxa/aa581ac7-f29a-4e72-be0d-48a5e0a64de3	Acanthiza (Geobasileus) chrysorrhoa	(Quoy & Gaimard, 1830)	species	Animalia	Chordata	Aves	Passeriformes	Acanthizidae	Acanthiza	Yellow-tail	44
https://biodiversity.org.au/afd/taxa/4b7b9c4a-1b60-4a43-ab70-b57bfc790138	Acanthiza (Geobasileus) inornata	Gould, 1841	species	Animalia	Chordata	Aves	Passeriformes	Acanthizidae	Acanthiza	Masters' Tit	19
https://biodiversity.org.au/afd/taxa/895ee633-7ac2-4281-afc7-7f56180ef2b9	Acanthodela protophaes	(Meyrick, 1883)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Acanthodela		3
https://biodiversity.org.au/afd/taxa/0242155c-714e-4f53-b973-333aab1343fb	Acanthorhynchus superciliosus	Gould, 1837	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Acanthorhynchus	Western Spinebill	28
https://biodiversity.org.au/afd/taxa/d470af0d-c131-48f7-961d-a55686e6a185	Accipiter (Leucospiza) fasciatus	(Vigors & Horsfield, 1827)	species	Animalia	Chordata	Aves	Accipitriformes	Accipitridae	Accipiter	Grey-headed Goshawk	4
https://biodiversity.org.au/afd/taxa/02725816-5d59-41e1-aa00-f7cc41cd66dc	Accipiter (Paraspizias) cirrocephalus	(Vieillot, 1817)	species	Animalia	Chordata	Aves	Accipitriformes	Accipitridae	Accipiter	Collared Sparrowhawk	3
https://biodiversity.org.au/afd/taxa/2ba88fd9-4afa-444f-8165-f1ebb0fbf728	Achyra affinitalis	(Lederer, 1863)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Achyra		18
https://biodiversity.org.au/afd/taxa/28befb60-bea4-4900-97a0-079e218e9eca	Acontia nivipicta	Butler, 1886	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Acontia		2
https://biodiversity.org.au/afd/taxa/8c181054-63bc-4139-81dc-6a8d98d0bdba	Acrida conica	(Fabricius, 1781)	species	Animalia	Arthropoda	Insecta	Orthoptera	Acrididae	Acrida	Giant Green Slant-face	1
https://biodiversity.org.au/afd/taxa/75b82e11-dfd2-4c27-b371-7046f006f0a3	Aedes (Ochlerotatus) hesperonotius	Marks, 1959	species	Animalia	Arthropoda	Insecta	Diptera	Culicidae	Aedes		1
https://biodiversity.org.au/afd/taxa/06c31d5c-61c7-400e-a036-6afa17b80ca8	Aedes (Rampamyia) notoscriptus	(Skuse, 1889)	species	Animalia	Arthropoda	Insecta	Diptera	Culicidae	Aedes		1
https://biodiversity.org.au/afd/taxa/ee694d26-6d4d-4837-99ad-9b25d3454d9d	Aegotheles (Aegotheles) cristatus	(Shaw, 1790)	species	Animalia	Chordata	Aves	Apodiformes	Aegothelidae	Aegotheles	Australian Owlet-nightjar	1
NZOR-6-5212	Aeshna brevistyla	Rambur	species	Animalia	Arthropoda	Insecta	Odonata	Aeshnidae	Aeshna		2
https://biodiversity.org.au/afd/taxa/94c7793f-d9a8-4abb-9834-23a4b0e1af3a	Agonoscelis rutila	(Fabricius, 1775)	species	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Agonoscelis	Horehound Bug	2
https://biodiversity.org.au/afd/taxa/00c78f45-da89-497c-b96d-0f4b5a4d82d1	Agrilus (Agrilus) hypoleucus	Gory & Laporte, 1837	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Agrilus		4
https://biodiversity.org.au/afd/taxa/d9d5caed-f028-4a4c-97cb-c686690ea582	Agrius convolvuli	(Linnaeus, 1758)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Sphingidae	Agrius		1
https://biodiversity.org.au/afd/taxa/cf72658d-bef6-4ea2-9b87-228f9ec2ff69	Agrius godarti	(W.S. Macleay, 1826)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Sphingidae	Agrius		1
https://biodiversity.org.au/afd/taxa/54b867e9-2d2c-49fb-bcb1-647a6a6a64e8	Agrotis infusa	(Boisduval, 1832)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Agrotis	Bogong Moth	1
https://biodiversity.org.au/afd/taxa/3922736f-1e6b-4b8e-9faf-806b1ce78f33	Agrotis ipsilon	(Hufnagel, 1766)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Agrotis		2
https://biodiversity.org.au/afd/taxa/579f62c4-22c2-4150-87af-61e9031dc4f3	Agrotis munda	Walker, 1857	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Agrotis		13
https://biodiversity.org.au/afd/taxa/c8f27237-108c-4b58-96d5-cce925952b04	Agrotis porphyricollis	GuenÃ©e, 1852	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Agrotis		2
https://biodiversity.org.au/afd/taxa/bd96f702-29b7-442f-91f2-5f2847e3850e	Alcaeus hermannsburgi	(Distant, 1910)	species	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Alcaeus		1
https://biodiversity.org.au/afd/taxa/bdb83ea0-a8a7-4a77-81be-b0930263cd58	Aleucosia maculosa	(Newman, 1841)	species	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Aleucosia		2
https://biodiversity.org.au/afd/taxa/69e130f2-e064-409c-aca0-a3edb796357a	Alona rigidicaudis	(Smirnov, 1971)	species	Animalia	Arthropoda	Branchiopoda	Diplostraca	Chydoridae	Alona		1
https://biodiversity.org.au/afd/taxa/b817ed58-14c6-4169-bcad-66f7a227e72a	Amblyomma triguttatum	Koch, 1844	species	Animalia	Arthropoda	Arachnida	Ixodida	Ixodidae	Amblyomma		1
https://biodiversity.org.au/afd/taxa/0724a2b5-5216-4f98-96b0-7761e4133204	Amegilla (Notomegilla) chlorocyanea	(Cockerell, 1914)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Amegilla	Blue Banded Bee	8
https://biodiversity.org.au/afd/taxa/5e6e1218-6b3b-4cab-aff2-aca4d7cc02fa	Amegilla (Zonamegilla) cingulata	(Fabricius, 1775)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Amegilla		1
https://biodiversity.org.au/afd/taxa/471a22c7-262b-46b3-bc0c-9994e51334f7	Amelora goniota	Guest, 1887	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Amelora		2
https://biodiversity.org.au/afd/taxa/caa10ee6-08ae-47ff-853d-d4d447321f3e	Amelora pachyspila	Turner, 1919	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Amelora		2
https://biodiversity.org.au/afd/taxa/e635e4da-4544-4a85-acb5-e81dbe5b7160	Amitermes modicus	(Hill, 1942)	species	Animalia	Arthropoda	Insecta	Blattodea	Termitidae	Amitermes		2
https://biodiversity.org.au/afd/taxa/18359185-4e14-4e47-ab55-0b92a5a036b3	Amitermes obeuntis	(Silvestri, 1909)	species	Animalia	Arthropoda	Insecta	Blattodea	Termitidae	Amitermes		1
https://biodiversity.org.au/afd/taxa/d928fa93-709d-481c-b32a-d0fc7d204472	Amitermes procerus	Gay, 1968	species	Animalia	Arthropoda	Insecta	Blattodea	Termitidae	Amitermes		1
https://biodiversity.org.au/afd/taxa/af7f208f-b696-4e99-ae7a-5bbc7df05c5b	Anachloris tofocolorata	Schmidt, 2001	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Anachloris		6
https://biodiversity.org.au/afd/taxa/b895689f-e622-4c9e-8e81-6d6d15cdd2a2	Anachloris uncinata	(GuenÃ©e, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Anachloris		31
https://biodiversity.org.au/afd/taxa/81be58f5-caf7-4f3d-b1eb-d4f83eb0af5a	Anas (Anas) superciliosa	Gmelin, 1789	species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Anas	Parera	17
https://biodiversity.org.au/afd/taxa/d0d5b903-32e8-48ee-b7c0-91f5ea9433a9	Anas (Nettion) castanea	(Eyton, 1838)	species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Anas	Chestnut Teal	1
https://biodiversity.org.au/afd/taxa/efaa935b-e248-456a-b85e-b048b465b676	Anas (Nettion) gracilis	Buller, 1869	species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Anas	Oceanic Teal	3
https://biodiversity.org.au/afd/taxa/29796f05-7bba-4837-8fa2-9b58ba1bd3b8	Anax papuensis	(Burmeister, 1839)	species	Animalia	Arthropoda	Insecta	Odonata	Aeshnidae	Anax		4
https://biodiversity.org.au/afd/taxa/8f0d7066-fe80-47ed-a26d-4567d15b5d85	Anestia ombrophanes	Meyrick, 1886	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Anestia		7
https://biodiversity.org.au/afd/taxa/bf3fcd09-dc47-4ec8-9612-1b4089c7258a	Anilios australis	(Gray, 1845)	species	Animalia	Chordata	Reptilia	Squamata	Typhlopidae	Anilios	Southern Blind Snake	2
https://biodiversity.org.au/afd/taxa/5897729c-7781-4bf7-910e-aafa6be0e43a	Anilios waitii	(Boulenger, 1895)	species	Animalia	Chordata	Reptilia	Squamata	Typhlopidae	Anilios	Beaked Blind Snake	2
https://biodiversity.org.au/afd/taxa/98d54aa9-9a0a-493c-a2ab-33e3853f3af0	Anisynta sphenosema	(Meyrick & Lower, 1902)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Hesperiidae	Anisynta	Wedge Skipper	2
https://biodiversity.org.au/afd/taxa/747b1d28-cd9d-4a82-ae98-31888ef987f2	Anoplognathus chloropyrus	(Drapiez, 1819)	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Anoplognathus		1
NZOR-6-54439	Anser anser	Linnaeus	species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Anser		1
https://biodiversity.org.au/afd/taxa/dd695ee8-faf5-41a8-8741-06111c16b5a8	Antaresia childreni	(Gray, 1842)	species	Animalia	Chordata	Reptilia	Squamata	Pythonidae	Antaresia	Children's Python	1
https://biodiversity.org.au/afd/taxa/59b7c7f5-1d07-4ab0-90ef-9be0885de1dd	Anthochaera (Anellobia) lunulata	Gould, 1838	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Anthochaera	Western Wattlebird	22
https://biodiversity.org.au/afd/taxa/8204979f-5302-41ea-943f-01d3c420f7bb	Anthochaera (Anthochaera) carunculata	(Shaw, 1790)	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Anthochaera	Red Wattlebird	42
https://biodiversity.org.au/afd/taxa/f05bd22b-e51f-49b8-8df7-026955602baf	Anthrenocerus australis	(Hope, 1843)	species	Animalia	Arthropoda	Insecta	Coleoptera	Dermestidae	Anthrenocerus	Australian Carpet Beetle	1
https://biodiversity.org.au/afd/taxa/e53a981f-22da-4f2f-a489-85c3ee79473e	Anthus (Anthus) novaeseelandiae	(Gmelin, 1789)	species	Animalia	Chordata	Aves	Passeriformes	Motacillidae	Anthus	Australian Pipit	8
https://biodiversity.org.au/afd/taxa/86ece03e-acae-4057-8061-5eae8e0c1f03	Antichiropus variabilis	Attems, 1911	species	Animalia	Arthropoda	Diplopoda	Polydesmida	Paradoxosomatidae	Antichiropus		1
https://biodiversity.org.au/afd/taxa/e130fae3-af3b-4cca-968c-a40e04243152	Antigastra catalaunalis	(Duponchel, 1831)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Antigastra		6
https://biodiversity.org.au/afd/taxa/98438f53-d19f-4b89-84c3-7d32a510271b	Antiporus femoralis	(Boheman, 1858)	species	Animalia	Arthropoda	Insecta	Coleoptera	Dytiscidae	Antiporus		4
https://biodiversity.org.au/afd/taxa/c7af5779-1437-495c-b844-e3922079ce0f	Aphanosperma occidentalis	Britton, 1969	species	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Aphanosperma		2
https://biodiversity.org.au/afd/taxa/c63ca6b5-e002-428b-9caf-f401aa17135b	Aphantes melanochorda	(Turner, 1919)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Aphantes		1
https://biodiversity.org.au/afd/taxa/5ebff4cf-11b2-444a-b60c-6ff6a17ba18d	Aphis (Aphis) nerii	Boyer de Fonscolombe, 1841	species	Animalia	Arthropoda	Insecta	Hemiptera	Aphididae	Aphis	Oleander Aphid	1
https://biodiversity.org.au/afd/taxa/7fc692cd-088b-4f29-bdcf-335d2cd0eb9b	Apiocera flabellata	Paramonov, 1953	species	Animalia	Arthropoda	Insecta	Diptera	Apioceridae	Apiocera		1
https://biodiversity.org.au/afd/taxa/cf854087-be13-445a-a7b1-8987d040af78	Apiocera pulchra	Paramonov, 1953	species	Animalia	Arthropoda	Insecta	Diptera	Apioceridae	Apiocera		1
https://biodiversity.org.au/afd/taxa/1a490f00-368f-427c-8d4c-fa3f3271d75f	Apis (Apis) mellifera	Linnaeus, 1758	species	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Apis		34
https://biodiversity.org.au/afd/taxa/152c2fa6-25d4-4c75-9e42-ce3ce5fb9ac3	Aporocera (Aporocera) flaviventris	(Saunders, 1843)	species	Animalia	Arthropoda	Insecta	Coleoptera	Chrysomelidae	Aporocera		2
https://biodiversity.org.au/afd/taxa/23e2ccef-06b0-4749-abc6-d8a710b94f69	Aquila (Uroaetus) audax	(Latham, 1801)	species	Animalia	Chordata	Aves	Accipitriformes	Accipitridae	Aquila	Wedge-tailed Eagle	12
https://biodiversity.org.au/afd/taxa/5baac49d-ce92-448d-b22f-6595060dca85	Aquita tactalis	(Walker, 1863)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nolidae	Aquita		2
https://biodiversity.org.au/afd/taxa/0c640437-7997-4a99-94e4-14bb92af5670	Araneus dimidiatus	(L. Koch, 1871)	species	Animalia	Arthropoda	Arachnida	Araneae	Araneidae	Araneus		1
https://biodiversity.org.au/afd/taxa/3da69b6c-5152-4f96-bf75-ce208d759c5f	Archaeosynthemis leachii	(Selys, 1871)	species	Animalia	Arthropoda	Insecta	Odonata	Synthemistidae	Archaeosynthemis		3
https://biodiversity.org.au/afd/taxa/2798ca0f-8c21-449a-93b6-a64a0fbc9287	Archaeosynthemis occidentalis	Tillyard, 1910	species	Animalia	Arthropoda	Insecta	Odonata	Synthemistidae	Archaeosynthemis		4
https://biodiversity.org.au/afd/taxa/2f288969-92ff-4ed4-91f6-eae354efefad	Archiargiolestes pusillus	(Tillyard, 1908)	species	Animalia	Arthropoda	Insecta	Odonata	Megapodagrionidae	Archiargiolestes		17
https://biodiversity.org.au/afd/taxa/b129c2db-7d93-4688-a17f-2f77f1a09ae1	Archimantis sobrina	Saussure, 1872	species	Animalia	Arthropoda	Insecta	Mantodea	Mantidae	Archimantis	Large Brown Mantid	5
https://biodiversity.org.au/afd/taxa/143cc9f0-bc3c-45b7-8e1c-21fbe9319bba	Ardea alba	Linnaeus, 1758	species	Animalia	Chordata	Aves	Ciconiiformes	Ardeidae	Ardea	Baluun	1
https://biodiversity.org.au/afd/taxa/cf8e02dd-2a6e-41dc-b14b-0e446444250a	Ardea pacifica	Latham, 1801	species	Animalia	Chordata	Aves	Ciconiiformes	Ardeidae	Ardea	White-necked Heron	5
https://biodiversity.org.au/afd/taxa/89218f01-d9b8-43e0-a663-e53d92dae24a	Ardozyga nyctias	(Meyrick, 1904)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Gelechiidae	Ardozyga		2
https://biodiversity.org.au/afd/taxa/b2bc11cf-b219-4416-811e-86493963f82d	Ardozyga stratifera	(Meyrick, 1904)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Gelechiidae	Ardozyga		2
https://biodiversity.org.au/afd/taxa/0c5d2393-45b6-4394-9f85-766e7c1c78e9	Arenopsaltria fullo	(Walker, 1850)	species	Animalia	Arthropoda	Insecta	Hemiptera	Cicadidae	Arenopsaltria	Sandgrinder	1
https://biodiversity.org.au/afd/taxa/33013eb9-e3e1-4e2b-95a4-89d7505ad0a1	Argiope protensa	L. Koch, 1872	species	Animalia	Arthropoda	Arachnida	Araneae	Araneidae	Argiope		2

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/9367c374-2234-41e5-aed0-fdbb083d6f2d	Arhodia lasiocamparia	GuenÃ©e, 1858	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Arhodia		2
https://biodiversity.org.au/afd/taxa/5996300f-967f-4c5c-b9ac-0585402d1cbc	Arniscus humeralis	(Dallas, 1851)	species	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Arniscus		1
https://biodiversity.org.au/afd/taxa/cfab7de8-e9a2-4195-b5fd-4d3d93d534dc	Arotrophora arcuatalis	(Walker, 1866)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Arotrophora		6
https://biodiversity.org.au/afd/taxa/429cd14f-2018-47e4-b084-037f6bb03249	Arrade destituta	(Walker, 1865)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Arrade		11
https://biodiversity.org.au/afd/taxa/6c3c2da2-508b-43c4-b0df-c69a99c0aae0	Artamus (Angroyan) cinereus	Vieillot, 1817	species	Animalia	Chordata	Aves	Passeriformes	Artamidae	Artamus	Black-faced Woodswallow	15
https://biodiversity.org.au/afd/taxa/320aeab1-aead-4b82-a580-8cd3ae99fdef	Artamus (Angroyan) cyanopterus	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Artamidae	Artamus	Dusky Woodswallow	10
https://biodiversity.org.au/afd/taxa/d6dfb3a5-dd9e-4307-986f-e3b50c2cb476	Assara holophragma	(Meyrick, 1887)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Assara		6
https://biodiversity.org.au/afd/taxa/a4794e71-b678-4a5a-9f57-2dea3b49dd00	Assara subarcuella	(Meyrick, 1879)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Assara		2
https://biodiversity.org.au/afd/taxa/f2f806e5-6103-4dc7-bb84-45998bf1aba1	Astraeus (Depollus) aberrans	van de Poll, 1886	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Astraeus		1
https://biodiversity.org.au/afd/taxa/c8ebe0f4-773e-4e8b-bfec-39e2cbc00918	Astrapometis saburalis	(Walker, 1859)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Astrapometis		1
https://biodiversity.org.au/afd/taxa/1bc681c1-19dc-4ff2-bb14-2d579a7d20b8	Athetis tenuis	(Butler, 1886)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Athetis		1
https://biodiversity.org.au/afd/taxa/e453dbf4-ac86-44b6-8776-de892b568f51	Austracantha minax	(Thorell, 1859)	species	Animalia	Arthropoda	Arachnida	Araneae	Araneidae	Austracantha		9
https://biodiversity.org.au/afd/taxa/db0d46fc-429c-4309-9bd6-eadc2d391e73	Australothis rubrescens	(Walker, 1858)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Australothis		1
https://biodiversity.org.au/afd/taxa/148d56da-bca5-4a9d-9ef5-530830d3a14a	Austroaeschna (Austroaeschna) anacantha	Tillyard, 1908	species	Animalia	Arthropoda	Insecta	Odonata	Telephlebiidae	Austroaeschna		3
https://biodiversity.org.au/afd/taxa/0cb18aba-116d-465d-94e6-784ecd86f7e4	Austroagrion cyane	(Selys, 1876)	species	Animalia	Arthropoda	Insecta	Odonata	Coenagrionidae	Austroagrion		2
https://biodiversity.org.au/afd/taxa/730a92ee-159b-4372-af6b-99de4bf94c6b	Austrocroce mira	(McKeown, 1939)	species	Animalia	Arthropoda	Insecta	Neuroptera	Nemopteridae	Austrocroce		1
https://biodiversity.org.au/afd/taxa/41d32c25-20dd-4dd4-b52c-cbccfafa38a0	Austrolestes analis	(Rambur, 1842)	species	Animalia	Arthropoda	Insecta	Odonata	Lestidae	Austrolestes		2
https://biodiversity.org.au/afd/taxa/2fe21bed-d7f5-4e45-8deb-5d4e5b08fc4d	Austrolestes annulosus	(Selys, 1862)	species	Animalia	Arthropoda	Insecta	Odonata	Lestidae	Austrolestes		2
https://biodiversity.org.au/afd/taxa/3029a74e-2791-45fa-bcb4-b1e7e8b88b55	Austromyzinum nubilipennis	(Turner, 1910)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Tiphiidae	Austromyzinum		1
https://biodiversity.org.au/afd/taxa/ed463183-2fd4-439e-92e1-7b07d2c7cf23	Austrosynthemis cyanitincta	(Tillyard, 1908)	species	Animalia	Arthropoda	Insecta	Odonata	Synthemistidae	Austrosynthemis		1
https://biodiversity.org.au/afd/taxa/d37d230d-c913-4248-b32e-c601761d1813	Austrothemis nigrescens	(Martin, 1901)	species	Animalia	Arthropoda	Insecta	Odonata	Libellulidae	Austrothemis		3
https://biodiversity.org.au/afd/taxa/3e6a9e28-aaf9-45e8-bcd4-f764aeda8bdc	Authomaema pentacosma	(Lower, 1900)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Authomaema		2
https://biodiversity.org.au/afd/taxa/615bdd63-9e8b-4f8d-9637-489c2a80c281	Aythya (Nyroca) australis	(Eyton, 1838)	species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Aythya	Brownhead	1
https://biodiversity.org.au/afd/taxa/b6dd9851-c39d-4bfe-9d22-70d08cbc96fd	Backobourkia heroine	(L. Koch, 1871)	species	Animalia	Arthropoda	Arachnida	Araneae	Araneidae	Backobourkia		2
https://biodiversity.org.au/afd/taxa/0b73e8bb-c141-4f07-8b14-47c3510c9c98	Badumna insignis	(L. Koch, 1872)	species	Animalia	Arthropoda	Arachnida	Araneae	Desidae	Badumna		4
https://biodiversity.org.au/afd/taxa/02f34d75-4830-4abe-9b78-8c941d5ae573	Ballarra longipalpus	Hunt & Cokendolpher, 1991	species	Animalia	Arthropoda	Arachnida	Opiliones	Neopilionidae	Ballarra		1
https://biodiversity.org.au/afd/taxa/8f3f660a-5391-47f7-8a77-a22d5569029b8	Balta hebardi	Princis, 1969	species	Animalia	Arthropoda	Insecta	Blattodea	Ectobiidae	Balta		3
https://biodiversity.org.au/afd/taxa/5fed5ecf-2199-4f64-a9f7-90b39f88a90a	Barnardius zonarius	(Shaw, 1805)	species	Animalia	Chordata	Aves	Psittaciformes	Psittacidae	Barnardius	Australian Ringneck	202
https://biodiversity.org.au/afd/taxa/588a782c-be72-4e20-a241-af5f3876a658	Bembix littoralis	Turner, 1908	species	Animalia	Arthropoda	Insecta	Hymenoptera	Crabronidae	Bembix		1
https://biodiversity.org.au/afd/taxa/d571ec3b-df38-426b-8a53-288e938e2694	Berosus (Berosus) approximans	Fairmaire, 1879	species	Animalia	Arthropoda	Insecta	Coleoptera	Hydrophilidae	Berosus		1
https://biodiversity.org.au/afd/taxa/89e14434-af3f-4ced-aae7-dd7844bec1e6	Berosus (Berosus) discolor	Blackburn, 1888	species	Animalia	Arthropoda	Insecta	Coleoptera	Hydrophilidae	Berosus		1
https://biodiversity.org.au/afd/taxa/cbbc328d-ec39-4159-9ef8-87943acad0c6	Berosus (Enoplurus) australiae	Mulsant & Rey, 1858	species	Animalia	Arthropoda	Insecta	Coleoptera	Hydrophilidae	Berosus		1
https://biodiversity.org.au/afd/taxa/728c4971-dbba-4587-9f2a-010c08c4d270	Berosus (Enoplurus) macumbensis	Blackburn, 1896	species	Animalia	Arthropoda	Insecta	Coleoptera	Hydrophilidae	Berosus		1
https://biodiversity.org.au/afd/taxa/9e337148-71dc-4871-96da-c9f24d7e9b1e	Bida radiosella	(Walker, 1863)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Bida		4
https://biodiversity.org.au/afd/taxa/48e09a45-e2af-4b68-a012-92fc13a4d09f	Blackbolbus frontalis	(GuÃ©rin-MÃ©neville, 1838)	species	Animalia	Arthropoda	Insecta	Coleoptera	Bolboceratidae	Blackbolbus		1
https://biodiversity.org.au/afd/taxa/213868e8-2366-4af1-865c-b1fe771c77bb	Blackburnium reichei	(GuÃ©rin-MÃ©neville, 1838)	species	Animalia	Arthropoda	Insecta	Coleoptera	Bolboceratidae	Blackburnium		1
https://biodiversity.org.au/afd/taxa/31b7f51d-fcdb-4e53-a761-2d385fe0a18d	Bostrychopsis jesuita	(Fabricius, 1775)	species	Animalia	Arthropoda	Insecta	Coleoptera	Bostrichidae	Bostrychopsis		2
https://biodiversity.org.au/afd/taxa/dba78701-cae9-4afb-a41a-6697c52c5e34	Botaurus poiciloptilus	(Wagler, 1827)	species	Animalia	Chordata	Aves	Ciconiiformes	Ardeidae	Botaurus	Australasian Bittern	1
https://biodiversity.org.au/afd/taxa/90eb5e4f-76a0-4692-be76-1eef39581bea	Bothriembryon (Bothriembryon) indutus	(Menke, 1843)	species	Animalia	Mollusca	Gastropoda	Stylommatophora	Bothriembryontidae	Bothriembryon		2
https://biodiversity.org.au/afd/taxa/477ea9f7-c06e-46fd-a1c1-41adc611ee82	Brachyurophis fasciolatus	(GÃ¼nther, 1872)	species	Animalia	Chordata	Reptilia	Squamata	Elapidae	Brachyurophis	Narrow-banded Shovel-nosed Snake	1
https://biodiversity.org.au/afd/taxa/33cc201a-3634-4cec-bd9c-c2859966203c	Brachyurophis semifasciatus	GÃ¼nther, 1863	species	Animalia	Chordata	Reptilia	Squamata	Elapidae	Brachyurophis	Southern Shovel-nosed Snake	4
https://biodiversity.org.au/afd/taxa/0c868946-1ba2-431f-a908-a3c5455cb051	Brevicyttara cyclospila	(Turner, 1945)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Cossidae	Brevicyttara		2
https://biodiversity.org.au/afd/taxa/5bf31cd8-1098-46e9-95df-88fd479d2d1e	Brunotartessus fulvus	(Walker, 1851)	species	Animalia	Arthropoda	Insecta	Hemiptera	Cicadellidae	Brunotartessus		1
https://biodiversity.org.au/afd/taxa/37b92c1b-8854-4213-a3e3-c14c4bf0e687	Bubas bison	(Linnaeus, 1767)	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Bubas		2
https://biodiversity.org.au/afd/taxa/2b11a727-32e5-4ee0-a1fd-0ca79555bcf3	Buciara bipartita	Walker, 1869	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Buciara		2
24490001	Bullastra lessoni	(Deshayes, 1831)	species	Animalia	Mollusca	Gastropoda		Lymnaeidae	Austropeplea	Freshwater Snail	1
https://biodiversity.org.au/afd/taxa/2c33a1fd-34f4-48ec-9ae6-38b51f2aa7ea	Cacatua (Cacatua) galerita	(Latham, 1790)	species	Animalia	Chordata	Aves	Psittaciformes	Cacatuidae	Cacatua	Sulphur-crested Cockatoo	4
https://biodiversity.org.au/afd/taxa/ab8816d0-2599-4813-a4c7-00d45d0c7ed0	Cacatua (Licmetis) pastinator	(Gould, 1841)	species	Animalia	Chordata	Aves	Psittaciformes	Cacatuidae	Cacatua	Western Corella	4
https://biodiversity.org.au/afd/taxa/34b31e86-7ade-4cba-960f-82a6ae586206	Cacatua (Licmetis) sanguinea	Gould, 1843	species	Animalia	Chordata	Aves	Psittaciformes	Cacatuidae	Cacatua	Little Corella	10
https://biodiversity.org.au/afd/taxa/1268648b-451b-4cb1-b931-ef54dcab9ba0	Cacatua (Licmetis) tenuirostris	(Kuhl, 1820)	species	Animalia	Chordata	Aves	Psittaciformes	Cacatuidae	Cacatua	Long-billed Corella	2
https://biodiversity.org.au/afd/taxa/408ee81c-6558-4ddf-b732-f9ad7d09f1ae	Cacomantis (Vidgenia) flabelliformis	(Latham, 1801)	species	Animalia	Chordata	Aves	Cuculiformes	Cuculidae	Cacomantis	Fan-tailed Cuckoo	3
https://biodiversity.org.au/afd/taxa/7deb7494-2acb-4722-b644-1adc915b6b47	Cadmus (Cadmus) excrementarius	Suffrian, 1859	species	Animalia	Arthropoda	Insecta	Coleoptera	Chrysomelidae	Cadmus		1
https://biodiversity.org.au/afd/taxa/c00e098c-3d52-4cfa-bca0-4f3a0fb41247	Calathusa ischnodes	(Turner, 1903)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Calathusa		6
https://biodiversity.org.au/afd/taxa/295263ef-b54f-4a28-86c7-37d9d61b62df	Callibracon capitator	(Fabricius, 1775)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Braconidae	Callibracon		1
NZOR-6-7529	Calliphora vomitoria sensu	auct	species	Animalia	Arthropoda	Insecta	Diptera	Calliphoridae	Calliphora		2
https://biodiversity.org.au/afd/taxa/a7b48a73-14d8-405a-958a-17f1fe46f945	Calotemognatha varicollis	(Carter, 1913)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Calotemognatha		2
https://biodiversity.org.au/afd/taxa/70eed478-5390-40c7-8660-97810fef7365	Calotemognatha yarelli	(Gory & Laporte, 1838)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Calotemognatha		3
https://biodiversity.org.au/afd/taxa/39083a3e-faf5-4b48-a5f0-69c2bfa32d68	Calyptorhynchus (Calyptorhynchus) banksii	(Latham, 1790)	species	Animalia	Chordata	Aves	Psittaciformes	Cacatuidae	Calyptorhynchus	Red-tailed Black Cockatoo	33
https://biodiversity.org.au/afd/taxa/e18ae8ab-640e-4199-9f78-d2dde7f6f198	Campion australasiae	(GuÃ©rin-MÃ©neville, 1844)	species	Animalia	Arthropoda	Insecta	Neuroptera	Mantispidae	Campion		1
https://biodiversity.org.au/afd/taxa/b6fa0e0e-ebf4-40a1-86d2-ff358ae053de	Campion tenuistrigus	(Gerstaecker, 1885)	species	Animalia	Arthropoda	Insecta	Neuroptera	Mantispidae	Campion		2
https://biodiversity.org.au/afd/taxa/df0e1cf0-aed0-4e5d-affc-cdbcdcdaae2a	Camponotus chalceus	Crawley, 1915	species	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Camponotus		4
https://biodiversity.org.au/afd/taxa/30ee9d69-b5f3-4f81-8b7c-10074fbdc485	Capra hircus	Linnaeus, 1758	species	Animalia	Chordata	Mammalia	Artiodactyla	Bovidae	Capra	Goat	2
https://biodiversity.org.au/afd/taxa/f374cb87-e7d8-4308-a8d0-d3ca23f2ee00	Carposina telesia	Meyrick, 1910	species	Animalia	Arthropoda	Insecta	Lepidoptera	Carposinidae	Carposina		1
https://biodiversity.org.au/afd/taxa/02755c89-eab2-4a68-872c-31cbf1803ca6	Casbia eutactopis	Turner, 1947	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Casbia		2
https://biodiversity.org.au/afd/taxa/41d01e6b-e265-424d-8d6d-e39966b4ce8f	Casmerodius modesta	J.E. Gray, 1831	species	Animalia	Chordata	Aves	Ciconiiformes	Ardeidae	Casmerodius	Eastern Great Egret	1
https://biodiversity.org.au/afd/taxa/107d0cfc-85c1-4126-b65a-008fa1e9bf65	Castiarina aeraticollis	(Carter, 1930)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		2
https://biodiversity.org.au/afd/taxa/e34028a2-3006-46be-af16-1baf61481eba	Castiarina amabilis	(Gory & Laporte, 1838)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		1
https://biodiversity.org.au/afd/taxa/02d0aa55-ed80-433a-a720-0aa971fe2c2a	Castiarina anchoralis	(Gory & Laporte, 1838)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		1
https://biodiversity.org.au/afd/taxa/5367bae3-f497-4907-9237-abf53ab25e4f	Castiarina aquila	(Barker, 1980)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		2
https://biodiversity.org.au/afd/taxa/9b27ace8-a0ca-44ae-b292-738dbca34420	Castiarina aureola	(Carter, 1913)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		4
https://biodiversity.org.au/afd/taxa/5a2d93bf-0657-459a-ad9f-c17b7fd5b9d3	Castiarina crocicolor	(Gory & Laporte, 1838)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		2
https://biodiversity.org.au/afd/taxa/184702bb-ac7f-44e8-b382-ead35eff5069	Castiarina filiformis	(Blackburn, 1892)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		2
https://biodiversity.org.au/afd/taxa/1e159e05-e603-49fa-a0a5-4362cc0e4b5e	Castiarina flaviceps	(Carter, 1913)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		7
https://biodiversity.org.au/afd/taxa/8ea6166a-9229-4783-80df-b8adb70e9b2f	Castiarina hostilis	(Blackburn, 1892)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		1
https://biodiversity.org.au/afd/taxa/99992944-b7c4-448e-92ae-d50205e00ab1	Castiarina mimesis	Barker, 1993	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		3

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/693b9f16-5207-4d19-8979-24f459ac31a8	Castiarina nonyma	Barker, 1996	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		4
https://biodiversity.org.au/afd/taxa/8833cc4a-73e7-48b6-9a8f-37b76b612dd6	Castiarina pallidiventris	(Gory & Laporte, 1838)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		12
https://biodiversity.org.au/afd/taxa/1719f5e7-2613-4ac5-a8e7-fdc28c627346	Castiarina parallela	(White, 1859)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		1
https://biodiversity.org.au/afd/taxa/36f99ede-f626-4588-9c23-dfcc0241289c	Castiarina placida	(Thomson, 1879)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		8
https://biodiversity.org.au/afd/taxa/9436bf4e-feb2-4f3f-91a4-be354b0de2d6	Castiarina robusta	(Saunders, 1869)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		1
https://biodiversity.org.au/afd/taxa/7ffbf204-cb65-4632-9312-3c1047ae3ea9	Castiarina rufipennis	(Kirby, 1818)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		26
https://biodiversity.org.au/afd/taxa/f5013a8e-bca0-4063-a07a-e17577f0aba0	Castiarina simulata	(Gory & Laporte, 1838)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		7
https://biodiversity.org.au/afd/taxa/4e4cd88d-b79c-458a-a9a1-a766e97cfda1	Castiarina subcincta	Barker, 1996	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		1
https://biodiversity.org.au/afd/taxa/b66b0c3d-3c09-4ec3-81b3-2c27904ed6ae	Catasarcus nephelodes	Thompson, 1968	species	Animalia	Arthropoda	Insecta	Coleoptera	Curculionidae	Catasarcus		1
https://biodiversity.org.au/afd/taxa/0a56e2e4-b38d-402e-b774-594a83d4522e	Catasarcus opimus	Pascoe, 1870	species	Animalia	Arthropoda	Insecta	Coleoptera	Curculionidae	Catasarcus		1
https://biodiversity.org.au/afd/taxa/7c1c010b-60d6-4ad5-9f42-bdafb24fe1ed	Catoryctis eugramma	Meyrick, 1890	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Catoryctis		1
https://biodiversity.org.au/afd/taxa/7058a23d-ab34-4b20-a8ff-b41704dd2973	Ceryerda cursitans	Simon, 1909	species	Animalia	Arthropoda	Arachnida	Araneae	Gnaphosidae	Ceryerda		6
https://biodiversity.org.au/afd/taxa/d6156ed3-bda2-42d6-a948-07d94c7e6559	Chalcites basalis	(Horsfield, 1821)	species	Animalia	Chordata	Aves	Cuculiformes	Cuculidae	Chalcites	Horsfield's Bronze-cuckoo	5
https://biodiversity.org.au/afd/taxa/99e4518d-7877-46c8-a809-7e4e4d5bad81	Chalcites lucidus	(Gmelin, 1788)	species	Animalia	Chordata	Aves	Cuculiformes	Cuculidae	Chalcites	Shining Bronze-cuckoo	7
https://biodiversity.org.au/afd/taxa/737198bf-0ca6-43e1-a428-f9e0f257f5c3	Chalcites osculans	Gould, 1847	species	Animalia	Chordata	Aves	Cuculiformes	Cuculidae	Chalcites	Black-eared Cuckoo	3
https://biodiversity.org.au/afd/taxa/424418ac-76a5-48b0-ad53-bf6da2ab96f5	Chasmoptera huttii	(Westwood, 1848)	species	Animalia	Arthropoda	Insecta	Neuroptera	Nemopteridae	Chasmoptera		1
https://biodiversity.org.au/afd/taxa/6540db4d-6ad2-4d02-a1a3-0ce812f68bca	Chauliognathus tricolor	(Castelnau, 1840)	species	Animalia	Arthropoda	Insecta	Coleoptera	Cantharidae	Chauliognathus		1
https://biodiversity.org.au/afd/taxa/27653d1b-205d-4cc4-931e-3a5396332ee7	Cheilomenes sexmaculata	(Fabricius, 1781)	species	Animalia	Arthropoda	Insecta	Coleoptera	Coccinellidae	Cheilomenes		2
https://biodiversity.org.au/afd/taxa/967549e7-7fa9-4770-b86e-5e3520d3c43d	Chelodina (Macrochelodina) oblonga	Gray, 1841	species	Animalia	Chordata	Reptilia	Testudines	Chelidae	Chelodina	Northern Snake-necked Turtle	1
https://biodiversity.org.au/afd/taxa/57815553-1b85-49b5-a46d-035c0a35622f	Chelodina (Macrodiremys) colliei	Gray, 1856	species	Animalia	Chordata	Reptilia	Testudines	Chelidae	Chelodina	South-western Long-necked Turtle	1
https://biodiversity.org.au/afd/taxa/7954bd26-ddb3-4e7e-823c-4a692b7bde74	Chenonetta jubata	(Latham, 1801)	species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Chenonetta	Australian Wood Duckmaned Goose	26
https://biodiversity.org.au/afd/taxa/5851a3f8-4962-477f-bd38-4f86473472f5	Cheramoeca leucosterna	(Gould, 1841)	species	Animalia	Chordata	Aves	Passeriformes	Hirundinidae	Cheramoeca	White-backed Swallow	1
https://biodiversity.org.au/afd/taxa/8dac12c2-6d68-4b92-9acc-0a1e1b26f171	Cherax preissii	(Erichson, 1846)	species	Animalia	Arthropoda	Malacostraca	Decapoda	Parastacidae	Cherax	Koonac	3
https://biodiversity.org.au/afd/taxa/8ce899d0-e1ad-4646-a161-6fe48388abbc	Cherax quinquecarinatus	(Gray, 1845)	species	Animalia	Arthropoda	Malacostraca	Decapoda	Parastacidae	Cherax	Djilgi	2
https://biodiversity.org.au/afd/taxa/8fc77349-3688-4294-a764-8d8bb1bc2df7	Chlaenius (Pelasmomimus) greyanus	White, 1841	species	Animalia	Arthropoda	Insecta	Coleoptera	Carabidae	Chlaenius		1
https://biodiversity.org.au/afd/taxa/d0eb223e-c5e4-48ad-8416-a0a8220d75fd	Chlenias banksiaria	(Le Guillou, 1841)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Chlenias		1
https://biodiversity.org.au/afd/taxa/0fc44003-1617-4f53-baff-1be37f0141c4	Chloroclystis insigillata	(Walker, 1862)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Chloroclystis		1
https://biodiversity.org.au/afd/taxa/ab3d2810-2de2-4068-a47c-6525bd1c36b6	Chlorocoma cadmaria	(GuenÃ©e, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Chlorocoma		2
https://biodiversity.org.au/afd/taxa/7816f9b5-70e6-495a-9226-fd5c84f51990	Chlorocoma rhodothrix	Turner, 1922	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Chlorocoma		1
https://biodiversity.org.au/afd/taxa/5d1f294c-d87a-4644-84ca-fe1f160902db	Chortoicetes terminifera	(Walker, 1870)	species	Animalia	Arthropoda	Insecta	Orthoptera	Acrididae	Chortoicetes	Australian Plague Locust	3
https://biodiversity.org.au/afd/taxa/f5f5b062-43f9-436d-ae93-8dcdcb7f71c6	Christinus marmoratus	(Gray, 1845)	species	Animalia	Chordata	Reptilia	Squamata	Gekkonidae	Christinus	Marbled Gecko	5
https://biodiversity.org.au/afd/taxa/5fa0da9c-420a-44de-821e-116cf5048142	Chrysis lincea	Fabricius, 1775	species	Animalia	Arthropoda	Insecta	Hymenoptera	Chrysididae	Chrysis		1
NZOR-6-34659	Chrysococcyx lucidus	Gmelin	species	Animalia	Chordata	Aves	Cuculiformes	Cuculidae	Chalcites	Shining Cuckoo	2
https://biodiversity.org.au/afd/taxa/26827e31-fa72-44bc-86cb-7ce377d0f2f9	Chrysodeixis argentifera	(GuenÃ©e, 1852)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Chrysodeixis		3
https://biodiversity.org.au/afd/taxa/326649d3-5119-406d-a661-f63a8c779dd2	Chrysolarentia gypsomela	(Lower, 1892)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Chrysolarentia		5
https://biodiversity.org.au/afd/taxa/be9b6968-ffb7-4140-87b8-5e990007704f	Chrysopogon albopunctatus	(Macquart, 1846)	species	Animalia	Arthropoda	Insecta	Diptera	Asilidae	Chrysopogon		7
https://biodiversity.org.au/afd/taxa/4ec69148-31ab-4830-83e5-3fbe5151b098	Ciampa arietaria	(GuenÃ©e, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Ciampa		3
https://biodiversity.org.au/afd/taxa/3308b448-6a73-47e9-8c7f-e1dd5fec5e09	Ciampa melanostrepta	(Lower, 1893)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Ciampa		1
https://biodiversity.org.au/afd/taxa/b39dfdf7-ce6a-4712-9304-13c7c7e0a604	Cincloramphus (Maclennania) mathewsi	Iredale, 1911	species	Animalia	Chordata	Aves	Passeriformes	Locustellidae	Cincloramphus	Rufous Songlark	5
https://biodiversity.org.au/afd/taxa/576c0cd7-73db-4202-9570-f45ea07d0ba9	Cirromitra tetratherma	(Lower, 1896)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Cirromitra		4
https://biodiversity.org.au/afd/taxa/eb73616a-9b0c-4a98-93be-a3e72bf1bef7	Clarana clarana	(Meyrick, 1881)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Clarana		2
https://biodiversity.org.au/afd/taxa/de840853-a3a3-4ec5-9dc0-7f12680a054f	Climacteris (Climacteris) rufus	Gould, 1841	species	Animalia	Chordata	Aves	Passeriformes	Climacteridae	Climacteris	Rufous Treecreeper	2
https://biodiversity.org.au/afd/taxa/d560c2ba-faff-4973-a2d1-f4dbcf06bbf0	Clogmia albipunctata	(Williston, 1893)	species	Animalia	Arthropoda	Insecta	Diptera	Psychodidae	Clogmia		2
https://biodiversity.org.au/afd/taxa/1351b437-2eb5-4949-990b-b18eb45252af	Coccinella transversalis	Fabricius, 1781	species	Animalia	Arthropoda	Insecta	Coleoptera	Coccinellidae	Coccinella	Transverse Ladybird	10
https://biodiversity.org.au/afd/taxa/7af45089-4a0f-4303-a417-1708623809af	Colluricincla (Colluricincla) harmonica	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Pachycephalidae	Colluricincla	Grey Shrike-thrush	17
https://biodiversity.org.au/afd/taxa/bf8abc11-ebe1-4f1a-9950-805e5bfcf90a	Columba (Columba) livia	Gmelin, 1789	species	Animalia	Chordata	Aves	Columbiformes	Columbidae	Columba	Rock Pigeon	1
https://biodiversity.org.au/afd/taxa/3049b5f8-5129-423d-b610-95a6e7ecfb91	Colymbomorpha vittata	Britton, 1959	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Colymbomorpha	Spring Beetle	2
https://biodiversity.org.au/afd/taxa/1f018b0d-2177-41a4-b1b4-5213f5d4e918	Comptosia tendens	(Walker, 1849)	species	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Comptosia		1
https://biodiversity.org.au/afd/taxa/44f60c7c-8b2b-4ecf-bc78-1bee5c2003d3	Conobrosis acervata	(Meyrick, 1914)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Conobrosis		3
https://biodiversity.org.au/afd/taxa/0a7f6150-7af3-4f1f-9d1c-31a2ac41363d	Copamyntis leptocosma	(Turner, 1904)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Copamyntis		2
https://biodiversity.org.au/afd/taxa/856e5658-3f4e-4c37-bf52-5f86b7b333e5	Coptocercus rubripes	(Boisduval, 1835)	species	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Coptocercus		4
https://biodiversity.org.au/afd/taxa/522a22ec-3318-4e17-97e7-8d8af150146b	Coptotermes michaelseni	Silvestri, 1909	species	Animalia	Arthropoda	Insecta	Blattodea	Rhinotermitidae	Coptotermes		1
https://biodiversity.org.au/afd/taxa/69c22b10-ff42-4bef-bb0f-88dc01a8f96c	Coracina (Coracina) novaehollandiae	(Gmelin, 1789)	species	Animalia	Chordata	Aves	Passeriformes	Campephagidae	Coracina	Black-faced Cuckoo-shrike	48
https://biodiversity.org.au/afd/taxa/6d7d78ca-a477-4c03-b09c-6cb3dcc31936	Corgatha pleuroplaca	Turner, 1936	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Corgatha		1
https://biodiversity.org.au/afd/taxa/bc165f53-184b-4531-8754-f82328676445	Cormocephalus aurantiipes	(Newport, 1844)	species	Animalia	Arthropoda	Chilopoda	Scolopendromorpha	Scolopendridae	Cormocephalus		4
https://biodiversity.org.au/afd/taxa/8117f68b-5460-4626-8400-e171464e08ad	Corvus coronoides	Vigors & Horsfield, 1827	species	Animalia	Chordata	Aves	Passeriformes	Corvidae	Corvus	Australian Raven	95
https://biodiversity.org.au/afd/taxa/3f192e7c-5eec-4696-9bc7-68211c69f473	Coryphistes ruricola	(Burmeister, 1838)	species	Animalia	Arthropoda	Insecta	Orthoptera	Acrididae	Coryphistes	Bark-mimicking Grasshopper	3
https://biodiversity.org.au/afd/taxa/d5a8bde0-f56a-4af9-962a-d168b3e3308b	Coturnix (Coturnix) pectoralis	Gould, 1837	species	Animalia	Chordata	Aves	Galliformes	Phasianidae	Coturnix	Grey Quail	1
https://biodiversity.org.au/afd/taxa/0f5df411-17dd-4719-91de-158fb1a77b27	Cracticus nigrogularis	(Gould, 1837)	species	Animalia	Chordata	Aves	Passeriformes	Artamidae	Cracticus	Pied Butcherbird	3
https://biodiversity.org.au/afd/taxa/681ea214-3788-4cc6-8b97-0b325d6bba6b	Cracticus torquatus	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Artamidae	Cracticus	Grey Butcherbird	12
https://biodiversity.org.au/afd/taxa/3fdcdf54-68f7-4fc8-a94a-2e09f6801dcd	Crenadactylus ocellatus	(Gray, 1845)	species	Animalia	Chordata	Reptilia	Squamata	Diplodactylidae	Crenadactylus	South-western Clawless Gecko	3
https://biodiversity.org.au/afd/taxa/ee90eb32-3d7c-41d6-8bf6-3ffda1ad8b9b	Crinia georgiana	Tschudi, 1838	species	Animalia	Chordata	Amphibia	Anura	Myobatrachidae	Crinia	Tschudi's Froglet	38
https://biodiversity.org.au/afd/taxa/5f46e9da-17dd-4e0c-add0-79c61b9f616a	Crinia glauerti	Loveridge, 1933	species	Animalia	Chordata	Amphibia	Anura	Myobatrachidae	Crinia	Glauert's Froglet	15
https://biodiversity.org.au/afd/taxa/0446dbe0-12c9-4a5e-a65b-b0b59c673089	Crinia insignifera	Moore, 1954	species	Animalia	Chordata	Amphibia	Anura	Myobatrachidae	Crinia	Sign-bearing Froglet	2
https://biodiversity.org.au/afd/taxa/cb702a02-a19c-4d9e-84d0-281496cc3e40	Crinia pseudinsignifera	Main, 1957	species	Animalia	Chordata	Amphibia	Anura	Myobatrachidae	Crinia	Bleating Froglet	19
https://biodiversity.org.au/afd/taxa/99bf0d55-0713-48d3-b5f1-a0517221578b	Crocidosema plebejana	Zeller, 1847	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Crocidosema		16
https://biodiversity.org.au/afd/taxa/dd3fe5ee-e526-4a37-ad58-72f1c8f73474	Cryphaea xylina	(Turner, 1917)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Cryphaea		4
https://biodiversity.org.au/afd/taxa/d7b2b8ef-9597-4048-9265-7c456b5ba90c	Crypsiphona ocultaria	(Donovan, 1805)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Crypsiphona		11
https://biodiversity.org.au/afd/taxa/238cfcda-851b-4a34-93ec-953a2b2922ae	Cryptoblabes euraphella	(Meyrick, 1879)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Cryptoblabes		3
https://biodiversity.org.au/afd/taxa/1142a7e2-ff49-4b09-9e2b-50587ce05801	Cryptoblepharus buchananii	(Gray, 1838)	species	Animalia	Chordata	Reptilia	Squamata	Scincidae	Cryptoblepharus	Buchanaâ€™s Snake-eyed Skink	10
https://biodiversity.org.au/afd/taxa/897cc242-5185-4b99-b38f-369638ab5ffb	Cryptoblepharus pannosus	Horner, 2007	species	Animalia	Chordata	Reptilia	Squamata	Scincidae	Cryptoblepharus	Ragged Snake-eyed Skink	1

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/d32ba5d4-cf49-4577-a478-691307ec7d6e	Cryptophlebia ombrodelta	(Lower, 1898)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Cryptophlebia		1
https://biodiversity.org.au/afd/taxa/3e61a01b-0ec9-4383-9540-b97bd073fc7a	Ctenotus inornatus	(Gray, 1845)	species	Animalia	Chordata	Reptilia	Squamata	Scincidae	Ctenotus	Bar-shouldered Ctenotus	1
https://biodiversity.org.au/afd/taxa/41c5176c-133e-4145-af0f-23258983b231	Culama dasythrix	Turner, 1945	species	Animalia	Arthropoda	Insecta	Lepidoptera	Cossidae	Culama		2
https://biodiversity.org.au/afd/taxa/5c17f3e1-359e-4c3a-97fe-8146ae3f840e	Culex (Culex) annulirostris	Skuse, 1889	species	Animalia	Arthropoda	Insecta	Diptera	Culicidae	Culex	Common Banded Mosquito	1
https://biodiversity.org.au/afd/taxa/974c4aef-d8bb-4773-8189-10701364c15f	Culex (Culex) globocoxitus	Dobrotworsky, 1953	species	Animalia	Arthropoda	Insecta	Diptera	Culicidae	Culex		2
https://biodiversity.org.au/afd/taxa/a9b2251c-0ee0-4e28-92c5-9e62c7121073	Cyclodomorphus celatus	Shea & Miller, 1995	species	Animalia	Chordata	Reptilia	Squamata	Scincidae	Cyclodomorphus	Western Slender Blue-tongue	1
https://biodiversity.org.au/afd/taxa/f83c15ca-4ff5-4c37-be49-ce49a431f0ca	Cygnus (Chenopis) atratus	(Latham, 1790)	species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Cygnus	Black Swan	4
https://biodiversity.org.au/afd/taxa/1fc76c4d-4830-4129-9b86-1c7e944c3c50	Dacelo (Dacelo) novaeguineae	(Hermann, 1783)	species	Animalia	Chordata	Aves	Coraciiformes	Alcedinidae	Dacelo	Kookaburra	65
https://biodiversity.org.au/afd/taxa/57fcbc39-071b-4a1f-bb6c-2e607919b357	Danaus chrysippus	(Linnaeus, 1758)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Danaus	Lesser Wanderer	3
https://biodiversity.org.au/afd/taxa/a5ea37bf-956a-430a-b719-3985da2b7ba9	Danaus petilia	(Stoll, 1790)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Danaus	Lesser Wanderer	10
https://biodiversity.org.au/afd/taxa/e24dc381-5c20-4580-b2ed-695fefce2622	Danaus plexippus	(Linnaeus, 1758)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Danaus	Wanderer	8
https://biodiversity.org.au/afd/taxa/8bf4b8b0-f432-4e9d-8ea6-08fc20c8090c	Daphoenositta (Neositta) chrysoptera	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Neosittidae	Daphoenositta	Varied Sittella	7
https://biodiversity.org.au/afd/taxa/8770492b-ee4c-4bec-b319-cb8d8fb0a492	Dasygaster padockina	(Le Guillou, 1841)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Dasygaster		2
https://biodiversity.org.au/afd/taxa/c28fcdb3-8a0f-4877-b3d0-cf6378d42db6	Dasyhesma robusta	Michener, 1965	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Dasyhesma		8
https://biodiversity.org.au/afd/taxa/741a9edf-3e5e-4548-9f35-7b76dc5a87ae	Dasyhesma scholtziae	Exley, 2004	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Dasyhesma		2
https://biodiversity.org.au/afd/taxa/558915f1-ed5c-4406-bdc5-41d5084abdbd	Dasypodia selenophora	GuenÃ©e, 1852	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Dasypodia		21
https://biodiversity.org.au/afd/taxa/a2260672-36df-48be-8a9e-d85a77237ba5	Dasyurus geoffroii	Gould, 1841	species	Animalia	Chordata	Mammalia	Dasyuromorphia	Dasyuridae	Dasyurus	Western Quoll	2
https://biodiversity.org.au/afd/taxa/8ff21448-35e3-4fc9-898a-8aa404ac2fe2	Debiliana GROUP debiliana	(Walker, 1863)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Debiliana		8
https://biodiversity.org.au/afd/taxa/ca07f77a-e8ce-401e-b20a-3cd7fda43231	Delias aganippe	(Donovan, 1805)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pieridae	Delias	Wood White	1
https://biodiversity.org.au/afd/taxa/19f72aa6-8444-4978-af79-3a7c027dd862	Delma fraseri	Gray, 1831	species	Animalia	Chordata	Reptilia	Squamata	Pygopodidae	Delma	Fraser's Delma	1
https://biodiversity.org.au/afd/taxa/97874787-7705-41c8-8b3b-6594bd06cc20	Destolmia lineata	Walker, 1855	species	Animalia	Arthropoda	Insecta	Lepidoptera	Notodontidae	Destolmia		2
https://biodiversity.org.au/afd/taxa/0c5ae789-ae33-4479-ac10-3528a90761a8	Diatenes gerula	GuenÃ©e, 1852	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Diatenes		2
https://biodiversity.org.au/afd/taxa/8f2d4aeb-50eb-438f-a145-5f12e356ffd8	Dicaeum (Dicaeum) hirundinaceum	(Shaw, 1792)	species	Animalia	Chordata	Aves	Passeriformes	Dicaeidae	Dicaeum	Mistletoebird	7
https://biodiversity.org.au/afd/taxa/5eb4f567-5adf-40ff-9441-62a333a1d51b	Dichromodes anelictis	Meyrick, 1890	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		21
https://biodiversity.org.au/afd/taxa/e6b65ba6-ed0a-4e20-9449-c8ab766dfaf2	Dichromodes aristadelpha	Lower, 1903	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		2
https://biodiversity.org.au/afd/taxa/8f233323-1cd8-4c12-9695-a2b1e9131ab5	Dichromodes consignata	(Walker, 1861)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		17
https://biodiversity.org.au/afd/taxa/abc9104e-6524-40d0-a8bd-e65174575e2f	Dichromodes denticulata	Turner, 1930	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		1
https://biodiversity.org.au/afd/taxa/60c836d7-ddb3-4921-b1c8-85ab88236e05	Dichromodes euprepes	Prout, 1910	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		2
https://biodiversity.org.au/afd/taxa/1381e177-debf-4b05-8647-829007e12291	Dichromodes haematopa	Turner, 1906	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		2
https://biodiversity.org.au/afd/taxa/ec80b05b-3b04-425e-a808-a60adaff7635	Dichromodes indicataria	(Walker, 1866)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		9
https://biodiversity.org.au/afd/taxa/26902a34-d5d4-4c76-9a01-ee6663ddeb34	Dichromodes leptozona	Turner, 1930	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		11
https://biodiversity.org.au/afd/taxa/67883201-f012-41b5-b98e-d78c728edd23	Dichromodes orthotis	Meyrick, 1890	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		18
https://biodiversity.org.au/afd/taxa/2149213e-1b45-4bb9-a6ab-9cff0a4ba56c	Dichromodes orthozona	Lower, 1903	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		8
https://biodiversity.org.au/afd/taxa/0434554f-45e3-46b3-ab94-98013c4ba09d	Dichromodes poecilotis	Meyrick, 1890	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		26
https://biodiversity.org.au/afd/taxa/09c6ba69-a0a2-4a41-ad8f-bf9194be9f0d	Dichromodes semicanescens	L.B. Prout, 1913	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		29
https://biodiversity.org.au/afd/taxa/6ae14740-ed24-4641-9cf5-88afccdff70c	Dictyotus caenosus	(Westwood, 1837)	species	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Dictyotus	Brown Shield Bug	1
https://biodiversity.org.au/afd/taxa/51210b39-d335-482c-b1d0-908a1ddb0b2f	Dictyotus conspicuus	Gross, 1975	species	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Dictyotus		1
https://biodiversity.org.au/afd/taxa/9b1c2ba7-4750-468d-97f6-00b05f80abff	Dinophalus atmoscia	(Meyrick, 1890)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dinophalus		3
https://biodiversity.org.au/afd/taxa/a1b850c6-3aa9-4296-b29c-a4fc0144ae79	Dinophalus serpentaria	(GuenÃ©e, 1864)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dinophalus		6
https://biodiversity.org.au/afd/taxa/0f638a2e-3d61-4cb6-a0a4-275dfe71657e	Diphucrania notulata	(Germar, 1848)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Diphucrania		1
https://biodiversity.org.au/afd/taxa/030e1e11-aea3-4d57-92f3-2b58c728256e	Diphucrania roseocuprea	(Hope, 1846)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Diphucrania		4
https://biodiversity.org.au/afd/taxa/0519208b-fe23-41e0-ab67-e1320ab89d30	Diphucrania stigmata	(Gory & Laporte, 1839)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Diphucrania		2
https://biodiversity.org.au/afd/taxa/a064e0ce-9140-4ab1-a143-bacc1835e9ee	Diphucrania tyrrhena	(Carter, 1923)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Diphucrania		11
https://biodiversity.org.au/afd/taxa/ebec0833-c589-4fd2-82a5-610853df11c9	Diphucrania viridiceps	(Kerremans, 1898)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Diphucrania		1
https://biodiversity.org.au/afd/taxa/c437f86d-edcd-44c3-b2f7-4fda1d11b316	Diplacodes bipunctata	(Brauer, 1865)	species	Animalia	Arthropoda	Insecta	Odonata	Libellulidae	Diplacodes		15
https://biodiversity.org.au/afd/taxa/0c6260a5-59f2-4feb-8372-db2138b29fc3	Diplacodes haematodes	(Burmeister, 1839)	species	Animalia	Arthropoda	Insecta	Odonata	Libellulidae	Diplacodes		2
https://biodiversity.org.au/afd/taxa/4f9d014d-1d42-4751-890f-5cc4e1880bf4	Diplodactylus granariensis	Storr, 1979	species	Animalia	Chordata	Reptilia	Squamata	Diplodactylidae	Diplodactylus	Wheat-belt Stone Gecko	1
https://biodiversity.org.au/afd/taxa/a3345886-a655-4dd1-9256-65b8a4e91b08	Dolopsis chalcophragma	(Meyrick, 1889)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Dolopsis		4
https://biodiversity.org.au/afd/taxa/0995e2a7-3222-4fd6-ac14-3d53ca819176	Doratifera quadriguttata	(Walker, 1855)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Limacodidae	Doratifera		4
https://biodiversity.org.au/afd/taxa/2a4e373b-913a-4e2a-a53f-74828f6dae7e	Dromaius novaehollandiae	(Latham, 1790)	species	Animalia	Chordata	Aves	Struthioniformes	Casuariidae	Dromaius	Emu	20
https://biodiversity.org.au/afd/taxa/4084ab92-7a98-420a-a1da-fbb5b970006d	Drymaplaneta semivitta	(Walker, 1868)	species	Animalia	Arthropoda	Insecta	Blattodea	Blattidae	Drymaplaneta		1
https://biodiversity.org.au/afd/taxa/3900049b-f2de-47c7-838b-c571c71ba4c7	Earias paralella	T.P. Lucas, 1898	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nolidae	Earias		5
https://biodiversity.org.au/afd/taxa/8fd1977b-9edf-4ddf-b6cf-24a09db4d18c	Egretta novaehollandiae	(Latham, 1790)	species	Animalia	Chordata	Aves	Ciconiiformes	Ardeidae	Egretta	Matuka	18
https://biodiversity.org.au/afd/taxa/e382a431-801d-4a24-9a5a-03a262be9279	Elanus axillaris	(Latham, 1801)	species	Animalia	Chordata	Aves	Accipitriformes	Accipitridae	Elanus	Black-shouldered Kite	11
https://biodiversity.org.au/afd/taxa/1a5b5d24-d7b5-43e9-b2d7-15ff1821fc7e	Elapognathus coronatus	(Schlegel, 1837)	species	Animalia	Chordata	Reptilia	Squamata	Elapidae	Elapognathus	Western Crowned Snake	1
https://biodiversity.org.au/afd/taxa/4e105955-f831-45f9-9d93-8421ac4aca99	Eleale aulicodes	Gorham, 1876	species	Animalia	Arthropoda	Insecta	Coleoptera	Cleridae	Eleale		2
https://biodiversity.org.au/afd/taxa/7233b5af-d31d-4a44-b71b-85c9e27fd88f	Enchocrates phaedryntis	Meyrick, 1888	species	Animalia	Arthropoda	Insecta	Lepidoptera	Depressariidae	Enchocrates		6
https://biodiversity.org.au/afd/taxa/7afc2e38-ddbb-44d7-a0d0-0f2226094ad4	Endeolena aurinatella	(Walker, 1864)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Endeolena		1
https://biodiversity.org.au/afd/taxa/d2e4a111-e471-4a55-97c5-a2fd9175a22a	Endosimilis stilbealis	(Walker, 1859)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Endosimilis		1
https://biodiversity.org.au/afd/taxa/a2be3cbf-90b3-4ab9-aed6-0929d5862364	Endotricha pyrosalis	GuenÃ©e, 1854	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Endotricha		1
https://biodiversity.org.au/afd/taxa/b048f739-16e8-40d6-a86d-eca601c371b8	Enochrus (Methydrus) eyrensis	(Blackburn, 1895)	species	Animalia	Arthropoda	Insecta	Coleoptera	Hydrophilidae	Enochrus		2
https://biodiversity.org.au/afd/taxa/ea7087ca-2b95-4b8b-bbef-3090be7a9a96	Entometa fervens	(Walker, 1855)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Lasiocampidae	Entometa		4
https://biodiversity.org.au/afd/taxa/2edd024c-e0d5-4514-840f-24448eac13f3	Eochrois epidesma	(Meyrick, 1886)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Eochrois		1
https://biodiversity.org.au/afd/taxa/9b4ad548-8bb3-486a-ab0a-905506c463ea	Eolophus roseicapilla	(Vieillot, 1817)	species	Animalia	Chordata	Aves	Psittaciformes	Cacatuidae	Eolophus	Galah	58
https://biodiversity.org.au/afd/taxa/a390a6d9-ca4f-459f-8959-e9305918590e	Eopsaltria (Eopsaltria) griseogularis	Gould, 1838	species	Animalia	Chordata	Aves	Passeriformes	Petroicidae	Eopsaltria	Western Yellow Robin	1
https://biodiversity.org.au/afd/taxa/75e8b301-ddf9-42ef-8fae-65a1dfab2643	Eosphora najas	Ehrenberg, 1830	species	Animalia	Rotifera	Monogononta	Ploima	Notommatidae	Eosphora		1
https://biodiversity.org.au/afd/taxa/4a55b0ed-5e8c-49d7-8513-27288f4adb96	Epharpastis daedala	Meyrick, 1887	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tineodidae	Epharpastis		2
https://biodiversity.org.au/afd/taxa/441414e1-8259-4435-9813-77638e8abbd6	Ephestia elutella	(HÃ¼bner, 1796)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Ephestia		1
https://biodiversity.org.au/afd/taxa/ffffae21-3184-41f6-b8bd-a9fd358fdd87	Ephestiopsis oenobarella	(Meyrick, 1879)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Ephestiopsis		1
https://biodiversity.org.au/afd/taxa/2797eeb1-2ba7-424b-835a-357521235c3f	Epicoma contristis	HÃ¼bner, 1823	species	Animalia	Arthropoda	Insecta	Lepidoptera	Notodontidae	Epicoma		1
https://biodiversity.org.au/afd/taxa/b7e0118a-75e2-46db-b537-9058f7ba7356	Epicyme rubropunctaria	(Doubleday, 1843)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Epicyme		3
https://biodiversity.org.au/afd/taxa/ef0eebf7-35de-41cf-8091-77820287b8d1	Epiphyas liadelpha	(Meyrick, 1910)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Epiphyas		2
https://biodiversity.org.au/afd/taxa/e5afebdc-33cd-4e99-b4a2-f09fd12b76e7	Epiphyas postvittana	(Walker, 1863)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Epiphyas		3
https://biodiversity.org.au/afd/taxa/c95af018-43ab-43b8-8e14-037604db64f6	Epthianura (Epthianura) albifrons	(Jardine & Selby, 1828)	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Epthianura	White-fronted Chat	3
https://biodiversity.org.au/afd/taxa/140080d1-cb9c-4e80-9b8c-8e084ed413e2	Epthianura (Parepthianura) tricolor	Gould, 1841	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Epthianura	Crimson Chat	1
https://biodiversity.org.au/afd/taxa/4cecb93f-bdf5-4c87-9bce-159ba0a0a115	Epyaxa sodaliata	(Walker, 1862)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Epyaxa		4

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/863fe242-b3ac-4a53-9ee9-831535a6b2e7	Epyaxa subidaria	(GuenÃ©e, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Epyaxa		5
https://biodiversity.org.au/afd/taxa/8172ded2-e2a6-4a86-90b0-4702e7b66a6b	Equus (Asinus) asinus	Linnaeus, 1758	species	Animalia	Chordata	Mammalia	Perissodactyla	Equidae	Equus	Donkey	1
https://biodiversity.org.au/afd/taxa/89d4b12d-8aaf-4360-9638-674ab7291083	Eretes australis	(Erichson, 1842)	species	Animalia	Arthropoda	Insecta	Coleoptera	Dytiscidae	Eretes		1
https://biodiversity.org.au/afd/taxa/c2215594-23a7-4e56-bb81-38b6108f0dd1	Eriophora pustulosa	(Walckenaer, 1842)	species	Animalia	Arthropoda	Arachnida	Araneae	Araneidae	Eriophora		3
https://biodiversity.org.au/afd/taxa/8e4bd073-9dae-4ec0-b1f8-d82286cdeb7e	Eristalinus (Lathyrophthalmus) punctulatus	(Macquart, 1847)	species	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Eristalinus		1
https://biodiversity.org.au/afd/taxa/5d937df2-e9dc-43a1-b829-2087ca5529ff	Ethmostigmus rubripes	(Brandt, 1840)	species	Animalia	Arthropoda	Chilopoda	Scolopendromorpha	Scolopendridae	Ethmostigmus		1
https://biodiversity.org.au/afd/taxa/a2cded5f-7277-44e4-8c41-1b04dd8690c9	Ethonion breve	(Carter, 1923)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Ethonion		1
https://biodiversity.org.au/afd/taxa/6671d23d-f916-4bb5-a995-200a5b0968eb	Ethonion roei	(Saunders, 1868)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Ethonion		1
https://biodiversity.org.au/afd/taxa/a82a6581-a07c-4484-85f7-a7483ba8ef61	Etiella behrii	(Zeller, 1848)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Etiella		1
https://biodiversity.org.au/afd/taxa/4f5ab623-d62d-4df2-9cad-05a3857a5988	Etiella chrysoporella	Meyrick, 1879	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Etiella		7
https://biodiversity.org.au/afd/taxa/be0286d0-9062-436a-a18b-c8533484deb0	Eublemma inconspicua	(Walker, 1865)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Eublemma		9
https://biodiversity.org.au/afd/taxa/bb9ca04b-020d-4e1d-a71b-ccf52e57e6ae	Euchaetis inceptella	(Walker, 1864)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Euchaetis		1
https://biodiversity.org.au/afd/taxa/f4a754fc-9516-4d0d-943e-f3d76b65961e	Euchaetis iozona	(Lower, 1893)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Euchaetis		2
https://biodiversity.org.au/afd/taxa/f7b7f1c6-a408-4465-917a-f5748cd15573	Euchaetis metallota	Meyrick, 1883	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Euchaetis		12
https://biodiversity.org.au/afd/taxa/8c2a0fa4-5de4-463c-a4dc-f4f6f2617be0	Eucyclodes buprestaria	(GuenÃ©e, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Eucyclodes		2
https://biodiversity.org.au/afd/taxa/c5835a16-cb39-49df-a8e7-3f392c4eca89	Eucyclops edytae	Tang & Knott, 2009	species	Animalia	Arthropoda	Maxillopoda	Cyclopoida	Cyclopidae	Eucyclops	Copepod	1
https://biodiversity.org.au/afd/taxa/b5ed8bd3-8c30-4703-b08c-6b154fab63a3	Eudesmeola lawsoni	(R. Felder & Rogenhofer, 1874)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Eudesmeola		2
https://biodiversity.org.au/afd/taxa/9d1d87b5-5573-4578-8974-c9898dc341c3	Eulechria heliophanes	(Lower, 1894)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Eulechria		1
https://biodiversity.org.au/afd/taxa/22733091-ad72-4da0-9295-e57c5daa3d75	Eumerus obliquus	(Fabricius, 1805)	species	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Eumerus		1
https://biodiversity.org.au/afd/taxa/70140ef1-3513-45fe-9437-77b1b14a4df9	Euoniticellus fulvus	(Goeze, 1777)	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Euoniticellus		2
https://biodiversity.org.au/afd/taxa/58521ae6-c841-4aa0-a275-efe9d6b3068e	Euoniticellus intermedius	(Reiche, 1849)	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Euoniticellus	Northern Sandy Dung Beetle	31
https://biodiversity.org.au/afd/taxa/37be4f00-f299-4d5c-ab68-d3fefa879ea7	Euoniticellus pallipes	(Fabricius, 1781)	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Euoniticellus	Southern Sandy Dung Beetle	30
https://biodiversity.org.au/afd/taxa/2c9251b8-4256-4eef-ad8f-68313a3bd3ed	Euoplos inornatus	(Rainbow & Pulleine, 1918)	species	Animalia	Arthropoda	Arachnida	Araneae	Idiopidae	Euoplos	Inornate Trapdoor Spider (northern Jarrah Forest)	3
https://biodiversity.org.au/afd/taxa/c4148fa4-ca18-463d-b761-b2a37c5c109c	Euproctis niphobola	Turner, 1902	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Euproctis		2
https://biodiversity.org.au/afd/taxa/aed5e8e8-e92b-4225-a30d-aaf3b370db11	Eupselia beltera	Turner, 1947	species	Animalia	Arthropoda	Insecta	Lepidoptera	Hypertrophidae	Eupselia		1
https://biodiversity.org.au/afd/taxa/78761d15-64d4-4e91-badf-770770f7778b	Eupselia iridizona	Lower, 1899	species	Animalia	Arthropoda	Insecta	Lepidoptera	Hypertrophidae	Eupselia		1
https://biodiversity.org.au/afd/taxa/a4c5c306-8f2a-4218-bcc4-a1afee2b7ab7	Eurepa yumbena	Otte & Alexander, 1983	species	Animalia	Arthropoda	Insecta	Orthoptera	Gryllidae	Eurepa		1
https://biodiversity.org.au/afd/taxa/70a29d57-3aea-43e3-b675-98c01960979d	Falco (Falco) longipennis	Swainson, 1838	species	Animalia	Chordata	Aves	Falconiformes	Falconidae	Falco	Australian Hobby	2
https://biodiversity.org.au/afd/taxa/083b413f-8746-4788-8dc1-3da495d78a79	Falco (Hierofalco) peregrinus	Tunstall, 1771	species	Animalia	Chordata	Aves	Falconiformes	Falconidae	Falco	Duck Hawk	2
https://biodiversity.org.au/afd/taxa/0628244e-287b-4001-946e-5a41ef056f41	Falco (Ieracidea) berigora	Vigors & Horsfield, 1827	species	Animalia	Chordata	Aves	Falconiformes	Falconidae	Falco	Chicken Hawk	3
https://biodiversity.org.au/afd/taxa/8f6b91ae-4019-490c-a133-73acb05d25e8	Falco (Tinnunculus) cenchroides	Vigors & Horsfield, 1827	species	Animalia	Chordata	Aves	Falconiformes	Falconidae	Falco	Wala	16
https://biodiversity.org.au/afd/taxa/dc2918a1-3d48-4628-b156-cf38c14c6c97	Faveria tritalis	(Walker, 1863)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Faveria		16
https://biodiversity.org.au/afd/taxa/7de6b16a-f854-4b4b-88cf-81868ce74ad8	Felis catus	Linnaeus, 1758	species	Animalia	Chordata	Mammalia	Carnivora	Felidae	Felis	Cat	10
https://biodiversity.org.au/afd/taxa/24c0a166-87a3-47ce-a4a2-c1ee5941d82a	Fisera hypoleuca	(Turner, 1919)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Fisera		4
https://biodiversity.org.au/afd/taxa/bb53b420-0a1f-4a49-9d1e-2a6154c685a8	Fulica atra	Linnaeus, 1758	species	Animalia	Chordata	Aves	Gruiformes	Rallidae	Fulica	Eurasian Coot	2
https://biodiversity.org.au/afd/taxa/4cee8a8f-3848-4095-8734-254056585182	Galaxias occidentalis	Ogilby, 1899	species	Animalia	Chordata	Actinopterygii	Salmoniformes	Galaxiidae	Galaxias	Western Galaxias	1
https://biodiversity.org.au/afd/taxa/b5e44fea-a0a2-412b-a1f7-476b3c1e8e03	Gallinula (Gallinula) tenebrosa	Gould, 1846	species	Animalia	Chordata	Aves	Gruiformes	Rallidae	Gallinula	Dusky Moorhen	2
https://biodiversity.org.au/afd/taxa/e96c4568-a10f-4ea9-a741-a551b1f22bc1	Gambusia holbrooki	Girard, 1859	species	Animalia	Chordata	Actinopterygii	Cyprinodontiformes	Poeciliidae	Gambusia	Top Minnow	1
https://biodiversity.org.au/afd/taxa/48b55567-78e6-402a-b265-43c4adf565e8	Garrha absumptella	(Walker, 1864)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Garrha		1
https://biodiversity.org.au/afd/taxa/96041039-3f04-4e2f-b83d-1b5c8a68376d	Garrha carnea	(Zeller, 1855)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Garrha		4
https://biodiversity.org.au/afd/taxa/a8b54d4a-70b9-458a-80f4-79109fc46226	Garrha idiosema	(Turner, 1917)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Garrha		2
https://biodiversity.org.au/afd/taxa/8a8aec47-2e99-4a59-aea2-214c803f841c	Garrha mesodesma	(Meyrick, 1889)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Garrha		1
https://biodiversity.org.au/afd/taxa/c1cbc4ca-5b2a-4329-a9a8-b00181054bdb	Garrha oncospila	(Turner, 1946)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Garrha		1
https://biodiversity.org.au/afd/taxa/59a14540-36ab-4dec-86ff-329ec3ce2af0	Garrha platyporphyra	(Turner, 1946)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Garrha		2
https://biodiversity.org.au/afd/taxa/4fc894fa-7f87-40d9-b950-19e1ba40fd78	Garrha pudica	(Zeller, 1855)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Garrha		1
https://biodiversity.org.au/afd/taxa/1e037046-a99b-4282-8aa9-92bec2fc903b	Garrha rubella	(Turner, 1939)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Garrha		2
https://biodiversity.org.au/afd/taxa/00067a34-0239-42f0-9335-aed46533933f	Gasteruption breviscutum	Kieffer, 1911	species	Animalia	Arthropoda	Insecta	Hymenoptera	Gasteruptiidae	Gasteruption		1
https://biodiversity.org.au/afd/taxa/a505061e-e848-4f4b-810d-54fda5828a1b	Gastrina cristaria	GuenÃ©e, 1857	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Gastrina		1
https://biodiversity.org.au/afd/taxa/7ef23364-cb69-4935-84da-98752b8f835e	Gastrinodes argoplaca	(Meyrick, 1892)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Gastrinodes		8
https://biodiversity.org.au/afd/taxa/c18cc9f6-d13c-4b1d-ae6d-ee5b79750507	Gastrinodes bitaeniaria	(Le Guillou, 1841)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Gastrinodes		1
https://biodiversity.org.au/afd/taxa/febdd33c-9403-4fad-83fd-5d6d0753df9e	Gastrinopa xylistis	Lower, 1903	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Gastrinopa		4
https://biodiversity.org.au/afd/taxa/6ccdb357-d666-4097-b0f6-88bb1a392112	Gavicalis virescens	(Vieillot, 1817)	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Gavicalis	Singing Honeyeater	46
https://biodiversity.org.au/afd/taxa/64c33410-27eb-4e05-87e5-675c6aba13c5	Gehyra variegata	(DumÃ©ril & Bibron, 1836)	species	Animalia	Chordata	Reptilia	Squamata	Gekkonidae	Gehyra	Tree Dtella	3
https://biodiversity.org.au/afd/taxa/c875d96f-82a1-459b-ac49-35057cfa0e70	Geitoneura minyas	(Waterhouse & Lyell, 1914)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Geitoneura	Western Xenica	2
https://biodiversity.org.au/afd/taxa/d393da76-46e5-456e-b555-b80655cdd271	Genduara acedesta	(Turner, 1911)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Lasiocampidae	Genduara		4
https://biodiversity.org.au/afd/taxa/b619c53b-e671-4052-8b96-21e42037bbbe	Genduara subnotata	(Walker, 1869)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Lasiocampidae	Genduara		2
https://biodiversity.org.au/afd/taxa/75e90438-cf36-403e-9223-a7d4737b1fd1	Gerygone fusca	(Gould, 1838)	species	Animalia	Chordata	Aves	Passeriformes	Acanthizidae	Gerygone	Fuscous Warbler	70
https://biodiversity.org.au/afd/taxa/f0a6a2c3-adad-4c57-9cae-17956131ecf0	Gliciphila melanops	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Gliciphila	Tawny-crowned Honeyeater	2
https://biodiversity.org.au/afd/taxa/b07aed34-2184-4ce6-b8f3-106e477c7eb1	Glycyphana (Glycyphaniola) stolata	(Fabricius, 1781)	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Glycyphana		1
https://biodiversity.org.au/afd/taxa/30dfcca6-8f44-4913-b8ad-0dda0533b8be	Goniaea australasiae	(Leach, 1814)	species	Animalia	Arthropoda	Insecta	Orthoptera	Acrididae	Goniaea	Gumleaf Grasshopper	5
https://biodiversity.org.au/afd/taxa/ce17b284-d607-496a-992f-f3129bfd3997	Grallina cyanoleuca	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Monarchidae	Grallina	Magpie-lark	34
https://biodiversity.org.au/afd/taxa/ace0a82b-ba52-4b4d-93cb-a412010fddb0	Gryllotalpa australis	Erichson, 1842	species	Animalia	Arthropoda	Insecta	Orthoptera	Gryllotalpidae	Gryllotalpa		1
https://biodiversity.org.au/afd/taxa/4c642a6d-3dd9-41bd-bd6d-79c981d9c197	Gryllotalpa pluvialis	(MjÃ¶berg, 1913)	species	Animalia	Arthropoda	Insecta	Orthoptera	Gryllotalpidae	Gryllotalpa		1
https://biodiversity.org.au/afd/taxa/5291343e-fdeb-4a65-8ba5-928f5b96acf5	Gymnorhina tibicen	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Artamidae	Gymnorhina	Australian Magpie	119
https://biodiversity.org.au/afd/taxa/048eeb2a-2c2e-473b-8016-c7f6824e92b8	Habronestes bradleyi	(O.P.-Cambridge, 1869)	species	Animalia	Arthropoda	Arachnida	Araneae	Zodariidae	Habronestes		1
https://biodiversity.org.au/afd/taxa/31113d80-ed4f-4bb0-9a65-48080e4c6dd1	Haliastur sphenurus	(Vieillot, 1818)	species	Animalia	Chordata	Aves	Accipitriformes	Accipitridae	Haliastur	Whistling Eagle-hawk	4
https://biodiversity.org.au/afd/taxa/c97ec903-a388-468e-a5a5-fb2229a06340	Havinthus rufovarius	Bergroth, 1895	species	Animalia	Arthropoda	Insecta	Hemiptera	Reduviidae	Havinthus		1
https://biodiversity.org.au/afd/taxa/9a386f42-e1a0-4109-b295-969d6a6639b8	Hednota bivittella	(Donovan, 1805)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Hednota		1
https://biodiversity.org.au/afd/taxa/6407a890-1405-48e3-a945-d52796cb4f3f	Hednota crypsichroa	Lower, 1893	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Hednota		1
https://biodiversity.org.au/afd/taxa/8bd56c10-3d69-463b-a01f-597da65178ba	Hednota dichospila	(Turner, 1937)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Hednota		1
https://biodiversity.org.au/afd/taxa/8de28b31-050d-415a-95fc-cb561d2fb4cb	Hednota longipalpella	(Meyrick, 1879)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Hednota		6
https://biodiversity.org.au/afd/taxa/0fa027bf-cc4d-4c61-905a-4930ee94cf39	Hednota pedionoma	(Meyrick, 1885)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Hednota		2
https://biodiversity.org.au/afd/taxa/1e540286-d6f2-43a1-bf27-180858eb9f98	Helea perforata	(Latreille, 1817)	species	Animalia	Arthropoda	Insecta	Coleoptera	Tenebrionidae	Helea		3
https://biodiversity.org.au/afd/taxa/c1d18a1e-5aec-4441-aa3c-e0ac799f51e8	Heleioporus albopunctatus	Gray, 1841	species	Animalia	Chordata	Amphibia	Anura	Limnodynastidae	Heleioporus	Western Spotted Frog	3
https://biodiversity.org.au/afd/taxa/c527388c-1cc7-4a10-800a-243b5a2dcd3c	Heleioporus barycragus	Lee, 1967	species	Animalia	Chordata	Amphibia	Anura	Limnodynastidae	Heleioporus	Western Marsh Frog	4

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/cf991494-ccee-433d-b049-f2a0996a0a3b	Heleioporus eyrei	(Gray, 1845)	species	Animalia	Chordata	Amphibia	Anura	Limnodynastidae	Heleioporus	Moaning Frog	11
https://biodiversity.org.au/afd/taxa/16fcc761-685a-4527-b5e4-e6c7042ae2c6	Heleioporus inornatus	(Lee & Main, 1954)	species	Animalia	Chordata	Amphibia	Anura	Limnodynastidae	Heleioporus	Plains Frog	1
https://biodiversity.org.au/afd/taxa/643c69f3-d060-4f65-a48a-e8d8466aa60b	Helicoverpa armigera	(HÃ¼bner, 1808)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Helicoverpa		1
https://biodiversity.org.au/afd/taxa/5c55fcda-c856-4584-a07b-07f9eb7b8875	Helicoverpa punctigera	(Wallengren, 1860)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Helicoverpa		2
https://biodiversity.org.au/afd/taxa/5e0ff2a3-c0b4-49b6-8314-dfe9e790169d	Heliothis punctifera	Walker, 1857	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Heliothis		1
https://biodiversity.org.au/afd/taxa/146f01aa-333f-4744-a8a2-f90a8e9c6050	Hellula hydralis	GuenÃ©e, 1854	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Hellula		25
https://biodiversity.org.au/afd/taxa/b89f6072-46a2-4c1f-a417-fd45ee4d5c3f	Hemicordulia tau	(Selys, 1871)	species	Animalia	Arthropoda	Insecta	Odonata	Corduliidae	Hemicordulia		8
https://biodiversity.org.au/afd/taxa/1a132b29-a7e7-499f-8086-eba8a14c77b6	Hemiergis initialis	(Werner, 1910)	species	Animalia	Chordata	Reptilia	Squamata	Scincidae	Hemiergis	Southwestern Earless Skink	1
https://biodiversity.org.au/afd/taxa/630adc1f-a781-4aed-9785-ac67078ffd06	Hemiergis quadrilineata	(DumÃ©ril & Bibron, 1839)	species	Animalia	Chordata	Reptilia	Squamata	Scincidae	Hemiergis	Two-toed Earless Skink	1
https://biodiversity.org.au/afd/taxa/3e1b019f-3659-4c9e-8d45-3e7b357aac4b	Hesperotermes infrequens	(Hill, 1927)	species	Animalia	Arthropoda	Insecta	Blattodea	Termitidae	Hesperotermes		1
https://biodiversity.org.au/afd/taxa/de170309-275c-4b5d-9a27-48a93536ac5a	Heteronychus arator	(Fabricius, 1775)	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Heteronychus	African Black Beetle	1
https://biodiversity.org.au/afd/taxa/9c63e271-8a12-4ba0-93bd-1d687dd652a1	Heteropternis obscurella	(Blanchard, 1853)	species	Animalia	Arthropoda	Insecta	Orthoptera	Acrididae	Heteropternis		2
https://biodiversity.org.au/afd/taxa/e948fd99-7550-4d1b-866a-75666cc61f96	Heteroscenes pallidus	(Latham, 1801)	species	Animalia	Chordata	Aves	Cuculiformes	Cuculidae	Heteroscenes	Pallid Cuckoo	12
https://biodiversity.org.au/afd/taxa/805db4b0-5a73-472f-8a44-89721c4640fd	Heterotermes intermedius	Hill, 1932	species	Animalia	Arthropoda	Insecta	Blattodea	Rhinotermitidae	Heterotermes		1
https://biodiversity.org.au/afd/taxa/ebf62841-becb-4e3f-88c8-b5d41ccc9cbe	Heteroteucha kershawi	(Lower, 1893)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Heteroteucha		1
https://biodiversity.org.au/afd/taxa/b47a4ecd-416b-458c-886a-1dc3490e8175	Hieraaetus (Hieraaetus) morphnoides	(Gould, 1841)	species	Animalia	Chordata	Aves	Accipitriformes	Accipitridae	Hieraaetus	Little Eagle	3
https://biodiversity.org.au/afd/taxa/f44f30a7-f6ed-4479-bb61-98f932701328	Hippodamia variegata	(Goeze, 1777)	species	Animalia	Arthropoda	Insecta	Coleoptera	Coccinellidae	Hippodamia		1
https://biodiversity.org.au/afd/taxa/d9061bb7-6e32-4e47-bb5c-ebd6f1919ec0	Hippotion celerio	(Linnaeus, 1758)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Sphingidae	Hippotion		2
https://biodiversity.org.au/afd/taxa/4e118c73-06a7-4131-bd67-5da5d2d61fd7	Hirundo (Hirundo) neoxena	Gould, 1843	species	Animalia	Chordata	Aves	Passeriformes	Hirundinidae	Hirundo	Welcome Swallow	17
https://biodiversity.org.au/afd/taxa/4e11a86f-c82f-429e-a7bc-ad2c50c1bca9	Hobartina amblyiodes	(Turner, 1931)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Notodontidae	Hobartina		2
https://biodiversity.org.au/afd/taxa/0dad39b6-1188-4fe7-8e42-6ebf797f1794	Hoggicosa bicolor	(Hogg, 1905)	species	Animalia	Arthropoda	Arachnida	Araneae	Lycosidae	Hoggicosa		1
https://biodiversity.org.au/afd/taxa/b81a8dc8-b9e0-4851-81e3-89297aace5ca	Holconia westralia	Hirst, 1991	species	Animalia	Arthropoda	Arachnida	Araneae	Sparassidae	Holconia		21
https://biodiversity.org.au/afd/taxa/90e848e6-1ed2-49e2-bc7a-04572be79c8e	Holocnemus pluchii	(Scopoli, 1763)	species	Animalia	Arthropoda	Arachnida	Araneae	Pholcidae	Holocnemus		1
https://biodiversity.org.au/afd/taxa/08396e68-1686-479d-89f0-56360d145115	Hololepta (Hololepta) australica	Marseul, 1853	species	Animalia	Arthropoda	Insecta	Coleoptera	Histeridae	Hololepta		2
https://biodiversity.org.au/afd/taxa/61c83128-fc72-426f-95e0-15b870528c22	Homalictus (Homalictus) dotatus	(Cockerell, 1912)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Homalictus		6
https://biodiversity.org.au/afd/taxa/ce69a115-a5e4-4332-b737-23baf53f77e9	Hoplostega ochroma	(Meyrick, 1886)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Hoplostega		16
https://biodiversity.org.au/afd/taxa/96c19766-8f88-44af-ae41-8ad6d20c9cf1	Hydrophilus (Hydrophilus) albipes	Castelnau, 1840	species	Animalia	Arthropoda	Insecta	Coleoptera	Hydrophilidae	Hydrophilus		1
https://biodiversity.org.au/afd/taxa/5ac1cf3f-ff43-490d-ac23-ea3ca00005e3	Hygraula nitens	(Butler, 1880)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Hygraula		26
https://biodiversity.org.au/afd/taxa/7685fef2-1975-4417-b16a-91f991c9bee0	Hylaeus (Euprosopis) violaceus	(Smith, 1853)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus		10
https://biodiversity.org.au/afd/taxa/215bdb2f-083a-41d8-b632-f7afa5a949b9	Hylaeus (Euprosopoides) musgravei	Cockerell, 1929	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus		2
https://biodiversity.org.au/afd/taxa/ae509348-06f3-46a2-b661-4094a62bfb46	Hylaeus (Macrohylaeus) alcyoneus	(Erichson, 1842)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus		2
https://biodiversity.org.au/afd/taxa/d20497ec-daef-4804-8d57-375b1c8b9ad8	Hylaeus (Planihylaeus) quadriceps	(Smith, 1879)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus		2
https://biodiversity.org.au/afd/taxa/31169355-0a49-4be3-93a0-503448d6762a	Hylaeus (Prosopisteron) quadratus	(Smith, 1853)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus		2
https://biodiversity.org.au/afd/taxa/6da97c42-23e2-435a-ba9f-f3f1432fa1c4	Hylaeus (Prosopisteron) sanguinipictus	(Cockerell, 1914)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus		2
https://biodiversity.org.au/afd/taxa/c2e705dd-ac7a-4beb-8af6-6b5eaf068630	Hyleoides zonalis	Smith, 1853	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hyleoides		4
https://biodiversity.org.au/afd/taxa/092b9246-16a8-461b-ac39-4363bebc9ce9	Hypertropha chlaenota	Meyrick, 1887	species	Animalia	Arthropoda	Insecta	Lepidoptera	Hypertrophidae	Hypertropha		3
https://biodiversity.org.au/afd/taxa/4e213a56-e4cf-461a-96d5-62b19ac1e401	Hypobapta barnardi	Goldfinch, 1929	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Hypobapta		7
https://biodiversity.org.au/afd/taxa/8eedd21f-c32c-44c9-82ca-c354557eb81d	Hypoperigea tonsa	(GuenÃ©e, 1852)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Hypoperigea		3
https://biodiversity.org.au/afd/taxa/11fa5231-a17e-4d72-bd5f-d0a63ec4975e	Hypoprora tyra	(Swinhoe, 1902)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Hypoprora		1
https://biodiversity.org.au/afd/taxa/bd136580-4ebe-4749-b652-3cfd934679a3	Hypsidia niphosema	(Lower, 1908)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Drepanidae	Hypsidia		3
https://biodiversity.org.au/afd/taxa/7361418f-6c31-47c3-9975-171c924b37e8	Icerya acaciae	(Morrison & Morrison, 1923)	species	Animalia	Arthropoda	Insecta	Hemiptera	Monophlebidae	Icerya		1
https://biodiversity.org.au/afd/taxa/224aad53-2948-4f19-b326-0cdd3eba4d44	Idaea costaria	(Walker, 1863)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Idaea		9
https://biodiversity.org.au/afd/taxa/3965ccbe-1b54-44b2-a8de-2039b2227ba1	Idaea inversata	(GuenÃ©e, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Idaea		10
https://biodiversity.org.au/afd/taxa/63a9074f-5f2e-4f8f-a80f-4c1aa0d90b02	Idaea philocosma	(Meyrick, 1888)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Idaea		3
https://biodiversity.org.au/afd/taxa/3f2bff77-e834-46ca-8bd5-adba797a1bfb	Idiodes apicata	GuenÃ©e, 1857	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Idiodes		1
https://biodiversity.org.au/afd/taxa/259086df-3dba-4f1c-989c-356eb82a056d	Idiodes idiocrossa	(Turner, 1947)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Idiodes		1
https://biodiversity.org.au/afd/taxa/cd1d1b8a-dea2-4df1-af19-a7aaa41ea89a	Idiommata blackwallii	(O.P.-Cambridge, 1870)	species	Animalia	Arthropoda	Arachnida	Araneae	Barychelidae	Idiommata		1
https://biodiversity.org.au/afd/taxa/d955c860-024c-489e-89dc-158a50e0ed3e	Idiosoma jarrah	Rix & Harvey, 2018	species	Animalia	Arthropoda	Arachnida	Araneae	Idiopidae	Idiosoma		2
https://biodiversity.org.au/afd/taxa/bb832480-4122-4475-b3b7-22f637c9c7db	Iphierga macarista	Turner, 1917	species	Animalia	Arthropoda	Insecta	Lepidoptera	Psychidae	Iphierga		6
https://biodiversity.org.au/afd/taxa/eba0227f-f618-41b7-b5f6-1e4041ae1d5c	Ischnura aurora	(Brauer, 1865)	species	Animalia	Arthropoda	Insecta	Odonata	Coenagrionidae	Ischnura		3
https://biodiversity.org.au/afd/taxa/de3bdeb9-41ec-4566-b676-9a1bfb579362	Ischnura heterosticta	(Burmeister, 1839)	species	Animalia	Arthropoda	Insecta	Odonata	Coenagrionidae	Ischnura		1
https://biodiversity.org.au/afd/taxa/7078f0b5-759e-448e-94a6-a9ffb93ba61b	Isomoralla curriculata	(Meyrick, 1920)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Isomoralla		1
https://biodiversity.org.au/afd/taxa/7ab4afa0-70ec-4a57-8429-7299ea4440eb	Isoodon fusciventer	(J.E. Gray, 1841)	species	Animalia	Chordata	Mammalia	Peramelemorphia	Peramelidae	Isoodon	Quenda	3
https://biodiversity.org.au/afd/taxa/260436e4-342d-4e7d-b2a3-f26003586d04	Isopeda leishmanni	Hogg, 1903	species	Animalia	Arthropoda	Arachnida	Araneae	Sparassidae	Isopeda		1
https://biodiversity.org.au/afd/taxa/5820f14a-6524-4b5e-8c29-7b8092a77ad4	Isopedella cana	(Simon, 1908)	species	Animalia	Arthropoda	Arachnida	Araneae	Sparassidae	Isopedella		1
https://biodiversity.org.au/afd/taxa/17213008-d097-4fe4-b191-8da0371271e2	Isturgia penthearia	(GuenÃ©e, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Isturgia		16
https://biodiversity.org.au/afd/taxa/c27d2d2d-1c9f-4f42-8d04-3097e30a2562	Junonia villida	(Fabricius, 1787)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Junonia	Meadow Argus	10
https://biodiversity.org.au/afd/taxa/751c4197-55cb-4e3c-bc52-3f308bf33e83	Kahaono wallacei	Evans, 1966	species	Animalia	Arthropoda	Insecta	Hemiptera	Cicadellidae	Kahaono		1
https://biodiversity.org.au/afd/taxa/bf8d2470-6c86-4483-b695-51fa1a373ec1	Kalotermes aemulus	Sewell & Gay, 1978	species	Animalia	Arthropoda	Insecta	Blattodea	Kalotermitidae	Kalotermes		1
https://biodiversity.org.au/afd/taxa/c29d7af4-2592-48b6-9e88-5fd0cfcb03e6	Kobonga umbrimargo	(Walker, 1858)	species	Animalia	Arthropoda	Insecta	Hemiptera	Cicadidae	Kobonga		1
https://biodiversity.org.au/afd/taxa/92358f59-80ae-482f-8979-5679b23e92cc	Lalage (Lalage) tricolor	(Swainson, 1825)	species	Animalia	Chordata	Aves	Passeriformes	Campephagidae	Lalage	Australian White-winged Triller	1
https://biodiversity.org.au/afd/taxa/e5757d76-2787-40dd-9880-80902f6f8956	Lancetes lanceolatus	(Clark, 1863)	species	Animalia	Arthropoda	Insecta	Coleoptera	Dytiscidae	Lancetes		2
https://biodiversity.org.au/afd/taxa/bed0da1d-99da-4bed-92ed-4c61441389f8	Lasioglossum (Chilalictus) castor	Walker, 1995	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		2
https://biodiversity.org.au/afd/taxa/a859dc81-d181-4e09-9630-153f2e448c45	Lasioglossum (Chilalictus) chapmani	(Cockerell, 1910)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		1
https://biodiversity.org.au/afd/taxa/71854944-f7e7-4e10-989d-59298c2f7515	Lasioglossum (Chilalictus) ebeneum	Walker, 1995	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		7
https://biodiversity.org.au/afd/taxa/1959f400-eee7-4719-8a60-538af420b1bc	Lasioglossum (Chilalictus) hemichalceum	(Cockerell, 1923)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		32
https://biodiversity.org.au/afd/taxa/8634ccfb-2dea-48d4-8853-6f91018440f2	Lasioglossum (Chilalictus) lanarium	(Smith, 1853)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		5
https://biodiversity.org.au/afd/taxa/49f8cdc0-d524-4569-bd9c-b2393e328b60	Lasioglossum (Chilalictus) mirandum	(Cockerell, 1914)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		5
https://biodiversity.org.au/afd/taxa/b3ec75ad-a607-4515-b8a8-e1f330e38b80	Lasioglossum (Chilalictus) plebeium	(Cockerell, 1914)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		1
https://biodiversity.org.au/afd/taxa/8c202b37-bd9d-404d-8456-3e0d663033f2	Lasioglossum (Chilalictus) supralucens	(Cockerell, 1916)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		2
https://biodiversity.org.au/afd/taxa/8b99e834-14c3-4aa2-8c5f-a10c55688998	Lasioglossum (Chilalictus) vitripenne	(Smith, 1879)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		1
https://biodiversity.org.au/afd/taxa/422b9adc-ce80-423f-b708-43f58670785d	Lasioglossum (Parasphecodes) hiltacum	(Smith, 1853)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		23
https://biodiversity.org.au/afd/taxa/867c5363-04e2-454f-bb6f-ff06713e2737	Lasioglossum (Parasphecodes) lichatum	(Smith, 1853)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		2
https://biodiversity.org.au/afd/taxa/c7d8dbc8-dcde-4182-85ba-907182f95ea9	Latrodectus hasseltii	Thorell, 1870	species	Animalia	Arthropoda	Arachnida	Araneae	Theridiidae	Latrodectus	Jockey Spider	8
https://biodiversity.org.au/afd/taxa/bda16534-6079-4d93-a36a-659bad74ae72	Leioproctus (Andrenopsis) douglasiellus	Michener, 1965	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Leioproctus	A Short-tongued Bee	9
https://biodiversity.org.au/afd/taxa/b5f1ca19-d69a-4fe9-b62b-edda5264f559	Leioproctus (Colletellus) velutinellus	Michener, 1965	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Leioproctus		1
https://biodiversity.org.au/afd/taxa/7036b0ec-7f13-4825-9a06-304242bc985a	Leioproctus (Colletopsis) contrarius	Michener, 1965	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Leioproctus	A Short-tongued Bee	2
https://biodiversity.org.au/afd/taxa/b7532c47-337f-4071-9d1f-afb1bac2a5b1	Leioproctus (Exleycolletes) microdontus	(Cockerell, 1929)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Leioproctus		2
https://biodiversity.org.au/afd/taxa/f37def20-f4b9-4fd5-b14b-83b2e0f51e20	Lepidurus apus	(Linnaeus, 1758)	species	Animalia	Arthropoda	Branchiopoda	Notostraca	Triopsidae	Lepidurus		1

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/36c9b836-29a5-43d3-8427-06ec942d75a3	Leponosandrus lepismoides	(Walker, 1871)	species	Animalia	Arthropoda	Insecta	Orthoptera	Anostostomatidae	Leponosandrus		1
https://biodiversity.org.au/afd/taxa/78c96276-bff1-43f7-a8e5-fbca2249965b	Leptocneria reducta	(Walker, 1855)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Leptocneria		1
https://biodiversity.org.au/afd/taxa/f4bdd4ee-47b1-4aa2-b359-81ae94e17269	Leucania diatrecta	Butler, 1886	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Leucania		8
https://biodiversity.org.au/afd/taxa/b17388f8-4468-4a91-b434-659bf3739561	Lialis burtonis	Gray, 1835	species	Animalia	Chordata	Reptilia	Squamata	Pygopodidae	Lialis	Burton's Snake-lizard	2
https://biodiversity.org.au/afd/taxa/ada6105e-c2de-4b93-9687-8e64d10863a7	Lichmera (Lichmera) indistincta	(Vigors & Horsfield, 1827)	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Lichmera	Brown Honeyeater	117
https://biodiversity.org.au/afd/taxa/dfff5b7a-3f00-4ce7-a9f6-1af927f14848	Limbodessus inornatus	(Sharp, 1882)	species	Animalia	Arthropoda	Insecta	Coleoptera	Dytiscidae	Limbodessus		1
https://biodiversity.org.au/afd/taxa/26e63f8d-45e7-4aac-bd73-d1a754421349	Limnaecia chionospila	Meyrick, 1897	species	Animalia	Arthropoda	Insecta	Lepidoptera	Cosmopterigidae	Limnaecia		4
https://biodiversity.org.au/afd/taxa/ac5ce2ed-f580-4aa7-a037-690b9f9fbf99	Limnodynastes dorsalis	(Gray, 1841)	species	Animalia	Chordata	Amphibia	Anura	Limnodynastidae	Limnodynastes	Western Banjo Frog	8
https://biodiversity.org.au/afd/taxa/dc3a97c6-d284-4627-8e85-8afaa3bb7fa8	Limnoxenus zealandicus	(Broun, 1880)	species	Animalia	Arthropoda	Insecta	Coleoptera	Hydrophilidae	Limnoxenus		4
https://biodiversity.org.au/afd/taxa/78225c2e-2fd0-48fe-b8d7-9ee2106c8906	Liparetrus striatus	Blanchard, 1850	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Liparetrus		6
https://biodiversity.org.au/afd/taxa/1a2d7242-f1d6-46d4-925a-a7ac5d9a2434	Lipotriches (Austronomia) australica	(Smith, 1875)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lipotriches		41
https://biodiversity.org.au/afd/taxa/96dd7eb9-d9d1-4083-a454-cc473fffe1c9	Lipotriches (Austronomia) flavoviridis	(Cockerell, 1905)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lipotriches		78
https://biodiversity.org.au/afd/taxa/d7f6c1e6-2c4a-42d3-9885-93742ff71f98	Lissomma postcarneata	(Prout, 1910)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Lissomma		6
https://biodiversity.org.au/afd/taxa/9e602831-9ffb-4491-83bb-fafcf96fc3fe	Lissopimpla excelsa	(Costa, 1864)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae	Lissopimpla		1
https://biodiversity.org.au/afd/taxa/cfed1332-ab8f-4009-8949-90aa3630ba67	Litoria adelaidensis	(Gray, 1841)	species	Animalia	Chordata	Amphibia	Anura	Hylidae	Litoria	Slender Tree Frog	15
https://biodiversity.org.au/afd/taxa/2f87aff4-450a-41a7-afe3-5f1423236b68	Litoria moorei	(Copland, 1957)	species	Animalia	Chordata	Amphibia	Anura	Hylidae	Litoria	Motorbike Frog	6
https://biodiversity.org.au/afd/taxa/715a2874-1942-4762-866c-1194990e7a91	Lophoictinia isura	(Gould, 1838)	species	Animalia	Chordata	Aves	Accipitriformes	Accipitridae	Lophoictinia	Square-tailed Kite	2
https://biodiversity.org.au/afd/taxa/659162c3-5cb2-4f8f-94f4-bb1cc3b6425c	Loweria platydesma	(Lower, 1901)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Loweria		4
https://biodiversity.org.au/afd/taxa/4f8d196e-6b81-44cb-beeb-64cd15c2ae19	Lychas marmoreus	(C.L. Koch, 1845)	species	Animalia	Arthropoda	Arachnida	Scorpiones	Buthidae	Lychas		7
https://biodiversity.org.au/afd/taxa/0eb43903-cf30-4e93-9a53-1eb3318087b3	Macrobathra alternatella	(Walker, 1864)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Cosmopterigidae	Macrobathra		3
https://biodiversity.org.au/afd/taxa/7a402ec9-f9f3-46f4-9cb1-701e0188c921	Macropus fuliginosus	(Desmarest, 1817)	species	Animalia	Chordata	Mammalia	Diprotodontia	Macropodidae	Macropus	Western Grey Kangaroo	49
https://biodiversity.org.au/afd/taxa/5a0997f4-c48c-4353-a66f-dd557119ec5c	Mallada signatus	(Schneider, 1851)	species	Animalia	Arthropoda	Insecta	Neuroptera	Chrysopidae	Mallada		1
https://biodiversity.org.au/afd/taxa/a6f866fa-5b13-4b6d-a134-6abd20fa572f	Malurus (Leggeornis) pulcherrimus	Gould, 1844	species	Animalia	Chordata	Aves	Passeriformes	Maluridae	Malurus	Blue-breasted Fairy-wren	2
https://biodiversity.org.au/afd/taxa/702a989c-9e87-40d5-9694-e6b94dc6521e	Malurus (Malurus) splendens	(Quoy & Gaimard, 1830)	species	Animalia	Chordata	Aves	Passeriformes	Maluridae	Malurus	Splendid Fairy-wren	142
https://biodiversity.org.au/afd/taxa/41cdea6a-9c0f-4b64-b59c-53822470a4da	Malurus (Musciparus) leucopterus	Dumont, 1824	species	Animalia	Chordata	Aves	Passeriformes	Maluridae	Malurus	White-winged Fairy-wren	1
https://biodiversity.org.au/afd/taxa/5c0d591a-0a98-48c6-8a4b-f925d43521cd	Manorina (Myzantha) flavigula	(Gould, 1840)	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Manorina	Yellow-throated Miner	4
https://biodiversity.org.au/afd/taxa/1f701f08-4aed-4edf-a45e-1d18a659182f	Maratus pavonis	(Dunn, 1947)	species	Animalia	Arthropoda	Arachnida	Araneae	Salticidae	Maratus		7
https://biodiversity.org.au/afd/taxa/a6861226-214e-400e-8ca3-23b127054480	Megachile (Eutricharaea) chrysopyga	Smith, 1853	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		18
https://biodiversity.org.au/afd/taxa/120c7497-f842-4b02-a2ed-36f7e318d931	Megachile (Eutricharaea) macularis	Dalla Torre, 1896	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		24
https://biodiversity.org.au/afd/taxa/0bc334cd-5caa-41f9-8af3-da9b3aad910e	Megachile (Eutricharaea) obtusa	Smith, 1853	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		22
https://biodiversity.org.au/afd/taxa/1a9bd784-a0c8-46a8-9e8c-0fabc4da9273	Megachile (Eutricharaea) serricauda	Cockerell, 1910	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		8
https://biodiversity.org.au/afd/taxa/4bff5ae8-c3d5-443f-8103-7d32270ea7ff	Megachile (Hackeriapis) tosticauda	Cockerell, 1912	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		1
https://biodiversity.org.au/afd/taxa/9f8cdb0f-0c09-456a-8fb1-6f5949828b82	Megachile (Schizomegachile) monstrosa	Smith, 1868	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		2
https://biodiversity.org.au/afd/taxa/a60cbf8f-5096-41ec-b9d0-df308a864f89	Megachile apicata	Smith, 1853	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		2
https://biodiversity.org.au/afd/taxa/f4bad98b-a1fe-449c-95c9-575972fa43d0	Megachile aurifrons	Smith, 1853	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		13
https://biodiversity.org.au/afd/taxa/34154a4f-ab12-4980-9c76-4ac51081e143	Megachile clypeata	Smith, 1853	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		2
https://biodiversity.org.au/afd/taxa/f437a84e-ce1e-4565-8b6c-4154b4fe4209	Megachile fultoni	Cockerell, 1913	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		2
https://biodiversity.org.au/afd/taxa/a2665ace-ee67-4396-8f4d-f2497e9550f4	Megachile ignita	Smith, 1853	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		20
https://biodiversity.org.au/afd/taxa/02513e18-9841-4ceb-8ecf-576793a3449c	Megachile latericauda	Cockerell, 1921	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		2
https://biodiversity.org.au/afd/taxa/8d05b465-6b60-4cc6-8753-3083471a7f48	Megachile preissi	Cockerell, 1910	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		2
https://biodiversity.org.au/afd/taxa/f11f7314-65fb-4702-9173-938be01eb2e1	Megachile semiluctuosa	Smith, 1853	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		2
https://biodiversity.org.au/afd/taxa/90848061-77fe-4881-b9a7-f59e2ad7e95b	Megachile speluncarum	Meade-Waldo, 1915	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		6
https://biodiversity.org.au/afd/taxa/b9802dbc-b97b-40fa-8025-8ad985506554	Megacmonotus magnus	(McLachlan, 1871)	species	Animalia	Arthropoda	Insecta	Neuroptera	Ascalaphidae	Megacmonotus		2
https://biodiversity.org.au/afd/taxa/a4a4001b-66c8-421b-92b3-078e80414c6d	Megalorhipida leucodactyla	(Fabricius, 1794)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pterophoridae	Megalorhipida		4
https://biodiversity.org.au/afd/taxa/4560f190-f134-485d-880b-27bf7960f0bb	Megaporus howittii	(Clark, 1862)	species	Animalia	Arthropoda	Insecta	Coleoptera	Dytiscidae	Megaporus		1
https://biodiversity.org.au/afd/taxa/623f0c55-e927-42a7-b0e6-220fec9d9691	Melangyna (Austrosyrphus) viridiceps	(Macquart, 1847)	species	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Melangyna		2
https://biodiversity.org.au/afd/taxa/7b537819-13c2-4974-969e-c95c6b00201d	Melanodryas (Melanodryas) cucullata	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Petroicidae	Melanodryas	Hooded Robin	1
https://biodiversity.org.au/afd/taxa/bdcc0acc-980a-4f51-b8c0-85447ce59bea	Melithreptus (Eidopsarus) brevirostris	(Vigors & Horsfield, 1827)	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Melithreptus	Brown-headed Honeyeater	4
https://biodiversity.org.au/afd/taxa/95efb4b0-67a8-4093-8bda-d55b2fa836be	Melithreptus (Melithreptus) lunatus	(Vieillot, 1802)	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Melithreptus	White-naped Honeyeater	1
https://biodiversity.org.au/afd/taxa/087e16f8-32a3-4e92-ac89-71a7483d15c4	Melobasis costipennis	Kerremans, 1898	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Melobasis		4
https://biodiversity.org.au/afd/taxa/683687f5-c7db-4447-a51a-34d8797c5d0b	Melobasis cuprifera	(Laporte & Gory, 1837)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Melobasis		1
https://biodiversity.org.au/afd/taxa/26271d50-30a1-457f-8ff5-f987231964bd	Melobasis gloriosa	(Laporte & Gory, 1837)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Melobasis		1
https://biodiversity.org.au/afd/taxa/ce8a3b07-0dae-4be2-9ecc-666abb2f85fd	Melobasis lathami	(Laporte & Gory, 1837)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Melobasis		9
https://biodiversity.org.au/afd/taxa/c1e8ec0e-a05a-4633-a60f-e0cd1539365d	Melobasis rubromarginata	Saunders, 1876	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Melobasis		3
https://biodiversity.org.au/afd/taxa/715b2939-34de-4ac6-bac3-62c7f3972292	Melobasis uniformis	Carter, 1923	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Melobasis		1
https://biodiversity.org.au/afd/taxa/3ef95407-5296-4235-bd98-4d0021569089	Melobasis vittata	Blackburn, 1887	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Melobasis		1
https://biodiversity.org.au/afd/taxa/dba6cff0-686f-4c61-a263-a4ba54dc2cc1	Menemerus bivittatus	(Dufour, 1831)	species	Animalia	Arthropoda	Arachnida	Araneae	Salticidae	Menemerus		1
https://biodiversity.org.au/afd/taxa/ada5e2b7-1b23-410d-a3cf-1a81853a7de8	Menetia greyii	Gray, 1845	species	Animalia	Chordata	Reptilia	Squamata	Scincidae	Menetia	Common Dwarf Skink	2
https://biodiversity.org.au/afd/taxa/fd6c27dc-bb92-4345-aa0f-467baaef0d54	Meritastis pyrosemana	(Meyrick, 1881)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Meritastis		3
https://biodiversity.org.au/afd/taxa/67234716-4e6c-4380-a559-f0fb4e68c696	Merophyas divulsana	(Walker, 1863)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Merophyas		1
https://biodiversity.org.au/afd/taxa/9f9ddea7-8c74-46df-8ed9-3233d681e354	Merops (Merops) ornatus	Latham, 1801	species	Animalia	Chordata	Aves	Coraciiformes	Meropidae	Merops	Rainbow Bee-eater	20
https://biodiversity.org.au/afd/taxa/5fb8f066-4b41-48be-a021-aa3ddf3ad2d5	Mesodina cyanophracta	Lower, 1911	species	Animalia	Arthropoda	Insecta	Lepidoptera	Hesperiidae	Mesodina	Blue Iris-skipper	3
https://biodiversity.org.au/afd/taxa/55f2faa7-94dc-4a2c-9c49-c7665f6c90a4	Metaballus frontalis	(Walker, 1869)	species	Animalia	Arthropoda	Insecta	Orthoptera	Tettigoniidae	Metaballus		4
https://biodiversity.org.au/afd/taxa/d81938e8-7972-4d68-8a1b-5701b9a17a05	Metaparagia maculata	(Meade-Waldo, 1910)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Metaparagia		6
https://biodiversity.org.au/afd/taxa/7f86301f-3992-4650-88f4-25f17d14897c	Metioche vittaticollis	(StÃ¥l, 1861)	species	Animalia	Arthropoda	Insecta	Orthoptera	Trigonidiidae	Metioche		1
https://biodiversity.org.au/afd/taxa/39dcb491-26b8-42bd-bade-f199025506a0	Meyriccia latro	(Zeller, 1873)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Meyriccia		6
https://biodiversity.org.au/afd/taxa/0b7c528a-4104-4a96-853e-05a37c327067	Microcarbo melanoleucos	(Vieillot, 1817)	species	Animalia	Chordata	Aves	Pelecaniformes	Phalacrocoracidae	Microcarbo	Little Cormorant	7
https://biodiversity.org.au/afd/taxa/77e3b031-9fba-4789-8e85-5f459d9f76d4	Microcerotermes serratus	(Froggatt, 1898)	species	Animalia	Arthropoda	Insecta	Blattodea	Termitidae	Microcerotermes		1
https://biodiversity.org.au/afd/taxa/64d63ac4-ae2d-4477-a433-fecf32fa6d86	Microdes squamulata	GuenÃ©e, 1857 [1858]	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Microdes		1
https://biodiversity.org.au/afd/taxa/5f6beca9-ce09-4110-9626-8f17b07f8888	Microdes villosata	GuenÃ©e, 1857	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Microdes		4
https://biodiversity.org.au/afd/taxa/316c5ff9-137b-4356-a46d-5d136aecb1d1	Microeca (Microeca) fascinans	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Petroicidae	Microeca	Jacky Winter	1
https://biodiversity.org.au/afd/taxa/5be359c8-dff8-4709-935e-db9c764cdda0	Micromus tasmaniae	(Walker, 1860)	species	Animalia	Arthropoda	Insecta	Neuroptera	Hemerobiidae	Micromus		1
https://biodiversity.org.au/afd/taxa/de272308-a7fb-46cf-bcfd-1bc245862c9b	Mictis profana	(Fabricius, 1803)	species	Animalia	Arthropoda	Insecta	Hemiptera	Coreidae	Mictis	Crusader Bug	1
https://biodiversity.org.au/afd/taxa/ffd0b271-5135-4a10-9c76-555669ca7200	Mimaglossa nauplialis	(Walker, 1859)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Mimaglossa		3
https://biodiversity.org.au/afd/taxa/e746c95b-8681-4e7c-813d-b82c17a71dee	Miniargiolestes minimus	(Tillyard, 1908)	species	Animalia	Arthropoda	Insecta	Odonata	Megapodagrionidae	Miniargiolestes		5
https://biodiversity.org.au/afd/taxa/b7da8abe-b0a1-4c34-ac00-01f08832f1c6	Missulena granulosa	(O.P.-Cambridge, 1869)	species	Animalia	Arthropoda	Arachnida	Araneae	Actinopodidae	Missulena		3
https://biodiversity.org.au/afd/taxa/528ed023-e74a-4b91-82cb-170b3bef9a34	Mnesampela privata	(GuenÃ©e, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Mnesampela		4

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/a2ca35ec-6541-450b-83d4-506ea5bd7017	Moerarchis clathrata	(R. Felder & Rogenhofer, 1875)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tineidae	Moerarchis		19
https://biodiversity.org.au/afd/taxa/29766037-e53a-4786-904a-462c221c010b	Mogulones larvatus	(Schultze, 1897)	species	Animalia	Arthropoda	Insecta	Coleoptera	Curculionidae	Mogulones	Paterson's Curse Crown Weevil	1
https://biodiversity.org.au/afd/taxa/595bc07a-1bbf-4220-830e-5c14a5a8f742	Monistria discrepans	(Walker, 1871)	species	Animalia	Arthropoda	Insecta	Orthoptera	Pyrgomorphidae	Monistria	Common Pyrgomorph	1
https://biodiversity.org.au/afd/taxa/a76d0963-5f6c-4ceb-9ad9-657084199b34	Monopis crocicapitella	(Clemens, 1859)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tineidae	Monopis		2
https://biodiversity.org.au/afd/taxa/f6f6d149-b76d-4e58-aa3c-7f9406175b45	Monopis icterogastra	(Zeller, 1852)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tineidae	Monopis		3
https://biodiversity.org.au/afd/taxa/7a39c977-3c87-4d6d-842f-9844d0c9ccd7	Monopis meliorella	(Walker, 1863)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tineidae	Monopis		13
https://biodiversity.org.au/afd/taxa/e57c5e45-a109-49ff-9539-2b3d7583ced1	Morethia obscura	Storr, 1972	species	Animalia	Chordata	Reptilia	Squamata	Scincidae	Morethia	Shrubland Morethia Skink	2
https://biodiversity.org.au/afd/taxa/941a2703-db06-494e-9d53-7820948e5ec9	Morosaphycita oculiferella	(Meyrick, 1879)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Morosaphycita		1
https://biodiversity.org.au/afd/taxa/cc44be1d-e4b1-4ab8-a95a-ba9c0dd08714	Munychryia periclyta	Common & McFarland, 1970	species	Animalia	Arthropoda	Insecta	Lepidoptera	Anthelidae	Munychryia		1
https://biodiversity.org.au/afd/taxa/107696b5-063c-4c09-a015-6edfdb6f4d52	Mus musculus	Linnaeus, 1758	species	Animalia	Chordata	Mammalia	Rodentia	Muridae	Mus	House Mouse	2
https://biodiversity.org.au/afd/taxa/1b11ebd1-7e44-4d81-8c12-7141ffddfc78	Myiagra (Seisura) inquieta	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Monarchidae	Myiagra	Restless Flycatcher	2
https://biodiversity.org.au/afd/taxa/2f7f8115-ead6-4e62-bb8c-e49ae2fd3b93	Myrmecia gratiosa	Clark, 1951	species	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Myrmecia		1
https://biodiversity.org.au/afd/taxa/397a4f2e-c8ed-4428-bda1-476530c66a14	Myrmecia gulosa	(Fabricius, 1775)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Myrmecia		1
https://biodiversity.org.au/afd/taxa/1490b47c-2908-4093-9a84-45c4138c2fd0	Myrmecia mandibularis	Smith, 1858	species	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Myrmecia		3
https://biodiversity.org.au/afd/taxa/72b56966-ff6a-4c5b-9919-a71c1145c191	Myrmecia vindex	Smith, 1858	species	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Myrmecia		2
https://biodiversity.org.au/afd/taxa/0841e0b8-f03a-42d8-8bbe-76b4fc7d520e	Mythimna (Pseudaletia) convecta	(Walker, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Mythimna		1
https://biodiversity.org.au/afd/taxa/dc38b13f-aca3-4e90-9420-607582807260	Nacaduba biocellata	(C. & R. Felder, 1865)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Lycaenidae	Nacaduba	Two-spotted Line-blue	5
https://biodiversity.org.au/afd/taxa/8b2912ee-b480-4308-854a-528b30e8dc59	Nacoleia mesochlora	(Meyrick, 1884)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Nacoleia		2
https://biodiversity.org.au/afd/taxa/6388c877-2bde-4fd9-8fb0-067ae333e79b	Nacoleia rhoeoalis	(Walker, 1859)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Nacoleia		4
https://biodiversity.org.au/afd/taxa/8b97af4e-a0ef-44d5-87ee-3aced755cca0	Nannophya dalei	(Tillyard, 1908)	species	Animalia	Arthropoda	Insecta	Odonata	Libellulidae	Nannophya		5
https://biodiversity.org.au/afd/taxa/9d860493-5392-4d8e-a242-eac9dbe36b84	Nearcha dasyzona	(Lower, 1903)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Nearcha		3
https://biodiversity.org.au/afd/taxa/1afb535b-e3e8-442c-b341-1cdb8e70ecfa	Nearcha pseudophaes	Lower, 1893	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Nearcha		3
https://biodiversity.org.au/afd/taxa/fc7dfe09-fa38-4b12-af6a-27a815572a3e	Nearcha staurotis	Meyrick, 1890	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Nearcha		1
https://biodiversity.org.au/afd/taxa/7c6e50b1-4931-4f90-a43e-552cf71dcb65	Necterosoma darwini	(Babington, 1841)	species	Animalia	Arthropoda	Insecta	Coleoptera	Dytiscidae	Necterosoma		1
https://biodiversity.org.au/afd/taxa/8b1eb1bb-9fdb-4ef7-b2a3-2874072c7b07	Neelaps bimaculatus	(DumÃ©ril, Bibron & DumÃ©ril, 1854)	species	Animalia	Chordata	Reptilia	Squamata	Elapidae	Neelaps	Black-naped Snake	6
https://biodiversity.org.au/afd/taxa/ef82ba0e-0d48-447e-963d-40517d3b25f9	Neelaps calonotus	(DumÃ©ril, Bibron & DumÃ©ril, 1854)	species	Animalia	Chordata	Reptilia	Squamata	Elapidae	Neelaps	Black-striped Burrowing Snake	3
https://biodiversity.org.au/afd/taxa/b9af926f-c8e2-41ce-b1aa-8cef8d131d82	Nematobola isorista	Meyrick, 1893	species	Animalia	Arthropoda	Insecta	Lepidoptera	Roeslerstammiidae	Nematobola		1
https://biodiversity.org.au/afd/taxa/22541be5-9e4b-43c5-85d9-1454ef8fc505	Neocuris discoflava	Fairmaire, 1877	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Neocuris		10
https://biodiversity.org.au/afd/taxa/4a04512b-b357-4e2b-9dad-374c5c7d2b84	Neocuris thoracica	Fairmaire, 1877	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Neocuris		3
https://biodiversity.org.au/afd/taxa/d3e1f2df-ce9b-4e42-ab17-ac74aa0e954c	Neolucia agricola	(Westwood, 1851)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Lycaenidae	Neolucia	Fringed Blue	1
https://biodiversity.org.au/afd/taxa/908e6ef4-de96-4951-a603-cb62caae6fdc	Neophema (Neonanodes) elegans	(Gould, 1838)	species	Animalia	Chordata	Aves	Psittaciformes	Psittacidae	Neophema	Elegant Parrot	2
https://biodiversity.org.au/afd/taxa/68fc5ba7-463f-4a86-8314-e42a5a8d0455	Ninox (Ninox) boobook	(Latham, 1801)	species	Animalia	Chordata	Aves	Strigiformes	Strigidae	Ninox		1
https://biodiversity.org.au/afd/taxa/856ed4e8-dbcf-487f-80c8-9c78591d2ff6	Ninox (Ninox) novaeseelandiae	(Gmelin, 1788)	species	Animalia	Chordata	Aves	Strigiformes	Strigidae	Ninox	Southern Boobook	2
https://biodiversity.org.au/afd/taxa/f32525fc-1691-4749-94af-659627756eac	Nisista serrata	(Walker, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Nisista		1
https://biodiversity.org.au/afd/taxa/c6db8a47-6be3-4943-9952-b56c75db5ab0	Nola celaenephes	(Turner, 1944)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nolidae	Nola		3
https://biodiversity.org.au/afd/taxa/7752f54b-1b72-486e-8011-785945b06c45	Nola euraphes	(Turner, 1944)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nolidae	Nola		1
https://biodiversity.org.au/afd/taxa/229de5a2-b185-4bb6-ad99-551cc4d9c099	Nola eurylopha	Turner, 1944	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nolidae	Nola		2
https://biodiversity.org.au/afd/taxa/f3e4be9c-6811-4df9-aef0-12e4a29dd4ad	Nola pothina	Turner, 1944	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nolidae	Nola		1
https://biodiversity.org.au/afd/taxa/55e89bf4-7e57-4cfb-bc86-a6d85f77e7ed	Nola pycnopasta	(Turner, 1944)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nolidae	Nola		13
https://biodiversity.org.au/afd/taxa/5e75008a-4ead-4d59-b784-4bf586a9d88d	Nomophila corticalis	(Walker, 1869)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Nomophila		4
https://biodiversity.org.au/afd/taxa/d968d4e0-11a2-4f15-a6bc-3756e6418e6f	Notamacropus irma	(Jourdan, 1837)	species	Animalia	Chordata	Mammalia	Diprotodontia	Macropodidae	Notamacropus	Western Brush Wallaby	1
https://biodiversity.org.au/afd/taxa/9e6273e9-5b3f-44ae-9ad6-319d1362d01a	Nothorhaphium aemulans	(Becker, 1922)	species	Animalia	Arthropoda	Insecta	Diptera	Dolichopodidae	Nothorhaphium		1
https://biodiversity.org.au/afd/taxa/467ed571-2ea5-43b7-b594-178d483b5154	Notiobia (Anisotarsus) dampierii	(Castelnau, 1867)	species	Animalia	Arthropoda	Insecta	Coleoptera	Carabidae	Notiobia		2
https://biodiversity.org.au/afd/taxa/56e85231-a01d-4db9-b0d7-89481f09f3e6	Nyctemera amicus	(White, 1841)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Nyctemera		1
https://biodiversity.org.au/afd/taxa/c5126b2c-3118-46a9-a21a-8b95b28596fc	Nycterephes anthracica	(Lower, 1905)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Nycterephes		3
https://biodiversity.org.au/afd/taxa/dec8c88f-7f20-4f30-b2af-c75d09fb066c	Nycticorax caledonicus	(Gmelin, 1789)	species	Animalia	Chordata	Aves	Ciconiiformes	Ardeidae	Nycticorax	Crane	3
https://biodiversity.org.au/afd/taxa/054b8aa4-fd1e-42ec-b103-094624ff5c1b	Nyctophilus geoffroyi	Leach, 1821	species	Animalia	Chordata	Mammalia	Chiroptera	Vespertilionidae	Nyctophilus	Lesser Long-eared Bat	1
https://biodiversity.org.au/afd/taxa/7b31b043-a8c7-4e48-9681-dcea0569d8db	Nyssus coloripes	Walckenaer, 1805	species	Animalia	Arthropoda	Arachnida	Araneae	Corinnidae	Nyssus		3
https://biodiversity.org.au/afd/taxa/2118456c-631c-4c4c-b995-72ce9d40d16e	Occasitermes occasus	(Silvestri, 1909)	species	Animalia	Arthropoda	Insecta	Blattodea	Termitidae	Occasitermes		1
https://biodiversity.org.au/afd/taxa/96a7e1ef-d604-4331-97a2-0d99cab925ae	Ochrogaster lunifer	Herrich-SchÃ¤ffer, [1855]	species	Animalia	Arthropoda	Insecta	Lepidoptera	Notodontidae	Ochrogaster		3
https://biodiversity.org.au/afd/taxa/0eff7442-3f34-40ba-8b60-9d52ec5d3578	Ocirrhoe dallasi	Gross, 1975	species	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Ocirrhoe		1
https://biodiversity.org.au/afd/taxa/a7b00ef0-108f-44d9-bf89-a062c8674335	Ocyphaps lophotes	(Temminck, 1822)	species	Animalia	Chordata	Aves	Columbiformes	Columbidae	Ocyphaps	Crested Pigeon	11
https://biodiversity.org.au/afd/taxa/d8af29b8-05d6-451a-ac51-ba27f3aa07b7	Oecobius navus	Blackwall, 1859	species	Animalia	Arthropoda	Arachnida	Araneae	Oecobiidae	Oecobius		4
https://biodiversity.org.au/afd/taxa/7c160670-01f6-45ed-8d51-f3aeabdf774a	Oenochroma pallida	Warren, 1898	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Oenochroma		1
https://biodiversity.org.au/afd/taxa/a3e148b8-2a20-4d4b-8467-ac7d27fd15d9	Oenochroma vinaria	GuenÃ©e, 1857	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Oenochroma		2
https://biodiversity.org.au/afd/taxa/908da9f7-4e75-4bdb-82a1-de5107d4b736	Oenosandra boisduvalii	Newman, 1856	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oenosandridae	Oenosandra		5
https://biodiversity.org.au/afd/taxa/3a561002-ef17-4bc5-9c86-f41b2658b3a3	Ogyris amaryllis	Hewitson, 1862	species	Animalia	Arthropoda	Insecta	Lepidoptera	Lycaenidae	Ogyris	Amaryllis Azure	3
https://biodiversity.org.au/afd/taxa/6e61b4ab-a84f-42e7-ad78-d2f84c02d3bb	Ommatoiulus moreleti	(Lucas, 1860)	species	Animalia	Arthropoda	Diplopoda	Julida	Julidae	Ommatoiulus		3
https://biodiversity.org.au/afd/taxa/fe5365be-9cbe-4519-b1de-ea668c40b8ff	Onitis alexis	Klug, 1835	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Onitis	Bronze Dung Beetle	23
https://biodiversity.org.au/afd/taxa/2b165243-c341-4395-8360-0d18c76a27db	Onitis aygulus	(Fabricius, 1781)	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Onitis		18
https://biodiversity.org.au/afd/taxa/5abd68a7-7b33-4e1f-9d37-97aff4f8b209	Onitis caffer	Boheman, 1857	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Onitis		9
https://biodiversity.org.au/afd/taxa/261409ca-6d6b-476f-8f9e-fa7e22f23972	Onthophagus binodis	Thunberg, 1818	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Onthophagus	Humpbacked Dung Beetle	2
https://biodiversity.org.au/afd/taxa/3ad08ff9-e24f-4234-8a57-33c045caff1a	Onthophagus ferox	Harold, 1867	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Onthophagus	Western Dung Beetle	8
https://biodiversity.org.au/afd/taxa/01fc01b5-45c5-46aa-8bf1-e9526211f7fe	Onthophagus taurus	(Schreber, 1759)	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Onthophagus	Bullhorned Dung Beetle	40
https://biodiversity.org.au/afd/taxa/ba72b1cb-a2f8-431c-b75c-b15494851978	Orthetrum caledonicum	(Brauer, 1865)	species	Animalia	Arthropoda	Insecta	Odonata	Libellulidae	Orthetrum		5
https://biodiversity.org.au/afd/taxa/4df73026-423d-4a0f-a9c5-cb82f319167f	Orthodera ministralis	(Fabricius, 1775)	species	Animalia	Arthropoda	Insecta	Mantodea	Mantidae	Orthodera	Green Mantid	2
https://biodiversity.org.au/afd/taxa/692effa3-b719-495f-a86f-ce89e2981652	Oryctolagus cuniculus	(Linnaeus, 1758)	species	Animalia	Chordata	Mammalia	Lagomorpha	Leporidae	Oryctolagus	Rabbit	6
https://biodiversity.org.au/afd/taxa/6f0e0562-211a-4a01-bf38-6f481070dec5	Oxyopes gracilipes	(White, 1849)	species	Animalia	Arthropoda	Arachnida	Araneae	Oxyopidae	Oxyopes		1
https://biodiversity.org.au/afd/taxa/378bdcd1-f52a-4907-9f71-0541b05437da	Pachycephala (Alisterornis) rufiventris	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Pachycephalidae	Pachycephala	Rufous Whistler	61
https://biodiversity.org.au/afd/taxa/f3522116-9bfc-483a-b765-fee8b17fb100	Pachycephala (Pachycephala) occidentalis	E.P. Ramsay, 1878	species	Animalia	Chordata	Aves	Passeriformes	Pachycephalidae	Pachycephala	Western Whistler	9
https://biodiversity.org.au/afd/taxa/30edbd1a-6367-4d84-87f1-3566e6cc54d6	Pachycephala (Pachycephala) pectoralis	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Pachycephalidae	Pachycephala	Golden Whistler	14
https://biodiversity.org.au/afd/taxa/93b89e13-504e-4459-ad50-a66c5a614e2c	Pachyplocia griseata	Warren, 1896	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Pachyplocia		2

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/de179f89-9593-4f0a-bdc0-d3945e9e01c9	Pachysaga australis	(Walker, 1869)	species	Animalia	Arthropoda	Insecta	Orthoptera	Tettigoniidae	Pachysaga		1
https://biodiversity.org.au/afd/taxa/46905981-7b21-4d6d-a61d-71f882e5634c	Pantydia capistrata	T.P. Lucas, 1894	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Pantydia		1
https://biodiversity.org.au/afd/taxa/c7a1ad76-0826-46fe-94c7-09d0e7a8b30a	Pantydia diemeni	GuenÃ©e, 1852	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Pantydia		3
https://biodiversity.org.au/afd/taxa/598aa06d-0a19-4c4c-96c6-b60b094bcc59	Pantydia sparsa	GuenÃ©e, 1852	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Pantydia		3
https://biodiversity.org.au/afd/taxa/b8098726-68e8-418e-be5a-d3cb03f7a163	Paracolletes (Anthoglossa) nigrocinctus	Cockerell, 1914	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Paracolletes		2
https://biodiversity.org.au/afd/taxa/3153b97b-1bdd-4338-98b6-cea694974b83	Paracolletes (Paracolletes) crassipes	Smith, 1853	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Paracolletes		6
https://biodiversity.org.au/afd/taxa/62326504-c699-4f73-9423-9b0b539c11a2	Paracyclops intermedius	Tang & Knott, 2009	species	Animalia	Arthropoda	Maxillopoda	Cyclopoida	Cyclopidae	Paracyclops	Copepod	8
https://biodiversity.org.au/afd/taxa/773e594e-74c9-498f-b671-40472fe6c29d	Paraoxypilus tasmaniensis	Saussure, 1870	species	Animalia	Arthropoda	Insecta	Mantodea	Amorphoscelidae	Paraoxypilus		1
https://biodiversity.org.au/afd/taxa/eedd1767-9b38-4f83-80ba-a8cbe6867550	Parapalaeosepsis plebeia	(De Meijere, 1906)	species	Animalia	Arthropoda	Insecta	Diptera	Sepsidae	Parapalaeosepsis		1
https://biodiversity.org.au/afd/taxa/f6c69e1f-2966-410e-ac19-185ae3dfb77c	Pararguda nasuta	(Lewin, 1805)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Lasiocampidae	Pararguda		2
https://biodiversity.org.au/afd/taxa/e3103245-2da1-4cc5-952d-49153f466bbf	Pardalotus (Pardalotinus) striatus	(Gmelin, 1789)	species	Animalia	Chordata	Aves	Passeriformes	Pardalotidae	Pardalotus	Striated Pardalote	51
https://biodiversity.org.au/afd/taxa/5254fe03-630b-44b2-9233-df51a7b8f25f	Pardalotus (Pardalotus) punctatus	(Shaw, 1792)	species	Animalia	Chordata	Aves	Passeriformes	Pardalotidae	Pardalotus	Spotted Pardalote	3
https://biodiversity.org.au/afd/taxa/032ef633-e508-4fd9-b0c6-58ca1b0bd545	Paropsis blandina	Blackburn, 1901	species	Animalia	Arthropoda	Insecta	Coleoptera	Chrysomelidae	Paropsis		1
https://biodiversity.org.au/afd/taxa/17e198fd-93d4-4e43-b664-da368bad137f	Paropsis latona	Blackburn, 1901	species	Animalia	Arthropoda	Insecta	Coleoptera	Chrysomelidae	Paropsis		2
https://biodiversity.org.au/afd/taxa/8f5b5c15-9a70-45f5-852b-caa490123d72	Paropsisterna basalis	(Chapuis, 1877)	species	Animalia	Arthropoda	Insecta	Coleoptera	Chrysomelidae	Paropsisterna		2
https://biodiversity.org.au/afd/taxa/eaa3f132-9191-4cce-83a2-8129ae075469	Paropsisterna crocata	(Boisduval, 1835)	species	Animalia	Arthropoda	Insecta	Coleoptera	Chrysomelidae	Paropsisterna		2
https://biodiversity.org.au/afd/taxa/a2399fe3-c90f-4fb1-a710-fe81643ff56e	Parvipsitta porphyrocephala	(Dietrichsen, 1837)	species	Animalia	Chordata	Aves	Psittaciformes	Psittacidae	Parvipsitta	Purple-crowned Lorikeet	1
https://biodiversity.org.au/afd/taxa/1c610d7e-660c-4309-bf90-d9341d8213f1	Pasiphilodes testulata	(GuenÃ©e, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Pasiphilodes		2
https://biodiversity.org.au/afd/taxa/43abe3ea-7ccc-41cc-920f-d9cfa107207e	Pelecanus conspicillatus	Temminck, 1824	species	Animalia	Chordata	Aves	Pelecaniformes	Pelecanidae	Pelecanus	Australian Pelican	2
https://biodiversity.org.au/afd/taxa/12521f6f-d06c-4f05-bc88-ac56877c4a1e	Pentasteron securifer	Baehr & JocquÃ©, 2001	species	Animalia	Arthropoda	Arachnida	Araneae	Zodariidae	Pentasteron		1
https://biodiversity.org.au/afd/taxa/92948586-2ae2-4dca-83e9-c4112863aaa6	Peraglyphis scepasta	Common, 1963	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Peraglyphis		10
https://biodiversity.org.au/afd/taxa/d6d43d2a-b1f5-4022-81db-7dcc8d4d2f11	Perga brullei	Westwood, 1880	species	Animalia	Arthropoda	Insecta	Hymenoptera	Pergidae	Perga		1
https://biodiversity.org.au/afd/taxa/c2a0beb5-ab72-4669-b933-df478bb0d6d3	Persectania ewingii	(Westwood, 1839)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Persectania		1
https://biodiversity.org.au/afd/taxa/e23e308f-870b-4d6c-b3c8-5a1e18bd2dc0	Persicoptera pulchrinalis	(GuenÃ©e, 1854)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Persicoptera		2
https://biodiversity.org.au/afd/taxa/e0da46e4-450b-4ded-ba66-2afe81ef28b5	Petalura hesperia	Watson, 1958	species	Animalia	Arthropoda	Insecta	Odonata	Petaluridae	Petalura		10
https://biodiversity.org.au/afd/taxa/7d38efed-12ce-4aa3-b51a-67f89b109ded	Petrochelidon (Hylochelidon) nigricans	(Vieillot, 1817)	species	Animalia	Chordata	Aves	Passeriformes	Hirundinidae	Petrochelidon	Tree Martin	38
https://biodiversity.org.au/afd/taxa/f29f01e6-0bfe-4621-b068-42dac6c758dc	Petrochelidon (Petrochelidon) ariel	(Gould, 1842)	species	Animalia	Chordata	Aves	Passeriformes	Hirundinidae	Petrochelidon	Fairy Martin	3
https://biodiversity.org.au/afd/taxa/a3e5376b-f9e6-4bdf-adae-1e7add9f5c29	Petroica (Petroica) boodang	(Lesson, 1838)	species	Animalia	Chordata	Aves	Passeriformes	Petroicidae	Petroica	Scarlet Robin	72
https://biodiversity.org.au/afd/taxa/10dbd908-00f3-4ec2-9a9c-a2fd4782eaf1	Petroica (Petroica) goodenovii	(Vigors & Horsfield, 1827)	species	Animalia	Chordata	Aves	Passeriformes	Petroicidae	Petroica	Red-capped Robin	19
https://biodiversity.org.au/afd/taxa/29472c00-22e3-42c3-b562-107bd28d1bdc	Phalacrocorax (Phalacrocorax) carbo	(Linnaeus, 1758)	species	Animalia	Chordata	Aves	Pelecaniformes	Phalacrocoracidae	Phalacrocorax	Great Cormorant	1
https://biodiversity.org.au/afd/taxa/c96b19fd-2a54-4361-a5cf-baecf741310e	Phalacrocorax (Phalacrocorax) sulcirostris	(Brandt, 1837)	species	Animalia	Chordata	Aves	Pelecaniformes	Phalacrocoracidae	Phalacrocorax	Little Black Cormorant	1
https://biodiversity.org.au/afd/taxa/55994a9e-8ba7-4ff9-89a2-e22586ab25d1	Phalacrocorax (Phalacrocorax) varius	(Gmelin, 1789)	species	Animalia	Chordata	Aves	Pelecaniformes	Phalacrocoracidae	Phalacrocorax	Black-and-white Shag	1
https://biodiversity.org.au/afd/taxa/b300c30c-39fe-4ed3-ab12-4fff02818d0f	Phallaria ophiusaria	GuenÃ©e, 1857	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Phallaria		1
https://biodiversity.org.au/afd/taxa/7da6fd6f-c180-4e68-b9e7-70d02e6f8448	Phaps (Phaps) chalcoptera	(Latham, 1790)	species	Animalia	Chordata	Aves	Columbiformes	Columbidae	Phaps	Common Bronzewing	61
https://biodiversity.org.au/afd/taxa/b6930f29-3f26-415e-a760-c12c320c2931	Phascogale tapoatafa	(Meyer, 1793)	species	Animalia	Chordata	Mammalia	Dasyuromorphia	Dasyuridae	Phascogale	Brush-tailed Phascogale	1
https://biodiversity.org.au/afd/taxa/8899ed59-044b-4ae8-a741-0c29bedb7975	Phaulacridium vittatum	(SjÃ¶stedt, 1920)	species	Animalia	Arthropoda	Insecta	Orthoptera	Acrididae	Phaulacridium	Wingless Grasshopper	1
https://biodiversity.org.au/afd/taxa/869dfe23-30b7-4605-a74e-cfc812e1f6e4	Philobota xanthastis	(Meyrick, 1889)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Philobota		17
https://biodiversity.org.au/afd/taxa/4b4e014a-9e2e-44f1-9d9e-a1912e8e3b7b	Philotarsopsis guttata	(Tillyard, 1923)	species	Animalia	Arthropoda	Insecta	Psocodea	Philotarsidae	Philotarsopsis		1
https://biodiversity.org.au/afd/taxa/8da02929-14b3-4b61-9840-7bcf196fe9f5	Phlogistus agraphus	Elston, 1922	species	Animalia	Arthropoda	Insecta	Coleoptera	Cleridae	Phlogistus		1
https://biodiversity.org.au/afd/taxa/0cf87549-56ab-44a0-9dae-98a9152228d6	Pholcus phalangioides	(Fuesslin, 1775)	species	Animalia	Arthropoda	Arachnida	Araneae	Pholcidae	Pholcus		3
https://biodiversity.org.au/afd/taxa/20743a8a-4e99-4bb5-887c-deb16ac9e9cb	Phoracantha punctata	(Donovan, 1805)	species	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Phoracantha		2
https://biodiversity.org.au/afd/taxa/bf610eb5-3521-4788-87ee-a5315edd986a	Phoracantha semipunctata	(Fabricius, 1775)	species	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Phoracantha		3
https://biodiversity.org.au/afd/taxa/4e971936-cff5-4877-a113-b5bd5f07d28a	Phrissogonus laticostata	(Walker, 1862)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Phrissogonus		24
https://biodiversity.org.au/afd/taxa/ccd1aa1a-371d-446c-bc13-971d839f8f7f	Phryganeutis cinerea	Meyrick, 1884	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Phryganeutis		4
https://biodiversity.org.au/afd/taxa/148208ff-e6ea-40bd-9999-9f1a6b8acc1e	Phylidonyris (Meliornis) niger	(Bechstein, 1811)	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Phylidonyris	White-cheeked Honeyeater	113
https://biodiversity.org.au/afd/taxa/da002998-b551-4328-ac4e-5e04fc72708b	Phylidonyris (Meliornis) novaehollandiae	(Latham, 1790)	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Phylidonyris	New Holland Honeyeater	47
https://biodiversity.org.au/afd/taxa/fa6229c1-7d13-4717-b036-fe0a667ef870	Phyllococerus purpurascens	Waterhouse, 1876	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Phyllococerus		1
https://biodiversity.org.au/afd/taxa/26f469e3-8e38-4f52-8b37-ad5817ef8493	Physeema convergens	(Walker, 1850)	species	Animalia	Arthropoda	Insecta	Hemiptera	Cicadidae	Physeema		3
https://biodiversity.org.au/afd/taxa/96fbc0ed-c0ea-4d4e-884f-1deaa862ecb2	Phytotrypa anazancla	(Meyrick, 1889)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Phytotrypa		3
https://biodiversity.org.au/afd/taxa/934ecab5-798d-45b9-bade-16b3380d08a0	Pieris rapae	(Linnaeus, 1758)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pieridae	Pieris	Cabbage White Butterfly	9
https://biodiversity.org.au/afd/taxa/2e16e72c-bed7-42a7-b8b0-0ad30f5e252a	Piloprepes antidoxa	Meyrick, 1889	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Piloprepes		2
https://biodiversity.org.au/afd/taxa/5e56298f-4aa9-4c3a-ae3b-8729f9e2ac32	Pison tibiale	Smith, 1869	species	Animalia	Arthropoda	Insecta	Hymenoptera	Crabronidae	Pison		1
https://biodiversity.org.au/afd/taxa/3dd39f84-1293-4c04-ac87-2474f5c887b0	Platalea (Platibis) flavipes	Gould, 1838	species	Animalia	Chordata	Aves	Ciconiiformes	Threskiornithidae	Platalea	Yellow-legged Spoonbill	3
https://biodiversity.org.au/afd/taxa/12efe8e2-13c3-4551-8c7c-2fd6923b0d9e	Platycercus (Violania) icterotis	(Temminck & Kuhl, 1820)	species	Animalia	Chordata	Aves	Psittaciformes	Psittacidae	Platycercus	Western Rosella	1
https://biodiversity.org.au/afd/taxa/6d49aa09-3cf7-450c-92f8-468369b87b81	Platynectes (Platynectes) aenescens	Sharp, 1882	species	Animalia	Arthropoda	Insecta	Coleoptera	Dytiscidae	Platynectes		2
https://biodiversity.org.au/afd/taxa/a5f83a90-288d-4f93-ad46-5a6e3018da19	Plebs cyphoxis	(Simon, 1908)	species	Animalia	Arthropoda	Arachnida	Araneae	Araneidae	Plebs		3
https://biodiversity.org.au/afd/taxa/a3d7cc8f-0883-4ce0-bd25-b06dcebc01cf	Plectophila thrasycosma	(Meyrick, 1915)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Plectophila		1
https://biodiversity.org.au/afd/taxa/0a4129c5-26c9-4fa2-824d-9a70126164b0	Plesanemma fucata	(R. Felder & Rogenhofer, 1875)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Plesanemma		2
https://biodiversity.org.au/afd/taxa/10a966de-78df-48be-89bc-172646a5abd8	Plesiolaea maritima	(Lower, 1897)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Plesiolaea		1
https://biodiversity.org.au/afd/taxa/6617f80d-3f99-46d7-9567-534d79a98108	Pletholax gracilis	Cope, 1864	species	Animalia	Chordata	Reptilia	Squamata	Pygopodidae	Pletholax	Keeled Legless Lizard	1
https://biodiversity.org.au/afd/taxa/6bf208a1-338f-41a0-82a7-d817918d4a2f	Plotiopsis balonnensis	(Conrad, 1850)	species	Animalia	Mollusca	Gastropoda	Cerithimorpha	Thiaridae	Plotiopsis	Gastropod	1
https://biodiversity.org.au/afd/taxa/0e526884-3eb4-490c-9362-3eb8065ee0d4	Plutella xylostella	(Linnaeus, 1758)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Plutellidae	Plutella		6
https://biodiversity.org.au/afd/taxa/ac48e985-2adb-4c1e-bce9-39906cf6761d	Podalonia tydei	(Le Guillou, 1841)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Sphecidae	Podalonia		1
https://biodiversity.org.au/afd/taxa/8bec5cc6-ac31-4d23-9df3-856034968af9	Podargus strigoides	(Latham, 1801)	species	Animalia	Chordata	Aves	Caprimulgiformes	Podargidae	Podargus	Tawny Frogmouth	1
https://biodiversity.org.au/afd/taxa/f2562e04-de31-42b2-bd6f-39a257e79464	Podomyrma adelaidae	(Smith, 1858)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Podomyrma		3
https://biodiversity.org.au/afd/taxa/07ad3a7a-19af-4f2f-8022-54d78159edd5	Poecilasthena anthodes	(Meyrick, 1891)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Poecilasthena		1
https://biodiversity.org.au/afd/taxa/523cecf0-ce09-4e08-b7c2-fa8731544617	Poecilasthena pulchraria	(Doubleday, 1843)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Poecilasthena		7
https://biodiversity.org.au/afd/taxa/ad2e304f-70f9-4a7c-9cc6-c519817fcb0b	Poecilasthena xylocyma	(Meyrick, 1891)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Poecilasthena		8
https://biodiversity.org.au/afd/taxa/b373ab3c-2a15-4644-b975-142dfecdb815	Poecilometis apicalis	(Westwood, 1837)	species	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Poecilometis		1
https://biodiversity.org.au/afd/taxa/a3dcddc8-c8c4-47be-b54e-8e0f7777566c	Poecilometis patruelis	StÃ¥l, 1860	species	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Poecilometis		1
https://biodiversity.org.au/afd/taxa/f777ebe8-250f-4b8e-9e25-b5944a2ea023	Pogona minor	(Sternfeld, 1919)	species	Animalia	Chordata	Reptilia	Squamata	Agamidae	Pogona	Dwarf Bearded Dragon	1
https://biodiversity.org.au/afd/taxa/e27d813a-0e26-45c5-9396-687d368a2c37	Polistes (Polistella) humilis	(Fabricius, 1781)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Polistes	Common Paper Wasp	7
https://biodiversity.org.au/afd/taxa/3134a393-7059-4099-a417-45ff499e1836	Polistes (Polistella) stigma	(Fabricius, 1793)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Polistes		1

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/7fcc9d58-823e-4095-9ca2-512ef3b93e4b	Polistes (Polistes) dominulus	(Christ, 1791)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Polistes		1
https://biodiversity.org.au/afd/taxa/928f9b98-d671-4c9d-8ffc-0698b21271f9	Pollanisus cupreus	Walker, 1854	species	Animalia	Arthropoda	Insecta	Lepidoptera	Zygaenidae	Pollanisus		2
https://biodiversity.org.au/afd/taxa/4aa8a4c4-b71e-474a-8338-7cb97849f6ff	Pollanisus viridipulverulenta	(GuÃ©rin-MÃ©neville, 1839)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Zygaenidae	Pollanisus		1
https://biodiversity.org.au/afd/taxa/171b0bfe-3afa-42bf-91ac-5cd85d3e43d1	Polytelis anthopeplus	(Lear, 1831)	species	Animalia	Chordata	Aves	Psittaciformes	Psittacidae	Polytelis	Regent Parrot	4
https://biodiversity.org.au/afd/taxa/adff994b-1001-4012-8bb7-0d9eb80dcde7	Prasinocyma rhodocosma	(Meyrick, 1888)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Prasinocyma		11
https://biodiversity.org.au/afd/taxa/a7f8a052-4d46-44a6-82bb-995d2c65f18e	Prasinocyma semicrocea	(Walker, 1861)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Prasinocyma		7
https://biodiversity.org.au/afd/taxa/b3675af7-fc48-47c7-97d4-1da8dcd40bf9	Praxis dirigens	Walker, 1858	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Praxis		1
https://biodiversity.org.au/afd/taxa/f05e4133-2784-42a1-8507-e34d53f707d6	Prionyx globosus	(Smith, 1856)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Sphecidae	Prionyx		1
https://biodiversity.org.au/afd/taxa/0c8623ec-0140-42fa-a8a9-c895b2321918	Protenaster australis	(Gray, 1851)	species	Animalia	Echinodermata	Echinoidea	Spatangoida	Schizasteridae	Protenaster	Heart Urchin	1
https://biodiversity.org.au/afd/taxa/123d0a02-1136-4f5e-95f4-1d51802c410b	Proteuxoa epiplecta	(GuenÃ©e, 1868)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Proteuxoa		1
https://biodiversity.org.au/afd/taxa/de7cce0d-7b4d-42c7-9bf9-2863803cb884	Proteuxoa florescens	(Walker, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Proteuxoa		4
https://biodiversity.org.au/afd/taxa/74577915-f04a-4a1b-bf8d-1aba4faf4753	Proteuxoa sarcomorpha	(Lower, 1902)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Proteuxoa		2
https://biodiversity.org.au/afd/taxa/9c669694-22a5-4e0b-a6fa-f0e71eed2cea	Proteuxoa tibiata	(GuenÃ©e, 1852)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Proteuxoa		1
https://biodiversity.org.au/afd/taxa/c6c2ad9d-4f52-451b-b123-6680187d8794	Pseudanapaea denotata	(Walker, 1865)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Limacodidae	Pseudanapaea		2
https://biodiversity.org.au/afd/taxa/f4da01d2-4937-4be2-92b2-de9fe2ae55ca	Pseudanapaea transvestita	Hering, 1931	species	Animalia	Arthropoda	Insecta	Lepidoptera	Limacodidae	Pseudanapaea		1
https://biodiversity.org.au/afd/taxa/3e76ec1f-622b-452b-b556-904da60adea2	Pseudapines geminata	(Van Duzee, 1905)	species	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Pseudapines	Pittosporum Bug	1
https://biodiversity.org.au/afd/taxa/6aa9025b-46ff-4427-b69c-6f81b59599d3	Pseudechis australis	(Gray, 1842)	species	Animalia	Chordata	Reptilia	Squamata	Elapidae	Pseudechis	King Brown Snake	1
https://biodiversity.org.au/afd/taxa/8308a376-50a5-483b-ac9f-39d702b817ec	Pseudemydura umbrina	Siebenrock, 1901	species	Animalia	Chordata	Reptilia	Testudines	Chelidae	Pseudemydura	Western Swamp Turtle	59
https://biodiversity.org.au/afd/taxa/895f3296-2b6c-48c2-a258-af796b671474	Pseudogobius olorum	(Sauvage, 1880)	species	Animalia	Chordata	Actinopterygii	Perciformes	Gobiidae	Pseudogobius	Bluespot Goby	2
https://biodiversity.org.au/afd/taxa/dcf303b1-0371-4c8b-b431-c2e147941926	Pseudonaja affinis	GÃ¼nther, 1872	species	Animalia	Chordata	Reptilia	Squamata	Elapidae	Pseudonaja	Dugite	4
https://biodiversity.org.au/afd/taxa/ddceda0c-0df4-4ff0-8f11-c4d546336c4b	Pseudozarba orthopetes	(Meyrick, 1897)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Pseudozarba		2
https://biodiversity.org.au/afd/taxa/b7784bed-c80d-44a8-9905-e3a1e63fb1a4	Psilosticha pristis	(Meyrick, 1892)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Psilosticha		18
https://biodiversity.org.au/afd/taxa/9c43c6d2-a083-4e6f-824d-d0b520662354	Psychopsis mimica	Newman, 1842	species	Animalia	Arthropoda	Insecta	Neuroptera	Psychopsidae	Psychopsis		1
https://biodiversity.org.au/afd/taxa/072c3304-9e6a-4a8a-983c-d8f3b951b26f	Pterodroma (Pterodroma) macroptera	(A. Smith, 1840)	species	Animalia	Chordata	Aves	Procellariiformes	Procellariidae	Pterodroma	Mutton-bird	1
https://biodiversity.org.au/afd/taxa/8ad936c1-e0c5-442d-a5e9-38343924448f	Ptilocnemus lemur	(Westwood, 1840)	species	Animalia	Arthropoda	Insecta	Hemiptera	Reduviidae	Ptilocnemus		1
https://biodiversity.org.au/afd/taxa/66f82bb4-ae71-4543-a99e-35452536c4c8	Purpureicephalus spurius	(Kuhl, 1820)	species	Animalia	Chordata	Aves	Psittaciformes	Psittacidae	Purpureicephalus	Red-capped Parrot	80
https://biodiversity.org.au/afd/taxa/5c9ab00e-2da3-49d9-9979-651b2bd4eba3	Pyralis farinalis	Linnaeus, 1758	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Pyralis		2
https://biodiversity.org.au/afd/taxa/19d57eff-503e-4811-b799-8e5f4a29e5df	Pyroderces falcatella	(Stainton, 1859)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Cosmopterigidae	Pyroderces		2
https://biodiversity.org.au/afd/taxa/178a17ff-2135-48e8-856b-39f546f02092	Rattus rattus	(Linnaeus, 1758)	species	Animalia	Chordata	Mammalia	Rodentia	Muridae	Rattus	Black Rat	4
https://biodiversity.org.au/afd/taxa/6b6a81b1-4928-488e-a45b-d42868c263a7	Raveniella peckorum	Rix & Harvey, 2010	species	Animalia	Arthropoda	Arachnida	Araneae	Anapidae	Raveniella		1
https://biodiversity.org.au/afd/taxa/1a2dcf1e-4352-46ca-8399-1507b83925fe	Rentinus dilatatus	(Westwood, 1838)	species	Animalia	Arthropoda	Insecta	Hemiptera	Fulgoridae	Rentinus		1
https://biodiversity.org.au/afd/taxa/85164eb6-0e1f-4311-94be-6ed652c1f56d	Requena verticalis	Walker, 1869	species	Animalia	Arthropoda	Insecta	Orthoptera	Tettigoniidae	Requena		2
https://biodiversity.org.au/afd/taxa/cddecf56-3979-4ad6-a31c-8519af2ac503	Rhantus suturalis	(W.S. Macleay, 1825)	species	Animalia	Arthropoda	Insecta	Coleoptera	Dytiscidae	Rhantus		3
https://biodiversity.org.au/afd/taxa/af7380c6-32cc-411d-a79e-500b2a20f147	Rhinodia rostraria	GuenÃ©e, 1857	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Rhinodia		2
https://biodiversity.org.au/afd/taxa/97a59c84-af21-4cdc-bac7-a97c5201db42	Rhipidura (Rhipidura) albiscapa	Gould, 1840	species	Animalia	Chordata	Aves	Passeriformes	Rhipiduridae	Rhipidura	Grey Fantail	113
https://biodiversity.org.au/afd/taxa/1c4dce12-16f6-49ab-b578-0673551214fd	Rhipidura (Sauloprocta) leucophrys	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Rhipiduridae	Rhipidura	Willie Wagtail	45
https://biodiversity.org.au/afd/taxa/39bbc8df-e685-4995-a4bf-955201edac65	Rhodomantis disparilis	(Westwood, 1889)	species	Animalia	Arthropoda	Insecta	Mantodea	Mantidae	Rhodomantis		1
https://biodiversity.org.au/afd/taxa/c7bf86ad-6ca4-4fd8-a786-72f6285f9871	Rhytidoponera mayri	(Emery, 1883)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Rhytidoponera		2
https://biodiversity.org.au/afd/taxa/81aa2878-5c8c-45b1-9517-834a03e477ea	Rhytidoponera metallica	(Smith, 1858)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Rhytidoponera		5
https://biodiversity.org.au/afd/taxa/28ee3b73-b677-43e3-b250-87cd81055ac1	Salma mnesibrya	(Meyrick, 1884)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Salma		7
https://biodiversity.org.au/afd/taxa/d718fa20-b17e-449f-8363-64a4c43f4e53	Sandava scitisignata	(Walker, 1862)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Sandava		12
https://biodiversity.org.au/afd/taxa/bbd6c97b-3ed8-4d6b-931f-ab6344b295f3	Sceliodes cordalis	(Doubleday, 1843)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Sceliodes		1
https://biodiversity.org.au/afd/taxa/1a03ac28-58ba-46c9-a175-fe9cf12c6cf5	Sceliphron laetum	(Smith, 1856)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Sphecidae	Sceliphron		1
https://biodiversity.org.au/afd/taxa/929eaaba-a8ba-4d4c-bcc1-e9dc8d12b001	Scolioplecta rigida	(Meyrick, 1910)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Scolioplecta		4
https://biodiversity.org.au/afd/taxa/d057765c-a936-4673-8518-2131e76bf335	Scoparia exhibitalis	Walker, 1866	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Scoparia		4
https://biodiversity.org.au/afd/taxa/9f01b07d-449b-4420-8f56-7da16e856b6c	Scopula axiotis	(Meyrick, 1888)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Scopula		2
https://biodiversity.org.au/afd/taxa/a7255079-40c3-4493-ad2a-a6048780afb3	Scopula optivata	(Walker, 1861)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Scopula		17
https://biodiversity.org.au/afd/taxa/494d559f-0dde-436d-bef8-6248a3cdb39c	Scopula sublinearia	(Walker, 1866)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Scopula		3
https://biodiversity.org.au/afd/taxa/7c1392ff-c0bc-43b8-87a5-889f43887b43	Sericophorus relucens	Smith, 1856	species	Animalia	Arthropoda	Insecta	Hymenoptera	Crabronidae	Sericophorus		2
https://biodiversity.org.au/afd/taxa/55598199-2b14-4f74-9821-9916f8cff2e5	Sericophorus viridis	(Saussure, 1855)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Crabronidae	Sericophorus		1
https://biodiversity.org.au/afd/taxa/031b2b69-e9fc-44c6-9df9-03c1470d5ec3	Sericornis (Sericornis) frontalis	(Vigors & Horsfield, 1827)	species	Animalia	Chordata	Aves	Passeriformes	Acanthizidae	Sericornis	White-fronted Scrubwren	4
https://biodiversity.org.au/afd/taxa/c74464f4-57fd-4386-90fe-c68e1d629729	Simoselaps bertholdi	(Jan, 1859)	species	Animalia	Chordata	Reptilia	Squamata	Elapidae	Simoselaps	Jan's Banded Snake	1
https://biodiversity.org.au/afd/taxa/09e007e5-22c5-44ff-9654-4bcf4f1fcdb4	Simosyrphus grandicornis	(Macquart, 1842)	species	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Simosyrphus		9
https://biodiversity.org.au/afd/taxa/986aa1db-7d6d-4a45-95f7-3ed68b0564f1	Smeringopus natalensis	Lawrence, 1947	species	Animalia	Arthropoda	Arachnida	Araneae	Pholcidae	Smeringopus		4
https://biodiversity.org.au/afd/taxa/f933497e-60d2-4f80-bc5e-08d8b1349c2c	Smicrornis brevirostris	(Gould, 1838)	species	Animalia	Chordata	Aves	Passeriformes	Acanthizidae	Smicrornis	Brown Weebill	45
https://biodiversity.org.au/afd/taxa/b200510f-c3f7-4a51-a22e-ed0b58d9bd15	Spectrotrota fimbrialis	Warren, 1891	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Spectrotrota		23
https://biodiversity.org.au/afd/taxa/43d8a366-7295-4c45-9e53-bc6fa4cf93bb	Sphex luctuosus	Smith, 1856	species	Animalia	Arthropoda	Insecta	Hymenoptera	Sphecidae	Sphex		1
https://biodiversity.org.au/afd/taxa/f5b6af6e-af3c-4e96-93e8-1502ce8bdf0d	Sphodropoda tristis	(Saussure, 1871)	species	Animalia	Arthropoda	Insecta	Mantodea	Mantidae	Sphodropoda		1
https://biodiversity.org.au/afd/taxa/b259eb3c-57a3-4cd6-a6df-5151d33bafc6	Spilonota constrictana	(Meyrick, 1881)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Spilonota		1
https://biodiversity.org.au/afd/taxa/941de859-ed16-490f-86be-70c8fcf42e72	Spilosoma glatignyi	(Le Guillou, 1841)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Spilosoma		3
https://biodiversity.org.au/afd/taxa/43adf129-76b1-4e81-9593-cd4f5ac7c829	Spoladea recurvalis	(Fabricius, 1775)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Spoladea		2
https://biodiversity.org.au/afd/taxa/b2669Ofc-d652-4777-9ead-3421170129ed	Stagonopleura (Zonaeginthus) oculata	(Quoy & Gaimard, 1830)	species	Animalia	Chordata	Aves	Passeriformes	Estrildidae	Stagonopleura	Red-eared Firetail	1
https://biodiversity.org.au/afd/taxa/521ff45c-7d85-4306-b4a5-23ffbd30111e	Stangeia xerodes	(Meyrick, 1886)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pterophoridae	Stangeia		6
https://biodiversity.org.au/afd/taxa/093b24db-34bf-4f75-97fe-2329e21c3b18	Steatoda grossa	(C.L. Koch, 1838)	species	Animalia	Arthropoda	Arachnida	Araneae	Theridiidae	Steatoda		2
https://biodiversity.org.au/afd/taxa/e3fa6417-87d6-48e3-a2fb-6a5f664abbb1	Stigmodera gratiosa	Chevrolat, 1843	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Stigmodera		2
https://biodiversity.org.au/afd/taxa/15ca28e9-1d01-43a6-ac4f-5943aa760b4f	Stigmodera sanguinosa	Hope, 1846	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Stigmodera		2
https://biodiversity.org.au/afd/taxa/cd7709bc-ac13-4b4b-b751-1e18f7d2f3b6	Storena formosa	Thorell, 1870	species	Animalia	Arthropoda	Arachnida	Araneae	Zodariidae	Storena		1
https://biodiversity.org.au/afd/taxa/8ce669b4-fb53-4be0-9203-b02444eca02a	Strepera (Neostrepera) versicolor	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Artamidae	Strepera	Grey Currawong	5
https://biodiversity.org.au/afd/taxa/0bb16cc7-899d-48c5-ba6a-4a4846f75248	Strepsicrates macropetana	(Meyrick, 1881)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Strepsicrates		2
NZOR-6-117936	Streptopelia chinensis	Scopoli	species	Animalia	Chordata	Aves	Columbiformes	Columbidae	Streptopelia	Spotted Dove	1
https://biodiversity.org.au/afd/taxa/9a942ab6-c29b-4de5-ab2a-72c9ef99605a	Strophurus spinigerus	(Gray, 1842)	species	Animalia	Chordata	Reptilia	Squamata	Diplodactylidae	Strophurus	South-western Spiny-tailed Gecko	2
https://biodiversity.org.au/afd/taxa/dadc6ab4-e986-4173-a476-2760b9760061	Sturnus (Sturnus) vulgaris	Linnaeus, 1758	species	Animalia	Chordata	Aves	Passeriformes	Sturnidae	Sturnus	Common Starling	1
https://biodiversity.org.au/afd/taxa/948d8ca1-62fc-4d03-a79d-4be2de837264	Sus scrofa	Linnaeus, 1758	species	Animalia	Chordata	Mammalia	Artiodactyla	Suidae	Sus	Pig	1
https://biodiversity.org.au/afd/taxa/44dea5cf-f8a3-4d2b-9b8a-9a94647dc6ab	Suta gouldii	(Gray, 1841)	species	Animalia	Chordata	Reptilia	Squamata	Elapidae	Suta	Gould's Hooded Snake	3
https://biodiversity.org.au/afd/taxa/5a1a02f8-eecf-4259-8168-ac9c6d4c0b1d	Swanea laticornis	(SjÃ¶stedt, 1921)	species	Animalia	Arthropoda	Insecta	Orthoptera	Morabidae	Swanea		1
https://biodiversity.org.au/afd/taxa/63960318-d34c-4f4f-891c-29d98b681ac2	Symphylistis leptocyma	Turner, 1930	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Symphylistis		7
https://biodiversity.org.au/afd/taxa/c188e141-68f6-47ad-8327-c9fe56075c0a	Synemon leucospila	Meyrick, 1891	species	Animalia	Arthropoda	Insecta	Lepidoptera	Castniidae	Synemon		2
https://biodiversity.org.au/afd/taxa/591cd6f0-1e4a-451b-a28c-2bad13d491a7	Synemon parthenoides	R. Felder, 1874	species	Animalia	Arthropoda	Insecta	Lepidoptera	Castniidae	Synemon		1

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/381ef11d-89bf-464e-9438-2aaebf2cf095	Syneora mundifera	(Walker, 1860)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Syneora		4
https://biodiversity.org.au/afd/taxa/cb748125-0c06-4649-8ed8-e379e81e53c1	Tachybaptus novaehollandiae	(Stephens, 1826)	species	Animalia	Chordata	Aves	Podicipediformes	Podicipedidae	Tachybaptus	Australian Little Grebe	11
https://biodiversity.org.au/afd/taxa/0d4c9c0c-51d3-44e0-a365-fe0f8b791c66	Tachyglossus aculeatus	(Shaw, 1792)	species	Animalia	Chordata	Mammalia	Monotremata	Tachyglossidae	Tachyglossus	Short-beaked Echidna	6
https://biodiversity.org.au/afd/taxa/65adf5ac-7539-4192-8117-85bd336c1fcd	Tachystola stenoptera	(Meyrick, 1884)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Tachystola		1
https://biodiversity.org.au/afd/taxa/8931bcfb-95ea-44b1-96c9-ce036191e15c	Tadorna (Casarca) tadornoides	(Jardine & Selby, 1828)	species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Tadorna	Chestnut Sheldrake	10
https://biodiversity.org.au/afd/taxa/d3ff58f5-a0e7-422c-bff0-bdf38387a991	Tanyzancla calliophthalma	(Meyrick, 1889)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Tanyzancla		3
https://biodiversity.org.au/afd/taxa/2e407d03-f15f-4bfb-8cb0-0e8dab31bb38	Tanyzancla melanocrossa	(Meyrick, 1889)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Tanyzancla		4
https://biodiversity.org.au/afd/taxa/e45a70ce-d159-4d7c-a812-11aef7c9b612	Tapeigaster argyrospila	Bezzi, 1923	species	Animalia	Arthropoda	Insecta	Diptera	Heteromyzidae	Tapeigaster		2
https://biodiversity.org.au/afd/taxa/9c444ffa-1c83-400f-96fb-4485205f1bfa	Tapinogyna perichroa	(Lower, 1903)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Tapinogyna		2
https://biodiversity.org.au/afd/taxa/562a5c6b-51e8-457e-9b5d-c921af5e18ed	Tarsipes rostratus	Gervais & Verreaux, 1842	species	Animalia	Chordata	Mammalia	Diprotodontia	Tarsipedidae	Tarsipes	Honey Possum	4
https://biodiversity.org.au/afd/taxa/49b45fba-598c-4957-9264-9a59bb67c50d	Tasmanicosa godeffroyi	(L. Koch, 1865)	species	Animalia	Arthropoda	Arachnida	Araneae	Lycosidae	Tasmanicosa		1
https://biodiversity.org.au/afd/taxa/53e737da-fc86-4534-beaf-d0eb86b1e9e7	Tasmanicosa leuckartii	(Thorell, 1870)	species	Animalia	Arthropoda	Arachnida	Araneae	Lycosidae	Tasmanicosa		2
https://biodiversity.org.au/afd/taxa/b8a8a73b-6484-4354-916e-28991dab6c25	Telecrates basileia	(Turner, 1902)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Telecrates		1
https://biodiversity.org.au/afd/taxa/5b33c3d7-07c7-4023-b5bb-b821e48b3142	Temognatha bruckii	(Thomson, 1878)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Temognatha		1
https://biodiversity.org.au/afd/taxa/10c3a1af-6c55-41a9-836c-fd385ce9d136	Temognatha chalcodera	(Thomson, 1878)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Temognatha		2
https://biodiversity.org.au/afd/taxa/ba53a695-0dd5-4884-9872-7ebb9235690f	Temognatha flavocincta	(Gory & Laporte, 1838)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Temognatha	Jewel Beetle	1
https://biodiversity.org.au/afd/taxa/61995ae8-d1ab-4dcf-a94f-d119c86ecb0c	Temognatha obscuripennis	(Mannerheim, 1837)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Temognatha		1
https://biodiversity.org.au/afd/taxa/8d51e063-e8a6-4904-9503-2e59fadf339c	Temognatha rectipennis	(Blackburn, 1891)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Temognatha		6
https://biodiversity.org.au/afd/taxa/959f58df-013a-4c3c-b374-c6a8fa6edc7e	Temognatha reichei	(Gory & Laporte, 1838)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Temognatha		2
https://biodiversity.org.au/afd/taxa/e55f2d1e-5bcf-41c3-97b4-b2df4ec470b4	Thalaina angulosa	Walker, 1865	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Thalaina		4
https://biodiversity.org.au/afd/taxa/c8bf8d38-b06f-4337-b9c7-d413b173b48f	Thallarcha eremicola	Pescott, 1951	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Thallarcha		4
https://biodiversity.org.au/afd/taxa/cb4b3f9d-280d-4a3a-a45a-602ec426f14b	Thallarcha fusa	Hampson, 1900	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Thallarcha		2
https://biodiversity.org.au/afd/taxa/e41ddad1-8eb0-403a-a3b7-6a3f55dbe011	Thallarcha rhaptophora	Lower, 1915	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Thallarcha		6
https://biodiversity.org.au/afd/taxa/31ee4129-8d8d-45eb-b6ef-0e72e16d0764	Thomisus spectabilis	Doleschall, 1859	species	Animalia	Arthropoda	Arachnida	Araneae	Thomisidae	Thomisus		2
https://biodiversity.org.au/afd/taxa/f5f5ddd8-ae6a-431b-9e08-3e992b12fa64	Threskiornis moluccus	(Cuvier, 1829)	species	Animalia	Chordata	Aves	Ciconiiformes	Threskiornithidae	Threskiornis	Black-necked Ibis	11
https://biodiversity.org.au/afd/taxa/c319dbaf-a363-4853-b333-75f14c47fc82	Threskiornis spinicollis	(Jameson, 1835)	species	Animalia	Chordata	Aves	Ciconiiformes	Threskiornithidae	Threskiornis	Letter Bird	27
https://biodiversity.org.au/afd/taxa/019c2615-faf5-40ba-887f-3ea2d07f4633	Thrips imaginis	Bagnall, 1926	species	Animalia	Arthropoda	Insecta	Thysanoptera	Thripidae	Thrips	Plague Thrips	1
https://biodiversity.org.au/afd/taxa/ff034710-5f08-4685-a348-ed5f58056118	Thudaca haplonota	Meyrick, 1893	species	Animalia	Arthropoda	Insecta	Lepidoptera	Hypertrophidae	Thudaca		13
https://biodiversity.org.au/afd/taxa/f9ebdfb1-7a0d-410f-b28e-3ce7cf356000	Thyreus waroonensis	(Cockerell, 1913)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Thyreus		6
https://biodiversity.org.au/afd/taxa/1a6623ab-8d46-4da0-957c-f27b663f7ef0	Tiliqua rugosa	(Gray, 1825)	species	Animalia	Chordata	Reptilia	Squamata	Scincidae	Tiliqua	Boggi	39
https://biodiversity.org.au/afd/taxa/7bcaa094-b0b1-4c63-8ee9-1503f5408817	Tineodes adactylalis	GuenÃ©e, 1854	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tineodidae	Tineodes		4
https://biodiversity.org.au/afd/taxa/5c419d2d-9259-429b-9cd3-023662fc4b7a	Tmesothynnus zelebori	(Saussure, 1868)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Tiphiidae	Tmesothynnus		1
https://biodiversity.org.au/afd/taxa/135cc880-f84e-4470-a1c1-fbce3a0ed534	Todiramphus (Todiramphus) sanctus	(Vigors & Horsfield, 1827)	species	Animalia	Chordata	Aves	Coraciiformes	Alcedinidae	Todiramphus	Sacred Kingfisher	19
https://biodiversity.org.au/afd/taxa/92bec3c2-6528-4901-86fb-355ac39b382d	Trachymantis dentifrons	(StÃ¥l, 1877)	species	Animalia	Arthropoda	Insecta	Mantodea	Mantidae	Trachymantis		3
https://biodiversity.org.au/afd/taxa/cf03e458-24d7-4791-8a53-f44074678dc0	Trachyops australis	Dallas, 1851	species	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Trachyops		2
https://biodiversity.org.au/afd/taxa/5185cfe8-f011-43bf-a04e-1d2ae810775d	Tranes vigorsii	Boheman, 1843	species	Animalia	Arthropoda	Insecta	Coleoptera	Curculionidae	Tranes		6
https://biodiversity.org.au/afd/taxa/13f8f6f4-21db-44a5-8c33-5dafb6fcbc69	Trichiocercus sparshalli	(Curtis, 1830)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Notodontidae	Trichiocercus		14
https://biodiversity.org.au/afd/taxa/49808d6d-d630-43e7-8c56-9117fb4f19ee	Trichoptilus ceramodes	Meyrick, 1886	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pterophoridae	Trichoptilus		3
https://biodiversity.org.au/afd/taxa/28764895-7f9d-4d22-ac06-31e9ff91055e	Trocnada dorsigera	Walker, 1858	species	Animalia	Arthropoda	Insecta	Hemiptera	Cicadellidae	Trocnada		1
https://biodiversity.org.au/afd/taxa/ec9b82b2-4ce8-47b1-8eef-4aa17ab9dca1	Turneromyia senex	(Turner, 1910)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Pompilidae	Turneromyia		1
https://biodiversity.org.au/afd/taxa/4e712566-8c49-4f8f-a8aa-8df157cddc10	Tymbophora peltastis	Meyrick, 1890	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Tymbophora		3
https://biodiversity.org.au/afd/taxa/221d8498-3374-4348-abc4-e2d6ff478cb4	Tympanophora andreae	Rentz, 2001	species	Animalia	Arthropoda	Insecta	Orthoptera	Tettigoniidae	Tympanophora		2
https://biodiversity.org.au/afd/taxa/86fb93fd-4551-4b38-9a12-62b6b433729b	Tyto javanica	(Gmelin, 1788)	species	Animalia	Chordata	Aves	Strigiformes	Tytonidae	Tyto	Eastern Barn Owl	3
https://biodiversity.org.au/afd/taxa/63b9d1e1-44e4-4b99-92a2-df17d9784942	Udea hyalistis	(Lower, 1902)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Udea		2
https://biodiversity.org.au/afd/taxa/daed54be-fbcf-49a2-940b-8f2569a0eb41	Underwoodisaurus milii	(Bory de Saint-Vincent, 1825)	species	Animalia	Chordata	Reptilia	Squamata	Carphodactylidae	Underwoodisaurus	Thick-tailed Gecko	1
https://biodiversity.org.au/afd/taxa/6a656905-79bd-41b6-8a45-5308a9f02472	Uraba lugens	Walker, 1863	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nolidae	Uraba		2
https://biodiversity.org.au/afd/taxa/6c33bbf4-9f47-4d92-a4f3-4a485ba1ccae	Uresiphita ornithopteralis	(GuenÃ©e, 1854)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Uresiphita		20
https://biodiversity.org.au/afd/taxa/3853fe16-ec36-44da-8fd8-2f9fe53e0170	Utetheisa pulchelloides	Hampson, 1907	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Utetheisa		4
https://biodiversity.org.au/afd/taxa/e8d7b862-1d56-4d27-84a1-937f7915a0de	Vanellus (Lobivanellus) tricolor	(Vieillot, 1818)	species	Animalia	Chordata	Aves	Charadriiformes	Charadriidae	Vanellus	Banded Lapwing	7
https://biodiversity.org.au/afd/taxa/5457e4b9-38c9-4f26-82dc-4b2c8ef10ab6	Vanessa kershawi	(McCoy, 1868)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Vanessa	Australian Painted Lady	23
https://biodiversity.org.au/afd/taxa/8313e5d6-0b23-4360-bffd-a81e9f83bc9d	Varanus gouldii	(Gray, 1838)	species	Animalia	Chordata	Reptilia	Squamata	Varanidae	Varanus	Gould's Goanna	3
https://biodiversity.org.au/afd/taxa/b89281d8-9f0a-4582-a2d8-21904dd6b5b1	Varanus tristis	(Schlegel, 1839)	species	Animalia	Chordata	Reptilia	Squamata	Varanidae	Varanus	Black-headed Monitor	4
https://biodiversity.org.au/afd/taxa/30afdc05-c995-4a3d-a342-9c29762996c2	Venator immansueta	(Simon, 1909)	species	Animalia	Arthropoda	Arachnida	Araneae	Lycosidae	Venator		3
https://biodiversity.org.au/afd/taxa/ef70e7c7-a3ca-4476-ac64-c2cbdc663562	Vespadelus regulus	(Thomas, 1906)	species	Animalia	Chordata	Mammalia	Chiroptera	Vespertilionidae	Vespadelus	Southern Forest Bat	1
https://biodiversity.org.au/afd/taxa/2869ce8a-8212-46c2-8327-dfb7fabb8296	Vulpes vulpes	Linnaeus, 1758	species	Animalia	Chordata	Mammalia	Carnivora	Canidae	Vulpes	Fox	9
https://biodiversity.org.au/afd/taxa/e7edd9e8-5bd2-4b41-b903-730d86751e0b	Wingia lambertella	(Wing, 1850)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Wingia		4
https://biodiversity.org.au/afd/taxa/71c9326f-b797-4286-9fae-375b7fc2f53d	Xanthagrion erythroneurum	(Selys, 1876)	species	Animalia	Arthropoda	Insecta	Odonata	Coenagrionidae	Xanthagrion		1
https://biodiversity.org.au/afd/taxa/a6e37294-2095-4222-8c74-2bf2ca08f4c1	Xanthodes congenita	(Hampson, 1912)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Xanthodes		1
https://biodiversity.org.au/afd/taxa/3d2d3066-d2e2-4edd-a0c5-81ccc2961b35	Xanthorhoe vacuaria	(GuenÃ©e, 1857 [1858])	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Xanthorhoe		2
https://biodiversity.org.au/afd/taxa/cff21565-2bc4-4a67-8c0c-600ae7c10fd8	Zanda baudinii	Lear, 1832	species	Animalia	Chordata	Aves	Psittaciformes	Cacatuidae	Zanda	Baudin's Black-cockatoo	8
https://biodiversity.org.au/afd/taxa/b7d8720e-447d-40a3-b7de-fdff2aaee7c6	Zaspilothynnus gilesi	Turner, 1910	species	Animalia	Arthropoda	Insecta	Hymenoptera	Tiphiidae	Zaspilothynnus		2
https://biodiversity.org.au/afd/taxa/fe0d4e5e-6bd5-4e46-a77c-00e8cec73410	Zosterops lateralis	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Zosteropidae	Zosterops	Silvereye	126
https://biodiversity.org.au/afd/taxa/125adc68-3bee-4ba9-86c3-3709572dcd13	Zygometis xanthogaster	(L. Koch, 1875)	species	Animalia	Arthropoda	Arachnida	Araneae	Thomisidae	Zygometis		3
NZOR-6-47151	Albugo candida	(Pers.) Kuntze	species	Chromista	Oomycota	Peronosporea	Albuginales	Albuginaceae	Albugo		1

APPENDIX 4

Protected Matters Search Tool Report

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

EPBC Act Protected Matters Report

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

Report created: 12-Apr-2023

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	43
Listed Migratory Species:	8

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	145
Commonwealth Heritage Places:	None
Listed Marine Species:	12
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	7
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	6
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Assemblages of plants and invertebrate animals of tumulus (organic mound) springs of the Swan Coastal Plain	Endangered	Community known to occur within area	In buffer area only
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area	In feature area
Clay Pans of the Swan Coastal Plain	Critically Endangered	Community likely to occur within area	In feature area
Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands of the Swan Coastal Plain	Endangered	Community known to occur within area	In feature area
Shrublands and Woodlands on Muchea Limestone of the Swan Coastal Plain	Endangered	Community known to occur within area	In feature area
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community may occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calyptorhynchus banksii naso			
Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area	In feature area
Leipoa ocellata			
Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis			
Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Zanda baudinii listed as Calyptorhynchus baudinii			
Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Zanda latirostris listed as Calyptorhynchus latirostris			
Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Species or species habitat known to occur within area	In feature area
FISH			
Galaxiella nigrostriata			
Blackstriped Dwarf Galaxias, Black-stripe Minnow [88677]	Endangered	Species or species habitat likely to occur within area	In buffer area only
INSECT			
Hesperocolletes douglasi			
Douglas' Broad-headed Bee, Rottnest Bee [66734]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
MAMMAL			
Bettongia penicillata ogilbyi			
Woylie [66844]	Endangered	Species or species habitat likely to occur within area	In feature area
Dasyurus geoffroii			
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area	In feature area
Petrogale lateralis lateralis			
Black-flanked Rock-wallaby, Moororong, Black-footed Rock Wallaby [66647]	Endangered	Translocated population known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
OTHER			
Westralunio carteri			
Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat may occur within area	In buffer area only
PLANT			
Acacia anomala			
Grass Wattle, Chittering Grass Wattle [8153]	Vulnerable	Species or species habitat known to occur within area	In feature area
Acacia aphylla			
Leafless Rock Wattle [13553]	Vulnerable	Species or species habitat may occur within area	In feature area
Andersonia gracilis			
Slender Andersonia [14470]	Endangered	Species or species habitat likely to occur within area	In feature area
Anigozanthos viridis subsp. terraspectans			
Dwarf Green Kangaroo Paw [3435]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Anthocercis gracilis			
Slender Tailflower [11103]	Vulnerable	Species or species habitat may occur within area	In feature area
Banksia mimica			
Summer Honeypot [82765]	Endangered	Species or species habitat may occur within area	In feature area
Caladenia huegelii			
King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Caleana dixonii listed as Paracaleana dixonii			
Sandplain Duck Orchid [87944]	Endangered	Species or species habitat may occur within area	In feature area
Chamelaucium lullfitzii listed as Chamelaucium sp. Gingin (N.G.Marchant 6)			
Gingin Wax [92777]	Endangered (listed as Chamelaucium sp. Gingin	Species or species habitat likely to occur within area	In feature area
Conospermum densiflorum subsp. unicephalatum			
One-headed Smokebush [64871]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Darwinia foetida			
Muchea Bell [83190]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Diplolaena andrewsii			
[6601]	Endangered	Species or species habitat known to occur within area	In feature area
Diuris micrantha			
Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diuris purdiei			
Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area	In feature area
Drakaea elastica			
Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Eleocharis keigheryi			
Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Eucalyptus leprophloia			
Scaly Butt Mallee, Scaly-butt Mallee [56712]	Endangered	Species or species habitat may occur within area	In feature area
Eucalyptus x balanites			
Cadda Road Mallee, Cadda Mallee [87816]	Endangered	Species or species habitat may occur within area	In buffer area only
Grevillea althoferorum			
[64906]	Endangered	Species or species habitat likely to occur within area	In feature area
Grevillea christineae			
Christine's Grevillea [64520]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Grevillea corrugata			
a shrub [65445]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Grevillea curviloba subsp. curviloba			
Curved-leaf Grevillea [64908]	Endangered	Species or species habitat known to occur within area	In feature area
Grevillea curviloba subsp. incurva			
Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat known to occur within area	In feature area
Grevillea flexuosa			
Zig Zag Grevillea [2957]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Macarthuria keigheryi			
Keighery's Macarthuria [64930]	Endangered	Species or species habitat may occur within area	In buffer area only
Synaphea sp. Fairbridge Farm (D. Papenfus 696)			
Selena's Synaphea [82881]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Thelymitra dedmaniarum			
Cinnamon Sun Orchid [65105]	Endangered	Species or species habitat likely to occur within area	In feature area
Thelymitra stellata			
Star Sun-orchid [7060]	Endangered	Species or species habitat likely to occur within area	In feature area
REPTILE			
Pseudemydura umbrina			
Western Swamp Tortoise [1760]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Motacilla cinerea			
Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

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

Commonwealth Land Name	State	Buffer Status
Defence		
Defence - MUCHEA ARMAMENT RANGE [50073]	WA	In buffer area only
Defence - MUCHEA ARMAMENT RANGE [50088]	WA	In buffer area only
Defence - PEARCE - AP11OBSTRUCTION BEACON NO.5 [50244]	WA	In buffer area only
Defence - PEARCE - AP15 WATER TREATMENT PLANT [50247]	WA	In buffer area only
Defence - PEARCE - AP15 WATER TREATMENT PLANT [50245]	WA	In buffer area only
Defence - PEARCE - AP15 WATER TREATMENT PLANT [50246]	WA	In buffer area only
Defence - PEARCE - AP17 WATER SUPPLY TANKS [50004]	WA	In feature area
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50044]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50053]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50051]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50050]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50047]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50028]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50029]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50054]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50055]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50052]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50048]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50049]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50045]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50033]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50039]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50032]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50036]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50031]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50030]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50037]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50035]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50034]	WA	In buffer area only
Defence - PEARCE - AP2 OBSTRUCTION BEACON NO.2 [50240]	WA	In feature area
Defence - PEARCE - AP3 RADAR STATION BULLSBROOK [50194]	WA	In buffer area only
Defence - PEARCE - AP4 AERIAL FARM [50250]	WA	In feature area
Defence - PEARCE - AP4 AERIAL FARM [50252]	WA	In feature area
Defence - PEARCE - AP4 AERIAL FARM [50253]	WA	In feature area
Defence - PEARCE - AP4 AERIAL FARM [50251]	WA	In feature area
Defence - PEARCE - AP4 AERIAL FARM [50248]	WA	In feature area
Defence - PEARCE - AP4 AERIAL FARM [50249]	WA	In feature area
Defence - PEARCE - AP5 OPERATIONS SITE [50018]	WA	In feature area
Defence - PEARCE - AP6 OBSTRUCTION BEACON NO.3 [50241]	WA	In buffer area only
Defence - PEARCE - AP7 OBSTRUCTION BEACON NO.1 [50242]	WA	In feature area
Defence - PEARCE - AP8 BORE SITES [50005]	WA	In buffer area only
Defence - PEARCE - AP9 OBSTRUCTION BEACON NO.4 [50243]	WA	In feature area
Defence - PEARCE - RAAF BASE [50017]	WA	In feature area
Defence - PEARCE - RAAF BASE [50010]	WA	In feature area
Defence - PEARCE - RAAF BASE [50013]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50016]	WA	In feature area
Defence - PEARCE - RAAF BASE [50011]	WA	In feature area
Defence - PEARCE - RAAF BASE [50012]	WA	In feature area
Defence - PEARCE - RAAF BASE [50014]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50015]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50008]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Defence - PEARCE - RAAF BASE [50009]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50007]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50006]	WA	In buffer area only
Defence - VACANT LAND - BULLSBROOK AP102 [50255]	WA	In feature area
Unknown		
Commonwealth Land - [50313]	WA	In buffer area only
Commonwealth Land - [51386]	WA	In feature area
Commonwealth Land - [50945]	WA	In feature area
Commonwealth Land - [50944]	WA	In feature area
Commonwealth Land - [50943]	WA	In feature area
Commonwealth Land - [50941]	WA	In feature area
Commonwealth Land - [50942]	WA	In feature area
Commonwealth Land - [50940]	WA	In feature area
Commonwealth Land - [50890]	WA	In buffer area only
Commonwealth Land - [50893]	WA	In feature area
Commonwealth Land - [50892]	WA	In feature area
Commonwealth Land - [50899]	WA	In feature area
Commonwealth Land - [50898]	WA	In feature area
Commonwealth Land - [50298]	WA	In buffer area only
Commonwealth Land - [50891]	WA	In feature area
Commonwealth Land - [50897]	WA	In feature area
Commonwealth Land - [50895]	WA	In feature area
Commonwealth Land - [50920]	WA	In feature area
Commonwealth Land - [50287]	WA	In buffer area only
Commonwealth Land - [50921]	WA	In feature area
Commonwealth Land - [50922]	WA	In feature area
Commonwealth Land - [50923]	WA	In feature area

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50912]	WA	In feature area
Commonwealth Land - [50911]	WA	In feature area
Commonwealth Land - [50910]	WA	In feature area
Commonwealth Land - [50926]	WA	In feature area
Commonwealth Land - [50927]	WA	In feature area
Commonwealth Land - [50284]	WA	In buffer area only
Commonwealth Land - [50908]	WA	In feature area
Commonwealth Land - [50286]	WA	In buffer area only
Commonwealth Land - [50285]	WA	In buffer area only
Commonwealth Land - [50280]	WA	In buffer area only
Commonwealth Land - [50904]	WA	In feature area
Commonwealth Land - [50909]	WA	In feature area
Commonwealth Land - [50296]	WA	In buffer area only
Commonwealth Land - [50295]	WA	In buffer area only
Commonwealth Land - [50290]	WA	In buffer area only
Commonwealth Land - [50283]	WA	In buffer area only
Commonwealth Land - [50297]	WA	In buffer area only
Commonwealth Land - [50282]	WA	In buffer area only
Commonwealth Land - [50925]	WA	In feature area
Commonwealth Land - [50928]	WA	In feature area
Commonwealth Land - [50929]	WA	In feature area
Commonwealth Land - [50281]	WA	In buffer area only
Commonwealth Land - [50291]	WA	In buffer area only
Commonwealth Land - [50292]	WA	In buffer area only
Commonwealth Land - [50924]	WA	In feature area
Commonwealth Land - [50293]	WA	In buffer area only
Commonwealth Land - [50299]	WA	In feature area

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50936]	WA	In feature area
Commonwealth Land - [50931]	WA	In feature area
Commonwealth Land - [50935]	WA	In feature area
Commonwealth Land - [50274]	WA	In buffer area only
Commonwealth Land - [50937]	WA	In feature area
Commonwealth Land - [50277]	WA	In buffer area only
Commonwealth Land - [50939]	WA	In feature area
Commonwealth Land - [50276]	WA	In buffer area only
Commonwealth Land - [50938]	WA	In feature area
Commonwealth Land - [50930]	WA	In feature area
Commonwealth Land - [50886]	WA	In feature area
Commonwealth Land - [50932]	WA	In feature area
Commonwealth Land - [50279]	WA	In buffer area only
Commonwealth Land - [50294]	WA	In buffer area only
Commonwealth Land - [51377]	WA	In buffer area only
Commonwealth Land - [50278]	WA	In buffer area only
Commonwealth Land - [50275]	WA	In buffer area only
Commonwealth Land - [50273]	WA	In buffer area only
Commonwealth Land - [51383]	WA	In feature area
Commonwealth Land - [50302]	WA	In buffer area only
Commonwealth Land - [50300]	WA	In buffer area only
Commonwealth Land - [51385]	WA	In feature area
Commonwealth Land - [51384]	WA	In feature area
Commonwealth Land - [50889]	WA	In feature area
Commonwealth Land - [50888]	WA	In buffer area only
Commonwealth Land - [50887]	WA	In feature area
Commonwealth Land - [50288]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50289]	WA	In buffer area only
Commonwealth Land - [50913]	WA	In feature area
Commonwealth Land - [50915]	WA	In feature area
Commonwealth Land - [50916]	WA	In feature area
Commonwealth Land - [50917]	WA	In feature area
Commonwealth Land - [50918]	WA	In feature area
Commonwealth Land - [50919]	WA	In feature area
Commonwealth Land - [50903]	WA	In feature area
Commonwealth Land - [50902]	WA	In feature area
Commonwealth Land - [50901]	WA	In feature area
Commonwealth Land - [50900]	WA	In feature area
Commonwealth Land - [50907]	WA	In feature area
Commonwealth Land - [50905]	WA	In feature area
Commonwealth Land - [50906]	WA	In feature area

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area overfly marine area	In buffer area only

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Bullsbrook	Nature Reserve	WA	In feature area
NTWA Bushland covenant (0121)	Conservation Covenant	WA	In buffer area only
Paruna	Private Nature Reserve	WA	In buffer area only

Protected Area Name	Reserve Type	State	Buffer Status
Twin Swamps	Nature Reserve	WA	In buffer area only
Unnamed WA46564	Nature Reserve	WA	In feature area
Unnamed WA53453	Nature Reserve	WA	In feature area
Walyunga	National Park	WA	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

RFA Name	State	Buffer Status
South West WA RFA	Western Australia	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Natural Gas Pipeline Expansion	2006/2813	Controlled Action	Post-Approval	In buffer area only
Perth-Darwin National Highway alignment (Swan Valley Section), WA	2013/7042	Controlled Action	Post-Approval	In buffer area only
Sand quarry development, Lot 2, Bingham Road, Bullsbrook, WA	2017/8104	Controlled Action	Assessment Approach	In buffer area only
Not controlled action				
Boral Bricks Western Australia Pty Ltd, Muchea East Road, Muchea, Western Australia	2019/8522	Not Controlled Action	Completed	In buffer area only
Eradication of the European House Borer, Perth metropolitan area, WA	2009/5027	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

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

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

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

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APPENDIX 5

Conservation Codes

Conservation Codes for Western Australian Flora and Fauna

Threatened, Extinct and Specially Protected fauna or flora are species which have been adequately searched for and are deemed to be, in the wild, threatened, extinct or in need of special protection, and have been gazetted as such.

The lists of Threatened, Extinct and Specially Protected species are listed under Part 2 of the Biodiversity Conservation Act 2016.

Categories of Threatened, Extinct and Specially Protected fauna and flora are:

T Threatened species

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

> ***Threatened fauna*** is the species of fauna that are listed as critically endangered, endangered or vulnerable threatened species.
>
> ***Threatened flora*** is the species of flora that are listed as critically endangered, endangered or vulnerable threatened species.

The assessment of the conservation status of threatened species is in accordance with the BC Act listing criteria and the requirements of Ministerial Guideline (Number 1) and Ministerial Guideline (Number 2) that adopts the use of the International Union for Conservation of Nature (IUCN) Red List of Threatened Species Categories and Criteria 4, and is based on the national distribution of the species.

CR Critically endangered species

Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines.

EN Endangered species

Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines.

VU Vulnerable species

Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines.

Extinct Species

EX Presumed extinct species

Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

EW Extinct in the wild species

Species that "*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

CD Species of special conservation interest (conservation dependent fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Currently only fauna are listed as species of special conservation interest.

OS Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Currently only fauna are listed as species otherwise in need of special protection.

P Priority species

Priority is not a listing category under the BC Act.

All fauna and flora are protected in WA following the provisions in Part 10 of the BC Act. The protection applies even when a species is not listed as threatened or specially protected, and regardless of land tenure (State managed land (Crown land), private land, or Commonwealth land).

Species that may possibly be threatened species that do not meet the criteria for listing under the BC Act because of insufficient survey or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of prioritisation for survey and evaluation of conservation status so that consideration can be given to potential listing as threatened.

Species that are adequately known, meet criteria for near threatened, or are rare but not threatened, or that have been recently removed from the threatened species list or conservation dependent or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of priority status is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

Priority 1: Poorly-known species

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, for example, agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation.

Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements for threatened listing and appear to be under immediate threat from known threatening processes. These species are in urgent need of further survey.

Priority 2: Poorly-known species

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, for example, national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation.

Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements for threatened listing and appear to be under threat from known threatening processes. These species are in urgent need of further survey.

Priority 3: Poorly-known species

Species that are known from several locations and the species does not appear to be under imminent threat or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat.

Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. These species need further survey.

Priority 4: Rare, Near Threatened and other species in need of monitoring

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as a conservation dependent specially protected species.

(c) Species that have been removed from the list of threatened species or lists of conservation dependent or other specially protected species, during the past five years for reasons other than taxonomy.

(d) Other species in need of monitoring.

Western Australian Ecological Communities

Threatened Ecological Communities

The BC Act provides for the statutory listing of threatened ecological communities (TECs) by the Minister.

Presumed Totally Destroyed (PD)

An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.

Critically Endangered (CR)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.

Endangered (EN)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

Vulnerable (VU)

An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

Priority Ecological Communities

Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community List under priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community. Ecological communities that are adequately known, and are rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

Priority One: Poorly-known ecological communities

Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤ 100ha).

Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.

Priority Two: Poorly-known ecological communities

Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

Priority Three: Poorly known ecological communities

(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:

(ii) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or;

(iii) munities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc.

Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.

Priority Four: Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.

(i) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands.

(ii) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for a higher threat category.

(iii) Ecological communities that have been removed from the list of threatened communities during the past five years.

Priority Five: Conservation Dependent ecological communities

Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Commonwealth of Australia Conservation Codes

Threatened Flora and Fauna

Threatened fauna and flora may be listed under Section 178 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in any one of the following six categories:

Extinct

A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.

Extinct in the wild

A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time:

a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.

Critically endangered

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing an extremely high risk of extinction in the wild.

Endangered

A taxon is Endangered when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing a very high risk of extinction in the wild.

Vulnerable

A taxon is Vulnerable when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing a high risk of extinction in the wild.

Conservation dependent

A native species is eligible to be included in the conservation dependent category at a particular time if, at that time:

a) the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or
b) the following subparagraphs are satisfied:
   i. the species is a species of fish;

ii. the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised;
iii. the plan of management is in force under a law of the Commonwealth or of a State or Territory;
iv. cessation of the plan of management would adversely affect the conservation status of the species.

The EPBC Act does not provide for listing in a data deficient category. Where sufficient data (evidence) is unavailable to allow assessment by the Threatened Species Scientific Committee against the criteria for listing, the species are found to be ineligible. A recommendation is made to the Minister to not include the species in any category under the EPBC Act. For reasons of transparency and to inform future research, the Threatened Species Scientific Committee publishes the names of those species found to be data deficient. As data deficient is not a listing category under the EPBC Act, this has no statutory implications and the species is not considered to be listed under the EPBC Act.

Threatened Ecological Communities

Threatened Ecological communities under the EPBC Act are listed in three categories.

Critically endangered

If, at that time, an ecological community is facing an extremely high risk of extinction in the wild in the immediate future (indicative timeframe being the next 10 years).

Endangered

If, at that time, an ecological community is not critically endangered but is facing a very high risk of extinction in the wild in the near future (indicative timeframe being the next 20 years).

Vulnerable

If, at that time, an ecological community is not critically endangered or endangered, but is facing a high risk of extinction in the wild in the medium–term future (indicative timeframe being the next 50 years).

APPENDIX 6

Aboriginal Heritage Inquiry System Reports

Aboriginal Heritage Inquiry System

List of Registered Aboriginal Sites

For further important information on using this information please see the Department of Planning, Lands and Heritage's Disclaimer statement at https://www.dplh.wa.gov.au/about-this-website

Search Criteria

2 Registered Aboriginal Sites in Custom search area - Polygon - 116.024992794822°E, 31.6308033711635°S (GDA94) : 116.045184464286°E, 31.6357361484377°S (GDA94) : 116.036129326652°E, 31.645747054986°S (GDA94) : 116.038060517143°E, 31.6489985408952°S (GDA94) : 116.042137474845°E, 31.6486697441181°S (GDA94) : 116.047630638908°E, 31.6518480642454°S (GDA94) : 116.041708321403°E, 31.6533458555937°S (GDA94) : 116.038790077995°E, 31.6533093243846°S (GDA94) : 116.0376313637°E, 31.6547340309001°S (GDA94) : 116.037588448356°E, 31.6580947905073°S (GDA94) : 116.028275818656°E, 31.6568162549809°S (GDA94) : 116.023383469413°E, 31.6587157871301°S (GDA94) : 116.020937294791°E, 31.6542226003048°S (GDA94) : 116.024885506461°E, 31.651921127798°S (GDA94) : 116.024992794822°E, 31.6308033711635°S (GDA94)

Disclaimer

The *Aboriginal Heritage Act 1972* preserves all Aboriginal sites in Western Australia whether or not they are registered. Aboriginal sites exist that are not recorded on the Register of Aboriginal Sites, and some registered sites may no longer exist.

The information provided is made available in good faith and is predominately based on the information provided to the Department of Planning, Lands and Heritage by third parties. The information is provided solely on the basis that readers will be responsible for making their own assessment as to the accuracy of the information. If you find any errors or omissions in our records, including our maps, it would be appreciated if you email the details to the Department at AboriginalHeritage@dplh.wa.gov.au and we will make every effort to rectify it as soon as possible.

South West Settlement ILUA Disclaimer

Your heritage enquiry is on land **within or adjacent to** the following Indigenous Land Use Agreement(s): Whadjuk People Indigenous Land Use Agreement.

On 8 June 2015, six identical Indigenous Land Use Agreements (ILUAs) were executed across the South West by the Western Australian Government and, respectively, the Yued, Whadjuk People, Gnaala Karla Booja, Ballardong People, South West Boojarah #2 and Wagyl Kaip & Southern Noongar groups, and the South West Aboriginal Land and Sea Council (SWALSC).

The ILUAs bind the parties (including 'the State', which encompasses all State Government Departments and certain State Government agencies) to enter into a Noongar Standard Heritage Agreement (NSHA) when conducting Aboriginal Heritage Surveys in the ILUA areas, unless they have an existing heritage agreement. It is also intended that other State agencies and instrumentalities enter into the NSHA when conducting Aboriginal Heritage Surveys in the ILUA areas. It is recommended a NSHA is entered into, and an 'Activity Notice' issued under the NSHA, if there is a risk that an activity will 'impact' (i.e. by excavating, damaging, destroying or altering in any way) an Aboriginal heritage site. The Aboriginal Heritage Due Diligence Guidelines, which are referenced by the NSHA, provide guidance on how to assess the potential risk to Aboriginal heritage.

Likewise, from 8 June 2015 the Department of Mines, Industry Regulation and Safety (DMIRS) in granting Mineral, Petroleum and related Access Authority tenures within the South West Settlement ILUA areas, will place a condition on these tenures requiring a heritage agreement or a NSHA before any rights can be exercised.

If you are a State Government Department, Agency or Instrumentality, or have a heritage condition placed on your mineral or petroleum title by DMIRS, you should seek advice as to the requirement to use the NSHA for your proposed activity. The full ILUA documents, maps of the ILUA areas and the NSHA template can be found at https://www.wa.gov.au/organisation/department-of-the-premier-and-cabinet/south-west-native-title-settlement.

Further advice can also be sought from the Department of Planning, Lands and Heritage at AboriginalHeritage@dplh.wa.gov.au.

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Coordinate Accuracy

Coordinates (Easting/Northing metres) are based on the GDA 94 Datum. Accuracy is shown as a code in brackets following the coordinates.

Terminology (NB that some terminology has varied over the life of the legislation)

Place ID/Site ID: This a unique ID assigned by the Department of Planning, Lands and Heritage to the place.

Status:

- **Registered Site**: The place has been assessed as meeting Section 5 of the *Aboriginal Heritage Act 1972.*
- **Other Heritage Place which includes:**
  - **Stored Data / Not a Site:** The place has been assessed as not meeting Section 5 of the *Aboriginal Heritage Act 1972.*
  - **Lodged:** Information has been received in relation to the place, but an assessment has not been completed at this *stage* to determine if it meets Section 5 of the *Aboriginal Heritage Act 1972.*

Access and Restrictions:

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3525	ELLEN BROOK: UPPER SWAN	Yes	Yes	No Gender Restrictions	Registered Site	Mythological	*Registered Knowledge Holder names available from DPL	Not available when location is restricted	S02516
3583	KI-IT MONGER BROOK 2	Yes	Yes	No Gender Restrictions	Registered Site	Ceremonial, Modified Tree, Mythological	*Registered Knowledge Holder names available from DPL	Not available when location is restricted	S02408

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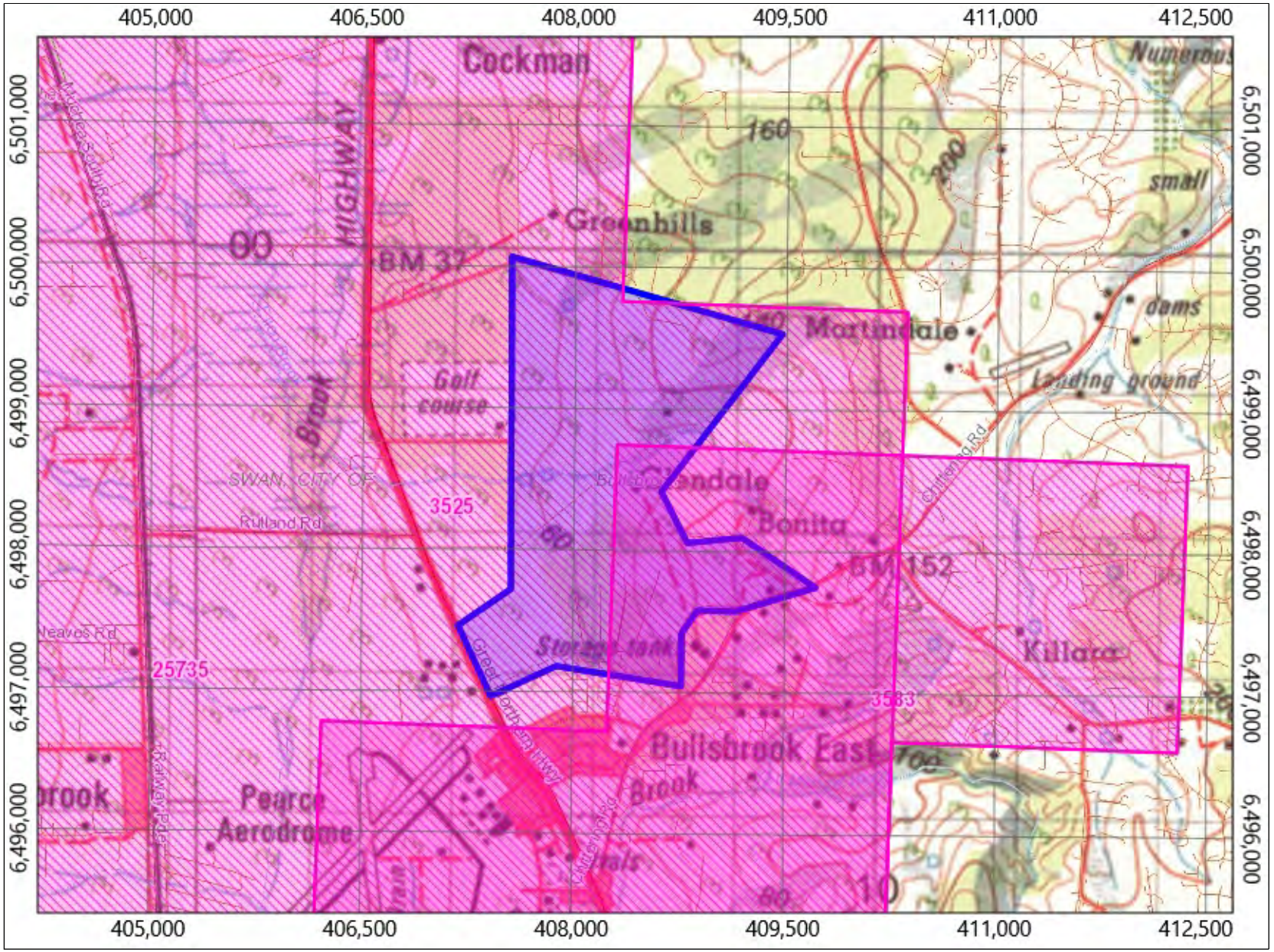

Legend

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- Search Area
- Town
- Road
- River
- Local Government Authority

1.59 kilometres

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No Other Heritage Places in Custom search area - Polygon - 116.024992794822°E, 31.6308033711635°S (GDA94) : 116.045184464286°E, 31.6357361484377°S (GDA94) : 116.036129326652°E, 31.645747054986°S (GDA94) : 116.038060517143°E, 31.6489985408952°S (GDA94) : 116.042137474845°E, 31.6486697441181°S (GDA94) : 116.047630638908°E, 31.6518480642454°S (GDA94) : 116.041708321403°E, 31.6533458555937°S (GDA94) : 116.038790077995°E, 31.6533093243846°S (GDA94) : 116.0376313637°E, 31.6547340309001°S (GDA94) : 116.037588448356°E, 31.6580947905073°S (GDA94) : 116.028275818656°E, 31.6568162549809°S (GDA94) : 116.023383469413°E, 31.6587157871301°S (GDA94) : 116.020937294791°E, 31.6542226003048°S (GDA94) : 116.024885506461°E, 31.651921127798°S (GDA94) : 116.024992794822°E, 31.6308033711635°S (GDA94)

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On 8 June 2015, six identical Indigenous Land Use Agreements (ILUAs) were executed across the South West by the Western Australian Government and, respectively, the Yued, Whadjuk People, Gnaala Karla Booja, Ballardong People, South West Boojarah #2 and Wagyl Kaip & Southern Noongar groups, and the South West Aboriginal Land and Sea Council (SWALSC).

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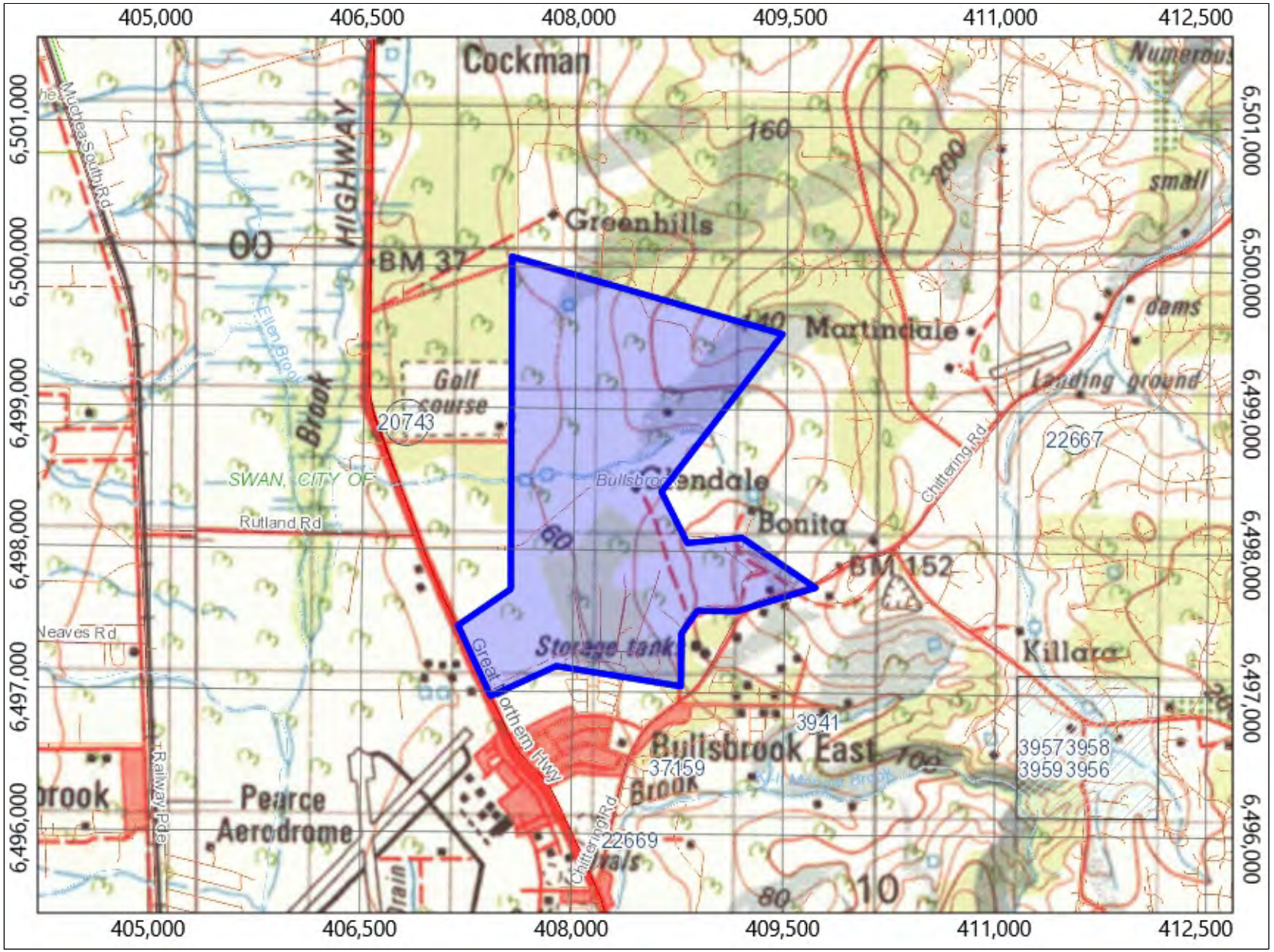

Legend

- Other Heritage Place
- Search Area
- Town
- Road
- River
- Local Government Authority

1.59 kilometres

Map Scale 1 : 48,100

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APPENDIX 4

Preliminary Geotechnical Investigation



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PRELIMINARY GEOTECHNICAL INVESTIGATION

For District Structure Plan

BULLSBROOK NORTH PRECINCT
BULLSBROOK
WESTERN AUSTRALIA

September 2022
Ref: 22027.1

FOR

WPG Landholdings No 5 Pty Ltd
and
Bullsbrook Investment Company



Brown Geotechnical

CONDITIONS RELATING TO THIS REPORT

1. This preliminary geotechnical report has been prepared for the sole use of WPG Landholdings No 5 Pty Ltd and Bullsbrook Investment Company.

2. The preliminary report has been issued in accordance with the agreed terms and scope detailed in the proposal for the investigation. No responsibility or liability to any third party is accepted for any damages arising out of the use of this report.

3. This preliminary report has been prepared by suitably qualified and experienced personnel for the purposes stated herein. Every care is taken with the report as it relates to interpretation of sub-surface conditions, discussion of findings and recommendations given. No responsibility for the consequences of extrapolation by others is accepted by the company.

4. Findings and conclusions produced in the preliminary report are based on the investigation of the sub-surface through isolated locations. Conditions between investigated sites are based on extrapolation, interpretation and professional estimates. Unexpected variations in ground conditions often occur which cannot always be anticipated. The conclusions and recommendations in the preliminary report were considered accurate at the time of issue and based on certain assumptions at the time. Conditions and assumptions change with time and may affect the accuracy of the report.

5. Certain content within this preliminary report is based on information provided by the client and/or other parties and the accuracy of this information cannot be guaranteed.

6. These conditions must be read as part of this preliminary report and must be reproduced with all future copies.

7. The recommendations of this preliminary geotechnical report should be considered a starting point. Recommendations should be continuously reviewed during the earthworks stage as sub-surface information and results from monitoring become available. It is strongly recommended that the Company be retained to provide consultancy and/or inspections during the earthwork stages.

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1 Introduction

In June 2022 Brown Geotechnical (BG) was commissioned by WPG Landholdings No 5 Pty Ltd and Bullsbrook Investment Company to undertake a preliminary geotechnical investigation for the development of a District Structure Plan for the proposed Bullsbrook North Precinct, Bullsbrook. This report presents the results of the investigation conducted at the site.

The following Lots were investigated, and are shown on the District Structure Plan Concept included in Appendix A.

Lots 800, 801 and 802 Morrissey Road, Bullsbrook.
Lots 4 and 5 Great Northern Highway, Bullsbrook.
Lots 21, 22, 23, 24, 27 Kimberley Street, Bullsbrook.
Lots 3, 17, 18 and 83 Ashton Road, Bullsbrook
Lots 451 and 452 Chittering Road, Bullsbrook

The fieldwork was carried out over the period 21st June to 21st July 2022. Details of the site were supplied by planners WPG. The site location is shown in Figure 1.

Note: It should be noted that this is a preliminary geotechnical investigation for the development of a District Structure Plan. In portions of the site where soils are non-homogenous, or where boundaries lines are drawn on Figures, for example between zones of different soil types or site classification, additional investigation should be undertaken. The conclusions in this report are based on limited test holes, sampling and testing, and should be used as starting point for further detailed investigations as the project proceeds.

2 Brief

The brief discussed with the planners required the report to address:

- Brief desk study to determine the likely subsoil conditions.
- Carry out test holes to confirm likely subsoil conditions.
- Determine the extent and geotechnical properties of sand across the site.
- Suitability of existing soils (sand) for use in the development.
- An estimate of existing soil classification in accordance with AS2870 (2011).
- Any earthworks required to obtain a classification suitable for development including estimated additional fill thickness requirements.
- Estimated CBR for road pavement design.
- Estimate retaining wall parameters.
- An assessment of Acid Sulphate Soil (ASS) issues and investigation requirements.
- Discuss site permeability and likely drainage issues.

3 Desk Study

The site covers approximately 355ha and consists predominantly of large, fenced paddocks used for grazing, adjistments and crops. The paddocks at the time of the investigation were mostly grass covered. Areas of native trees cover the lateritic soils in the northeast portion, with some trees and bush in the southeast. A small creek runs east-west across the centre of the site. The southern area, along Kimberley Street and Ashton Road, has smaller Lots, mostly with a single residence, out buildings and paddocks.

The geological map for the area indicates much of the site to be underlain by Colluvium, including valley filled deposits (sand, silty sand and clays), and variable laterised deposits. Additional geotechnical subsoil information has been obtained from investigation carried out by BG in the area. The information is used by permission from the owners. The investigations indicate much of the site to underlain by sand, with laterite and gravels in the northeast.

Aerial photographic studies help show the extent of the lateritic gravels and laterite. Vegetation and trees remain on the lateritic areas, and soil colour varies where the lateritic soils are present. This information has been plotted on Figure 3.

The Perth Groundwater Map does not currently cover the area. Recent investigations in the area by BG, suggest groundwater to be at least 1.5m below the existing ground level across most of the site, rising close to ground level in the vicinity of the stream running east-west across the centre of the site.

The acid sulphate soil risk map for the area, indicates soils to be in the No Known Risk Category.

4 Fieldwork and Laboratory Testing

4.1 Scope of Work

The following scope of work was undertaken:

- Follow-up fieldwork, including a walk-over survey to determine any obvious geological features, outcrops, hazards and ASS indicators.
- Test holes excavated to confirm soil type identified in the desk study. Some areas allowed limited access; however enough information was collected for the preliminary report.
- Limited soil sampling was carried out for laboratory analysis to determine soil classification and geotechnical properties.
- Laboratory testing included: particle size distribution, Atterberg Limits and percent fines content.
- In the absence of any high-risk ASS indicators in the vicinity of proposed development areas, no preliminary acid sulphate soil testing was required.
- In-situ falling head permeability testing was carried out in proposed drainage or POS areas, and on all soil types encountered, for site drainage information.

Test locations are shown on Figure 2, with test hole logs and photos enclosed in Appendix B.

4.2 Laboratory Testing

Soil samples were delivered to the NATA accredited Western Geotechnical Laboratory Services for geotechnical testing. The laboratory test certificates are presented in Appendix C.

Laboratory test results are summarized in Table 1

Table 1 – Classification Test Results

Test Hole No.	Depth (m)	LL (%)	PL (%)	PI (%)	Particle Size Distribution		
					Fines (%)	Sand (%)	Gravel (%)
TH01	0.5 – 1.0	NP	NP	NP	13	50	8
TH03	0.5 – 1.0	NP	NP	NP	7	91	2
TH04	0.5 – 1.0	NP	NP	NP	13	55	32
TH06	0.5 – 1.0	27	13	14	32	65	3
TH09	0.5 – 1.0	NP	NP	NP	10	90	0
TH10	0.5 – 1.0	NP	NP	NP	8	92	0
TH12	0.5 – 1.0	NP	NP	NP	7	93	0
TH13	0.5 – 1.0	NP	NP	NP	13	87	0
TH16	0.5 – 1.0	NP	NP	NP	5	95	0
TH18	1.0 -1.5	NP	NP	NP	3	97	0
TH20	1.0 -1.5	NP	NP	NP	10	90	0
TH22	1.0 -1.5	NP	NP	NP	17	58	25
TH24	1.0 -1.5	NP	NP	NP	19	81	0
TH28	1.0 -1.5	NP	NP	NP	10	90	3
TH29	1.0 -1.5	NP	NP	NP	21	69	10
TH30	1.0 -1.5	50	24	26	38	41	21
TH31	1.0 -1.5	50	24	26	39	42	19
TH33	1.0 -1.5	NP	NP	NP	6	94	0
TH35	1.0 -1.5	NP	NP	NP	6	94	0
TH40	1.0 -1.5	NP	NP	NP	9	91	0
TH44	1.0 -1.5	NP	NP	NP	9	91	0
TH45	1.0 -1.5	NP	NP	NP	20	72	8

TH46	1.0 -1.5	NP	NP	NP	5	95	0
TH49	1.0 -1.5	NP	NP	NP	18	82	0
TH52	1.0 -1.5	NP	NP	NP	23	77	0
TH55	1.0 -1.5	NP	NP	NP	15	85	0
TH67	1.0 -1.2	26	12	14	16	40	44
TH69	1.0 -1.2	NP	NP	NP	28	72	0
TH71	1.0 -1.2	NP	NP	NP	12	88	0
TH74	1.0 -1.2	NP	NP	NP	13	87	0
TH75	1.0 -1.2	NP	NP	NP	8	92	0
TH77	1.0 -1.2	NP	NP	NP	9	89	2
TH79	1.0 -1.2	NP	NP	NP	19	56	25
TH80	1.0 -1.2	NP	NP	NP	8	92	0
TH81	1.0 -1.2	NP	NP	NP	12	82	0

*Non-plastic

5 Geotechnical Results

5.1 Subsurface Condition

Subsurface conditions encountered in the test holes and inferred from laboratory test results are described as follows:

5.1.1 Topsoil and Fill

Test holes encountered topsoil consisting of silty sand with organics, locally with roots and rootlets. The topsoil varied in thickness from 0.1m to 0.2m, the average across the site being 0.1m. Visual evidence suggests the topsoil quality to be poor, with estimated organic content of approx. 5%. The quality increased locally, especially in Lots with residential buildings and paddocks, where soil quality may have undergone improvement.

No uncontrolled fill was encountered in the test holes.

5.1.2 Sand

Sand was encountered in most test holes to at least 1.5m depth. The material varied from fine to medium grained; to medium to coarse grained. The other major variant was fines content, varying from low fines of 3% up to moderate fines of 40% (classed as Silty Sand). Most test holes contained ‘Sand with Silt’ with 5% to 12% fines or ‘Silty Sand’ with fines >12%. The extent of the sand is shown on Figure 3, with fines content noted from laboratory gradings.

5.1.3 Gravel / Laterite

A very dense, often cemented, sandy gravel or laterite was encountered close to or at the surface in some test holes in the northeast portion of the site. The excavator refused in the material at <0.5m. The approximate extent is shown on Figure 3. A smaller pocket of laterite was also noted in the centre of Lot 17.

5.1.4 Sandy Clay

Very stiff, sandy clay was encountered at 0.5m below silty sand in the southwest corner of the site (southern half of Lot 5) refer Figure 3. Test results show the material to have a moderate fines content, intermediate to low plasticity with a low expansive nature.

Very stiff, sandy clay was also encountered at the surface in the southeast corner of the site (Lot 451). Test results show the material to have a moderate fines content, intermediate to high plasticity with a moderate expansive nature.

5.1.5 Groundwater

Groundwater was only encountered perched on the sandy clay within the silty sand in Lot 5, and at the base of TH1 in Lot 4 at 1.5m.

5.2 Soil Permeability

Permeability test results are summarized in Table 2.

Table 2 – Permeability Test Results

Test Location	Testing Material	In-situ Permeability Test Result (m/s)	Permeability (m/day)	Drainage Characteristics
P1	Dense gravelly sand	$2x10^{-3}$m/s	173	Good
P2	Dense sand trace silt	$9x10^{-4}$m/s	78	Moderate to Good
P3	Very dense gravel sand / laterite	$1x10^{-7}$m/s	0.01	Poor
P4	Very dense sand over laterite	$5x10^{-7}$m/s	0.04	Poor
P5	Medium dense silty sand	$3x10^{-4}$m/s	26	Moderate
P6	Medium dense silty sand	$4x10^{-4}$m/s	35	Moderate
P7	Dense silty sand	$9x10^{-5}$m/s	7.8	Moderate
P8	Medium dense sand trace silt	$1x10^{-3}$m/s	86	Good
P9	Dense sand trace silt	$7x10^{-4}$m/s	61	Moderate to Good
P10	Dense silty sand	$5x10^{-5}$m/s	4.3	Poor to Moderate
P11	Medium dense sand with silt	$2x10^{-4}$m/s	17	Moderate
P12	Dense sand trace silt	$7x10^{-4}$m/s	61	Moderate to Good
P13	Very dense silty sand	$3x10^{-5}$m/s	2.6	Poor to Moderate
P14	Stiff sandy clay	*$1x10^{-9}$m/s	<0.001	Practically Impervious
P15	Stiff sandy clay	*$1x10^{-9}$m/s	<0.001	Practically Impervious

*Estimated: Minimal Soakage

6 Analysis and Conclusions

6.1 Subsurface Conditions (refer Figure 3)

The topsoil has an average thickness of 0.1m. Once the grass and roots are removed the topsoil will be relatively low in organic content. It should be suitable for use as engineering fill when screened and blended with clean sand fill at a ratio of approximately 1:3 (screened topsoil : clean sand). Further testing following screening could bring the ratio down to 1:2 or 1:1 for some portions of the site.

Below the topsoil, most of the site is covered by granular soils, including sand, silty sand and gravel / laterite. The sands are non-cohesive, relatively free draining, but with only moderate drainage characteristics as the fines content across much of the site is relatively high.

Sand with Silt (fines 5% to 12%) and Silty Sand (fines >12%) cover practically the entire site. The silty sand fines content generally ranging from 12% to 25%, locally higher. There are pockets of sand with fines <5% (Sand trace Silt), however without a far more detailed investigation it is difficult to see any defined pattern to their extent. Permeability of the sands is discussed below.

Much of the north-eastern area consists of gravel and laterite, with thin sand deposits over the laterite in areas of Lot 802. The hard lateritic soils caused refusal of the excavator close to the surface. Though the gravels show reasonable drainage characteristics, they are immediate underlain by laterite which is practically impermeable.

Very stiff, sandy clay was encountered at two locations: In the southern half of Lot 5 approximately 0.5m below the surface, and in Lot 451 at the surface. Drainage within these soils will be very low or practically impervious.

With respect to the desk study, it has been shown that the sands noted are the predominant soil type, with the clays confined to the southern corners. The outcrops of laterite seen in the aerial photos were confirmed on site, with additional laterite present in Lot 802 approx. 0.5m below sandy deposits, likely windblown on to the laterite over past years.

6.2 Groundwater

Groundwater was only encountered perched on the sandy clay within the silty sand in Lot 5, and at the base of TH1 in Lot 4. The Perth Groundwater Map does not currently cover the area. Recent investigations in the area by BG suggest groundwater to be at least 1.5m below the existing ground level across most of the site, rising close to ground level in the vicinity of the stream running east-west across the centre of the site.

This investigation was carried out during a time of high rainfall.

To determine groundwater levels such as the AAMGL (annual average maximum groundwater level) often used in subdivisional development, permanent groundwater monitoring bores will require installation, with monitoring over at least one winter period.

6.3 Site Classification and Fill Requirements

Based on this preliminary geotechnical investigation, test hole spacing and limited testing, the classification for the site in accordance with AS 2870 – 2011 can be divided in to three classes (refer Figure 4):

Class ‘M’: The southeast corner of the site underlain by a clayey subgrade with moderate fines content, intermediate to high plasticity with a moderate expansive nature.

Class ‘S’: The southwest corner of the site underlain by a clayey subgrade with moderate fines content, intermediate low plasticity with a low expansive nature.

Class ‘A’: The remainder of the site underlain by sand, silty sand, gravels and laterite.

To obtain a site classification of Class 'A' across the entire site, additional sand fill will be required in some areas, specifically the southern corners. A minimum of 1.8m of sand fill will be required above any clayey subgrade.

To obtain a site classification of Class 'S' in the southeast corner, a minimum of 0.8m of sand fill will be required above the clayey subgrade.

Additional sand will also be required if footings are to be installed on the laterite areas. It is recommended that footings be founded on at least 0.3m of sand to reduce the potential for differential settlement between footings bridging areas of sand, where some settlement can take place, and laterite where zero settlement would occur.

Further investigation will be required to determine the exact boundaries between the site classification zones for specific Lots. Additional soil expansion tests on the clayey subgrades could alter the classifications and refine the amount of sand fill required.

Table 3 – Definition of Site Classifications (Australian Standard AS2870-2011)

Class	Foundation
A	Most sand and rock sites with little or no ground movement from moisture changes
S	Slightly reactive clay sites with only slight ground movement for moisture changes (y_s<20mm).
M	Moderately reactive clay or silt sites, which can experience moderate ground movement from moisture changes (y_s 20-40mm).
H1	Highly reactive clay site, which can experience moderate to high ground movement from moisture changes (y_s 40-60mm)
H2	Highly reactive clay site, which can experience high ground movement from moisture changes (y_s 60-75mm)
E	Extremely reactive sites, which can experience extreme ground movement from moisture changes (y_s>75mm)
P	Sites which include: soft soils, such as soft clays or silts or loose sands; landslip; mine subsidence; collapsing soils; soils subject to erosion; reactive sites subject to abnormal moisture conditions or sites which cannot be classified otherwise

y_s: Characteristic Surface Movement

6.4 Earthworks

6.4.1 Introduction

All earthworks should be undertaken in accordance with AS3798-1996 “Guidelines on earthworks for commercial and residential developments”. This section should act as a guide to likely earthwork requirements for the site, pending a detailed investigation.

6.4.2 Topsoil and Fill Management

A thin layer of topsoil is present across the site. It is not suitable for foundation support and should be removed along with trees and roots then replaced with clean sand fill. The topsoil may be used in landscaping following the removal of any tree roots, unless screened and blended as described below. A geotechnical inspection will be required to confirm topsoil stripping.

6.4.1 Blending of Topsoil for use as Engineering Fill

Topsoil in most areas of the site appears to be of lower quality i.e. low in organic and fines content. An option would be to blend the screened topsoil with clean sand fill to reduce the organic and fines content to acceptable levels for use in residential or commercial development. A ratio of approximately 1:3 (screened topsoil : clean sand) should be appropriate. Further testing following screening could bring the ration down to 1:2 or 1:1 for portions of the site.

Ongoing tests for organic and fines content would be required post screening and on the blended soil to confirm suitability for use in the development.

6.4.2 Proof Rolling

Following the removal of topsoil, prior to footing placement or placing any additional fill on site, the surface should be proof rolled to achieve at least 95% SMDD for residential and 98% SMDD for commercial developments.

6.4.3 Imported Fill Material

Any sand fill imported to obtain site formation levels should be compacted in layers not more than 300mm thick to at least 95% SMDD for residential and 98% SMDD for commercial developments. In-situ density tests should be carried out to calibrate a Perth Sand Penetrometer to specific densities of the compacted material to check fill compaction. Moisture conditioning (wetting) of the sand may to be required to optimise compaction. Imported sand should ideally contain less than 5% non-plastic fines to maintain good drainage conditions.

Following excavation for foundations, the bases of pad and strip footings should also be compacted to achieve at least 95% SMDD for residential and 98% SMDD for commercial developments.

6.4.4 Earthwork Inspections

A geotechnical engineer should inspect the site following the removal of vegetation, trees, roots and unsuitable materials, and to confirm the compaction of the subsurface following proof rolling. Inspections and auditing of the earthworks should be carried out by the geotechnical engineer to enable confirmation of the final site classification.

6.5 Suitability of In-situ Soils as Engineering Fill

The majority of in-situ sands contain a moderate fines content but zero plasticity. The soils will be suitable for use as engineering fill in the future development but will have a reduced permeability due to the raised silt content. Blending with clean sand fill will reduce the fines content and increase drainage potential. Compaction of these soils should be carefully monitored, as the higher fines content will aid compaction further reducing permeability.

6.6 Estimated Design CBR

Assuming the subgrade material below the road pavement or car park areas will be the natural in-situ Silty Sand, a design CBR of 10 will be suitable for pavement design. This value could increase to 18 in sands with low fines content.

Pavements founded on the sandy gravels or laterite will have a higher CBR of at least 30.

Pavements founded within the clayey subgrade will have a lower CBR of approx. 5.

Further investigation will be required along road alignments to confirm the actual CBR for detailed pavement design.

6.7 Estimated Retaining Wall Parameters

The site is sloping in most areas, and some cut to fill with retaining maybe required in the development. The following retaining wall parameters have been based on a compacted dense sand soil with ϕ=40°.

γ=19 kN/m^3
Ko=0.36
Ka=0.22
Kp=4.6

The parameters detailed above assume design of the retaining structure and compaction of the foundations are in accordance with AS 4678-2002, and that backfill material is composed of cohesionless sand.

6.8 Acid Sulphate Soils

The acid sulphate soil risk map for the area indicates soils below the site to be in the No Known Risk category. The walkover survey and descriptions from test holes indicated no soils associated with high-risk ASS below the proposed building envelopes (refer Figure 5).

Soils excavated in the vicinity of the east-west trending stream, may have high organic and silt content. These when excavated could result in an ASS risk. Further investigation will be required if excavations are to be carried out in this area.

6.9 Site Permeability and Drainage Recommendations

Except for the two areas underlain by the clayey subgrade, where drainage will be poor, the near surface sands across most of the site contain moderate fines, zero plasticity and are relatively free draining. The drainage condition within the sands due to the higher fines, prior to proof rolling, is moderate. An average permeability of approx. 5x10^{-4}m/s was recorded (refer Table 2).

It was noted that in denser silty sand soils, the permeability decreased considerably to approx. 5x10^{-5}m/s, poor drainage characteristics.

There are areas of the site where sands have a lower fines content of <5%, where the permeability is closer to 1x10^{-3}m/s. Drainage conditions here are good. However, further investigation will be required to determine the extent of these soils.

Blending of the silty sand with sand of low fines (in-situ or imported) would result in improved drainage characteristic of the subsoil.

For soakwell installation, additional sand fill will be required in some areas, especially where the clayey subgrade approaches the existing surface. A suitably designed drainage system would allow for the use of soakwells if sufficient height, say at least 1.5m, is obtained above the clayey subgrade and any groundwater.

For soakwell installation within the higher silt content sands, it is borderline as to whether they will be effective. This is especially the case where the silty sands are compacted during earthworks. A silty sand compacted to 95% SMDD may become quite impermeable. It is recommended that permeability testing be carried out in the laboratory on the soils compacted to 95% and 98% SMDD to gain an insight into the permeability for drainage design.

If clean fill sand is to be imported on to the site to raise site formation levels or for blending, permeability can vary depending on the source. Values between 1x10^{-3}m/s and a 1x10^{-4}m/s are usual, based on observed results on typical Perth fill sands.

Permeability and drainage conditions may be reduced during earthworks due to compaction of in-situ and imported sands. Over compaction during earthworks, especially for the silty sand soils, will seriously reduce soil permeability. It is recommended that further permeability testing be carried out following earthworks to confirm parameters used during drainage design.

BROWN GEOTECHNICAL

Benjamin Boers
Graduate Geotechnical Engineer

Reviewed by
Ken Brown
Senior Geotechnical Engineer

REFERENCES

1. Standards Australia AS 2870 (2011). Residential Slabs and Footings – Construction.

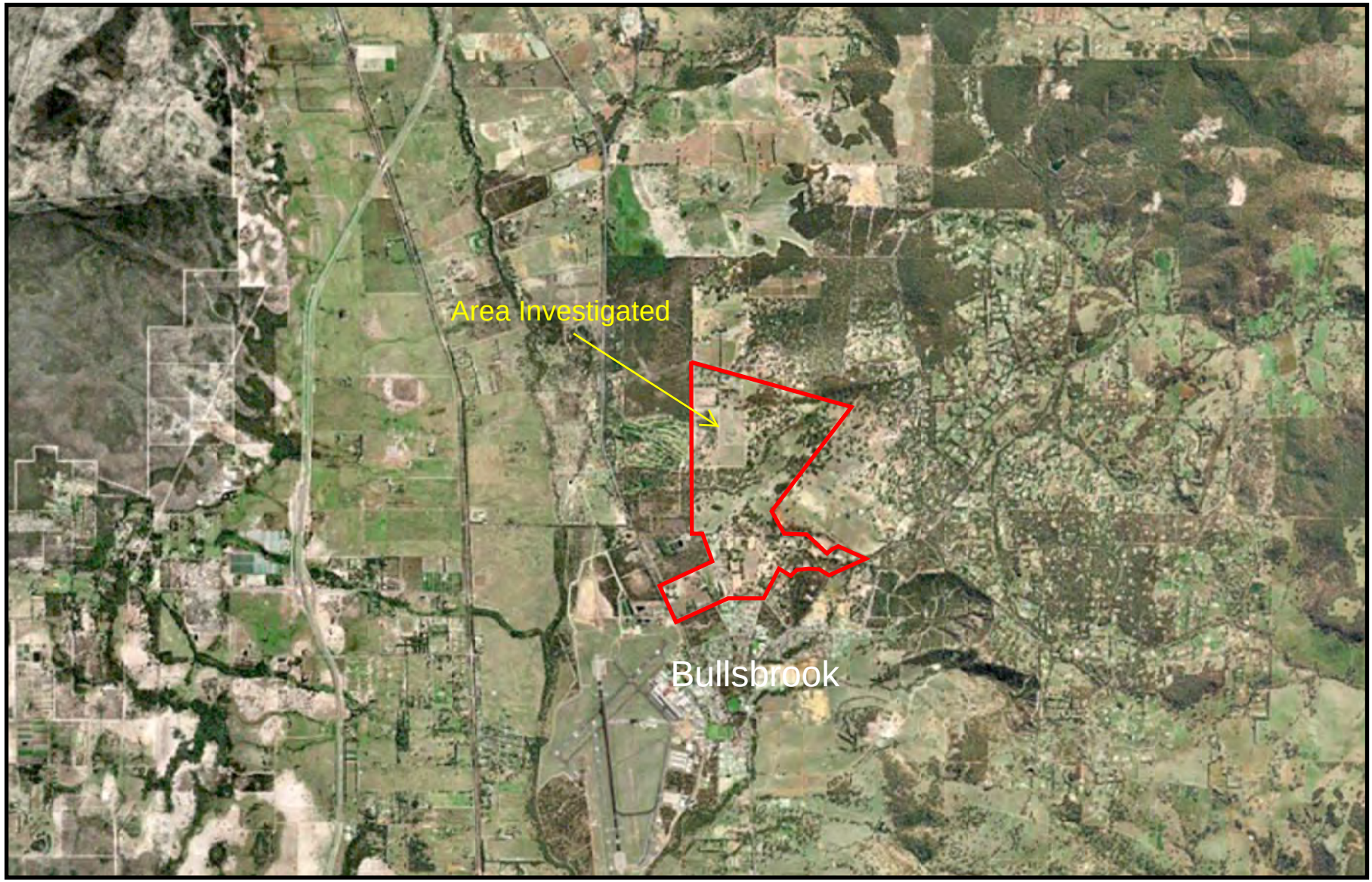
2. Geological Survey of Western Australia. 1:50,000 Environmental Geology Series, Perth.

3. Department of Water. *Perth Groundwater Map*

4. Standards Australia AS3798-2011. “Guidelines on earthworks for commercial and residential developments”.

5. Standards Australia AS 4678-2002. Earth-Retaining Structures.

FIGURES



Brown Geotechnical
Suite 9, 47 Monash Avenue
Como WA6152
Email: admin@browngeotechnical.com.au

Date	Description	Drawn	Checked	Approved
31.08.22	: Location Plan	BB	KB	

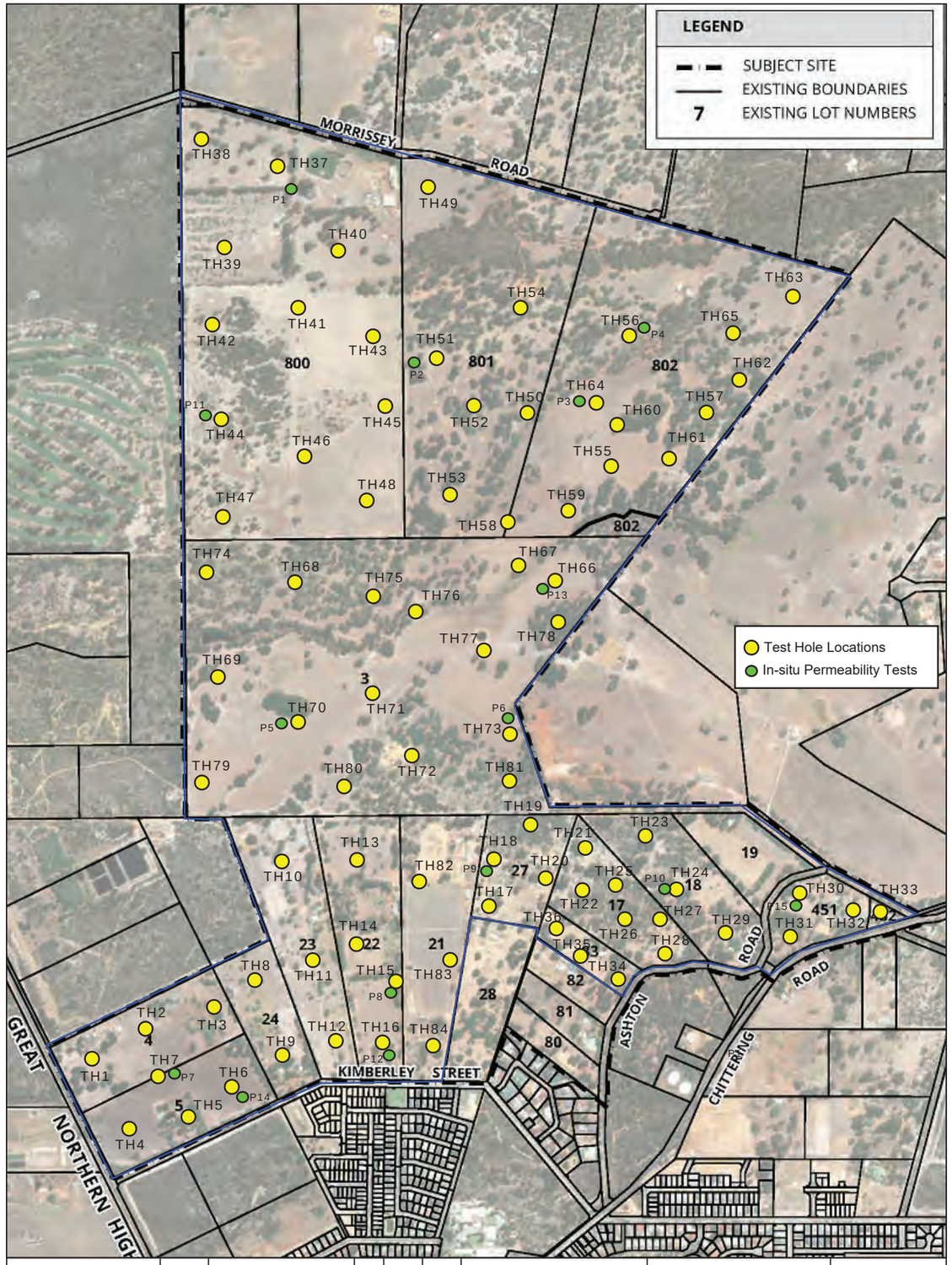
LOCATION PLAN

BULLSBROOK NORTH PRECINCT
BULLSBROOK

CLIENT

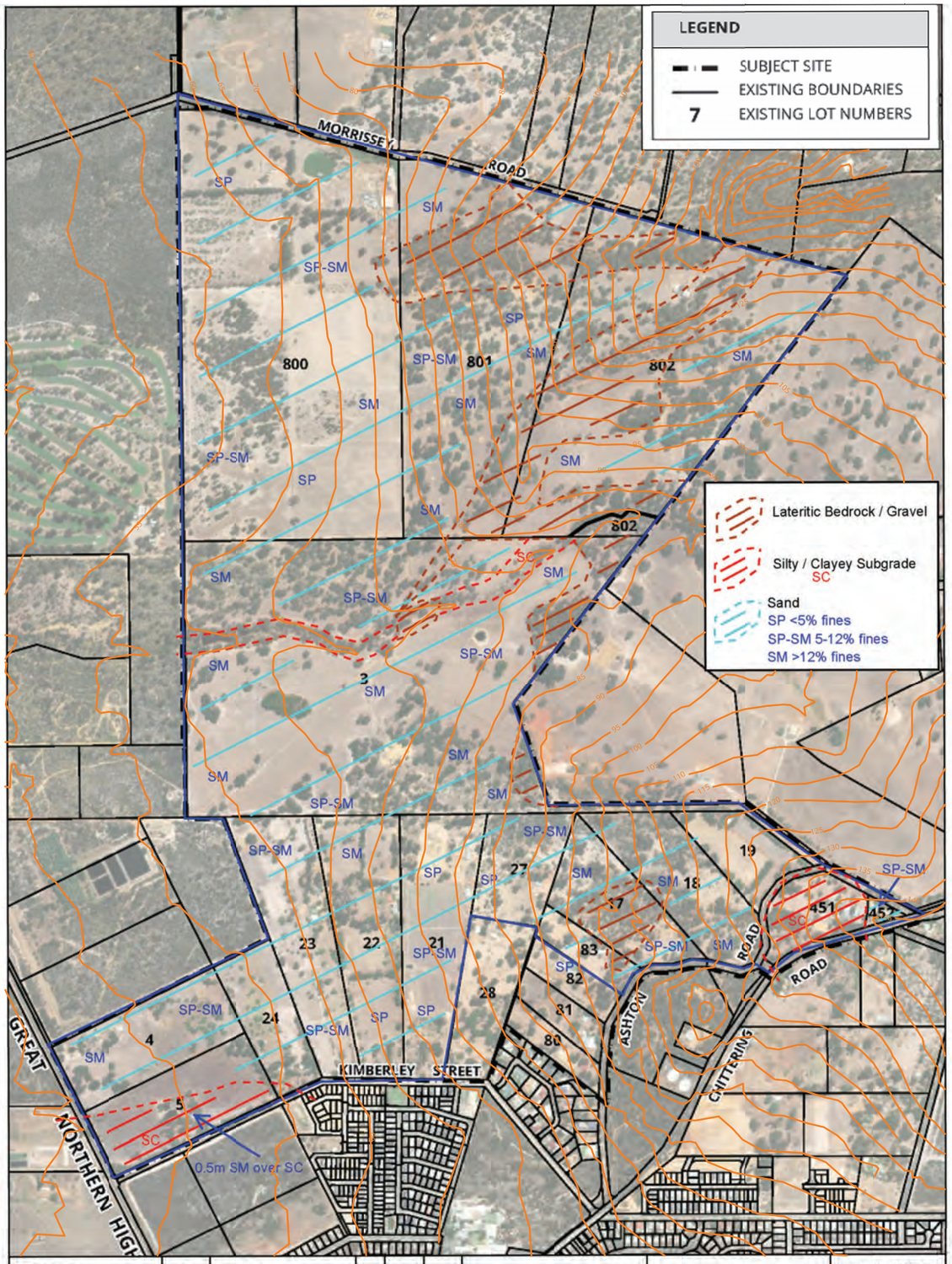
WPG Landholdings No 5 Pty Ltd
Bullsbrook Investment Company

Drawing No.22027 Fig 1
Scale: NTS
Sheet Size: A4
Job No: 22027.01
FIGURE 1



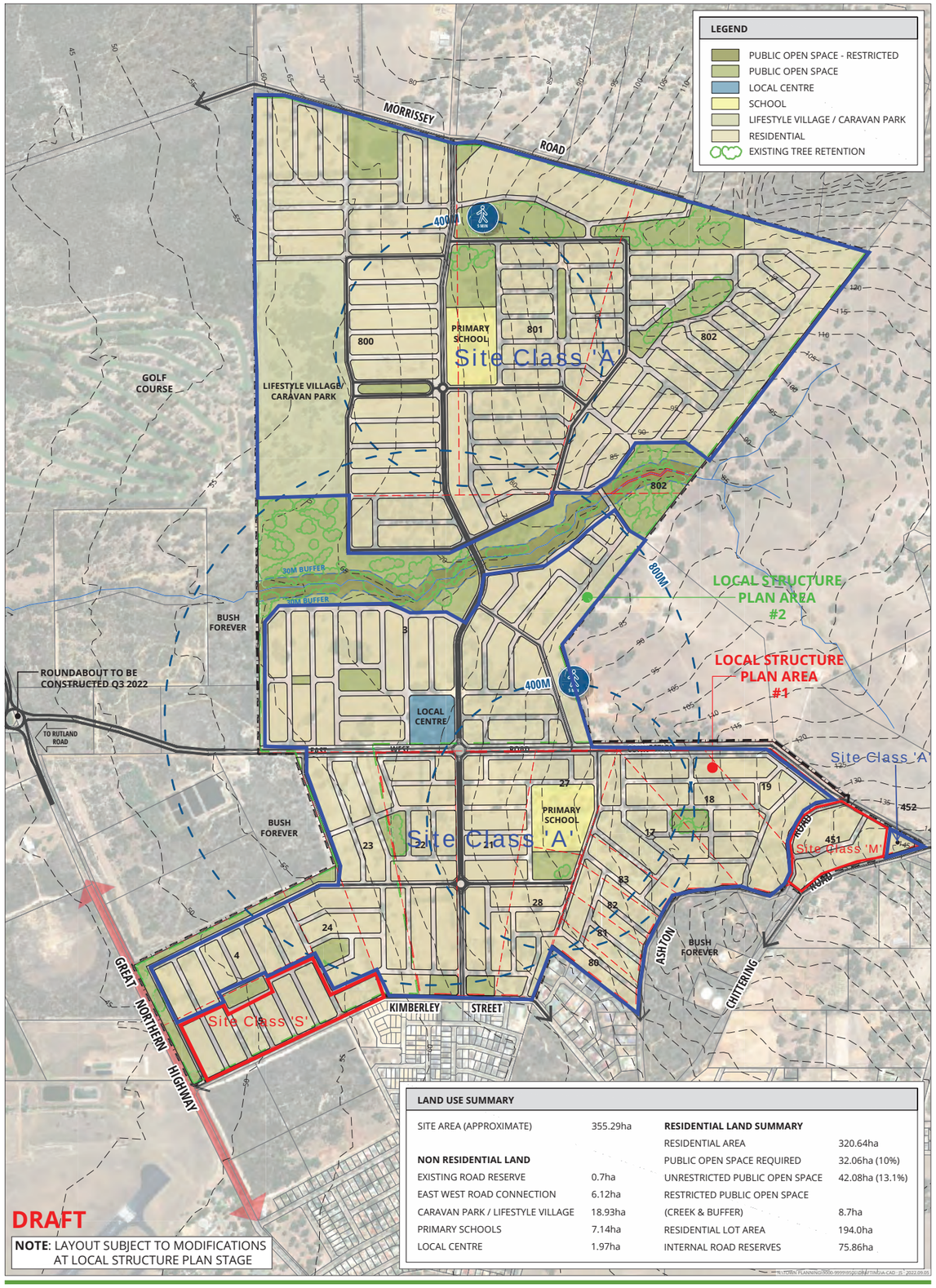
BG Brown Geotechnical Suite 9, 47 Monash Avenue Como WA 6152 admin@browngeotechnical.com.au	Date	Description	Drawn	Checked	Approved	TEST HOLE LOCATION	CLIENT
	12.09.22	Test Location Plan	BB	KB		BULLSBROOK NORTH PRECINCT BULLSBROOK	WPG Landholdings No 5 Pty Ltd Bullsbrook Investment Company

Drawing No. 22027 Fig 2
Scale: NTS
Sheet Size: A4
Job No. 22027.01
FIGURE 2



BG Brown Geotechnical Suite 9, 47 Monash Avenue Como WA 6152 admin@browngeotechnical.com.au	Date	Description	Drawn	Checked	Approved	SUBSOIL CONDITIONS	CLIENT
	12.09.22	Subsoil Conditions	BB	KB	KB	BULLSBROOK NORTH PRECINCT BULLSBROOK	WPG Landholdings No 5 Pty Ltd Bullsbrook Investment Company

Drawing No. 22027 Fig3
Scale: NTS
Sheet Size: A4
Job No. 22027.01
FIGURE 3



LAND USE SUMMARY			
SITE AREA (APPROXIMATE)	355.29ha	**RESIDENTIAL LAND SUMMARY**	
		RESIDENTIAL AREA	320.64ha
NON RESIDENTIAL LAND		PUBLIC OPEN SPACE REQUIRED	32.06ha (10%)
EXISTING ROAD RESERVE	0.7ha	UNRESTRICTED PUBLIC OPEN SPACE	42.08ha (13.1%)
EAST WEST ROAD CONNECTION	6.12ha	RESTRICTED PUBLIC OPEN SPACE	
CARAVAN PARK / LIFESTYLE VILLAGE	18.93ha	(CREEK & BUFFER)	8.7ha
PRIMARY SCHOOLS	7.14ha	RESIDENTIAL LOT AREA	194.0ha
LOCAL CENTRE	1.97ha	INTERNAL ROAD RESERVES	75.86ha

MASTER PLAN CONCEPT

VARIOUS LOTS GREAT NORTHERN HIGHWAY - MORRISSEY ROAD TO KIMBERLEY STREET
BULLSBROOK

N

0 250 m
SCALE @ A3: 1:10,000

9506-CON-04-C

DRAWN: JS
DATE CREATED: 2022.09.05
PROJECTION: MGA50 GDA94
CADASTRE: LANDGATE
AERIAL: BING 2020

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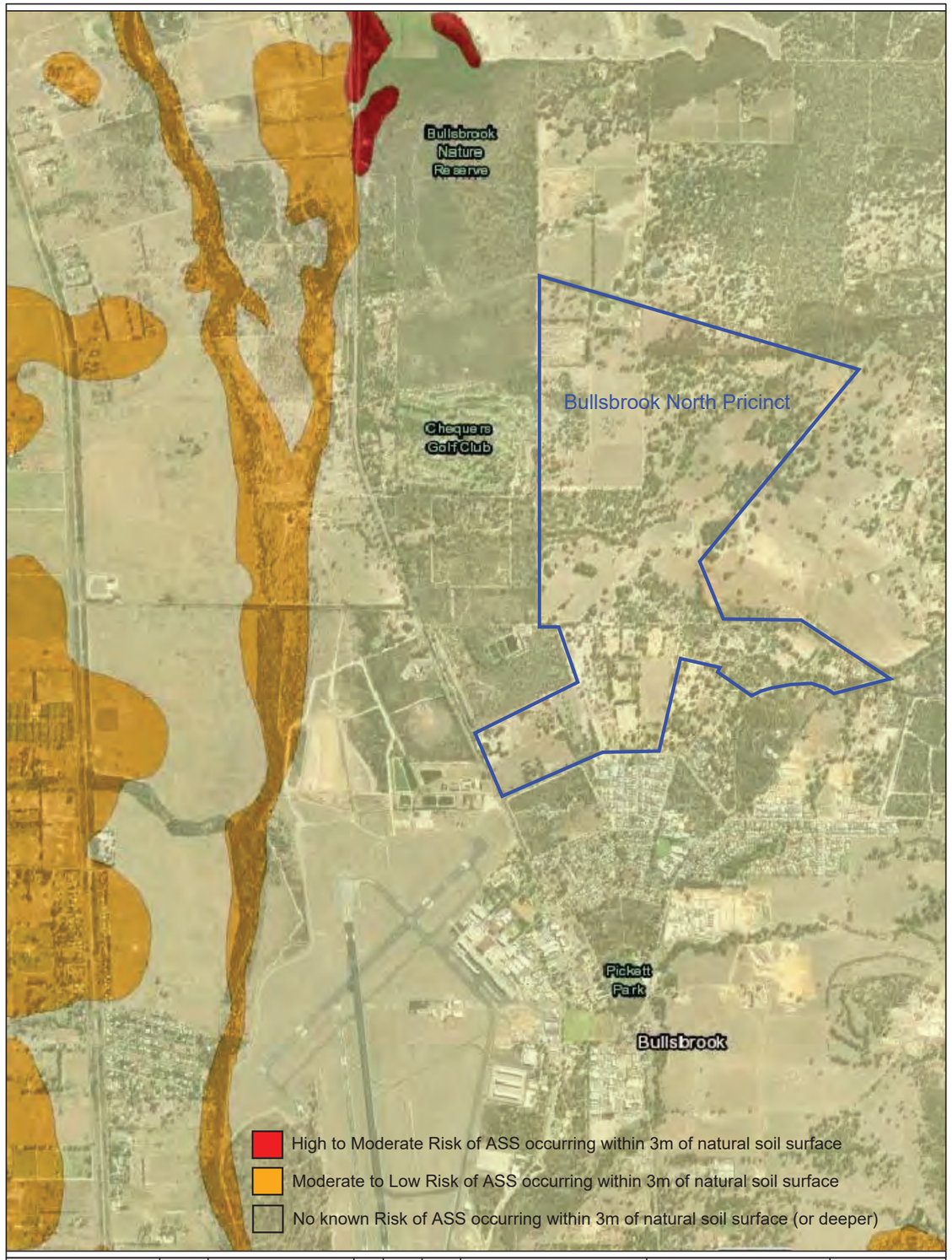
ROWE GROUP DESIGN

Figure 4



BG
Brown Geotechnical
Suite 9, 47 Monash Avenue
Como WA 6152
admin@browngeotechnical.com.au

Date	Description	Drawn	Checked	Approved
15.09.22	Acid Sulphate Soil	BB	KB	KB

ACID SULPHATE SOIL RISK

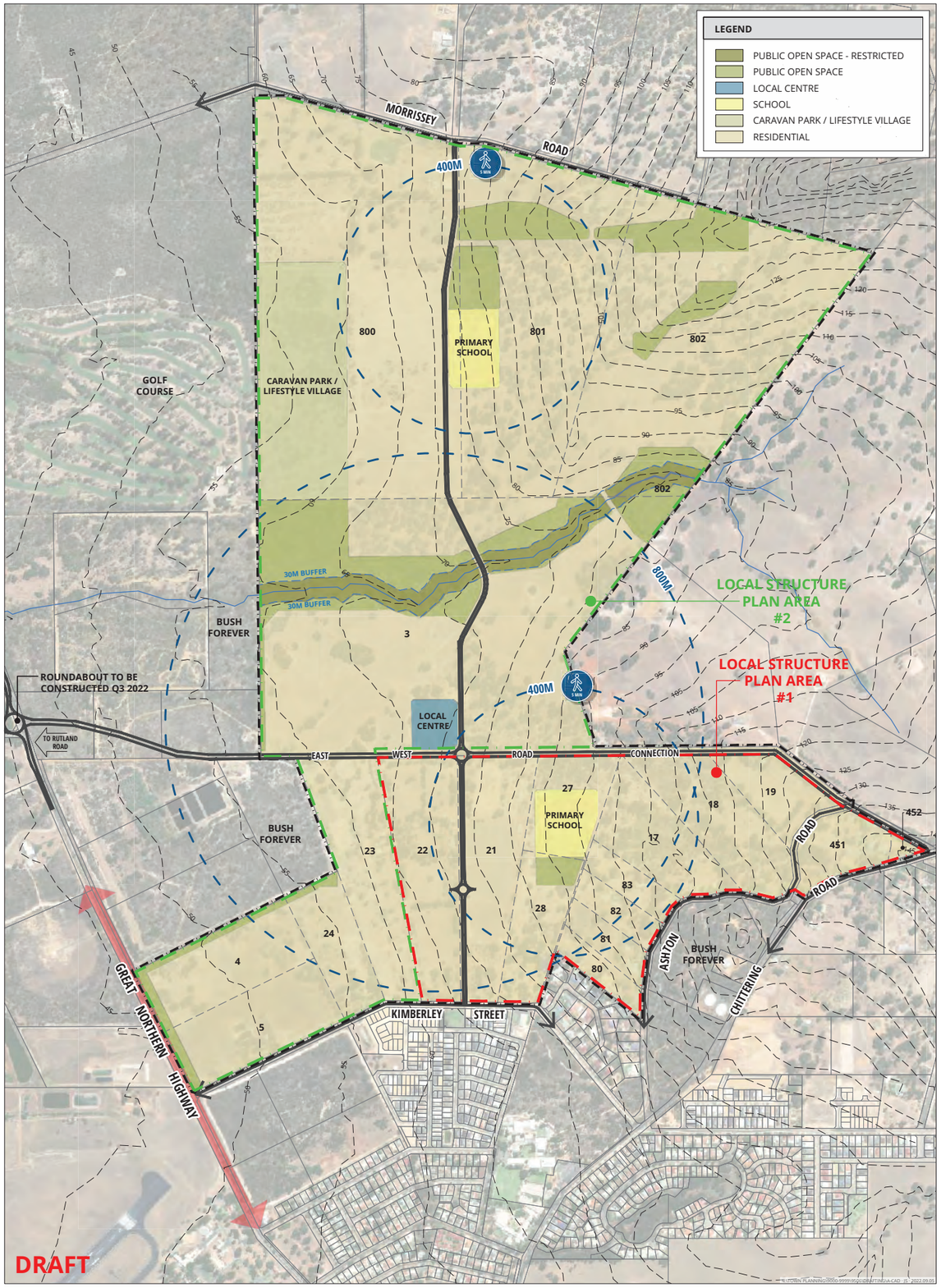
BULLSBROOK NORTH PRECINCT
BULLSBROOK

CLIENT

WPG Landholdings No 5 Pty Ltd
Bullsbrook Investment Company

Drawing No. 22027 Fig5
Scale: NTS
Sheet Size: A4
Job No. 22027.01
FIGURE 5

APPENDIX A



DISTRICT STRUCTURE PLAN CONCEPT

VARIOUS LOTS GREAT NORTHERN HIGHWAY - MORRISSEY ROAD TO KIMBERLEY STREET
BULLSBROOK

N

0 250 m

SCALE @ A3: 1:10,000

9506-DSP-01-B

DRAWN: JS
DATE CREATED: 2022.09.05
PROJECTION: MGA50 GDA94
CADASTRE: LANDGATE
AERIAL: BING 2020

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ROWE GROUP DESIGN



LAND USE SUMMARY			
SITE AREA (APPROXIMATE)	355.29ha	**RESIDENTIAL LAND SUMMARY**	
		RESIDENTIAL AREA	320.64ha
NON RESIDENTIAL LAND		PUBLIC OPEN SPACE REQUIRED	32.06ha (10%)
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CARAVAN PARK / LIFESTYLE VILLAGE	18.93ha	(CREEK & BUFFER)	8.7ha
PRIMARY SCHOOLS	7.14ha	RESIDENTIAL LOT AREA	194.0ha
LOCAL CENTRE	1.97ha	INTERNAL ROAD RESERVES	75.86ha

MASTER PLAN CONCEPT

VARIOUS LOTS GREAT NORTHERN HIGHWAY - MORRISSEY ROAD TO KIMBERLEY STREET
BULLSBROOK

N

0 250 m

SCALE @ A3: 1:10,000

9506-CON-04-C

DRAWN: JS
DATE CREATED: 2022.09.05
PROJECTION: MGA50 GDA94
CADASTRE: LANDGATE
AERIAL: BING 2020

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ROWE GROUP DESIGN

Figure 4

APPENDIX B

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		(LITTLE OR NO FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES		SM	SILTY SANDS, SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

BOREHOLE NUMBER TH01

PAGE 1 OF 1

BG Brown Geotechnical

CLIENT WPG Landholdings No 5 Pty Ltd / Bullsbrook Investment Company **PROJECT NAME** Bullsbrook North Precinct

PROJECT NUMBER 22027 **PROJECT LOCATION** Bullsbrook

DATE STARTED 24/6/22 **COMPLETED** 24/6/22 **R.L. SURFACE** 48 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 3 tonne excavator/auger **HOLE LOCATION** 31.6540 S, 116.0259 E

HOLE SIZE 600mm dia **LOGGED BY** FH **CHECKED BY** KB

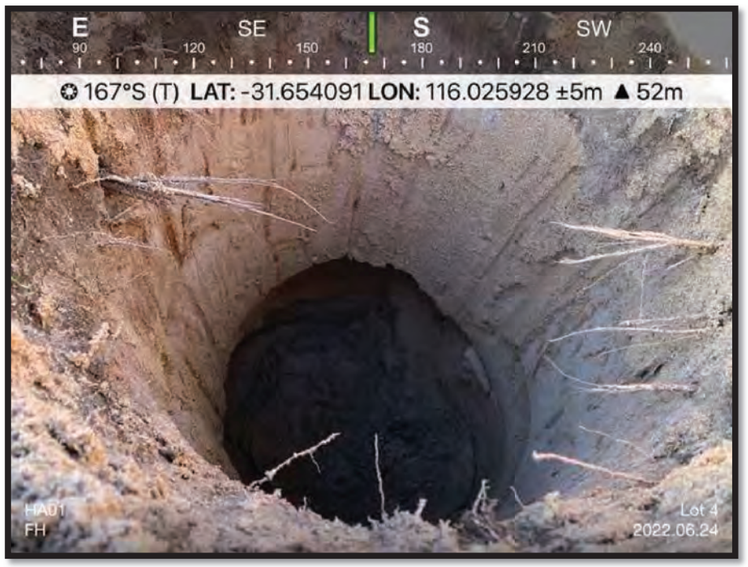
NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
		47.5	0.5			TOPSOIL: Loose, grey silty sand with organics		
		47.0	1.0			GRAVELLY SAND: Medium dense, coarse grained, light grey brown, moist to wet	Fines=13% Sand=50% Gravel=27% (Medium=27%)	
	▼ 1.5m	46.5	1.5			wet - Collapse from 1.0m Borehole TH01 terminated at 1.5m		
		46.0	2.0					
		45.5	2.5					
		45.0	3.0					

BOREHOLE / TEST PIT BULLSBROOK LOGS UPDATED - COPY 4.GPJ GINT STD AUSTRALIA.GDT 19/9/22

TH1





BOREHOLE NUMBER TH02

BG Brown Geotechnical

CLIENT WPG Landholdings No 5 Pty Ltd / Bullsbrook Investment Company **PROJECT NAME** Bullsbrook North Precinct

PROJECT NUMBER 22027 **PROJECT LOCATION** Bullsbrook

DATE STARTED 24/6/22 **COMPLETED** 24/6/22 **R.L. SURFACE** 50 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 3 tonne excavator/auger **HOLE LOCATION** 31.6540 S, 116.0259 E

HOLE SIZE 600mm dia **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						Topsoil: Loose, brown, with organics, wet		
	Not Encountered	49.5	0.5		SM	SILTY SAND: Medium dense, medium to coarse grained, light grey, wet Collapsing below 0.3m		
		49.0	1.0					
						Borehole TH02 terminated at 1.2m		
		48.5	1.5					
		48.0	2.0					
		47.5	2.5					
		47.0	3.0					

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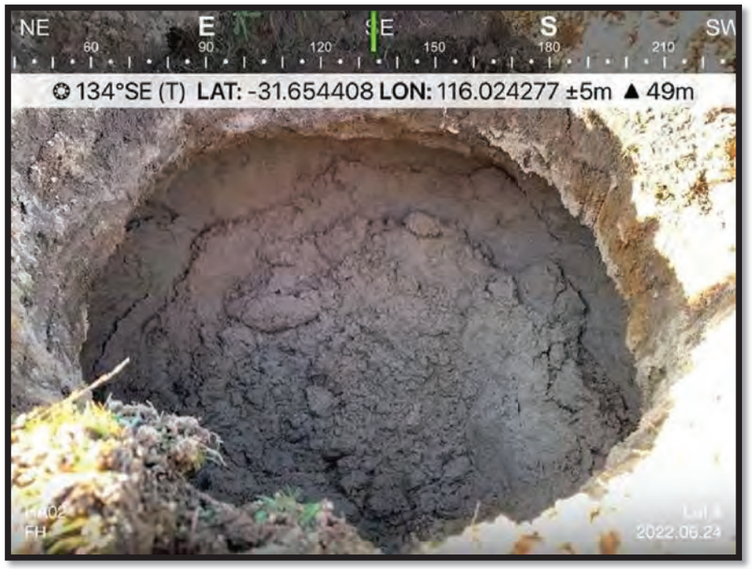
TH2





BOREHOLE NUMBER TH03

BG Brown Geotechnical

CLIENT WPG Landholdings No 5 Pty Ltd / Bullsbrook Investment Company **PROJECT NAME** Bullsbrook North Precinct

PROJECT NUMBER 22027 **PROJECT LOCATION** Bullsbrook

DATE STARTED 24/6/22 **COMPLETED** 24/6/22 **R.L. SURFACE** 53 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 3 tonne excavator/auger **HOLE LOCATION** 31.6551 S, 116.0224 E

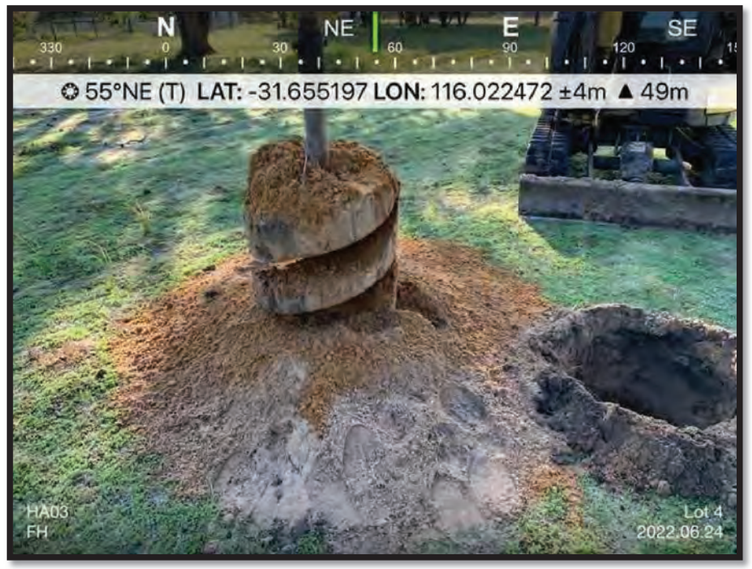
HOLE SIZE 600mm dia **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
	Not Encountered	52.5	0.5		SP-SM	SAND: Medium dense, medium to coarse grained, with silt, grey, dry to moist light brown Dense below 0.5m	Fines=7% Sand=91% Gravel=2% (Medium=48%)	
		52.0	1.0			trace silty clay		
		51.5	1.5			Borehole TH03 terminated at 1.5m		
		51.0	2.0					
		50.5	2.5					
		50.0	3.0					

BOREHOLE / TEST PIT BULLSBROOK LOGS UPDATED - COPY 4.GPJ GINT STD AUSTRALIA.GDT 19/9/22

TH3



BOREHOLE NUMBER TH04

BG Cr: Tn Ge: @l Lnil dl

kAG- 3 WF 3

CLIENT B k G ydn0L: l0inhs V: 5 k 0Ny0 4CMlswr: : Hcnves@nenOo : mPdnr **PROJECT NAME** CMlswr: : HV: r0 k rel inl O

PROJECT NUMBER 2212° **PROJECT LOCATION** CMlswr: : H

DATE STARTED 2f 4 422 **COMPLETED** 2f 4 422 **R.L. SURFACE** f u **DATUM** m Ap E

DRILLING CONTRACTOR **SLOPE** 91x **BEARING** 888

EQUIPMENT %Onne eK dvdOr4dMner **HOLE LOCATION** %3./ 55/ at 33/ .12/ u -

HOLE SIZE / 11mm 0id **LOGGED BY** Fp **CHECKED BY** 6C

NOTES

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	▼ 1.5m	f °.5	1.5			GDAb- yyR aAVEgEenset Yne O me0iMmt lihLOw: Tnt m: is0 @dl e hrdvel	Fines=3%S adn0=55S Grdvel=%2S 7(e0iMm=2uS)	Td@r Perl Le0 : n ao
		f °.1	3.1					
		f /.5	3.5			C: reL: le , p 1f @rmind@0 dC3.5m		
		f /.1	2.1					
		f 5.5	2.5					
		f 5.1	%1					

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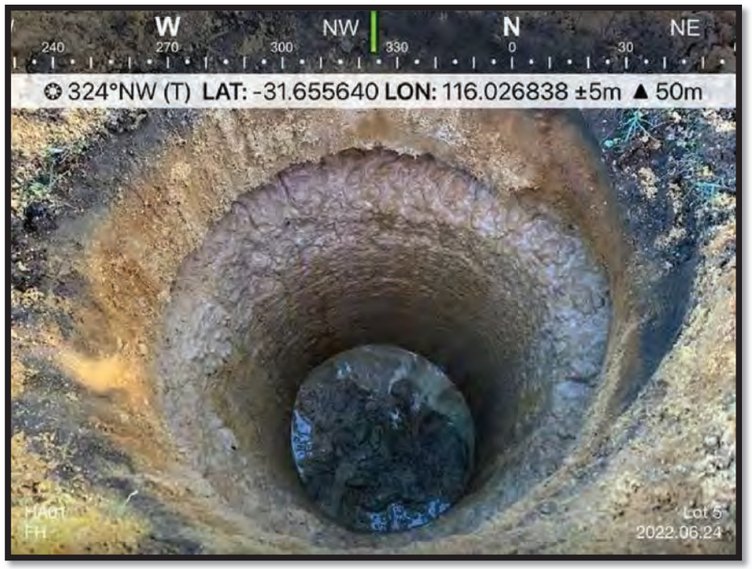
TH4





BOREHOLE NUMBER TH05

BG Brown Geotechnical

CLIENT WPG Landholdings No 5 Pty Ltd / Bullsbrook Investment Company **PROJECT NAME** Bullsbrook North Precinct

PROJECT NUMBER 22027 **PROJECT LOCATION** Bullsbrook

DATE STARTED 24/6/22 **COMPLETED** 24/6/22 **R.L. SURFACE** 50 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 3 tonne excavator/auger **HOLE LOCATION** 31.6562 S, 116.0251 E

HOLE SIZE 600mm dia **LOGGED BY** FH **CHECKED BY** KB

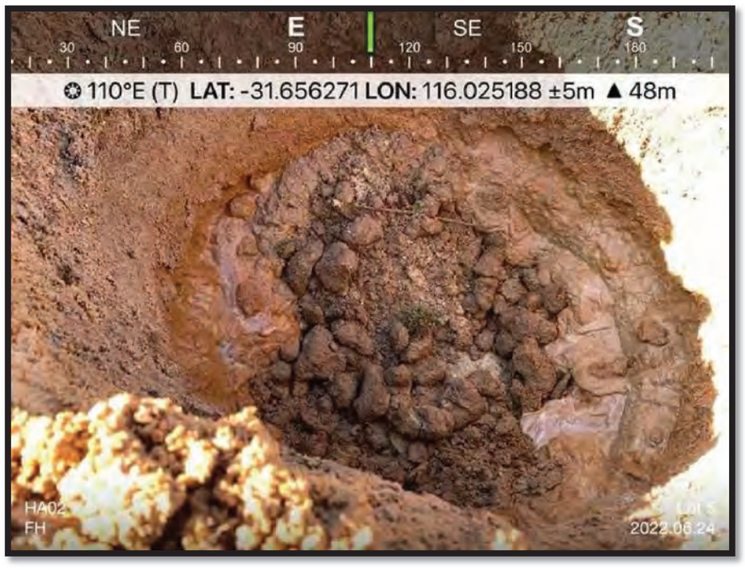
NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, with organics, brown, moist		
					SM	SILTY SAND: Medium dense, fine to coarse grained, trace gravel, grey, wet		
	▼ 0.5m	49.5	0.5		SC	CLAYEY SAND: Very dense, fine to medium, light brown, moist, trace gravel		water perched on SC
		49.0	1.0			refusal at 0.7m. Borehole TH05 terminated at 0.7m		
		48.5	1.5					
		48.0	2.0					
		47.5	2.5					
		47.0	3.0					

BOREHOLE / TEST PIT BULLSBROOK LOGS UPDATED - COPY 4.GPJ GINT STD AUSTRALIA.GDT 19/9/22

TH5





BOREHOLE NUMBER TH06

BG Brown Geotechnical

CLIENT WPG Landholdings No 5 Pty Ltd / Bullsbrook Investment Company **PROJECT NAME** Bullsbrook North Precinct

PROJECT NUMBER 22027 **PROJECT LOCATION** Bullsbrook

DATE STARTED 24/6/22 **COMPLETED** 24/6/22 **R.L. SURFACE** 53 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 3 tonne excavator/auger **HOLE LOCATION** 31.6542 S, 116.0220 E

HOLE SIZE 600mm dia **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, with organics, brown, moist		
					SM	SILTY SAND: Medium dense, fine to coarse grained, trace gravel, grey, wet		
		52.5	0.5		SC	CLAYEY SAND: Stiff, low plasticity, light brown, moist, trace gravel	LL=27 PL=13 Fines=32% Sand=65% Gravel=3% (Medium=37%)	water perched on SC
		52.0	1.0			refusal at 0.7m. Borehole TH06 terminated at 0.7m		
		51.5	1.5					
		51.0	2.0					
		50.5	2.5					
		50.0	3.0					

BOREHOLE / TEST PIT BULLSBROOK LOGS UPDATED - COPY 4.GPJ GINT STD AUSTRALIA.GDT 19/9/22

TH6





BOREHOLE NUMBER TH06

BG Cromn PeotecAn,caY

vI PE y kG y

CLIENT 2 v P pandAoYl,ngwNo H v tl ptd / CuYwDrooR TnOewtb ent 7 ob 1an **PROJECT NAME** CuYwDrooR NortA v rec,nct

PROJECT NUMBER FF. F3 **PROJECT LOCATION** CuYwDrooR

DATE STARTED F4/6/FF **COMPLETED** F4/6/FF **R.L. SURFACE** H **DATUM** b l 0:

DRILLING CONTRACTOR **SLOPE** x. ° **BEARING** ---

EQUIPMENT 5 tonne e9caOator/auger **HOLE LOCATION** 5yBHHHShyy6B F46 E

HOLE SIZE 6. . b b d,a **LOGGED BY** G0 **CHECKED BY** KC

NOTES

MetAod	2 ater	Wp (b)	: e1tA (b)	Pra1Ac pog	7 Yawwf,cat,on SI b DoY	Mater,aY: ewcr,1t,on	Sab 1Yew s ewtw Web arRw	I dd,t,onaYk DwerOat,onw
	Not Encountered				SM	STpsi SI N: LMed,ub denwehb ed,ub gra,nedhgrel hb o,wt		
						YgAt Dromn		
		4xBH	. BH					
		4xB	yB			: enwe DeYomyb		
						trace w,Yl cYal		
		48BH	yBH			CoreAoYe s 0 . 3 terb ,nated at yBHb		
		48B	FB					
		43BH	FBH					
		43B	5B					

Ck WE0 k pE / sESs v Ts CUppSCWk k K pk PS Uv: I sE: - 7k vi 4BPv J PTNs Ss: I USs W pT BP: s yx/x/FF

BOREHOLE NUMBER TH08

BG Brown Geotechnical

PAGE 1 OF 1

CLIENT WPG Landholdings No 5 Pty Ltd / Bullsbrook Investment Company **PROJECT NAME** Bullsbrook North Precinct

PROJECT NUMBER 22027 **PROJECT LOCATION** Bullsbrook

DATE STARTED 21/6/22 **COMPLETED** 21/6/22 **R.L. SURFACE** 55 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 3 tonne excavator/auger **HOLE LOCATION** 31.6556 S, 116.0283 E

HOLE SIZE 600mm dia **LOGGED BY** FH **CHECKED BY** KB

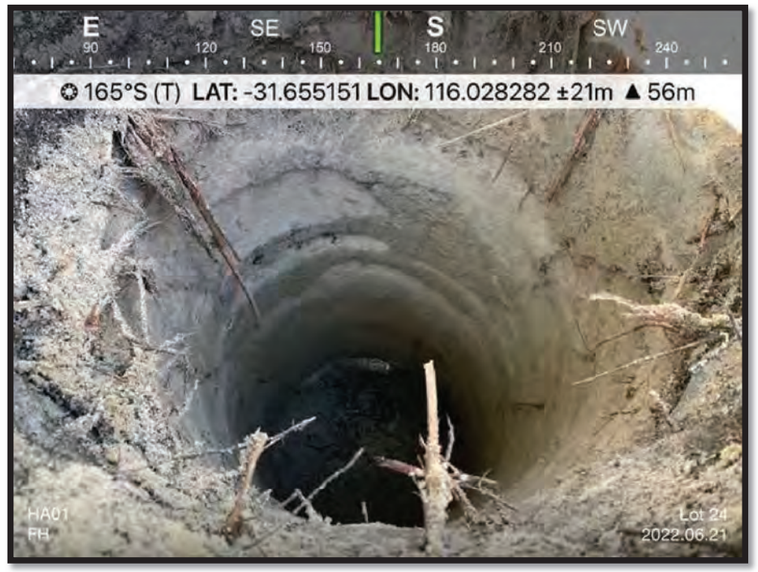
NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						Topsoil: Loose, brown, with organics, grass and roots, moist		
					SP-SM	SAND: Medium dense, fine to coarse grained, grey, with silt, moist. Roots to 0.3m		
		54.5	0.5			Dense & light brown below 0.5m		
		54.0	1.0					
								seepage at 1.5m
	1.5m	53.5	1.5			Borehole TH08 terminated at 1.5m		
		53.0	2.0					
		52.5	2.5					
		52.0	3.0					

BOREHOLE / TEST PIT BULLSBROOK LOGS UPDATED - COPY 4.GPJ GINT STD AUSTRALIA.GDT 19/9/22

TH8





BOREHOLE NUMBER TH09

BG

Ba8: u Se8,ehguch=1

MySR N pn N

CLIENT H MS - =u7g817cuwr b 8 t M,5 - ,7 CBl 1fr Da88Wlu9er,E eu, C8E) =u8 **PROJECT NAME** Bl 1fr Da88Wb 8ag Maehcuh,

PROJECT NUMBER kkFkU **PROJECT LOCATION** Bl 1fr Da88W

DATE STARTED kN0Qk **COMPLETED** kN0Qk **R.L. SURFACE** t / **DATUM** E yT0

DRILLING CONTRACTOR **SLOPE** %FL **BEARING** mm

EQUIPMENT K,8uue e°h=9=,8aGl wea **HOLE LOCATION** KNo/ t t N s ANN/ oFkxk R

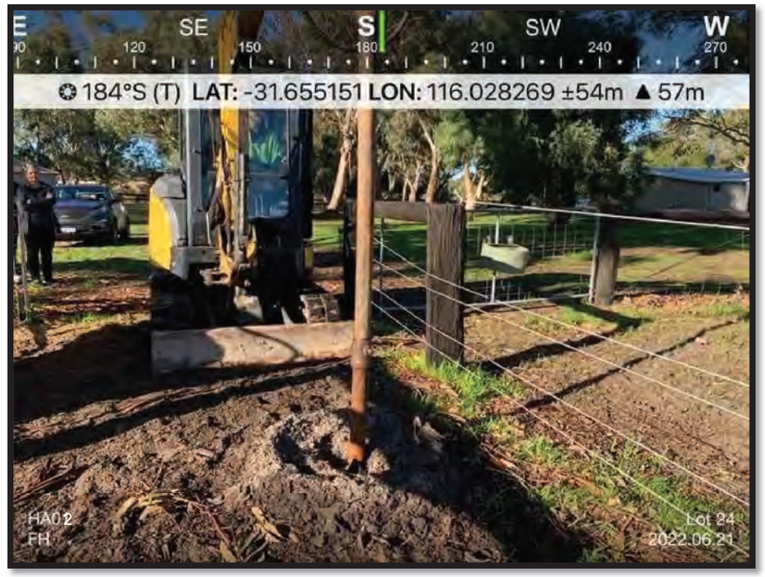
HOLE SIZE / FFE E 7c= **LOGGED BY** nT **CHECKED BY** 6B

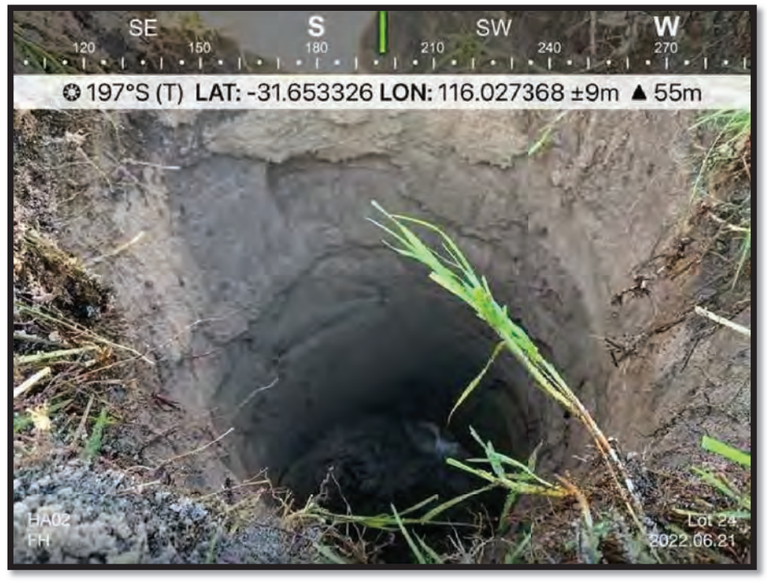
NOTES

v e,g87	H =,ea	3 - GE (	0 e),g GE (	Sa=) gch - 8w	C1=r rcch=,c8u s5E D81	v =,eas=10 er ha),c8u	s =E) 1er 4 er,r 3 eE =aW/	y 77cc8u=1p Dr ea9=,c8ur
						48) r 8cP- 88r eADa8: uA: cg 8aw=uchr Awa=r r AE 8cr,		
					s Mns v	s y b 0 Pv e7d: E 7eur eA cue ,8 h8=ar e wa=cue7Awae5A: cg r d,AE 8cr,o		
		t t d	Fd			0 eur e		
							n cuer dNFi s =u7d%Fi Sa=9e1dFi Gv e7d: E dt 2i (	
		t t cF	NcF					
	▼	t 2d	Nd					
	Nd E					B8aeg81e 4 T F%,eaE cu=,e7 =, Nd E		
		t 2cF	kcF					
		t Kd	kd					
		t KcF	KcF					

Bp 3 RT p - R O4Rs 4 M4 BY - - s B3 p p 6 - p Ss YM0 y 4R0 mCp MJ 2c6 M Slb 4 s 40 y Ys 43 y - ly c6 0 4 N%Qk

TH9





BG Brown Geotechnical

BOREHOLE NUMBER TH01

P0GE H OF H

CLIENT _p PG , andholdinys No WPtb , td / Bulls5rook Investment ComDan **PROJECT NAME** Bulls5rook North Precinct

PROJECT NUMBER 11218 **PROJECT LOCATION** Bulls5rook

DATE STARTED 1H/6/11 **COMPLETED** 1H/6/11 **R.L. SURFACE** 62 **DATUM** m 0T.

DRILLING CONTRACTOR **SLOPE** 92L **BEARING** ---

EQUIPMENT x tonne e°cavator/auyer **HOLE LOCATION** xH6WWSgH-632198 E

HOLE SIZE 622mm dia **LOGGED BY** FT **CHECKED BY** KB

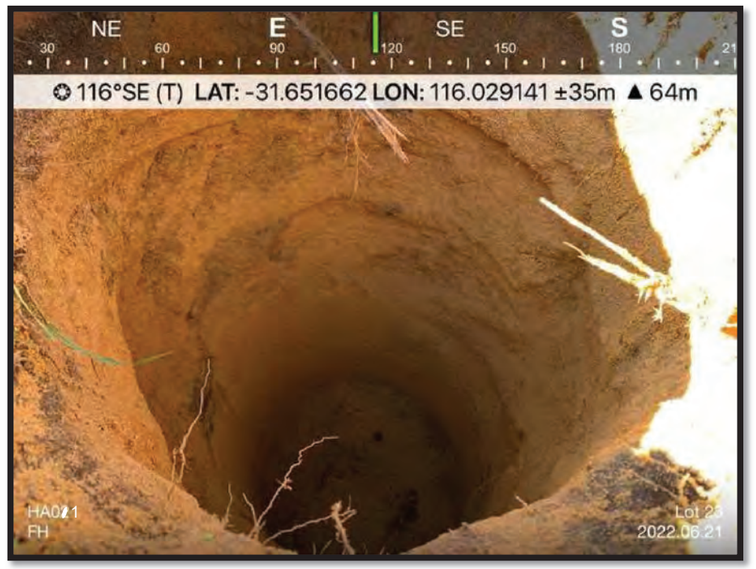
NOTES

Method	p ater	R, (m)	. eDth (m)	GraDic , oy	Classification Sbm5ol	Material . escriDtion	SamDles Aests Remarks	0dditional O5servations
						AoDsoil: , oosegwith oryanicsgliyht yreb sandgand rootletsgdrb		
	Not Encountered				SP-SM	S0N. : Medium densegmedium yrainedgoranye 5rowngwith siltgmoist		
		w03W	23W				Fines=7% Sand=91% Gravel=2% (Medium=48%)	
		w032	H32					
		W73W	H3W					
						Borehole AT H2 terminated at H3W m		
		W732	132					
		W63W	13W					
		W632	x32					

BORETO. E / AESA PIA BU. , SBROOK . OGS UP. 0AE. - COPY 43GPJ GINA SA. 0USAR0. I03G. A H9/9/11

TH10





BG BroYn v eotecAn:chL

BOREHOLE NUMBER TH11

MDv E 2 kP 2

CLIENT WMv bhndAold:nal No 1 MtI btd FBullL Croog °nOel ty ent - oy i hn **PROJECT NAME** BullL Croog NortA Mrec:nct

PROJECT NUMBER GG0GK **PROJECT LOCATION** BullL Croog

DATE STARTED G2F4FGG **COMPLETED** G2F4FGG **R.L. SURFACE** 40 **DATUM** y DHm

DRILLING CONTRACTOR **SLOPE** 30x **BEARING** TIT

EQUIPMENT 6 tonne e9chOntorFhuaer **HOLE LOCATION** 62.4102 Sw224.0GK5 E

HOLE SIZE 400y y d:h **LOGGED BY** PH **CHECKED BY** / B

NOTES

p etAod	Whter	Rb)y 8	mei tA)y 8	v rhi A:c boa	- IthI l :f:chton Sl y CoL	p hter:hLmel cr:i t:on	Shy i lel s el tl Rey hrgl	Ddd:t:onhLk Cl erOht:onl
						soi l o:L bool ewdhrg arel wY:tAI hnd hnd orahn:cl wdrl		
	Not Encountered	13.1	0.1		SMfSp	SDNm, p ed:uy denl ewy ed:uy to cohrl e arh:nedwLaAt arel CroYnwY:tAI :ltwy o:l t		
		13.0	2.0			menl e CeloY 0.3y		
		15.1	2.1			BoreAole s H22 tery :nhted ht 2.1y		
		15.0	G0					
		1K.1	G1					
		1K0	6.0					

Bk REHk bE FsESs Mfs B7 bbSBRk k / bk v S 7MmDsEm T- k MJ J.v M(v Ns Ssm D7 Ss RDb'D.v ms 23BRG

TH11





BG Trog n Geotecwnical

BOREHOLE NUMBER TH12

) bGE 3 / F 3

CLIENT R) G : andwoldinhs No p) ty : td 6Tulls. rooOLnvestment l omAanyPROJECT NAME Tulls. rooONortw) recinct

PROJECT NUMBER VW2W7 **PROJECT LOCATION** Tulls. rooO

DATE STARTED V36B6/WV **COMPLETED** V36B6/WV **R.L. SURFACE** p9 **DATUM** m bH0

DRILLING CONTRACTOR **SLOPE** 92° **BEARING** FFP

EQUIPMENT 1 tonne excavator6auher **HOLE LOCATION** 135BpW1 S, 33B52W02 E

HOLE SIZE B22mm dia **LOGGED BY** FH **CHECKED BY** KT

NOTES

Metwod	R ater	k : (m8	0 eAtw (m8	GraAwic : oh	I lassification Sym. ol	Material 0 escriAtion	SamAles - ests k emarCs	bdditional / . servations
						- oAsoilD: oose, gitworhanics, lihwt hrey sand, and rootlets, dry		
	Not Encountered	pJ5p	25p		S) RSM	SbN0 DMedium dense, medium hrained, oranhe . rogn, gitwsilt, moist		
						0 ense . elog 25Bm	Fines=7% Sand=91% Gravel=2% (Medium=49%8	
		pJ52	352					
		p75p	35p			Torewole - H3Wterminated at 35pm		
		p752	W52					
		pB5p	W5p					
		pB52	152					

T/ k EH/ : E 6- ES-) L TC: : STk / / K: / GS C) 0 b- E0 PI /) U 4B) Y GIN- S- 0 bCS- k b: lb 5G0 - 3998/W

TH12



BOREHOLE NUMBER TH13

6. vE 7 / F 7

BG Wrohn v eotecynic92

CLIENT k 6v D9ndyo2linBs No H6twDtd KWu2s, roog bnl est4 ent 3 o4 - 9nm **PROJECT NAME** Wu2s, roog Norty 6 recinct

PROJECT NUMBER RR(RG **PROJECT LOCATION** Wu2s, roog

DATE STARTED R7kkRR **COMPLETED** R7kkRR **R.L. SURFACE** xl **DATUM** 4 . p5

DRILLING CONTRACTOR **SLOPE** l (C **BEARING** UUU

EQUIPMENT %tonne eLc9l 9tork9uBer **HOLE LOCATION** %7TxH8Ha: 77xT(%4 1 E

HOLE SIZE x((4 4 di9 **LOGGED BY** Fp **CHECKED BY** ° W

NOTES

metyod	k 9ter	OD M4)	5e-ty M4)	v r9- yic DoB	3 29ssific9tion aw4 , o2	m9teri925 escri- tion	a94 - 2es Pests Oe4 9rgs	. ddition92/ , serl 9tions
	Not Encountered					Po- soi2ADoose: , 29cg: si2ws9nd: hity root2ets: drw		
					am	abDP0 a. N5 Amediu4 dense: 4 ediu4 to co9rse Br9ined: we2ohisy , rohn: 4 oist		
		x1TH	(TH			5ense , e2oh (TH4	Fines=7%S a9nd=1GS v r9l e2=(S Mmediu4 =8%S)	
		x1T(	7T(					
						3 o29- se Wbreyo2e Pp 7%ter4 in9ted 9t 7TR4		
		xGTH	7TH					
		xGT(	RT(					
		xxTH	RTH					
		xxT(	%T(					

W OEp/ DE KPEaP 6iP WrDDaWO/ / ° D' v a Y65 . PE5 U3/ 60 8Tv 6J vtNPaP5 . YaPO. Db Tv 5P 7l KKRR

TH13





BG Brown Geotechnical

BOREHOLE NUMBER TH14

CLIENT WPG Landholdings No 5 Pty Ltd / Bullsbrook Investment Company **PROJECT NAME** Bullsbrook North Precinct

PROJECT NUMBER 22027 **PROJECT LOCATION** Bullsbrook

DATE STARTED 21/6/22 **COMPLETED** 21/6/22 **R.L. SURFACE** 67 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 3 tonne excavator/auger **HOLE LOCATION** 31.6545 S, 116.0297 E

HOLE SIZE 600mm dia **LOGGED BY** FH **CHECKED BY** KB

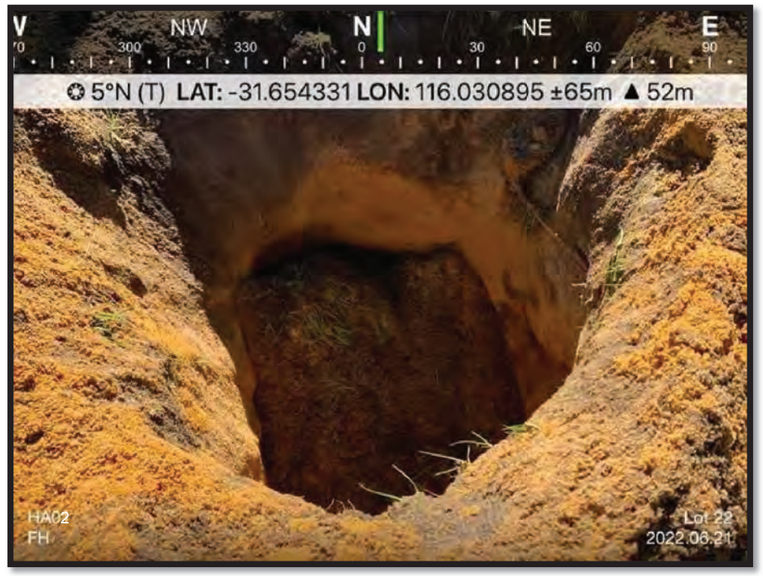
NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
	Not Encountered	66.5	0.5			Topsoil: Loose, black, silty sand, with rootlets, dry		
					SP	SAND: Medium dense, fine to coarse grained, yellowish brown, trace silt, dry		
						Dense below 0.5m		
		66.0	1.0					
		65.5	1.5					
						Borehole TH14 terminated at 1.5m		
		65.0	2.0					
		64.5	2.5					
		64.0	3.0					

BOREHOLE / TEST PIT BULLSBROOK LOGS UPDATED - COPY 4.GPJ GINT STD AUSTRALIA.GDT 19/9/22

TH14





BG 0roan k eotecl nicwl

BOREHOLE NUMBER TH15

MYk E 3 WO 3

CLIENT 2 Mk LwndI oldinCs No B Mtg Ltd P0 ullsbrooh xnPestment ° ompwng **PROJECT NAME** 0 ullsbrooh NortI Mrecinct

PROJECT NUMBER vv/ v- **PROJECT LOCATION** 0 ullsbrooh

DATE STARTED v3R3Rv **COMPLETED** v3R3Rv **R.L. SURFACE** GK **DATUM** m Y. A

DRILLING CONTRACTOR **SLOPE** K/ 5 **BEARING** 999

EQUIPMENT 4 tonne e6cwRwtorRwuCer **HOLE LOCATION** 43HBB4B S, 33GH434 E

HOLE SIZE G / mm diw **LOGGED BY** O **CHECKED BY** F0

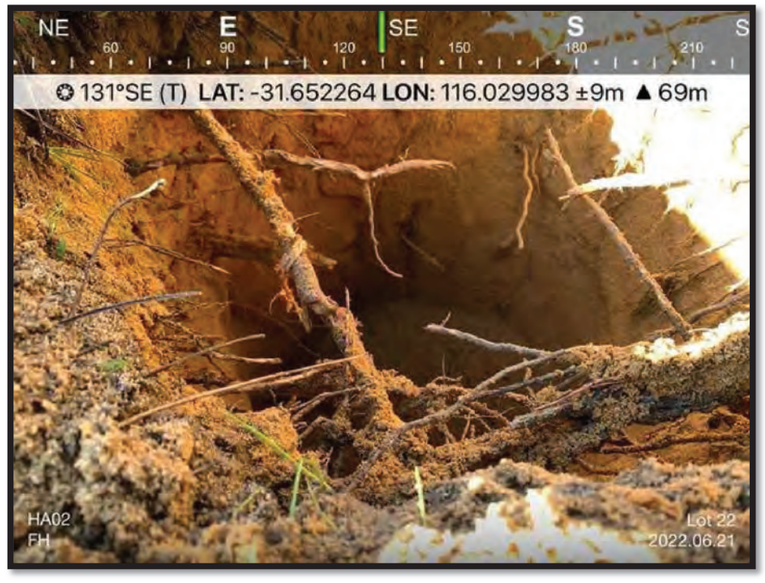
NOTES

Detl od	2 wter	1 L)m8	Aeptl)m8	k rwpl ic LoC	° lwssiycwtion Sgmbol	Dwteriwl Aescription	Swmples Tests 1 emwrhs	Ydditionwl WbserRwtions
						Topsoil: Loose, blwch, siltg swnd, aitI rootlets, drg		
	Not Encountered	GH HB	/ HB		SM	SYNA: Dedium dense, yine to cowrse Orwined, gelloa isI broan, trwce silt, drg		
		GH H	3H					
		G- HB	3HB					
		G- H	v H			0orel ole T. 3B terminwted wt 3HBm		
		GGHB	v HB					
		GGH	4H					

0WI E. VLE PTEST MAT 07 LLS01 WWF LWk S 7MAYTEA 9° WMU JIK M k-NT STA Y7 ST1 YLXHI AT 3KRRv

TH16





BG Wrohn 1 eotecynicav

BOREHOLE NUMBER TH16

) b1E 4 OF 4

CLIENT k) 1 Dandyovdin. s No 7) twDtd / Wuws, roog InGestMent HoM- an **PROJECT NAME** Wuws, roog Norty) recinct

PROJECT NUMBER 33l 3C **PROJECT LOCATION** Wuws, roog

DATE STARTED 34/R/33 **COMPLETED** 34/R/33 **R.L. SURFACE** R7 **DATUM** M bp0

DRILLING CONTRACTOR **SLOPE** 9l ° **BEARING** LLL

EQUIPMENT K tonne excaGator/au. er **HOLE LOCATION** K45R733 S: 44R5 399 E

HOLE SIZE Rl I MM dia **LOGGED BY** Fp **CHECKED BY** 6W

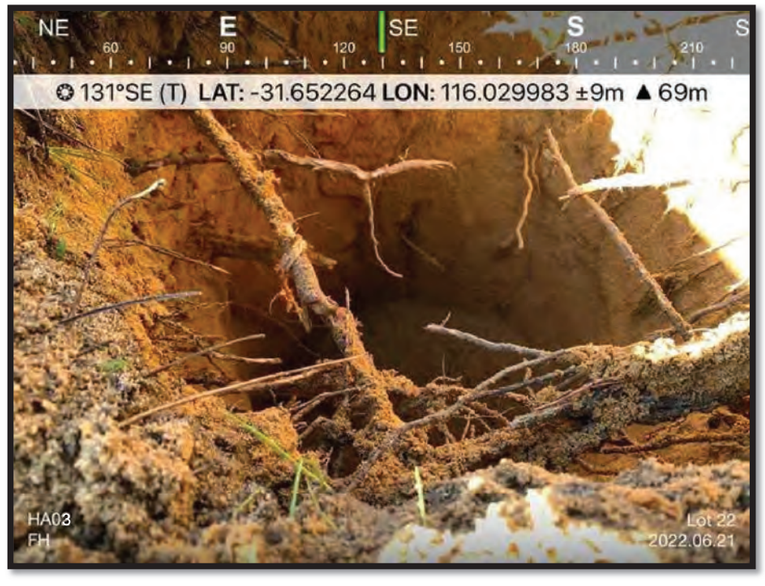
NOTES

(etyod	k ater	BD 2M8	0e- ty 2M8	1 ra- yic Do.	Hvassification SwM, ov	(ateriav0 escri- tion	SaM- ves Pests BeMargs	bdditionavO, serGations
						Po- soivADoose: , vacg: sivtwsand: h ity roots: drw		
					S)	SbN0A(ediuM dense: MediuM to coarse . rained: oran. e , rohn: trace sivt: drwto Moist5Boots to l 57M		
	Not Encountered	Rm57	l 57			0 ense , evoh l 57M	Fines=7% Sand=97% 1 raGev=l % 2(ediuM=m4%8	
		Rm5	45			wevohisy , rohn , evoh l 5TM		
		RK57	457			Howa- se at 453M		
						Woreyove Pp 4RterMinated at 457M		
		RK5	35					
		R357	357					
		R35	K5					

WORE p.ODE / PESP) IP WUDDSWBOO6 DO1S U) 0 b PE0. LHO) Y m8) J 1 INP SP0. bUSPBbDbSl 0 P 49/9/33

TH16





BOREHOLE NUMBER TH16

MYPE H p G H

BG 3ro, n Peotecwnbcgy

CLIENT WMP i gndwoydbnh: No . Mtl i td F3uyy arooOsnve: tment 7 omRgnt **PROJECT NAME** 3uyy arooONortwMrecbnct

PROJECT NUMBER 11C12 **PROJECT LOCATION** 3uyy arooO

DATE STARTED H2F11 **COMPLETED** H2F11 **R.L. SURFACE** 9. **DATUM** m YBA

DRILLING CONTRACTOR **SLOPE** xC° **BEARING** ---

EQUIPMENT / tonne e5cgvgtorFguher **HOLE LOCATION** / H06. HK SLHH60C/ K1 E

HOLE SIZE 6CCmm dbg **LOGGED BY** 33 **CHECKED BY** 43

NOTES

Detwod	Wgter	k i)m8	AeRtw)m8	PrgRwbc i oh	7yg: : bfbcgtbon SI maoy	Dgterbgy Ae: crbRtbon	SgmRye: Te: t: k emgrO	Yddbbongyp a: ervgtbon:
						Tp MSp si l i oo: eL, bworhgnbc: Laro, nLdrl		
					SM	SYNAI Dedbum den: eLmedbum to cogr: e hrgbnedLl eyo, aro, nLmob t		
		9K0	C0			Aen: e aeyo, C0 m		
	Not Encountered	9K0C	H0C					
		9/ 0	H0					
		9/ 0C	10C					
						3 orewoye TBH2 termbngted gt 1m		
		910	10					
		910C	/ 0C					

3pk EBpi E FTEST MsT 3Ui i S3k pp 4 i p PS UMAYTEA - 7p MJ KPM(PsNT STA YUSTk Yi sY0PAT HkfkF11

TH17





BG Bro, n Geotecgnical

BOREHOLE NUMBER TH18

8bGE H PF H

CLIENT W8G Aandgoldinws No 5 8ty Atd CBullshrook -nvestMent l oMpanY **PROJECT NAME** Bullshrook Nortg 8recinct

PROJECT NUMBER mm2m1 **PROJECT LOCATION** Bullshrook

DATE STARTED H3C2m **COMPLETED** H3C2m **R.L. SURFACE** 35 **DATUM** M bT0

DRILLING CONTRACTOR **SLOPE** 92° **BEARING** LLL

EQUIPMENT 7 tonne excavator@uwer **HOLE LOCATION** 7H652mS: HH6.27KK E

HOLE SIZE 622MM dia **LOGGED BY** BB **CHECKED BY** / B

NOTES

(etgod	Water	RA JM4	0eptg JM4	Grapgic Aow	I lassification SyMhol	(aterial 0escription	SaMples) ests ReMarks	bdditional Phservations
						) P8SP-ADAoose: , itg orwanics and rootlets: hro, n: dry		
					S8	SbN0D(ediuM dense: coarse wrained: yello, hro, n: trace silt: Moist		
		3K5	2.5			0ense helo, 2.5M		
	Not Encountered	3K2	H2				Fines=7% Sand=91% Gravel=2% (ediuM=7m%4	
		37.5	H5					
		37.2	m2			Boregole) TH3 terMinated at nM		
		3m5	m5					
		3m2	7.2					

BPRETPAE Q ES) 8-) BCAASBRPP/ APGS C80b) E0 LI P8U KG8Y G-N) S) 0 bCS) RbAb.G0) H9Gm

TH18





BOREHOLE NUMBER TH19

MDGE 2 i F 2

BG Brown Geotecgnhcl C

CLIENT R MG : I ndgoCdhna, No 3 MtA: td 4BuCCYroov InPe, ty ent 7 oy kl n **PROJECT NAME** BuCCYroov Nortg Mrechnct

PROJECT NUMBER WW0W **PROJECT LOCATION** BuCCYroov

DATE STARTED 24 4/W **COMPLETED** 24 4/W **R.L. SURFACE** ° / **DATUM** y DHm

DRILLING CONTRACTOR **SLOPE** 10- **BEARING** TTT

EQUIPMENT K tonne excl Pl tor4 uaer **HOLE LOCATION** K2.5919 Sb225.0339 E

HOLE SIZE 500y y dh **LOGGED BY** BB **CHECKED BY** 6B

NOTES

p etgod	R l ter	O:)y 8	mektg)y 8	Grl kgh c : oa	7 C , , hfrcl thon SAy YoC	p l terh Cme, crhkthon	Sl y kG, s e, t, Oey l rv,	Ddhthonl C Y, erPl thon,
						si MSi l: L: oo, ebwhtg oral nhc, I nd tree root, bYrownbdrA		
					SMTSp	SDNmLp edhuy den, eby edhuy to col r, e arl hmedbAeCCw Yrownbwhtg , hCby oh t		
		°5.3	0.3					
						men, e YeCow 0.3y		
	Not Encountered	°5.0	2.0					
		°3.3	2.3					
		°3.0	W0					
						Boregoe s H21 tery hnl ted l t Wy		
		°9.3	W3					
		°9.0	K.0					

Bi OEHi : E 4sESs Ms BU: : SBOi i 6 : i GS UMmDsEm T7 i MJ 9.GM(GINs Ssm DUSs OD: ID.Gms 214 4/W

TH19





BOREHOLE NUMBER TH02

80GE 7 - F 7

BG Trog n Geotecwnic9l

CLIENT W8G D9ndwoldinhs No m8tb Dtd OTullsyrook AnvestMent LoMp9nd **PROJECT NAME** Tullsyrook Nortw8recinct

PROJECT NUMBER 33%3B **PROJECT LOCATION** Tullsyrook

DATE STARTED 7OBO33 **COMPLETED** 7OBO33 **R.L. SURFACE** 13 **DATUM** M 0H.

DRILLING CONTRACTOR **SLOPE** 1%° **BEARING**)))

EQUIPMENT 6 tonne exc9v9torO9uher **HOLE LOCATION** 675Km%1 a, 77K5%6m1 E

HOLE SIZE K%%MM di9 **LOGGED BY** TT **CHECKED BY** / T

NOTES

(etwod	W9ter	RD 2M4	. eptw 2M4	Gr9pwic Doh	Li9ssific9tion abMyol	(9teri9l . escription	a9Mples Pests ReM9rks	0ddition9l - yserv9tions
						P- 8a- AD. Doose, gitworh9nics 9nd tree roots, yrog n, drb		
					a8)a(	a0N. : (ediuM dense, MediuM hr9ined, gitwsilt, bellog, gitwtree roots, Moist		
		175m	%5m					
						. ense yelog %5BM		
	Not Encountered	175%	75%					
							Fines=7%S a9nd=1%S Gr9vel=%S 2(ediuM=m%S 4	
		1%5m	75m					
		1%5%	35%					
						Torewole PH3%terMin9ted 9t 3M		
		J15m	35m					
		J15%	65%					

T- REH- DE OPEaP 8AP TI DDaTR- - / D- Ga I 8. 0PE.)L- 8C UG8Y GANP aP. 0I aPR0D4N5G. P 71O3

TH20





BOREHOLE NUMBER TH12

BG Brown Peotecgnhcl Y

MmPE 1 i G 1

CLIENT WMP : I ndgoYdlma, No 3 MtD: td FBuY,ArooOInve, tCent - oCRI nt **PROJECT NAME** BuY,ArooONortg Mrechnct

PROJECT NUMBER 22024 **PROJECT LOCATION** BuY,ArooO

DATE STARTED 1F4F22 **COMPLETED** 1F4F22 **R.L. SURFACE** 90 **DATUM** C mHy

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** TTT

EQUIPMENT 6 tonne excl vl torFuaer **HOLE LOCATION** 61.K599 Sb11K.0640 E

HOLE SIZE K00CC dhi **LOGGED BY** BB **CHECKED BY** / B

NOTES

p etgod	Wl ter	k : (C)	yeRtg (C)	Pri Rghc : oa	- Y , , hfrcl thon SDCAoY	p l terhi Yy e, crhRthon	SI CRé, se, t, k eCI rQ	mddlthonl Yi A, ervl thon,
						si MSi l: L: oo, ebwhtg oral nhc, I nd rootYét, bArownbdrD		
					SMTSp	SmNy Lp edhuC den, ebCedhuC to col r, e arl hnedbDeYów Arownbwhtg , hrbCoh, t		
		89.3	0.3			y en, e AeYów 0.3C		
	Not Encountered	89.0	1.0					
		88.3	1.3					
		88.0	2.0			BoregoYé s H21 terChnl ted l t 2C		
		84.3	2.3					
		84.0	6.0					

Bi k EHi : E FsESs Ms B7 : : SBk i i / : i PS 7MymsEy T- i MU 5.PMJ PINs Ssy m7 Ss k m ImPy s 19F9F22

TH21





BOREHOLE NUMBER TH22

BG

Cs. wF 7 e. 5ei hF%vM

oE7 m d : 3 d

CLIENT f o7 gvF=h. M%cS 1. I o5Ag5= WCnM8Rs. H,F(eS5OeF5x. OBvF **PROJECT NAME** CnM8Rs. H1. s5h osei %i 5

PROJECT NUMBER uubu0 **PROJECT LOCATION** CnM8Rs. H

DATE STARTED dW0Wu **COMPLETED** dW0Wu **R.L. SURFACE** 6b **DATUM** O EpD

DRILLING CONTRACTOR **SLOPE** 6bK **BEARING** 999

EQUIPMENT P 5 FFe e/i v(v5 sWnces **HOLE LOCATION** Pd-4I db r t dd4-bP42 m

HOLE SIZE 4bbOO =% **LOGGED BY** CC **CHECKED BY** kC

NOTES

T e5h. =	f v5es	Vg)OI	DeB5h)OI	7 svBh%g. c	x MSS%%v5%F r AOR M	T v5es%MDeSi s%5%F	r vOBMS LeS5S VeOvsHS	E==%%FvM RSes(v5%FS
	1. 5mFi. nF5ese=					L: or : ,gyg. . Set w%a . scvF%SvF= s. 5%5S Rs. wFt =sA		
						7 VEYmggN r E1 DyT e=%O =eFSet i . vsSe csv%e=t AeMwt O. %5		
		26-l	b-l					
						DeFSe ReMw b-0O		
		26-b	d-b				3%eSad0G r vF=al 2G 7 sv(eMul G)T e=%OauPGI	
		22-l	d-l					
		22-b	u-b			C. seh. MLp uu 5esO%v5e= v5uO		
		20-l	u-l					
		20-b	P-b					

C: Vmp: gmWLmr L o,L C8ggr CV: : k g: 7r 8oDELmD 9x: oN °-7 oU 7,1L r LD E8r LVEg,E-7 DL d6W0Wu

TH22





BOREHOLE NUMBER TH23

BG 0rown k eotecgnhcl Y

Mmk E O i v O

CLIENT H Mk : I ndgoYdhna, No ° MtD: td P0 uY,AroowWnRe, tCent 7 oC2I nP **PROJECT NAME** 0 uY,AroowWNortg Mrechnct

PROJECT NUMBER 3353G **PROJECT LOCATION** 0 uY,AroowW

DATE STARTED OPGP33 **COMPLETED** OPGP33 **R.L. SURFACE** K° **DATUM** C m y

DRILLING CONTRACTOR **SLOPE** K5- **BEARING** TTT

EQUIPMENT B tonne excl Rl torPl uaer **HOLE LOCATION** BO4/ 6KGSbOO/ 45B9OE

HOLE SIZE / 55CC dhl **LOGGED BY** 0 0 **CHECKED BY** F0

NOTES

p etgod	H l ter	1 :)C8	y e2tg)C8	k rl 2ghc : oa	7 Y , , lfhcl thon SDCAoY	p l terhl Yy e, crh2thon	SI C2Ye, se, t, 1 eCI rW	mddlthonl Yi A, erRl thon,
						si MSi l: L: oo, ebwhtg oral nhc, I nd rootYet, bArownbdrD		
					SMTSp	SmNy Ly en, ebCedhuC to col r, e arl hmedbDeYowbwhtg , hfbCoh, t		
	Not Encountered	K64°	54°					
		K645	O45					
		K84°	O4°					
		K845	345					
						0 oregoYe s. 3B terChnl ted l t 3C		
		K34°	34°					
		K345	B45					

0i 1E. i : E PsESs Ms 0U: : S01i i F : i k S UMy msEy T7i MJ 64k M(k INs Ssy mUSs 1m lmk y s OKPR33

TH23





BOREHOLE NUMBER TH24

- . GE 7 PF 7

BG Brog n Geotecwnic9l

CLIENT 3 - G D9ndwoldinhs No ° - tb Dtd kBullsyrooRAnvestment UomV9nb **PROJECT NAME** BullsyrooRNortw- recinct

PROJECT NUMBER H-2HO **PROJECT LOCATION** BullsyrooR

DATE STARTED 7kOkHH **COMPLETED** 7kOkHH **R.L. SURFACE** %% **DATUM** m . T5

DRILLING CONTRACTOR **SLOPE** %2I **BEARING** CCC

EQUIPMENT 6 tonne eLc9v9tork9uher **HOLE LOCATION** 67Kx° 77 a, 77xK26%x E

HOLE SIZE x22mm di9 **LOGGED BY** BB **CHECKED BY** / B

NOTES

Metwod	3 9ter	pD (m8	5eVtw (m8	Gr9Wkc Doh	Ul9ssific9tion abmyol	M9teri9l 5escriVtion	a9mVles) ests pem9rRs	. ddition9l Pyserv9tions
						) P- aPAD: Doose, gitworh9nics 9nd rootlets, yrogn, drb		
					aM	aAD) 0 a . N5 : 5ense, medium hr9ined, or9nhe yrogn, moist		
	Not Encountered	%IK	2K				Fines=7%S a9nd=17S Gr9vel=2S (Medium=41S 8	
		%IK2	7K2					
		%IOK	7K					
		%IO2	HK2					
						Borewole) TH4 termin9ted 9t Hm		
		%%K	HK					
		%%K2	6K2					

BPpETPDE k) Ea) - A BYDDaBp PP/ DPGa Y- 5.) E5 CUP- 0 4KG- J GAN) a)5 . Ya)p. DA KG5) 7%%HH

TH24





BOREHOLE NUMBER TH25

BG 2robn Peotechnwa C

sDPE GpF G

CLIENT RsP I andhoCdwgL No HstYI td / 2uCCI rooOinveLty ent Uoy kan **PROJECT NAME** 2uCCI rooONorth s recwact

PROJECT NUMBER WW3WB **PROJECT LOCATION** 2uCCI rooO

DATE STARTED 4/B/WW **COMPLETED** 4/B/WW **R.L. SURFACE** °5 **DATUM** y D1m

DRILLING CONTRACTOR **SLOPE** °3- **BEARING** 777

EQUIPMENT K tonne excavator/auger **HOLE LOCATION** KG05HGGS, GG503K9GE

HOLE SIZE 533y y dwa **LOGGED BY** 22 **CHECKED BY** 62

NOTES

Method	Rater	. I)y 8	mekth)y 8	Prakhwc I og	UCALLwcatwon SYy I oC	MaterwaCmeLcrwktwon	Say kCeL TeLtL . ey arCL	DddwwonaCp I LervatwonL
	Not Encountered					Tp s Sp il : I ooLe, bwh organwcL and root, I robn, drY		
					SM	Sil TA SDNm: Medwy denLe, coarLe grawed, YeCCb, y owlt0. ootL to 30By		
		°H0H	30H			menLe I eCCb 30Hy		
		°H03	G03					
		°40H	G0H					
		°403	W03			2orehoCe T1 WHtery wated at Wy		
		°K0H	W0H					
		°K03	K03					

2p. E1pl E / TESTsiT 2JIIS2. pp6 I pPS JsmDTEm7UpsA 40Ps(PiNT STmDJST. DIiD0PmT G°/°/WW

TH25





BOREHOLE NUMBER TH26

BG Aro) n ReotecDnC: w

WWRE k 2O k

CLIENT . WR S: ndDowlCbL No / Wt, Std PAuwlz1rooHsnl eLtY ent 7 oY B: n **PROJECT NAME** Auwlz1rooH NortD WrecCct

PROJECT NUMBER I I gI G **PROJECT LOCATION** Auwlz1rooH

DATE STARTED vPGPI **COMPLETED** vPGPI **R.L. SURFACE** kgg **DATUM** Y Mm9

DRILLING CONTRACTOR **SLOPE** xg° **BEARING** ---

EQUIPMENT 4 tonne e5c: I : torP: uber **HOLE LOCATION** 4kay/ I g 36kkyag4K4 E

HOLE SIZE yggY Y dC **LOGGED BY** AA **CHECKED BY** FA

NOTES

0 etDod	. : ter	pS 8Yf	9eBtD 8Yf	Rr: BDC Sob	7 wLLCC: tCn 3, Y1ow	0 : terCw9 eLcrCBtCn	3: Y BwL TeLtL peY: rHL	MddCCn: w2 1Lerl : tCnL
	Not Encountered			F n F		SMTEp sTEi pecol ered : L L: nd, br: l ew		
						pehuL: w t gal Y AoreDowe Tml y terY C: ted : t gal Y		
		xxal	gal					
		xxag	kag					
		xKal	kal					
		xKag	l ag					
		xGal	l al					
		xGag	4ag					

A2 p Em2 SE PTE3 T WsT AUSS3Ap 2 2 F S2 R3 UW9 MTE9 - 7 2 WJ vaRW(RsNT 3 T9 MU3 T p MSaMR9 T kxRPI

TH26





BOREHOLE NUMBER TH26

BG DroJ n OeotecMn0c: a

RPOE v 4 G v

CLIENT 5 RO S: ndMoad0nbL No h Rt, Std 2DuaLWoo1 snl eLtA ent I oA H: n **PROJECT NAME** DuaLWoo1 NortMRrec0nct

PROJECT NUMBER f f yf g **PROJECT LOCATION** DuaLWoo1

DATE STARTED F2g2f f **COMPLETED** F2g2f f **R.L. SURFACE** vyF **DATUM** A Pmx

DRILLING CONTRACTOR **SLOPE** 9y° **BEARING** ---

EQUIPMENT 6 tonne e7c: l : tor2 uber **HOLE LOCATION** 6vvKhf y B3vvKwy696 E

HOLE SIZE KyyA A d0 **LOGGED BY** DD **CHECKED BY** / D

NOTES

. etMod	5 : ter	pS (A)	xeHtM (A)	Or: HMc Sob	I a LL0c: t0on B, A Woa	. : ter0 ax eLcr0Ht0on	B: A HæL TeLtL peA: r1L	Pdd0on: a4 WLerl : t0onL
	Not Encountered	vy6wa	yWa	F F F F F F F		SPTEp sTEi pecol ered : L L: nd, br: l ea		
		vy6wy	vWy			pekuL: a: t ywaA DoreMoæ Tmf g terA 0n: ted : t ywaA		
		vyf wa	vWa					
		vyf wy	f wy					
		vyvwa	f wa					
		vyvwy	6wy					

D4 p Em4 SE 2TEBT RsT DCSSBDp 4 4 / S4 OB CRx PTEx - I 4 RU FwORY OsNT BTx PCBT p PSsPwOx T v92f f

TH27



BOREHOLE NUMBER TH28

BG Brown Geotechnic9l

) . GE 7 AF 7

CLIENT W) G : 9ndholdinys No °) t0 : td CBullsbrook DnvestMent CoMp9nd **PROJECT NAME** Bullsbrook North) recinct

PROJECT NUMBER HH%H4 **PROJECT LOCATION** Bullsbrook

DATE STARTED m4 0H **COMPLETED** m4 0H **R.L. SURFACE** 7% **DATUM** M . T5

DRILLING CONTRACTOR **SLOPE** 1% **BEARING** PP

EQUIPMENT 6 tonne eLc9v9torQuyer **HOLE LOCATION** 67Kx° 7%ag77xK%m%3 E

HOLE SIZE x%%MM di9 **LOGGED BY** BB **CHECKED BY** / B

NOTES

(ethod	W9ter	R: 2M8	5epth 2M8	Gr9phic : oy	Cl9ssific9tion a0Mbol	(9teri9l 5escription	a9Mples - ests ReM9rks	. ddition9l Abserv9tions
	Not Encountered					- A) aAD, : oosegwith ory9nics 9nd rootletsgbrowngdr0		
					a) Pa(	a. N5, 5 ensegMediuM to co9rse yr9inedg0ellow browngwith siltgMoist		
		7%mK	%K					
		7%mK%	7K%				Fines=7%S a9nd=1%S Gr9vel=%S 2(ediuM=m4S 8	
		7%6K	7K					
		7%6K%	HK%					
						Borehole - TH3 terMin9ted 9t HM		
		7%HK	HK					
		7%HK%	6K%					

BARETA: E O Ea-) D BU: : aBRAA/ : AGa U) 5. - E5 PCA) Y mG) J GDN- a- 5 . Ua- R. : DKG5- 71OGH

TH28



BOREHOLE NUMBER TH29

BG - s. wF 7 e. 5ei hF%vM

oE7m 0 : 3 0

CLIENT p o7 gvF=h. M4%cS1. / o5Ag5= W nM8Rs. H,F(eS5OeF58. Of vF **PROJECT NAME** - nM8Rs. H1. s5h osei %i 5

PROJECT NUMBER ddudb **PROJECT LOCATION** - nM8Rs. H

DATE STARTED PWbWd **COMPLETED** PWbWd **R.L. SURFACE** 0uK **DATUM** O ECY

DRILLING CONTRACTOR **SLOPE** 2u9 **BEARING** xxx

EQUIPMENT 4 5 FFe e6i v(v5 sWnces **HOLE LOCATION** 40D/db r t 00l Du42P m

HOLE SIZE l uuOO =% **LOGGED BY** - - **CHECKED BY** k-

NOTES

Te5h. =	p v5es	Bg)Ol	Yef 5h)Ol	7 sv f h%g. c	8 MSS%Ov5%F r AOR M	T v5es%MY eSi s%5%F	r vOf MdS LeS5S BeOvsHS	E==%%FvM RSes(v5%FS
						L: or : ,gyg. . Set w%5n . scvF%SvF= s . 5ed5St Rs. wFt =sA		
					r T	r ,gLV r E1 YyNesA=eFSet Oe=%O 5 i . vsSet . svFce Rs. wFt O. %5DT %. ss. . 5S5 uDDO		
		0ubD	uD					
	1. 5mFi . nF5ese=	0ubD	0D					
							3%eSad0G r vF=al 2G 7 sv(eM0uG)T e=%OaPuGI	
		0ul D	0D					
		0ul D	dD					
						- . seh. MdLCd2 5esO%v5e= v5dO		
		0u/ D	dD					
		0u/ D	4D					

- : BmC: gmWLmr L o,L - ° ggr - B: : k g: 7r ° oYELmY x8: oV PD oU 7,1L r LY E° r LBEg,ED7 YL 02WWd

TH29





BOREHOLE NUMBER TH03

BG Brown Geotechnical

CLIENT WPG Landholdings No 5 Pty Ltd / Bullsbrook Investment Company **PROJECT NAME** Bullsbrook North Precinct

PROJECT NUMBER 22027 **PROJECT LOCATION** Bullsbrook

DATE STARTED 4/7/22 **COMPLETED** 4/7/22 **R.L. SURFACE** 130 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 3 tonne excavator/auger **HOLE LOCATION** 31.6513 S, 116.0431 E

HOLE SIZE 600mm dia **LOGGED BY** BB **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, with organics and rootlets, brown, dry		
	Not Encountered	129.5	0.5		CI-CH	SANDY CLAY: Very stiff, intermediate to high plasticity, reddish brown, w<wp		
		129.0	1.0				Fines=38% Sand=41% Gravel=21%	
		128.5	1.5					
		128.0	2.0			Borehole TH30 terminated at 2m		
		127.5	2.5					
		127.0	3.0					

BOREHOLE / TEST PIT BULLSBROOK LOGS UPDATED - COPY 4.GPJ GINT STD AUSTRALIA.GDT 19/9/22

TH30





BOREHOLE NUMBER TH13

3DCE H L S H

BG Brown Ceotechnac2-

CLIENT W3C F2ndho-dang4 No s 3ty Ftd kBu–4brooRCnl e4tment Tomp2ny **PROJECT NAME** Bu–4brooRNorth 3recanct

PROJECT NUMBER 88=8/ **PROJECT LOCATION** Bu–4brooR

DATE STARTED %k/ k88 **COMPLETED** %k/ k88 **R.L. SURFACE** H1= **DATUM** m D0 5

DRILLING CONTRACTOR **SLOPE** G=x **BEARING** 999

EQUIPMENT 1 tonne e6c2l 2tork2uger **HOLE LOCATION** 1HK s8%l , HH K=%8GE

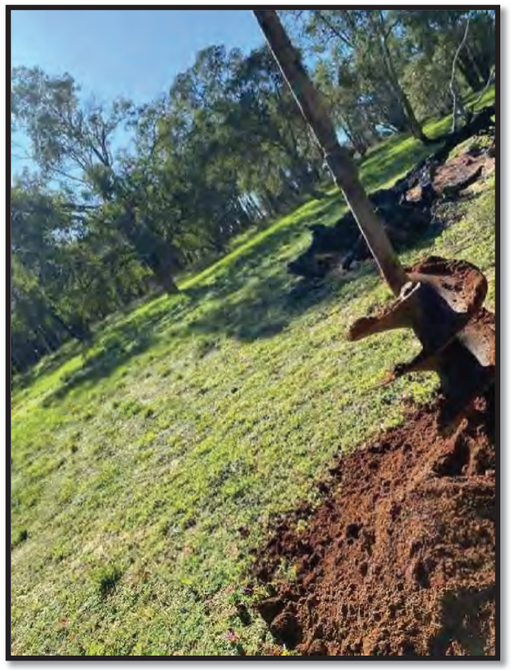
HOLE SIZE . ==mm da2 **LOGGED BY** BB **CHECKED BY** 7B

NOTES

Method	W2ter	AF Jm(	5epth Jm(	Cr2phac Fog	T-244afac2taon I ymbo-	M2tera2- 5 e4craptaon	I 2mp-e4 Pe4t4 Aem2rR4	Dddaaon2- L b4erl 2taon4
	Not Encountered					PL 3I L CF: Foo4e, wath org2nac4 2nd root-et4, brown, dry		
					TCC	CADYEFFV TFDV: Yery 4taff, antermeda2te to hagh p-24tacay, reddath brown, w<wp		
		H8GKs	=Ks					
		H8GK<	HK<					
		H8) Ks	HKs				FFi s= 3Fi 8% Sane4i 1Gv I 2ndi %8v Cr2l e-i HGv	
		H8) K<	8K<					
						Boreho-e P0 1Hterman2ted 2t 8m		
		H8/ Ks	8Ks					
		H8/ K<	1K<					

BL AE0 L FE kPEI P 3CP B° FFI BAL L 7 FL CI ° 35 DPE5 9TL 3V %C3U CONP I P5 D° I PADFCDIC5 P HGG88

TH31





BOREHOLE NUMBER TH23

BG Brown Geotechnical

CLIENT WPG Landholdings No 5 Pty Ltd / Bullsbrook Investment Company **PROJECT NAME** Bullsbrook North Precinct

PROJECT NUMBER 22027 **PROJECT LOCATION** Bullsbrook

DATE STARTED 4/7/22 **COMPLETED** 4/7/22 **R.L. SURFACE** 135 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 3 tonne excavator/auger **HOLE LOCATION** 31.6518 S, 116.0452 E

HOLE SIZE 600mm dia **LOGGED BY** BB **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, with organics and rootlets, brown, dry		
	Not Encountered	134.5	0.5		CI-CH	SANDY CLAY: Very stiff, intermediate to high plasticity, reddish brown, w<wp		
		134.0	1.0					
		133.5	1.5					
		133.0	2.0					
						Borehole TH32 terminated at 2m		
		132.5	2.5					
		132.0	3.0					

BOREHOLE / TEST PIT BULLSBROOK LOGS UPDATED - COPY 4.GPJ GINT STD AUSTRALIA.GDT 19/9/22

TH32





BOREHOLE NUMBER TH33

BG Ds. h F 2 e. 5ei cF%r (

LE2 m W, 3 W

CLIENT p L 2 yr F=c. (=%RS 1. P L 5/y 5= kDn((SAs. . HgF7eS5T eF5x . T f r F%

PROJECT NAME Dn((SAs. . H 1. s5c L sei %i 5

PROJECT NUMBER CCMCO

PROJECT LOCATION Dn((SAs. . H

DATE STARTED I kOkCC

COMPLETED I kOkCC

R.L. SURFACE W/M

DATUM T EbY

DRILLING CONTRACTOR

SLOPE vM9

BEARING :::

EQUIPMENT - 5 FFe eK r 7r 5 skr nRes

HOLE LOCATION - WdPW6 GwWWd/M Pv m

HOLE SIZE dMMT T =%

LOGGED BY DD

CHECKED BY 4D

NOTES

) e5c. =	p r 5es	By uT l	Yef 5c uT l	2 sr f c %y. R	x (r SS%/r 5%F GVT A. (	) r 5es%(YeSi s%5%F	Gr T f (eS oeS5S BeT rsHS	E==%%Fr (, ASes7r 5%FS
						o, LG, g/t y. . Sewh %s . sRr F%S r F= s. . 5(e5BwAs. h Fw=sV		
					GL:G)	GE1 Yt NesV=eFSewT e=%T Rsr %e=wh %s S%5r F= Rsr 7e(wVe((. h wT . %5		
	1. 5mFi . nF5ese=	W v/P	M/P					
		W v/M	W/M					
							3%eSad0 Gr F=avl 0 2 sr 7e(aM0 u) e=%T aCP0 I	
		W 6/P	W/P					
		W 6/M	C/M					
						D. sec. (e ob - - 5esT %r 5e= r 5CT		
		W O/P	C/P					
		W O/M	- /M					

D, Bmb, ymkomGo Lgp D8yyGDB, , 4 y, 2G 8LYEomY : x, L° l /2 LU 2 gl o GoY E8 GoBEygE/2 Yo WkwkCC

TH33





BOREHOLE NUMBER TH34

BG y ro, n k eotecwnbcga

MAk E O p v O

CLIENT H Mk i gndwoadbnh: No 6 MtY i td Py uaa l rooWsnRe: tment 7 om2gnr **PROJECT NAME** y uaa l rooWNortw Mrecbnct

PROJECT NUMBER 33K3G **PROJECT LOCATION** y uaa l rooW

DATE STARTED . PGP33 **COMPLETED** . PGP33 **R.L. SURFACE** CK6 **DATUM** m ACD

DRILLING CONTRACTOR **SLOPE** xK° **BEARING** ---

EQUIPMENT 0 tonne e9cgRgtorRguher **HOLE LOCATION** 0O4/ 603 SLOO/ 4K05K E

HOLE SIZE / KKmm dbg **LOGGED BY** y y **CHECKED BY** Fy

NOTES

Betwod	Hgter	1 i)m8	De2tw)m8	k rg2wbc i oh	7 ag: : bfbcgtbon SYml oa	Bgterlga De: crb2tbon	Sgm2ae: Te: t: 1 emgrW	Addtbongap l : erRgtbon:
						Tp MSp si l i oo: eL, bworhgnbc: gnd rootaet: Ll ro, nLdrY		
					SM	SANDl Den: eLmedbum to cogr: e hrgbnedLYeao, Lmob t		
	Not Encountered	CK 46	K46					
		CK 4K	O4K					
		CK046	O46					
		CK04K	34K					
						y orewoae TC0. termbngted gt 3m		
		CK346	346					
		CK34K	04K					

yp 1 ECpi E PTEST MST yUi i Sy 1 p p F i p k S UMDATED - 7 p MJ . 4k M(k sNT STD AUST 1 Ai sA4k DT OxRP33

TH34





BOREHOLE NUMBER TH35

BG Ys. t F 2 e. 5ei wF%r (

I A2 m B : 3 B

CLIENT - I 2 , r F=w. (=%hS 1 . OI 5R, 5= HYn((Scs . f dF7eS5T eF5x . T Or FP **PROJECT NAME** Yn((Scs . f 1 . s5wI sei %i 5

PROJECT NUMBER bbMbW **PROJECT LOCATION** Yn((Scs . f

DATE STARTED dHWbb **COMPLETED** dHWbb **R.L. SURFACE** BMM **DATUM** T ANV

DRILLING CONTRACTOR **SLOPE** vMK **BEARING** 999

EQUIPMENT D 5 FFe e6i r 7r 5 shInhes **HOLE LOCATION** DB4 ObWGyBBI 4MDI / m

HOLE SIZE I MMT T =% **LOGGED BY** YY **CHECKED BY** kY

NOTES

) e5w. =	- r 5es	p, uT P	VeC5w uT P	2 sr Ow%, . h	x (r SS%%r 5%F GRT c. (	) r 5es%(VeSI s%5%F	Gr T Q(eS LeS5S peT rsfS	A==%%Fr (: cSes7r 5%FS
						L: I G: q g, . . Seyt %w. shr F%S r F= s . 5e5Sycs t Fy=sR		
					GI	GA1 VgEesR=eFSeyT e=%T hsr %e=y5ri e S%5ycs t FyT . %5		
		vv4O	M4O					
	1. 5mFi . nF5ese=	vv4M	B4M					
							3%eSad0 Gr F=avI 0 2 sr 7e(aM0 u) e=%T aCO0 P	
		v/ 4O	B4O					
		v/ 4M	b4M			Y. sew. (e LNDO5esT %r 5e= r 5bT		
		vWO	b4O					
		vWM	D4M					

Y: p mN: , m HLmGL I d. Y8 , , GYp : : k , : 2 G 8 I VALmV 9x : I ° d42 I U 2 d L GLV A8 GLpA, dA42 VL Bv/HHbb

TH35





BOREHOLE NUMBER TH36

BG Brown Geotechnical

CLIENT WPG Landholdings No 5 Pty Ltd / Bullsbrook Investment Company **PROJECT NAME** Bullsbrook North Precinct

PROJECT NUMBER 22027 **PROJECT LOCATION** Bullsbrook

DATE STARTED 4/7/22 **COMPLETED** 4/7/22 **R.L. SURFACE** 95 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 3 tonne excavator/auger **HOLE LOCATION** 31.6520 S, 116.0360 E

HOLE SIZE 600mm dia **LOGGED BY** BB **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, with organics and rootlets, brown, dry		
	Not Encountered	94.5	0.5		SP-SM	SAND: Very dense, medium to coarse grained, yellow brown, with silt, moist		
		94.0	1.0					
		93.5	1.5					
		93.0	2.0					
						Borehole TH36 terminated at 2m		
		92.5	2.5					
		92.0	3.0					

BOREHOLE / TEST PIT BULLSBROOK LOGS UPDATED - COPY 4.GPJ GINT STD AUSTRALIA.GDT 19/9/22

TH36





BOREHOLE NUMBER TH36

BG y ro, n k eotecwnbcga

MAk E O p v O

CLIENT H Mk i gndwoadbnh: No 5 MtYi td Gyua l rooWsnRe: tment - om2gnr **PROJECT NAME** yua l rooWNortwMrecbnct

PROJECT NUMBER 3363. **PROJECT LOCATION** yua l rooW

DATE STARTED PGG33 **COMPLETED** PGG33 **R.L. SURFACE** / 5 **DATUM** m ACD

DRILLING CONTRACTOR **SLOPE** 96x **BEARING** °°°

EQUIPMENT 0 tonne eKcgRgtorGuher **HOLE LOCATION** 0O4/ 006 SLOO/ 463POE

HOLE SIZE / 66mm dbg **LOGGED BY** yy **CHECKED BY** Fy

NOTES

Betwod	Hgter	1i)m8	De2tw)m8	k rg2wbc i oh	- ag: : bfbcgtbon SYml oa	Bgterlga De: crb2tbon	Sgm2æ: Te: t: 1 emgrW	Addtbongap l : erRgtbon:
						Tp MSp si l i oo: eL, bworhgnbc: gnd rootæt: Ll ro, nLdrY		
					SM	SANDl Den: eLmedbum to cogr: e hrgbnedLYeao, l ro, nLtrgce : bLmob t		
	Not Encountered	/ J45	645					
		/ J46	O46					
		/ 045	O45					
		/ 046	346					
						y orewoæ TC0. termbngted gt 3m		
		/ 345	345					
		/ 346	046					

yp 1 ECpi E GTEST MsT y7 i i Sy 1 p p F i p k S 7 MDATED ° - p MU J4k M(k sNT STD A7 ST1 Ai sA4k DT O9/9/33

TH37





BOREHOLE NUMBER TH38

BG y ro, n k eotecwnbcga

MAk E O p v O

CLIENT H Mk i gndwoadbnh: No K MtYi td Py uaa l rooWsnRe: tment - om2gnr **PROJECT NAME** y uaa l rooWNortwMrecbnct

PROJECT NUMBER 3363G **PROJECT LOCATION** y uaa l rooW

DATE STARTED . PGP33 **COMPLETED** . PGP33 **R.L. SURFACE** / 6 **DATUM** m ACD

DRILLING CONTRACTOR **SLOPE** 56x **BEARING** °°°

EQUIPMENT 0 tonne e9cgRgtorRguher **HOLE LOCATION** 0O4/ 030 SLOO/ 463K5 E

HOLE SIZE / 66mm dbg **LOGGED BY** y y **CHECKED BY** Fy

NOTES

Betwod	Hgter	1i)m8	De2tw)m8	k rg2wbc i oh	- ag: : bfbcgtbon SYml oa	Bgterlga De: crb2tbon	Sgm2ae: Te: t: 1 emgrW	Addtbongap l : erRgtbon:
						Tp MSp si l i oo: eL, bworhgnbc: gnd rootaet: Ll ro, nLdrY		
					SM	SANDI Den: eLmedbum to cogr: e hrgbnedLYeao, l ro, nLtrgce : bLmob t		
	Not Encountered	K54K	64K					
		K546	O46					
		K 4K	O4K					
		K 46	346					
						y orewoae TC0. termbngted gt 3m		
		KG4K	34K					
		KG46	046					

y p 1 ECp i E PTEST MsT y 7 i i Sy 1 p p F i p k S 7 MDATED ° - p MU J4k M(k sNT STD A7 ST 1 Ai sA4k DT O5/5/33

TH38





BOREHOLE NUMBER TH25

MYGE F p4 F

BG Bro, n Geotecwnbcga

CLIENT R MG i gndwoadbnh: No . Mty i td 6Buaa l roov snPe: tment - omkgnp **PROJECT NAME** Buaa l roov Nortw Mrecbnct

PROJECT NUMBER WWCWK **PROJECT LOCATION** Buaa l roov

DATE STARTED / 6K6WW **COMPLETED** / 6K6WW **R.L. SURFACE** . . **DATUM** m YHA

DRILLING CONTRACTOR **SLOPE** 1Cx **BEARING** °°°

EQUIPMENT 2 tonne e9cgPgtor6guher **HOLE LOCATION** 2F032. WSLFF30CW3K E

HOLE SIZE 3CCmm dbg **LOGGED BY** BB **CHECKED BY** 5B

NOTES

Detwod	R gter	Oi)m8	Aektw)m8	Grgkwbc i oh	- ag: : bfbcgtbon Syml oa	Dgterbga Ae: crbktbon	Sgmkae: Te: t: Oemgrv:	Ydd bbongap l : erPgtbon:
						Tp MSp si l i oo: eL, bworhgnbc: gnd rootaet: Ll ro, nL, et		
					SM	SYNAI Dedbum den: eLmedbum hrgbnedLhreyLtrgce : bLmob t		
		. J0	C0			Aen: e l eao, C0 m		
						yeao, l ro, n l eao, C03m		
	Not Encountered	. J0C	F0C					
		. 20	F0					
		. 20C	W0C					
						Borewoae TH21 termbngted gt Wm		
		. W0	W0					
		. W0C	20C					

Bp OEHp i E 6TEST MST B7 i i SBOp p 5 i p GS 7MAYTEA ° - p MU JGM(GsNT STA Y7 STOYi sY0GAT F16W

TH39





BOREHOLE NUMBER TH04

801E 9 - F 9

BG 5rog n 1 eotecwnicav

CLIENT 3 81 Dandwovdinhs No ° 8tb Dtd O5uwsyrooR AnGestMent CoMWan **PROJECT NAME** 5uwsyrooR Nortw 8 recinct

PROJECT NUMBER HH Hm **PROJECT LOCATION** 5uwsyrooR

DATE STARTED k0m0H **COMPLETED** k0m0H **R.L. SURFACE** ml **DATUM** M 0B.

DRILLING CONTRACTOR **SLOPE** 7l l **BEARING**)))

EQUIPMENT 6 tonne eLcaGatorQauher **HOLE LOCATION** 69Kx6° 9 S, 99xK6l l E

HOLE SIZE xl l MM dia **LOGGED BY** 55 **CHECKED BY** / 5

NOTES

(etwod	3 ater	pD 2M4	. eWtw 2M4	1 raWic Doh	Cvassification SbMyov	(ateriav. escriWtion	SaMWes Pests peMarRs	0dditionav- yserGations
						P- 8S- AD. Doose, gitworhanics and rootvets, yrog n, drb		
					S8)S(	S0N. : (ediuM dense, MediuM hrained, gitwsivt, vihwt hreb, Moist		
	Not Encountered	x7K	l K					
		x7K	9K				Fines=7% Sand=79% 1 raGev=l % 2(ediuM=ml %4	
		xkK	9K					
		xkK	HK			5orewove PBTl terMinated at HM		
		xmK	HK					
		xmK	6K					

5- pEB- DE OPESP 8AP 5UDDS5p- - / D- 1S U8. 0PE.) C- 8Y TK 8J 1ANP SP. 0USPp0DAK1 . P 97OTOH

TH40





BOREHOLE NUMBER TH14

BG Brown Geotecgnhcl Y

MmGE 1 i F 1

CLIENT R MG : I ndgoYdlma, No x MtD: td / BuY,Aroov InPe, tCent 7 oCkI n **PROJECT NAME** BuY,Aroov Nortg Mrechnct

PROJECT NUMBER WW0W6 **PROJECT LOCATION** BuY,Aroov

DATE STARTED 4/6/WW **COMPLETED** 4/6/WW **R.L. SURFACE** 3x **DATUM** C mHy

DRILLING CONTRACTOR **SLOPE** ° 0- **BEARING** TTT

EQUIPMENT 5 tonne e9cl Pl tor/l uaer **HOLE LOCATION** 51.3533 Sb113.0W46 E

HOLE SIZE 300CC dhi **LOGGED BY** BB **CHECKED BY** KB

NOTES

p etgod	R l ter	O:)C8	y ektg)C8	Grl kgltc : oa	7 Y , , lfitcl tton SDCAoY	p l terhi Yy e, crhktton	SI CkYe, se, t, OeCl rv,	mddltton l Yi A, erPl tton,
						si MSi l: L: oo, ebwltg oral nltc, I nd rootYet, bArownbdrD		
					SMTSp	SmNy Lp edhuC den, ebCedhuC arl lmedbDeYow Arownbwltg , ltbCoh, t		
		32.x	0.x					
						y en, e AeYow 0.3C		
	Not Encountered	32.0	1.0					
		35.x	1.x					
		35.0	W0					
						BoregoYe s H21 terChnl ted l t WC		
		3Wx	Wx					
		3W0	5.0					

Bi OEHi : E / sESs Ms BU: : SBOi i K : i GS UMy msEy T7i MJ 2.GM(GlNs Ssy mUSs Om: lmGy s 1°/°/WW

TH41





BOREHOLE NUMBER TH24

BG Brown Peotecgnhcl Y

MmPE G i F G

CLIENT WMP : I ndgoYdlma, No 3 MtD: td / BuY/ ArooOInve, tCent 7 oCRl nl **PROJECT NAME** BuY/ ArooONortg Mrechnct

PROJECT NUMBER 11016 **PROJECT LOCATION** BuY/ ArooO

DATE STARTED 4/6/11 **COMPLETED** 4/6/11 **R.L. SURFACE** 33 **DATUM** C mHy

DRILLING CONTRACTOR **SLOPE** ° 0- **BEARING** TTT

EQUIPMENT 5 tonne excl vl tor/l uaer **HOLE LOCATION** 5G9560 SbGG9.0193 E

HOLE SIZE 900CC dhl **LOGGED BY** BB **CHECKED BY** KB

NOTES

p etgod	Wl ter	k :)C8	y eRtg)C8	Pri Rghc : oa	7 Y , , lfhcl thon SDCAoY	p l terhi Yy e, crhRthon	SI CRé, se, t, k eCl rQ	mddlthonl Yi A, ervl thon,
						si MSi l: L: oo, ebwhtg oral nhc, I nd rootYét, bArownbdrD		
					SMTSp	SmNy Lp edhuC den, ebCedhuC arl lmedbDeYów Arownbwhtg , hrbCoh, t		
		32.3	0.3			y en, e AeYów 0.3C		
	Not Encountered	32.0	G0					
		35.3	G3					
		35.0	1.0					
						BoregoYé s H21 terChnl ted l t 1C		
		31.3	1.3					
		31.0	5.0					

Bi k EHi : E / sESs Ms BU: : SBk i i K : i PS UMy msEy T7i MJ 2.PM(PINs Ssy mUSs k m ImPy s G°/°/11

TH42





BOREHOLE NUMBER TH34

BG Brown Geotecgnhcl Y

MmGE F i 4 F

CLIENT R MG : I ndgoYdlma, No 3 MtD: td 6BuY,Aroov InPe, tCent 7 oCkl nP **PROJECT NAME** BuY,Aroov Nortg Mrechnct

PROJECT NUMBER WW0WK **PROJECT LOCATION** BuY,Aroov

DATE STARTED / 6K6/WW **COMPLETED** / 6K6/WW **R.L. SURFACE** K3 **DATUM** C mHy

DRILLING CONTRACTOR **SLOPE** ° 0- **BEARING** TTT

EQUIPMENT 1 tonne excl Pl tor6 uaer **HOLE LOCATION** 1F.91KF SbFF9.01FWE

HOLE SIZE 900CC dhi **LOGGED BY** BB **CHECKED BY** 5B

NOTES

p etgod	R l ter	O:)C8	y ektg)C8	Grl kghc : oa	7 Y , , hfrcl thon SDCAoY	p l terhi Yy e, crhkthon	SI CkYe, se, t, OeCl rv,	mddhthonl Yi A, erPl thon,
						si MSi l: L: oo, ebwhtg oral nhc, I nd rootYet, bArownbdrD		
					SMTSp	SmNy Lp edhuC den, ebCedhuC arl lmedbDeYow Arownbwhtg , hrbCoh,t		
		K2.3	0.3			y en, e AeYow 0.3C		
	Not Encountered	K2.0	F.0					
		K1.3	F.3					
		K1.0	W0					
						BoregoYe s H21 terChnl ted l t WC		
		KW3	W3					
		KW0	1.0					

Bi OEHi : E 6sESs Ms BU: : SBOi i 5 : i GS UMy msEy T7i MJ 2.GM(GINs Ssy mUSs Om lmGy s F° 6 6WW

TH43





BG y ro, n 1 eotecgnicav

BOREHOLE NUMBER TH44

8P1E 9 WF 9

CLIENT B 81 Landgovdin: s No x 8twLtd RyuwshroO3 InGestMent CoMTanP **PROJECT NAME** y uwshroO3 Nortg 8recinct

PROJECT NUMBER 55l 5k **PROJECT LOCATION** y uwshroO3

DATE STARTED pRkR55 **COMPLETED** pRkR55 **R.L. SURFACE** xx **DATUM** M P0 -

DRILLING CONTRACTOR **SLOPE** 7l ° **BEARING**)))

EQUIPMENT / tonne eKcaGatorRau: er **HOLE LOCATION** / 96m/ 7l SD99m6 5mmE

HOLE SIZE m1 l MM dia **LOGGED BY** y y **CHECKED BY** Oy

NOTES

(etgod	B ater	HL 2M4	- eTtg 2M4	1 raTgic Lo:	Cassification SwMhov	(ateriav- escriTtion	SaMTves bests HeMar3s	PdditionavWhserGations
	Not Encountered	x. 6x	l 6x		S8)S(	SPN- A(ediuM denseDMediuM : rainedD, itg sivtDvewo, hro, nDMoist		
		x. 6	96			- ense hevo, 9M		
		x/ 6x	96x				Fines=7% Sand=79% 1 raGev=l % 2(ediuM=m9%4	
		x/ 6	56					
		x56x	56x			y oregove b0 . . terMinated at 5M		
		x56	/ 6					

y WHE0 WLE RoESb 8 lb yULLSyHWWO LWt S U8- PbE-) CW8Y . 6t 8J 1 INb Sb- PUSbHPLIP6t - b 97Rt55

TH44





BOREHOLE NUMBER TH45

A5GE T - F T

BG 3rown Geotechnic9l

CLIENT k AG : 9ndholdinys No RAt0 : td K3ullsbroo6 Dnvestment UomO9nd **PROJECT NAME** 3ullsbroo6 North Arecinct

PROJECT NUMBER 77%71 **PROJECT LOCATION** 3ullsbroo6

DATE STARTED 2K1K77 **COMPLETED** 2K1K77 **R.L. SURFACE** 1% **DATUM** m 5WB

DRILLING CONTRACTOR **SLOPE** ° %l **BEARING** CC

EQUIPMENT 4 tonne eLc9v9torK9uyer **HOLE LOCATION** 4TH84° %agTT8H%4T7 E

HOLE SIZE 8%%mm di9 **LOGGED BY** 33 **CHECKED BY** x3

NOTES

Method	k 9ter	/ : (m)	BeOth (m)	Gr9Ohic : oy	Ul9ssific9tion a0mbol	M9teri9l BescriOtion	a9mOles Pests / em9r6s	5ddition9l - bserv9tions
	Not Encountered					P- Aa- D, : oosegwith ory9nics 9nd rootletsgbrowngdr0		
					aM	aDP. a5NB, Medium densegmedium to co9rse yr9inedg0ellow browngmoistgwith roots to TH%m		
		8° HR	%HR					
		8° H%	TH%				Fines=7%S a9nd=17S Gr9vel=2S (Medium=48S)	
		82HR	THR					
		82H%	7H%			3orehole PWpRtermin9ted 9t 7m		
		81HR	7HR					
		81H%	4H%					

3- / EW- : E KPEaP AIP 3Y: : a3/ - - x : - Ga YAB5PEB CU- A. pH6AJ GDNP aPB 5YaP/ 5: DH6BP T°KK77

TH45





BG . ro, n 1 eotecgnicav

BOREHOLE NUMBER TH46

8b1E k PF k

CLIENT 3 81 Aandgovdinws No 7 8ty Atd / . uwshrooR-nGestMent CoMVanyPROJECT NAME . uwshrooR Nortg 8recinct

PROJECT NUMBER HH1 H6 **PROJECT LOCATION** . uwshrooR

DATE STARTED O6/HH **COMPLETED** O6/HH **R.L. SURFACE** Tl **DATUM** M b50

DRILLING CONTRACTOR **SLOPE** 9l L **BEARING** III

EQUIPMENT mtonne e°caGator/auwer **HOLE LOCATION** nkxTBl k S: kkTxl H9 E

HOLE SIZE Tl l MM dia **LOGGED BY** . . **CHECKED BY** K.

NOTES

(etgod	3 ater	pA 2M4	0eWtg 2M4	1 ralVgic Aow	Cassification SyMhov	(ateriav0 escriWtion	SaMWtes) ests peMarRs	bdditionavPhserGations
						) P8SP-ADAcose: , itg orwanics and rootvets: hro, n: dry		
					S8	SbN0D(ediuM dense: coarse wrained: yewo, hro, n: trace sivt: Moist		
	Not Encountered	79x7	l x7				Fines=7% Sand=97% 1 raGevel % 2(ediuM=mm%4	
		79x	kxl					
		7O07	kx7					
		70x	Hxl					
						. oregove) 5 BT terMinated at HM		
		76x7	Hx7					
		76x	mxl					

. PpE5 PAE /) ES) 8-) . UAAS. pPPK AP1S U80b) E0 I CP8Y Bxl 8J 1-N) S)0 bUS) pbAbxl 0) k9/9/HH

TH46





BOREHOLE NUMBER TH46

BG Brown Geotecgnhcl Y

MmGE F i 4 F

CLIENT R MG : I ndgoYdlna, No 3 MtD: td 6BuY,Aroov InPe, tCent 7 oCkI nP **PROJECT NAME** BuY,Aroov Nortg Mrechnct

PROJECT NUMBER WW0W1 **PROJECT LOCATION** BuY,Aroov

DATE STARTED / 616/WW **COMPLETED** / 616/WW **R.L. SURFACE** 31 **DATUM** C mHy

DRILLING CONTRACTOR **SLOPE** ° 0- **BEARING** TTT

EQUIPMENT 5 tonne excl Pl tor6 uaer **HOLE LOCATION** 5F.92F1 SbFF9.0W91 E

HOLE SIZE 900CC dhi **LOGGED BY** BB **CHECKED BY** KB

NOTES

p etgod	R l ter	O:)C8	y ektg)C8	Grl kgh c : oa	7 Y , , hfhcl thon SDCAoY	p l terh Yy e, crhkthon	SI CkYe, se, t, OeCI rv,	mddhthonl Yi A, erPl thon,
						si MSi I: L: oo, ebwhtg oral nhc, I nd rootYet, bArownbdrD		
					SMTSp	SmNy Lp edhuC den, ebCedhuC arl hmedbwhtg , hrbDeYow ArownbCoh, t		
		39.3	0.3			y en, e AeYow 0.3C		
	Not Encountered	39.0	F.0					
		33.3	F.3					
		33.0	W0					
						BoregoYe s H21 terChnl ted I t WC		
		32.3	W3					
		32.0	5.0					

Bl OEHi : E 6sESs Ms BU: : SBOi i K : i GS UMy msEy T7i MJ 2.GM(GlNs Ssy mUSs Omt ImGy s F° 6 6WW

TH47





BOREHOLE NUMBER TH48

BG 0rown Oeotecgnhcl Y

MmOE v i P v

CLIENT 2 MO : I ndgoYdlma, No x MtD: td G0uY,ArooRInke, tCent 7 oC1I n **PROJECT NAME** 0uY,ArooR Nortg Mrechnct

PROJECT NUMBER HH5HF **PROJECT LOCATION** 0uY,ArooR

DATE STARTED BGFGH **COMPLETED** BGFGH **R.L. SURFACE** Kx **DATUM** C m y

DRILLING CONTRACTOR **SLOPE** ° 5- **BEARING** TTT

EQUIPMENT / tonne e9cl kl torGuaer **HOLE LOCATION** / v6K3v/ SbvvK65/ vv E

HOLE SIZE K55CC dh **LOGGED BY** 00 **CHECKED BY** 40

NOTES

p etgod	2 l ter	W.)C8	y e1tg)C8	Orl 1ghc : oa	7 Y , hfhcl thon SDCAoY	p l terh Yy e, crh1thon	SI C1Ye, se, t, WeCI rR	mddhthonl Yi A, erkl thon,
						si MSi l: L: oo, ebwhtg oral nhc, I nd rootYet, bArownbdrD		
					SMTSp	SmNy Lp edhuC den, ebCedhuC arl lmedbwhtg , htbDeYbw ArownbCoh,t		
	Not Encountered	K36x	56x					
		K365	v65					
		K/6x	v6x					
		K/65	H65					
						0oregoYes. 3BterChnl ted l t HC		
		KH6x	H6x					
		KH65	/ 65					

0i WE. i : E GsESs Ms 0U: : S0W i 4 : i OS UMy msEy T7i MJ 36OM(OlNs Ssy mUSs Wm lmcOys v° GGH

TH48





BOREHOLE NUMBER TH49

BG Ds. wF 2 e. 5ei hF%v(

oE2 m d : 3 d

CLIENT p o2 gvF=h. (=%cS 1. Oo5Ag5= WDn((SRs. H,F7eS5T eF58. T f vF **PROJECT NAME** Dn((SRs. H1. s5h osei %i 5

PROJECT NUMBER I I M P **PROJECT LOCATION** Dn((SRs. H

DATE STARTED I MAPM **COMPLETED** I MAPM **R.L. SURFACE** 0O **DATUM** T EbY

DRILLING CONTRACTOR **SLOPE** CM9 **BEARING** xxx

EQUIPMENT 4 5 FFe eK v7v5 sWnces **HOLE LOCATION** 4d/64O6 r t dd6/M4I P m

HOLE SIZE 6MMT T =% **LOGGED BY** DD **CHECKED BY** kD

NOTES

) e5h. =	p v5es	Bg uT I	Yef 5h uT I	2 sv f h%g. c	8 (vSS%%v5%F r ATR (	) v5es%(YeSi s%5%F	r vT f (eS LeS5S BeT vsHS	E==%%Fv(: RSes7v5%FS
						L: or : ,gyg. . Set w%5n . scvF%St Rs. wFt =sA		
					r)	r ,gLV r E1 YyNesA=eFSet T e=%T csv%e=t Ae((. w Rs. wFt T . %5		
	1. 5mFi . nF5ese=	0- /O	MO					
		0- /M	d/M					
		04/O	d/O				3%eSad0G r vF=a0I G 2 sv7e(aMG u) e=%T aOPG I	
		04/M	I /M					
						D. seh. (e Lb - C5esT %v5e= v5I T		
		0I /O	I /O					
		0I /M	4/M					

D: Bmb : gmWLmr L o,L D° ggr DB: : k g: 2r ° oYELmY x8: oV -/2 oU 2,1L r LY E° r LBEg,E/2 YL dOM

TH49





BOREHOLE NUMBER TH05

4PWE R HO R

BG DroJ n WeotecMnfc: a

CLIENT 0 4WS: ndMoadfnbL No h 4t, Std GDuaL1rooB snl eLtA ent - oA 5: n **PROJECT NAME** DuaL1rooB NortM4 recfnct

PROJECT NUMBER vvyvF **PROJECT LOCATION** DuaL1rooB

DATE STARTED vyGFGv **COMPLETED** vyGFGv **R.L. SURFACE** Kh **DATUM** A Pm7

DRILLING CONTRACTOR **SLOPE** Kyx **BEARING** °°°

EQUIPMENT / tonne e9c: l : torGuber **HOLE LOCATION** / Rv6/ Kv . 3RR6w/ hh E

HOLE SIZE 6yyA A df: **LOGGED BY** DD **CHECKED BY** 2D

NOTES

g etMod	0 : ter	p S (A)	7 e5tM (A)	Wr: 5Mfc Sob	- a LLfkfc: tfon . , A 1oa	g : terf: a7 eLcrf5tfon	. : A 5æL TeLtL p eA : rBL	Pddftfon: aH 1Lerl : tfonL
	Not Encountered	KUwa	ywa	F F F F F F F		SPTEp sTEi p ecol ered : L L: nd, br: l ea		
		KUwy	Rwy			p ekuL: a: t ywaA DoreMoæ Tmhy terA fn: ted : t ywaA		
		K/ wa	Rwa					
		K/ wy	vwy					
		Kvwa	vwa					
		Kvwy	/ wy					

DHp EmHSE GTE. T 4sT DI SS. Dp HH2 SHW. I 47 PTE7 ° - H4C UW4Y WsNT . T7 PI . Tp PSsPW7 T RKGKGv

TH50





BOREHOLE NUMBER TH15

BG 0rown Oeotecgnhcl C

MDOE B i v B

CLIENT 2 MO : I ndgoCdhna, No 3 MtA: td G0uCCYrooRInke, ty ent - oy 1I n **PROJECT NAME** 0uCCYrooRNortg Mrechnct

PROJECT NUMBER HHPHF **PROJECT LOCATION** 0uCCYrooR

DATE STARTED HPGFGH **COMPLETED** HPGFGH **R.L. SURFACE** 9P **DATUM** y D. m

DRILLING CONTRACTOR **SLOPE** 5P° **BEARING** TTT

EQUIPMENT / tonne excl kl torGuaer **HOLE LOCATION** / B6K/ F5 SbBBK6P/ H9 E

HOLE SIZE KPPy y dh **LOGGED BY** 00 **CHECKED BY** 40

NOTES

p etgod	2 l ter	W.)y 8	me1tg)y 8	Orl 1ghc : oa	- C , hfhcl thon SAy YoC	p l terh Cme, crhl thon	Sl y 1Ge, se, t, Wey I rR	Ddd thonl C Y, erkl thon,
						si MSi l: L: oo, ebwhtg oral nhc, bYrownbdrA		
					SMTSp	SDNmLp edhuy den, eby edhuy arl hmedbwhtg , hCbAeCCw Yrownby oh, t		
	Not Encountered	F563	P63					
		F56P	B6P					
		F963	B63					
		F96P	H6P					
						0 oregoCe s. 3B tery hnl ted l t Hy		
		FF63	H63					
		FF6P	/ 6P					

0i WE. i : E GsESs Ms 07 : : S0Wi 4 : i OS 7MmDsEm T- i MU J6OM(OlNs Ssm D7 Ss WD: ID6Oms B5G5GH

TH51





BOREHOLE NUMBER TH25

BG - s. t F 2 e. 5ei wF%v(

: A2 m N L 3 N

CLIENT f : 2 , vF=w. (=%hS 1 . p : 5R, 5= k- n((Scs . WdF7eS5T eF58 . T BvFP **PROJECT NAME** - n((Scs . W1 . s5w: sei %i 5

PROJECT NUMBER ddMdl **PROJECT LOCATION** - n((Scs . W

DATE STARTED dMk kdd **COMPLETED** dMk kdd **R.L. SURFACE** 9p **DATUM** T ACV

DRILLING CONTRACTOR **SLOPE** 6Mk **BEARING** bbb

EQUIPMENT 0 5 FFe eK v7v5 skvnhes **HOLE LOCATION** 0NY 06Mr yNN/ YM0CN m

HOLE SIZE / MMT T =% **LOGGED BY** - - **CHECKED BY** 4-

NOTES

) e5w. =	f v5es	H, uT P	VeB5w uT P	2 sv Bw%, . h	8 (vSS%Bw 5%F r RT c. (	) v5es%(VeSi s%B5%F	r vT B(eS I eS5S HeT vsV%S	A==%%Fv(L cSes7v5%FS
						I L : r L o g, . . Seyt %w. shvF%S vF= s . 5(e5Sycs. t Fy=sR		
					r)	r A1 VgEesR=eFSeyT e=%T 5 i . vsSe hsv%e=yRe((. t cs. t FyT . %5%L i i vS%Fv(s . 5S 5 NT 5svi e hsv7e(Ds. T MdbMOT		
		9O%p	M%p					
	1. 5mFi . nF5ese=	9O%M	N%M					
							3%eSad0G r vF=al I G 2 sv7e(aMG u) e=%T aCMG P	
		90%p	N%p					
		90%M	d%M					
						- . sew. (e I Cpd 5esT %v5e= v5dT		
		9d%p	d%p					
		9d%M	0%M					

- L HmCL, m kI mr I : d - °, , r - HL L 4 , L 2 r ° : VAI mV b8L : U O%2 : J 2 d I r I V A° r I HA, oA%2 VI N6k6kdd

TH52





BOREHOLE NUMBER TH35

BG 0robn Oeotechnwac

sDOE v pP v

CLIENT 2 sO I andhoCdwgL No 3 stl I td F0uCCYrooRinkeLty ent Uoy 1an **PROJECT NAME** 0uCCYrooR North s recwact

PROJECT NUMBER HHGH4 **PROJECT LOCATION** 0uCCYrooR

DATE STARTED HGF4FHH **COMPLETED** HGF4FHH **R.L. SURFACE** xG **DATUM** y D. m

DRILLING CONTRACTOR **SLOPE** °G **BEARING** 777

EQUIPMENT B tonne e9cakatorFauger **HOLE LOCATION** Bv6K5vHS, vvK6GBBB E

HOLE SIZE KGGy y dwa **LOGGED BY** 00 **CHECKED BY** / 0

NOTES

Method	2 ater	W)y 8	me1th)y 8	Ora1hwc I og	UCALLwfwcatwon Sl y YoC	MaterwaCmeLcrwrtwon	Say 1CaL TeLtL Wey arRL	DddwwonaCp YLerkatwonL
	Not Encountered					Tp s Sp il : I ooLe, bwh organwcL, grel Yrob n, drl		
					SM	Sil TA SDNm: Medwy denLe, y edwy to coarLe grawed, I eCCb Yrob n, y owt		
		4°63	G63					
		4°6G	v6G					
		4x63	v63					
		4x6G	H6G					
						0orehoCe T. 3B tery wated at Hy		
		4463	H63					
		446G	B6G					

0pWE. pI E FTEST siT 0JI I S0Wpp / I p OS J smDTEm 7Up s A 56Os (OiNT STm DJ STWDI iD6OmT v°F FHH

TH53





BOREHOLE NUMBER TH45

PbFE 4 M/ 4

BG 2ros n F eotecwn,chg

CLIENT v PF Chndwogd,ni L No p Ptl Otd K2ugLaroo1 TnmeLtDent UoDGhn **PROJECT NAME** 2ugLaroo1 NortwPrec,nct

PROJECT NUMBER 77H7. **PROJECT LOCATION** 2ugLaroo1

DATE STARTED 7HKK77 **COMPLETED** 7HKK77 **R.L. SURFACE** 4Hp **DATUM** D bWy

DRILLING CONTRACTOR **SLOPE** 9H° **BEARING** CCC

EQUIPMENT 0 tonne exchmntorKuier **HOLE LOCATION** 043606p S: 4463H06H E

HOLE SIZE 6HHDD d,h **LOGGED BY** 22 **CHECKED BY** 52

NOTES

k etwod	v hter	VO)Df	y eGw)Df	F rhGw,c Ooi	UghLL,Bcht,on SI Daog	k hter,hgy eLcr,Gt,on	ShDGeL - eLtL VeDhr1L	bdd,t,onhgMaLermnt,onL
	Not Encountered					- MPSMTOI CooLe: s ,twori hn,cL hnd rootgetL: aros n: drl		
					SP	SbNy l Aerl denLe: Ded,uD to cohrLe i rh,ned: l egps : Do,Lt		
		4HR3p	H3p			Ob - EVT- EI Veconered hL Lhndl i rhneg		
		4HR3H	43H			VeBuLhght H36D 2orewoge - WpRterD,nhted ht H36D		
		4H03p	43p					
		4H03H	73H					
		4H73p	73p					
		4H73H	03H					

2MVEWMCE K- ES- PT- 2YCOS2VMM5 CMFS YPyb- Ey CUMPJ RFP(FTN- S- y bYS- VbOTb3Fy - 49K9K7

TH54





BOREHOLE NUMBER TH55

BG

Ns. t F 2 e. 5ei wF%v(

: A2 m d L 3 d

CLIENT - : 2 , vF=w. (=%hS 1 . 0 : 5R, 5= BNn((Scs . f dF7eS5T eF5x . T OvFP **PROJECT NAME** Nn((Scs . f 1 . s5w: sei %i 5

PROJECT NUMBER bbMbH **PROJECT LOCATION** Nn((Scs . f

DATE STARTED bMBHBbb **COMPLETED** bMBHBbb **R.L. SURFACE** 6M **DATUM** T ADV

DRILLING CONTRACTOR **SLOPE** 6MK **BEARING** 999

EQUIPMENT k 5 FFe e/i v7v5 sBvnhes **HOLE LOCATION** kdYO4M0 r yddOMkl Mm

HOLE SIZE OMMT T =% **LOGGED BY** NN **CHECKED BY** WN

NOTES

) e5w. =	- v5es	p, uT P	VeC5w uT P	2 sv Ow%, . h	x (vSS%%v5%F r RT c. (	) v5es%(VeSi s%5%F	r vT C(eS I eS5S p eT vsf S	A==%%Fv(L cSes7v5%FS
						I L : r L q g, . . Seyt %w. shvF%S vF= s . 5(e5Bycs. t Fy=sR		
					r)	r A1 VgEesR=eFSeyT e=%T 5 i . vsSe hsv%e=y. svFhe cs. t FyT . %5Y		
		I 6Y0	MY0					
	1. 5mFi . nF5ese=	I 6YM	dYM					
							3%eSad0G r vF=al 0G 2 sv7e(aMG u) e=%T a0CGP	
		I I Y0	dY0					
		I I YM	bYM					
						N. sew. (e I D00 5esT %v5e= v5bT		
		I HY0	bY0					
		I HYM	kYM					

NL p mDL, mBl mr I : d N8, , r Np L L W, L 2 r 8 : VAI mV 9 x L : ° 4Y2 : U 2 d I r I V A8 r I p A, dAY2 V I d6 5 5 5 b

TH55





BOREHOLE NUMBER TH56

BG

yr. OwRe. 5eal wPa: s

hgRm k oG k

CLIENT B h R S: wpl . spRwLM0 . l h5 S5p Fy t sM r. . WnwDeM5A ew5- . A H- w **PROJECT NAME** y t sM r. . W0 . r5 h reaRwa5

PROJECT NUMBER 11f 12 **PROJECT LOCATION** y t sM r. . W

DATE STARTED 1f F2F11 **COMPLETED** 1f F2F11 **R.L. SURFACE** kkl **DATUM** A gEb

DRILLING CONTRACTOR **SLOPE** xf 9 **BEARING** °°°

EQUIPMENT / 5 wwe e3a: D. 5 rF: t Ler **HOLE LOCATION** / kW/ 2l c TkkVvf / 6K m

HOLE SIZE Vf f A A pP **LOGGED BY** y y **CHECKED BY** 4 y

NOTES

7 e5 . p	B : 5er	NS)A8	beH5)A8	Rr: H Pa S. L	- s MPa: 5P w ci A, . s	7 : 5erP sb eMarPH5P w	c: A HseM deM5M NeA: rVM	gppP5P w. so , MerD. 5P wM
	0 . 5mwa. t w5erep					do h c o rSCS. . MeTOP5 . rL: wPaM: wp r. . 5e5M T, r. OwTpri		
					ch	cg 0 b CYeri pewMeTA epPA 5 a. : rMe Lr: RwepTi es OTA . PR5		
		kkKvl	f vl			Sg dmNrdmCNea. Derep : MM wpi Lr: Des		
		kkKvf	kvf			Neut M s: 5f vl A y. rel . se dEl V 5erA Rw. 5ep : 5f vl A		
		kk/ vl	kvl					
		kk/ vf	1vf					
		kk1vl	1vl					
		kk1vf	/ vf					

yo NmEo Sm Fdmcd hrd y USSc y No o 4 So Rc Uh b gdmb ° - o h J KkRh (Rr0 d cdb gUcd NgSrgvRb d kxfxP11

TH56





BOREHOLE NUMBER TH56

BG Vr. I wGe. 5ea: wla, i

hYGm f S1 f

CLIENT WhG M, wp: . iplwsO0 . B h5o M5p 4Vt iiOgr. . k 0wueO5D ew5° . DR, wl **PROJECT NAME** Vt iiOgr. . k 0 . r5 hrealwa5

PROJECT NUMBER FF2FH **PROJECT LOCATION** Vt iiOgr. . k

DATE STARTED F24H4FF **COMPLETED** F24H4FF **R.L. SURFACE** f 22 **DATUM** D Y7 A

DRILLING CONTRACTOR **SLOPE** 329 **BEARING** dbd

EQUIPMENT 6 5 wwe exa, u, 5 r4, t ser **HOLE LOCATION** 6f vK63F c Pf f Kv2I f 2 m

HOLE SIZE K22D D pL **LOGGED BY** VV **CHECKED BY** / V

NOTES

o e5 . p	W, 5er	y M (D)	AeR5 (D)	Gr, R la M s	° i, OOlEa, 5L w cbDg. i	o , 5erL, i AeOarlR5L w	c, DRieO neO5O y eD, rkO	Yppl5L w, i SgOeru, 5L wO
						nSh c S0MTM . OePl l5 . rs, wlaO, wp r. . 5e5OPgr. I wPprb		
					chdco	cY0 ATNerb pewOePDeplt D 5 a. , rOe sr, lwepP. r, wse gr. I wPD. lO5		
	0 . 5mwa. t w5erep	33vB	2vB					
		33v2	f v2					
		38vB	f vB			sr, ueiib gei. I f vI D		
						y eEt Q i V. re: . ie n7 BH5erD lw, 5ep , 5f vBD		
		38v2	Fv2					
		3HvB	FvB					
		3Hv2	6v2					

VSy m7 SMn4nmcn h0 V- MdcVy SS/ MSGc - hAYnmA d° ShU I vGhJ GOn cnA Y- cny YMOYGAn f 34-4FF

TH57





BOREHOLE NUMBER TH58

BG Ar. Pw We. 5eaTwdah:

H7Wm R Bk R

CLIENT I HWchwpT. :pdwl C0. u H5Sc5p 1At ::CCr. . V°wLeC5Yew5- . YEhw **PROJECT NAME** At ::CCr. . V0. r5T Hreadwa5

PROJECT NUMBER GGI GF **PROJECT LOCATION** At ::CCr. . V

DATE STARTED GI 1F1GG **COMPLETED** GI 1F1GG **R.L. SURFACE** f u **DATUM** Y 7DK

DRILLING CONTRACTOR **SLOPE** 3i x **BEARING** 999

EQUIPMENT b 5 wwe e6ahLh5 r1nt l er **HOLE LOCATION** bRg4/ Rf y MRR4gj b/ 4 m

HOLE SIZE 4i i YY pdh **LOGGED BY** AA **CHECKED BY** 2A

NOTES

v e5T. p	l h5er	s c)Y8	KeE5T)Y8	WrhETdac. l	- :hCCdahd5d w y SYO. :	v h5erdh: KeCardE5d w	y hY EeC NeC5C s eY hrVC	7 ppd5d wh: B CCerLh5d wC
	0. 5mwa. t w5erep			F F F F		ch5erd5eon erSpewCeMreppdCT Cr. PwM rhLe::S		
		f / gu	i gu			s e,t Ch: h5i gbY A. reT. :e NDuf 5erY dwh5ep h5i gbY		
		f / gj	Rgj					
		f bgu	Rgu					
		f bgj	Ggj					
		f Ggu	Ggu					
		f Ggj	bgj					

ABs mDBcm 1Nmy N H°N AUccy As BB2 cBWy UHK7NmK 9- BHJ / gWH(W0 N y NK 7 UyNs 7 c°7 gWKN R3 1 3 1GG

TH58





BOREHOLE NUMBER TH59

BG Ar. Pw We. 5eaTwdah:

H7Wm R Bk R

CLIENT I HWchwpT. :pdwl C0. u H5Sc5p 1At ::CCr. . V°wLeC5Yew5- . YEhwP **PROJECT NAME** At ::CCr. . V0. r5T Hreadwa5

PROJECT NUMBER GGI GF **PROJECT LOCATION** At ::CCr. . V

DATE STARTED GI 1F1GG **COMPLETED** GI 1F1GG **R.L. SURFACE** 6F **DATUM** Y 7D3

DRILLING CONTRACTOR **SLOPE** fix **BEARING** 999

EQUIPMENT 4 5 wwe eKahLh5 r1nt I er **HOLE LOCATION** 4Rg/bi 6 yMRR/gi 4f Rm

HOLE SIZE /iiYY pdh **LOGGED BY** AA **CHECKED BY** 2A

NOTES

v e5T. p	I h5er	s c)Y8	3 eE5T)Y8	WthETdac. I	- :hCCdahd5d w y SYO :	v h5erdh: 3 eCardE5d w	y hY EeC NeC5C s eY hrVC	7 ppc5d wh: B CCerLh5d wC
	0 . 5mwa. t w5erep			F F F F F F		ch5erdseon erSpewCeMreppdCT Cr. PwM rhLe::S		
		6/gu	i gu			s e,t Ch: h5i gbY A. reT. :e NDuf 5erY dwh5ep h5i gbY		
		6/gi	Rgi					
		6ugu	Rgu					
		6ugi	Ggi					
		6bgu	Ggu					
		6bgi	4gi					

ABs mDBcm 1Nmy N H°N AUccy As BB2 cBWy UH3 7Nm3 9- BHJ bgWH(W0 N y N3 7UyNs 7c°7gW3 N Rf 1 1GG

TH59





BOREHOLE NUMBER TH06

BG

Vr. Pwde. 5eaLwlas,

hYdm G n1 G

CLIENT Whd CswpL. ,plw. T0. 9 h5g C5p 2Vt „Ti r. . k SvfeT5u ew5U. u RswgP **PROJECT NAME** Vt „Ti r. . k 0. r5L hrealwa5

PROJECT NUMBER FFl F4 **PROJECT LOCATION** Vt „Ti r. . k

DATE STARTED Fl 2l2FF **COMPLETED** Fl 2l2FF **R.L. SURFACE** K9 **DATUM** u Y7 D

DRILLING CONTRACTOR **SLOPE** Kl ° **BEARING** ---

EQUIPMENT 6 5 wve exasf s5 r2st : er **HOLE LOCATION** 6GJB6K3 c OGGBVJ 63Gm

HOLE SIZE Bl l u u pls **LOGGED BY** VV **CHECKED BY** / V

NOTES

Hed.. p	Wst5er	bC)u 8	DeR5L)u 8	drsRLlaC. :	U,sTTWas3. w cgu i . ,	Hs5erls, DeTarlR5. w	csu ReT oeT5T beu srkT	Yppl5. ws, n i Terfs5. wT
	0. 5mwa. t wErep					on hcn SDMC . TeOPlsL . r: swlaT swp r. . 5e5TO r. PwOprg		
					chd	d b YAmOON cY0 DMAerg pewTeOu epltu 5 a. srTe : rslwepO regi r. PwOu . lT5		
				F. . . F.		Os5erl5eMAerg pewTeOreppITL i r. PwO rsfe.,g		
		KEy9	l y9			bevt Ts, s5l yEu V. reL. ,e o7 Bl 5eru lws5ep s5l yEu		
		KEy	GJ					
		K6y9	G.9					
		K6y	Fy					
		KFy9	Fy9					
		KFy	6y					

Vnb m7 n Om 2omco h5 VJ CO: Vb n n / On d c JhDYomD - Un h N Eyd h(d5o coD YJ cob YC3Yyd Do GKKFF

TH60





BOREHOLE NUMBER TH16

BG 0robn Oeotechnwal

smOE B pv B

CLIENT 2 s O l andholdwgL No - stYI td G0ullLArooRinkeLtCent 7 oC 1anP **PROJECT NAME** 0ullLArooR North s recwact

PROJECT NUMBER HHPHF **PROJECT LOCATION** 0ullLArooR

DATE STARTED HPGGH **COMPLETED** HPGGH **R.L. SURFACE** 5P **DATUM** C m y

DRILLING CONTRACTOR **SLOPE** 5Px **BEARING** °°°

EQUIPMENT / tonne e9cakatorGauger **HOLE LOCATION** / B63KPK S, BB36P/ 53 E

HOLE SIZE 3PPCC dwa **LOGGED BY** 00 **CHECKED BY** 40

NOTES

Method	2 ater	W (C)	y e1th (C)	Ora1hwc l og	7 laLLwfwcatwon SYCAol	Materwal y eLcrwtwon	SaC1leL TeLtL WeCarRL	mddwonal p ALerkatwonL
						Tp s Sp il : l ooLe, bwh organwL and rootletL, greYArob n, drY		
					SM	Sil TD SmNy : MedwC denLe, CedwC grawed, orange Arob n, Cowt		
	Not Encountered	856	P6					
		856P	B6P					
		886	B6					
		886P	H6P					
						0 orehole T. 3B terCwated at HC		
		8F6	H6					
		8F6P	/ 6P					

0p WE. p l E GTEST s iT 0UI l S0Wp p 4 l p OS Us y mTEy ° 7 p s D K6Os J OiNT STy mUSTWnl imOy T B5GH

TH61





BOREHOLE NUMBER TH26

BG 0robn k eotechnwal

smkE Opv O

CLIENT H sk l andholdwgL No 5 stYI td G0ullLArooWinReLtCent UoC2anP **PROJECT NAME** 0ullLArooWNorth s recwact

PROJECT NUMBER BBPBF **PROJECT LOCATION** 0ullLArooW

DATE STARTED BPGGBB **COMPLETED** BPGGBB **R.L. SURFACE** OOP **DATUM** C m y

DRILLING CONTRACTOR **SLOPE** °P- **BEARING** 777

EQUIPMENT / tonne excaRatorGauger **HOLE LOCATION** / O63/ K5 S, OO36P9OF E

HOLE SIZE 3PPCC dwa **LOGGED BY** 00 **CHECKED BY** 40

NOTES

Method	Hater	1l)C8	ye2th)C8	k ra2hwc l og	UlaLLwfwcatwon SYCAol	Materwal y eLcrv2twon	SaC2leL TeLtL 1 eCarWL	mddwonal p ALerRatwonL
	Not Encountered					Tp s Sp il : l ooLe, bwh organwL and rootletL, greYArob n, drY		
					SM	Sil TD SmNy : MedwC denLe, CedwC grawed, orange Arob n, Cowt		
		OP°65	P65					
		OP°6P	O6P					
		OPK65	O65					
		OPK6P	B6P					
						0orehole T. 3B terCwated at BC		
		OPF65	B65					
		OPF6P	/ 6P					

0p1E. pl E GTEST siT 0JI l S01pp4 l pk S Jsymi TEy 7Ups D96k s(kiNT STy mJ ST1mi imk y T O'GGBB

TH62





BOREHOLE NUMBER TH36

BG 0robn Oeotechnwal

smOE v pP v

CLIENT 2 sO I andholdwgL No - stYI td F0ullLArooRinkeLtCent 7oC1anP **PROJECT NAME** 0ullLArooR North srecwact

PROJECT NUMBER HHGH4 **PROJECT LOCATION** 0ullLArooR

DATE STARTED HGF4FHH **COMPLETED** HGF4FHH **R.L. SURFACE** vHG **DATUM** C m y

DRILLING CONTRACTOR **SLOPE** 9Gx **BEARING** °°°

EQUIPMENT B tonne e5cakatorFauger **HOLE LOCATION** Bv63B3B S, vv36GKBB E

HOLE SIZE 3GGCC dwa **LOGGED BY** 00 **CHECKED BY** / 0

NOTES

Method	2 ater	W (C)	ye1th (C)	Ora1hwc l og	7 laLLwfwcatwon SYCAol	Materwal y eLcrwtwon	SaC1leL TeLtL WeCarRL	mddwwonal p ALerkatwonL
	Not Encountered					Tp s Sp il : I ooLe, bwh organwcL and rootletL, greYArobn, drY		
					SM	Sil TD SmNy : MedwC denLe, CedwC grawed, orange Arobn, Cowt		
		vv96	G6					
		vv96G	v6G					
		vv86	v6					
		vv86G	H6G					
						0orehole T. 3B terCwated at HC		
		vv46	H6					
		vv46G	B6G					

0pWE. pl E FTEST siT 0UI I S0Wpp / I p OS Usy mTEy ° 7p s D K6Os J OiNT STy mUSTWnl imCOy T v9f9FHH

TH63





BOREHOLE NUMBER TH46

hYdm G n1 G

BG Vr. Pwd e. 5eaLwlas,

CLIENT Whd CswpL. ,plw: T0. ° h5g C5p 2Vt ,,Ti r. . k SwfeT5u ew5- . u Rswg **PROJECT NAME** Vt ,,Ti r. . k 0. r5L hrealwa5

PROJECT NUMBER FFI F4 **PROJECT LOCATION** Vt ,,Ti r. . k

DATE STARTED FI 242FF **COMPLETED** FI 242FF **R.L. SURFACE** GI **DATUM** u Y7D

DRILLING CONTRACTOR **SLOPE** KI x **BEARING** 999

EQUIPMENT 6 5 wwe e3asf s5 r2st : er **HOLE LOCATION** 6GyE6KI cOGGEyI 64E m

HOLE SIZE EI l u u pls **LOGGED BY** VV **CHECKED BY** / V

NOTES

He5L. p	Ws5er	bC (u)	DeR5L (u)	drsRLla C:	- ,sTTMas5. w cgui . ,	Hs5erls, DeTarlR5. w	csu ReT oeT5T beu srkT	Yppl5. ws, n i Terf s5. wT
	0. 5mwa. t w5erep					on hcn SOMC . TeOPl5L . r: swlaT swp r. . 5e5TOI r. PwOprg		
					chd	d b YAmCON c Y0 DMAerg pewTeOu epIt u 5 a. srTe : rslwepO regi r. PwOu . IT5		
		KKy°	I y°			Cs5erl5eMAerg pewTeOreppITL i r. PwO rsf e,,g		
						b evt Ts, s5I yEu V. reL. ,e o7 EB 5eru lws5ep s5I yEu		
		KKyI	GyI					
		K8y°	Gy°					
		K8yI	FyI					
		K4y°	Fy°					
		K4yI	6yI					

Vn b m7 n Om 2omco h S VUCCc Vb n n / On d c UhDYomD 9- n hN Byd hJ d S o coD YUcob YCSyd Do GKKFF

TH64





BOREHOLE NUMBER TH56

BG 0robn v eotecknacwh

smvE GpF G

CLIENT 1 sv l wndkohdanyL No BstAl td / 0uhLDrooRinOeLtg ent Cog 4wn **PROJECT NAME** 0uhLDrooRNortk s recanct

PROJECT NUMBER HH2H6 **PROJECT LOCATION** 0uhLDrooR

DATE STARTED H2/6/HH **COMPLETED** H2/6/HH **R.L. SURFACE** GGB **DATUM** g m f

DRILLING CONTRACTOR **SLOPE** °2- **BEARING** III

EQUIPMENT 3 tonne excwOwtor/wuyer **HOLE LOCATION** 3G95363 S, GG5927G6 E

HOLE SIZE 522g g daw **LOGGED BY** 00 **CHECKED BY** K0

NOTES

Petkod	1 wter	Wl Jg (	f e4tk Jg (	v rw4kac l oy	ChwLLajacwtaon SAg Doh	Pwterawhf eLcra4taon	Swg 4heL TeLtL Weg wrRL	mddaaonwhp DLerOwtaonL
						Tp s Spil : l ooLe, bak orywnacL wnd rootheLL, yreADrobn, drA		
					SP	Sil TMSmNf : Pedaug denLe, g edaug yrwaned, Aehob Drobn, g oaLt		
	Not Encountered	GG79B	29B					
		GG79 2	G92					
		GG39B	G9B					
		GG39 2	H92					
						0 orekohe T. 5B terg anwted wt Hg		
		GG H9B	H9B					
		GG H92	392					

0pWE. pl E / TEST siT 0UI l S0Wp p K l p v S Usf mTEf l Cp s M79v s Y v iNT STf mUSTWnl im9v f T G°/°/HH

TH65





BOREHOLE NUMBER TH66

BG yr. PwGe. 5eaLwlas,

nYGm 1 oF 1

CLIENT B nG CswpL. ,plw. T0. - n5g C5p 2yt ,,Ti r. . RSwkeT5u ew5U. u Hswg **PROJECT NAME** yt ,,Ti r. . R0. r5L nrealwa5

PROJECT NUMBER 77f 74 **PROJECT LOCATION** yt ,,Ti r. . R

DATE STARTED 7124277 **COMPLETED** 7124277 **R.L. SURFACE** l f **DATUM** u YEA

DRILLING CONTRACTOR **SLOPE** xf 9 **BEARING** °°°

EQUIPMENT 6 5 wwe e3asks5 r2st : er **HOLE LOCATION** 61vWK67 cO11Wf 6VK m

HOLE SIZE Vf f u u pls **LOGGED BY** yy **CHECKED BY** / y

NOTES

h e5L. p	B s5er	WC)u 8	AeH5L)u 8	GrsHLla C. :	U,sTTIDas5. w cgu i . ,	h s5erls, AeTarlH5. w	csu HeT deT5T Weu srRT	Yppl5. ws, o i Terks5. wT
						do nco SCVC. . TeCPl5L . r: swlaT swp r. . 5e5TCl r. PwOprg		
					ch	c SCdb cY0 AMNerg pewTeCDwe : rslwepO regOu . IT5		
		4xv-	f v-					
	0. 5mwa. t w5erep					ge,,. P i r. Pwi e,. P f v u		
		4xvf	1vf					
		4l v-	1v-					
		4l vf	7vf					
						y . reL. ,e dEVV 5eru lws5ep s57u		
		44v-	7v-					
		44vf	6vf					

yo WnEo Cm 2dmcd nSl y J CCcy Wbo / Co Gc J nAYdmA ° Uo nb KvGn(GSd cdA YJ cdWCSYvGAd 1x2x277

TH66





BOREHOLE NUMBER TH58

BG Brown Geotechnical

CLIENT WPG Landholdings No 5 Pty Ltd / Bullsbrook Investment Company **PROJECT NAME** Bullsbrook North Precinct

PROJECT NUMBER 22027 **PROJECT LOCATION** Bullsbrook

DATE STARTED 24/6/21 **COMPLETED** 24/6/21 **R.L. SURFACE** 75 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT Auger **HOLE LOCATION** 31.6436 S, 116.0409 E

HOLE SIZE 100mm dia **LOGGED BY** BB **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
	Not Encountered	74.5	0.5			TOPSOIL: Loose, with organics and rootlets, brown, dry		
					GPS	SAND GRAVEL: Very dense, reddish brown, fine to medium grained, sunrounded, with clay, moist		
		74.0	1.0				LL=26 PL=12 Fines=16% Sand=40% Gravel=44%	
		73.5	1.5			Borehole TH67 terminated at 1.2m		
		73.0	2.0					

BOREHOLE / TEST PIT BULLSBROOK LOGS UPDATED - COPY 4.GPJ GINT STD AUSTRALIA.GDT 19/9/22

BOREHOLE NUMBER TH68

PAGE 1 OF 1

BG Brown Geotechnical

CLIENT WPG Landholdings No 5 Pty Ltd / Bullsbrook Investment Company **PROJECT NAME** Bullsbrook North Precinct

PROJECT NUMBER 22027 **PROJECT LOCATION** Bullsbrook

DATE STARTED 24/6/21 **COMPLETED** 24/6/21 **R.L. SURFACE** 65 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT Auger **HOLE LOCATION** 31.6436 S, 116.0292 E

HOLE SIZE 100mm dia **LOGGED BY** BB **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
	Not Encountered	64.5	0.5			TOPSOIL: Loose, sandy with organics and rootlets, grey brown, dry		
		64.0	1.0		SM	SILTY SAND: Medium dense, medium grained, orange brown, moist		
		63.5	1.5			Borehole TH68 terminated at 1.2m		
		63.0	2.0					

BOREHOLE / TEST PIT BULLSBROOK LOGS UPDATED - COPY 4.GPJ GINT STD AUSTRALIA.GDT 19/9/22

BOREHOLE NUMBER TH69

BG Vs , F 2 e. 5ei gF%v(

Oh2m p T3 p

CLIENT D O2 l vF=g. (=%yS 1 . 4 O5o l 5= f Vn((St s . CFF7eS5A eF59 . A bvF **PROJECT NAME** Vn((St s . C 1 . s5g Oseei %i 5

PROJECT NUMBER ddMdl **PROJECT LOCATION** Vn((St s . C

DATE STARTED dpfl fdd **COMPLETED** dpfl fdd **R.L. SURFACE** Yd **DATUM** A hEc

DRILLING CONTRACTOR **SLOPE** NM6 **BEARING** KKK

EQUIPMENT H5 FFe e/i v7v5 sfvnyes **HOLE LOCATION** HpWk4Y r : ppYWdYk m

HOLE SIZE YMMA A =% **LOGGED BY** VV **CHECKED BY** BV

NOTES

u e5g. =	D v5es	- l °A U	c eb5g °A U	2 sv bg%l . y	9 (v SS2&w5%F r oA t . (	u v5es%(c eSi sh%F	r vA b(eS) eS55 - eA vsCS	h==%%Fv(T t Ses7v5%FS
						) T Or T PLI . . Se: SvF=o , %g . syvF%sSvF= s . 5e5S yseo t s , F: =so		
					r u	r P) w r h 1 c LResc =eFSe: A e=%A 5 i . vsSe ys/%e=: oe((, t s , F: A . %5		
		YpW	MAV					
	1 . 5nFi . nF5ese=	YpW	pW				3%eSad0G r vF=al dG 2 sv7e(aMG	
		YMW	pW					
		YMW	dW					
		4NW	dW			V. seg. (e) E YN5esA %v5e= v5dA		

VT - nETl mf) nr) OP) VxI l r V- TTB I T 2r xOc h) mc kGTOwkW OB 2Pt) r) c hxr) - hl PtW c) pNNdd

BOREHOLE NUMBER TH06

BG 0rok n v eotecwnycbA

smv E G pF G

CLIENT 1 s v l bndwoAlynhL No ° s ta l td 20uALDrooRinOeLtg ent Cog 4bnP **PROJECT NAME** 0uALDrooR Nortw s recynct

PROJECT NUMBER HHBH5 **PROJECT LOCATION** 0uALDrooR

DATE STARTED HG252HH **COMPLETED** HG252HH **R.L. SURFACE** 3° **DATUM** g m f

DRILLING CONTRACTOR **SLOPE** 7B- **BEARING** III

EQUIPMENT 6 tonne excbOtor2buher **HOLE LOCATION** 6GK3937 S, GG3KBH7GE

HOLE SIZE 3BBg g dyb **LOGGED BY** 00 **CHECKED BY** / 0

NOTES

Petwod	1 bter	W Jg (	f e4tw Jg (	v rb4wyc l oh	CAsLLyycbtyon Sag DoA	P btenybAf eLcry4tyon	Sbg 4AeL TeLtL Weg brRL	mddytyonbAp DLerObtyonL
						Tp s Sp il : l ooLe, Lbnda k ytworhbnycL bnd rootAetL, hrea Drok n, dra		
					SP	Sil TM SmNf : P edyug denLe, g edyug hrbyned, orbnhe Drok n, g oyLt		
	Not Encountered	39K	BK					
		39KB	GKB					
		36K	GK					
		36KB	HKB					
						0 orewoAe T. 5B terg ynbted bt Hg		
		3HK	HK					

0pWE. p l E 2TEST s iT 0UI l S0Wp p / l p v S Us f mTEf l Cp s M9K s Y v iNT STf mUSTWnl imK f T G72/2HH

BOREHOLE NUMBER TH16

BG Brown Geotechnical

PAGE 1 OF 1

CLIENT WPG Landholdings No 5 Pty Ltd / Bullsbrook Investment Company **PROJECT NAME** Bullsbrook North Precinct

PROJECT NUMBER 22027 **PROJECT LOCATION** Bullsbrook

DATE STARTED 24/6/21 **COMPLETED** 24/6/21 **R.L. SURFACE** 70 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT Auger **HOLE LOCATION** 31.6462 S, 116.0301 E

HOLE SIZE 100mm dia **LOGGED BY** BB **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, sandy with organics and rootlets, grey brown, dry		
					SM	SILTY SAND: Medium dense, medium grained, orange brown, moist		
	Not Encountered	69.5	0.5				Fines=12% Sand=88% Gravel=0% (Medium=59%)	
		69.0	1.0					
						Borehole TH71 terminated at 1.2m		
		68.5	1.5					
		68.0	2.0					

BOREHOLE / TEST PIT BULLSBROOK LOGS UPDATED - COPY 4.GPJ GINT STD AUSTRALIA.GDT 19/9/22

BOREHOLE NUMBER TH26

BG Brown Reotechnical

PARE k Ov k

CLIENT 1 PR Landholdings No - Pty Ltd FBullsbrooWnpestment Com. an **PROJECT NAME** BullsbrooW North Precinct

PROJECT NUMBER 88086 **PROJECT LOCATION** BullsbrooW

DATE STARTED 8GF4fB8k **COMPLETED** 8GF4fB8k **R.L. SURFACE** 60 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 905 **BEARING** °°°

EQUIPMENT Auger **HOLE LOCATION** Kk34G64 S, kk43DK80 E

HOLE SIZE k00mm dia **LOGGED BY** BB **CHECKED BY** / B

NOTES

Method	1 ater	2 L Jm(	De. th Jm(	Rra. hic Log	Classification Symbol	Material Descri. tion	Sam. les Tests 2 emarW	Additional Obserpations
						TOPSOIL: Loose, sandy with organics and rootlets, grey brown, dry		
					SM	SILTY SAND: Dense, medium grained, yellow brown, moist		
		493	03					
	Not Encountere	4930	k30					
		4)3	k3					
		4)30	830					
						Borehole TH68 terminated at 8m		
		463	83					
		4630	K30					

BO2 EHOLE FTEST PIT B7 LLSB2 OO/ LORS 7PDATED ° COPY GRPU RINT STD A7 ST2ALIA3RDT k9fB88

BOREHOLE NUMBER TH36

BG Hrown Geotechnical

PAGE B OF B

CLIENT WPG Landholdings No 2 Pty Ltd KHullsbrook Investment 7 ompan **PROJECT NAME** Hullsbrook North Precinct

PROJECT NUMBER 44948 **PROJECT LOCATION** Hullsbrook

DATE STARTED 4/ K3K4B **COMPLETED** 4/ K3K4B **R.L. SURFACE** 5/ **DATUM** m A6 D

DRILLING CONTRACTOR **SLOPE** ° 9- **BEARING** CCC

EQUIPMENT Auger **HOLE LOCATION** 1B.3/ 8/ S, BB3.9112 E

HOLE SIZE B99mm dia **LOGGED BY** HH **CHECKED BY** 0H

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	7 lassification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, sandy with organics and rootlets, grey brown, dry		
					SM	SILTY SAND: Medium dense, medium grained, yellow brown, moist		
		51.2	9.2					
	Not Encountered							
		51.9	B.9			dense below Bm		
		54.2	B.2			Horehole T6 81 terminated at B.2m		
		54.9	4.9					

HORE6 OLE KTEST PIT HULLSHROO0 LOGS UPDATED C7 OPY / . GPJ GINT STD AUSTRALIA.GDT B'K'K44

BOREHOLE NUMBER TH46

BG . ro: n v eotec, nic92

8yv E 7 4F 7

CLIENT H 8v P9nd, o2lings No L 8tDPtd R u2swroop)nl est0 ent l o0 39n **PROJECT NAME** . u2swroop Nort, 8recinct

PROJECT NUMBER TT(TG **PROJECT LOCATION** . u2swroop

DATE STARTED T7R3RT **COMPLETED** T7R3RT **R.L. SURFACE** / 7 **DATUM** 0 y5b

DRILLING CONTRACTOR **SLOPE** K(x **BEARING** °°°

EQUIPMENT %tonne e6c9l 9torR9uger **HOLE LOCATION** %7ØBT%aA77/ ØT/ B E

HOLE SIZE /((0 0 di9 **LOGGED BY** . . **CHECKED BY** k .

NOTES

Met. od	H 9ter	WP Y0 J	be3t, Y0 J	v r93, ic Pog	l 2ssific9tion aDD wo2	M9teri92b escri3tion	a90 32es rrests We0 9rps	y ddition924 wserl 9tions
						m4 8a4)P- PooseAs9ndD: it, org9nics 9nd root2tsAgreDwro: nAdrD		
					aM	a)Prrh ay Nb - b enseA0 ediu0 gr9inedAor9nge wro: nA0 oist		
	Not Encountered	/(Ø1	(Ø1				Fines=7%S a9nd=1GS v r9l e2=(S	
		/(Ø	7Ø1					
		LKØ1	7Ø1					
		LKØ	TØ1			. ore, o2= rn6 GB ter0 in9ted 9t T0		
		L1Ø1	TØ1					
		L1Ø	%Ø1					

. 4VE54 PE RtEam8)m . CPPa . W4 4 k P4 v a C8b y rnEb °1 4 8h B0 3U v)Nmam b y CamWy Ply Ø b m 7KRRTT

BOREHOLE NUMBER TH56

BG 5ro: n Geotec, nical

(hGE k 8F k

CLIENT 3 (G Pand, oldings No H(tDPtd O5ullswrooR)nvestb ent L ob W4n **PROJECT NAME** 5ullswrooR Nort, (recinct

PROJECT NUMBER 1121T **PROJECT LOCATION** 5ullswrooR

DATE STARTED 1kOTO1 **COMPLETED** 1kOTO1 **R.L. SURFACE** T2 **DATUM** b hBy

DRILLING CONTRACTOR **SLOPE** 92° **BEARING** NWM

EQUIPMENT 6 tonne excavator2uger **HOLE LOCATION** 6k0 K67 SAkk. 02629 E

HOLE SIZE . 22b b dia **LOGGED BY** 55 **CHECKED BY** / 5

NOTES

met. od	3 ater	p P Y5 J	y eW, Y5 J	GraWic Pog	L lassification SDb wol	material y escriWtion	Sab Wles 4ests p eb arRs	h dditional 8 wservations
						48 (S8)P- PooseAsandD: it, organics and rootletsAgreDwro: nAdrD		
					S(NSm	Sh Ny - mediub Ab ediub grainedAorange wro: nA: it, siltAb oist		
	Not Encountered	. 90H	20H			dense welo: 20 b	Fines=7% Sand=91% Gravel=2%	
		. 902	k02					
		. 70H	k0H					
		. 702	102			5ore, ole 4 BTH terb inated at 1b		
		. T0H	10H					
		. T02	602					

58 p EB8 PE O4ES4 ( )4 5l PPS5p 88 / P8 GS l (y h4Ey M.8 (C KdGj U GN4 S4y h l S4 ph PyhdGy 4 k9 9GO1

BOREHOLE NUMBER TH58

PAGE 1 OF 1

BG Brown Geotechnical

CLIENT WPG Landholdings No 5 Pty Ltd / Bullsbrook Investment Company **PROJECT NAME** Bullsbrook North Precinct

PROJECT NUMBER 22027 **PROJECT LOCATION** Bullsbrook

DATE STARTED 24/6/21 **COMPLETED** 24/6/21 **R.L. SURFACE** 72 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT Auger **HOLE LOCATION** 31.6445 S, 116.0316 E

HOLE SIZE 100mm dia **LOGGED BY** BB **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
	Not Encountered					Ferricrete: Very dense, reddish brown, gravelly		
		71.5	0.5			Refusal at 0.1m Borehole TH76 terminated at 0.1m		
		71.0	1.0					
		70.5	1.5					
		70.0	2.0					

BOREHOLE / TEST PIT BULLSBROOK LOGS UPDATED - COPY 4.GPJ GINT STD AUSTRALIA.GDT 19/9/22

BOREHOLE NUMBER TH66

0y8E A 5F A

BG grol n 8 eotecLnicSv

CLIENT B 0 8) SndLovdin: s No / 0tP) td pguws, roo. 9nGesth ent 3 oh HSn **PROJECT NAME** guws, roo. NortL 0recinct

PROJECT NUMBER l l 6l Y **PROJECT LOCATION** guws, roo.

DATE STARTED l WpRp A **COMPLETED** l WpRp A **R.L. SURFACE** Y/ **DATUM** h y b w

DRILLING CONTRACTOR **SLOPE** 16K **BEARING** (((

EQUIPMENT y u: er **HOLE LOCATION** 4ADRW 6 %OAARD4W4 E

HOLE SIZE A66h h diS **LOGGED BY** gg **CHECKED BY** kg

NOTES

MetLod	B Ster	7) Uh J	weHtL Uh J	8 rSHLic) o:	3 xSssifiStion %PPh , ov	MSteriSvwescriHtion	%Sh Hues mests 7 eh Sr. s	y ddionSv5 , serGStions
	Not Encountered	YVD	6D			m5 0 %59 T) ooseOsSndPOl itL or: SnicsQ rol nOdrP %0 (%M %y NwTwenseOh ediuh : rSinedObrSn: e , rol nOl itL sivtOrSce : rSGeWOh oist		
		YVB	ADB				Fines=12 %Snd=a12 8 rSGev=l 2	
		Y4D	AD			goreLove mb YY terh inSted St ADh		
		Y4B	l B					

g57Eb5)E pnE%m09n g°)) %g7 5 5 k) 5 8 %° 0wy nEw (3 5 0 - W8 0C 8 9Nm%mw y° %n7y) 9 B wm Afrd d l

BOREHOLE NUMBER TH68

BG Brown Geotechnical

CLIENT WPG Landholdings No 5 Pty Ltd / Bullsbrook Investment Company **PROJECT NAME** Bullsbrook North Precinct

PROJECT NUMBER 22027 **PROJECT LOCATION** Bullsbrook

DATE STARTED 24/6/21 **COMPLETED** 24/6/21 **R.L. SURFACE** 80 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT Auger **HOLE LOCATION** 31.6443 S, 116.0363 E

HOLE SIZE 100mm dia **LOGGED BY** BB **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
	Not Encountered					Ferricrete: Very dense, reddish brown, gravelly		
						Refusal at 0.1m Borehole TH78 terminated at 0.1m		
		79.5	0.5					
		79.0	1.0					
		78.5	1.5					
		78.0	2.0					

BOREHOLE / TEST PIT BULLSBROOK LOGS UPDATED - COPY 4.GPJ GINT STD AUSTRALIA.GDT 19/9/22

BOREHOLE NUMBER TH69

BG groPn Geotecl nical

myGE D MF D

CLIENT H mG 9andl oldinLs No 2 mtO9td Rgulls: rooW5nvesth ent ° oh 7anP **PROJECT NAME** gulls: rooWNortl mrecinct

PROJECT NUMBER 1181Y **PROJECT LOCATION** gulls: rooW

DATE STARTED 1pRRID **COMPLETED** 1pRRID **R.L. SURFACE** k8 **DATUM** h ybw

DRILLING CONTRACTOR **SLOPE** A8K **BEARING** 333

EQUIPMENT yuLer **HOLE LOCATION** / DBkp6/ STDDkB12A E

HOLE SIZE D88h h dia **LOGGED BY** gg **CHECKED BY** 4g

NOTES

0 etl od	H ater	. 9 Uh J	we7tl Uh J	Gra7l ic 9oL	° lassification SOh : ol	0 aterial wescri7tion	Sah 7les (ests . eh arWs	y dditional M: servations
	Not Encountered					(MmSM59) 9ooseTsandOPitl orLanics and rootletsTLreO: roPnTdrO		
					S0	S59(, Sy Nw) wenseTh ediuh LrainedToranLe : roPnTPitl LravelTh oist		
		2AB2	8B2					
		2AB3	DB3				Fines=12% Sand=28% Gravel=12%	
						gorel ole (b YA terh inated at DBh		
		26B2	DB2					
		26B3	1B3					

gM. Eb M9E R(ES(m5 g- 99Sg. MM4 9MGS - mwy(Ew 3° Mm pBGmC G3N(S(w y- S(. y95 BGw(DARR1

BOREHOLE NUMBER TH08

BG YroL n Geotec: nicSl

(wGE D 9F D

CLIENT B (G TSnd: oldin, s No K (tl Ttd pYullsyroo.)nvestg ent 3 og HSnt **PROJECT NAME** Yullsyroo. Nort: (recinct

PROJECT NUMBER 8808/ **PROJECT LOCATION** Yullsyroo.

DATE STARTED 8WpRp8D **COMPLETED** 8WpRp8D **R.L. SURFACE** / 0 **DATUM** g wAh

DRILLING CONTRACTOR **SLOPE** a06 **BEARING** MM

EQUIPMENT wu, er **HOLE LOCATION** 4DbRW14 %PDDRb08aa E

HOLE SIZE D00g g diS **LOGGED BY** YY **CHECKED BY** kY

NOTES

met: od	B Ster	7 T Ug J	heHt: Ug J	GrSH ic To,	3lSssificStion %l g yol	mSteriSl h escriHtion	%Sg Hes 5ests 7 eg Sr. s	wdditionSl 9 yservStions
						59 (%9)TOToosePsSndl L it: or, Snics Snd rootletsP, rel yroL nPdrl		
					%(M%m	%wNh Omediug densePg ediug , rSinedPorSn, e yroL nPL it: siltPg oist		
	Not Encountered	RatK	0bK					
						h ense yeloL 0bag		
		Rab0	Db0				Fines=12 %Snd=a82 GrSvel=02	
						Yore: ole 5A10 terg inSted St Db8g		
		R1bK	DbK					
		R1b0	8b0					

Y97EA9TE p5E%5 ( )5 Y° TT%Y7 9 9 k T9 G%° (h w5Eh M89 (- WtG(C G)N5 %5h w° %57wTwtGh 5 Dapap88

BOREHOLE NUMBER TH18

BG brol n GeotecLnical

5wGE 1 mF 1

CLIENT D 5G) andLoldin: s No 3 5tP) td Wbulls, roo7 9nvestg ent ° og Bant **PROJECT NAME** bulls, roo7 NortL 5recinct

PROJECT NUMBER 22024 **PROJECT LOCATION** bulls, roo7

DATE STARTED 2. WpW21 **COMPLETED** 2. WpW21 **R.L. SURFACE** 80 **DATUM** g wYh

DRILLING CONTRACTOR **SLOPE** / 06 **BEARING** KK

EQUIPMENT wu: er **HOLE LOCATION** k1Ap. 8. SO11pA0k. 4 E

HOLE SIZE 100g g dia **LOGGED BY** bb **CHECKED BY** Rb

NOTES

(etLod	D ater	H) Ug J	heBtL Ug J	GraBLic) o:	° lassification SPg , ol	(aterial h escriBtion	Sag Bles Mests Heg ar7s	wdditional m, servations
						Mm5Sm9 T) ooseOsandPl itL or: anics and rootletsO reP, rol nOdrP		
					S(	S9 My SwNh Th enseOg ediug : rainedOoran: e , rol nOl itL : ravelOg oist		
	Not Encountered	4/ A8	0A8					
		4/ A0	1A0				Fines=12% Sand=82% Gravel=0%	
						boreLole MY81 terg inated at 1A2g		
		48A8	1A8					
		48A0	2A0					

bmHEYm) E WESM59M b-)) SbHmmR) mGS - 5h wMEh K° m5y . AG5C G9NMSMh w- SMHw) 9wAGh M 1/ W92

BOREHOLE NUMBER TH28

BG

0rog n k eotecI nacwA

MDkE O i v O

CLIENT H Mk : wndI oAlanY, No 5 Mth : td G0uAACrooWnRe, ty ent - oy 2wn **PROJECT NAME** 0uAACrooWNortl Mrecanct

PROJECT NUMBER BB9BF **PROJECT LOCATION** 0uAACrooW

DATE STARTED CPCPGGF **COMPLETED** CPCPGGF **R.L. SURFACE** F5 **DATUM** y D. m

DRILLING CONTRACTOR **SLOPE** P9° **BEARING** TIT

EQUIPMENT 5 tonne excwRwtorGuuYer **HOLE LOCATION** / O3K5O9 SbOOK69/ BOE

HOLE SIZE 965y x O65y **LOGGED BY** 40 **CHECKED BY** 40

NOTES

p etI od	H wter	1 :)y 8	me2tI)y 8	k rw2I ae : oY	- Aw, ,ftaewtaon Shy CoA	p wteravAme, cra2taon	Swy 2Ae, se, t, 1 ey wrW	Dddataonwai C, erRwtaon,
						si MSi l: L: oo, eb, wndh gall orYwnac, wnd rootAat, bAYl t Yrehbdrh		
					SM	SDNmLp edauy den, eby edauy Yrwanedborwn Ye Crog nbgall , atby oa t		
	Not Encountered	FJ65	965					
		FJ69	O69					
		F/65	O65					
		F/69	B69					
						0orel oAe s. 3B tery anwted wt By		
		FB65	B65					
		FB69	/ 69					

0i 1E. i : E GsESs Mis 07 : : S01i i 4 : i k S 7MvhDsEmT-i MJ.J/k M\ k INs Ssm D7 Ss 1D: ID8k ms CPCPGGB

BOREHOLE NUMBER TH38

BG

Crown k eotecgnhc, I

MYkE O p v O

CLIENT H Mk i , ndgoldhma: No K Mtb i td GCull: yrooWsnRe: tment - om2, n **PROJECT NAME** Cull: yrooWNortg Mrechnct

PROJECT NUMBER BB5BF **PROJECT LOCATION** Cull: yrooW

DATE STARTED CPCPGGF **COMPLETED** CPCPGGF **R.L. SURFACE** FK **DATUM** m Y0A

DRILLING CONTRACTOR **SLOPE** P5x **BEARING** °°°

EQUIPMENT K tonne e9c, R torGuaer **HOLE LOCATION** 3O/6K35 SLOO6/533OE

HOLE SIZE 5/Km 9 O'Km **LOGGED BY** 4C **CHECKED BY** 4C

NOTES

Detgod	H , ter	1 i)m8	Ae2tg)m8	k r, 2gltc i oa	- l, : : tfhc, tton Sbmyol	D, terh, l Ae: crI2thon	S, m2le: Te: t: 1 em, rW	Ydd'hton, I p y: erR, tton:
						Tp MSp si l i oo: eL: , ndb wtkg ora, nhc: , nd rootlet: Llhagt arebLdrb		
					SM	SYNAI Dedhum den: eLmedhum ar, hmedLor, nae yrownLtr, ce : HtLmoh t		
	Not Encountered	FJ/K	5/K					
		FJ/5	O/5					
		F3/K	O/K					
		F3/5	B/5					
						Coregole T0 . 3 termhn, ted , t Bm		
		FB/K	B/K					
		FB/5	3/5					

Cp 1E0 p i E GTEST MsT C7 i i SC1 p p 4 i p k S 7MAYTEA ° - p MJ.J/k M\ k sNT STA Y7 ST1 Yi sY/k AT CPCPGGB

BOREHOLE NUMBER TH48

BG Crown k eotecgnhc, l

MYk E O p v O

CLIENT H Mk i , ndgoldhna: No 5 Mtb i td GCull: yrooWsnRe: tment 7 om2, nl **PROJECT NAME** Cull: yrooWNortg Mrechnct

PROJECT NUMBER BB9BF **PROJECT LOCATION** Cull: yrooW

DATE STARTED OPGPGF **COMPLETED** OPGPGF **R.L. SURFACE** F5 **DATUM** m Y0 A

DRILLING CONTRACTOR **SLOPE** P9° **BEARING** ---

EQUIPMENT 5 tonne exc, R, torGuaer **HOLE LOCATION** / O6K53. SLOCK69/ BK E

HOLE SIZE 965m x O65m **LOGGED BY** 4 C **CHECKED BY** 4 C

NOTES

Detgod	H , ter	1 i)m8	Ae2tg)m8	k r, 2ghc i oa	7 l, : : hfhc, thon Sbmyol	D, terh, l Ae: crh2thon	S, m2le: Te: t: 1 em, rW	Yddhthon, l p y: erR, thon:
						Tp MSp si l i oo: eL: , ndb wltg ora, nhc: , nd rootlet: Llhagt arebLdrb		
					SM	SYNAI Dedhum den: eLmedhum ar, lmedLor, nae yrownLtr, ce : hltLmoh t		
	Not Encountered	F365	965					
		F369	O69					
		F/ 65	O65					
		F/ 69	B69					
						Coregole T0 . 3 termlm, ted , t Bm		
		FB65	B65					
		FB69	/ 69					

Cp 1 E0 p i E GTEST MsT CUi i SC1 p p 4 i p k S UMAYTEA - 7 p MJ 36k M k sNT STA YUST 1 Yi sY6k AT OPGPGB

APPENDIX C

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

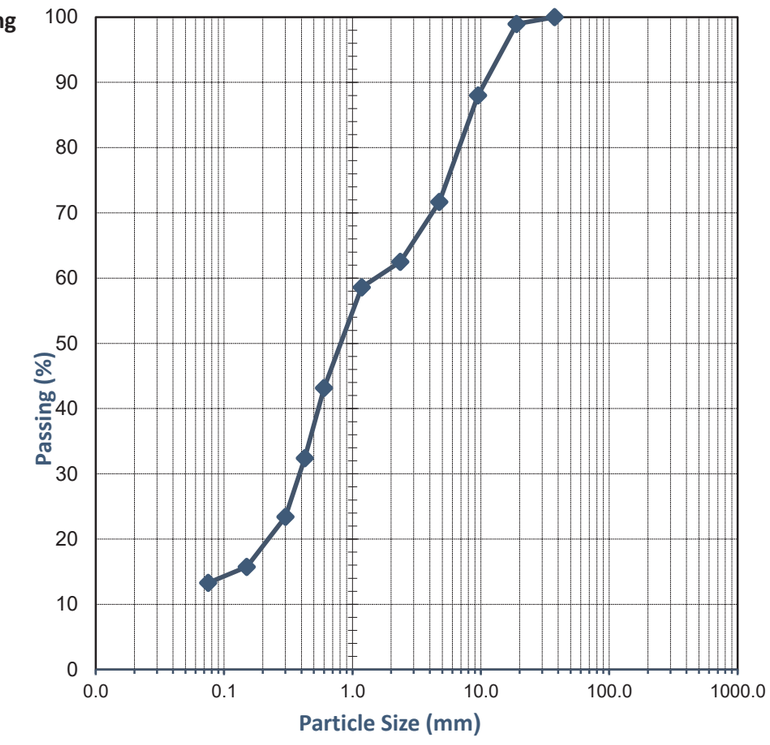
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11761_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11761
Location:	Bullsbrook	*Date Sampled:*	21/06 -20/07/2022
Sample Identification:	TH1	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	100
19.0	99
9.5	88
4.75	72
2.36	63
1.18	59
0.600	43
0.425	32
0.300	23
0.150	16
0.075	13



Comments:

Approved Signatory: Cody O'Neill

Name: Cody O'Neill

Date: 02/August/2022

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SOIL | AGGREGATE | CONCRETE | CRUSHING

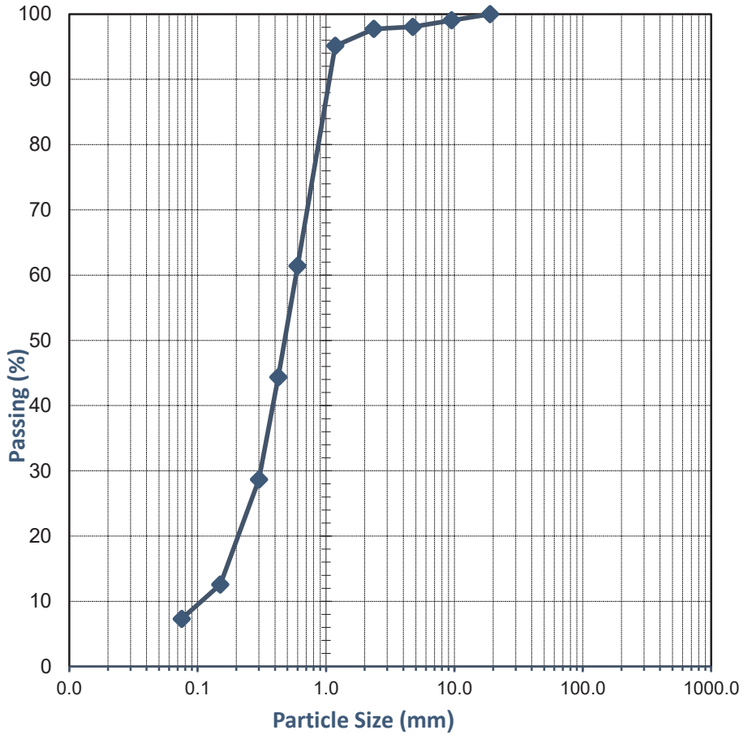
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11818_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11818
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH3	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	100
9.5	99
4.75	98
2.36	98
1.18	95
0.600	61
0.425	44
0.300	29
0.150	13
0.075	7



Comments:

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SOIL | AGGREGATE | CONCRETE | CRUSHING

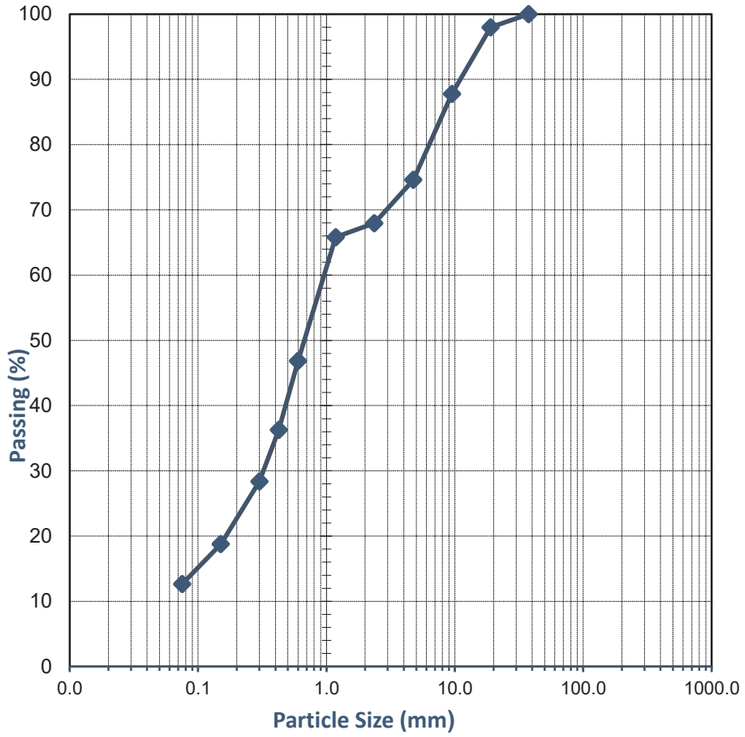
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11819_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11819
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH4	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	100
19.0	98
9.5	88
4.75	75
2.36	68
1.18	66
0.600	47
0.425	36
0.300	28
0.150	19
0.075	13



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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

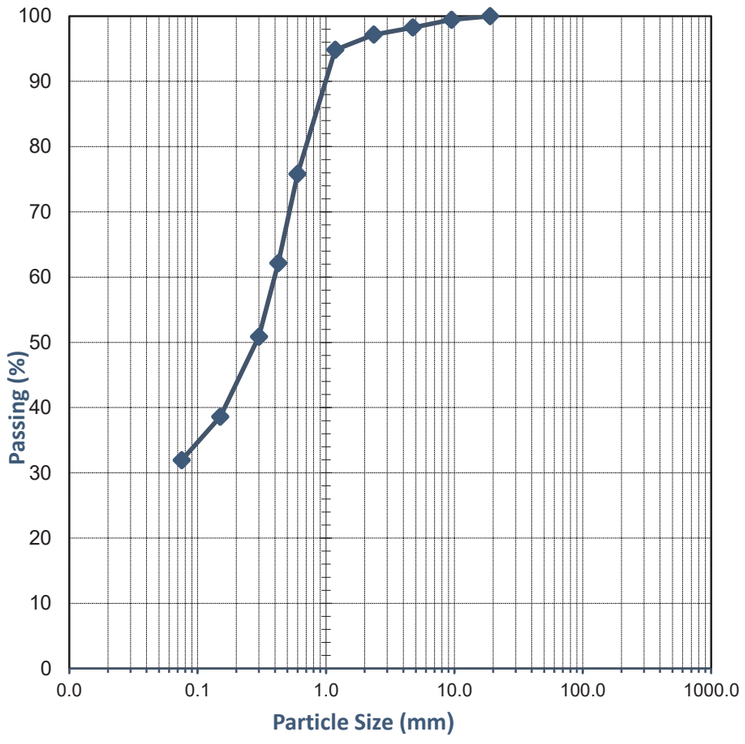
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11762_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11762
Location:	Bullsbrook	*Date Sampled:*	21/06 -20/07/2022
Sample Identification:	TH6	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	100
9.5	99
4.75	98
2.36	97
1.18	95
0.600	76
0.425	62
0.300	51
0.150	39
0.075	32



Comments:

Approved Signatory: Cody O'Neill

Name: Cody O'Neill

Date: 02/August/2022

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11762_1_PI
Project:	North Precinct	*Sample No.*	WG22.11762
Location:	Bullsbrook	*Date Sampled:*	21/06 -20/07/2022
Sample Identification:	TH6	*Date Tested:*	2-08-2022

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	Sampled by Client, Tested as Received
History of Sample:	Oven Dried <50°C
Method of Preparation:	Dry Sieved

AS 1289.3.1.1	Liquid Limit (%)	27
AS 1289.3.2.1	Plastic Limit (%)	13
AS 1289.3.3.1	Plasticity Index (%)	14
AS 1289.3.4.1	Linear Shrinkage (%)	6.0
AS 1289.3.4.1	Length of Mould (mm)	250
AS 1289.3.4.1	Condition of Dry Specimen:	Curled

Comments:

Approved Signatory:

Name: Natasha Bielawski

Date: 03-August-2022

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

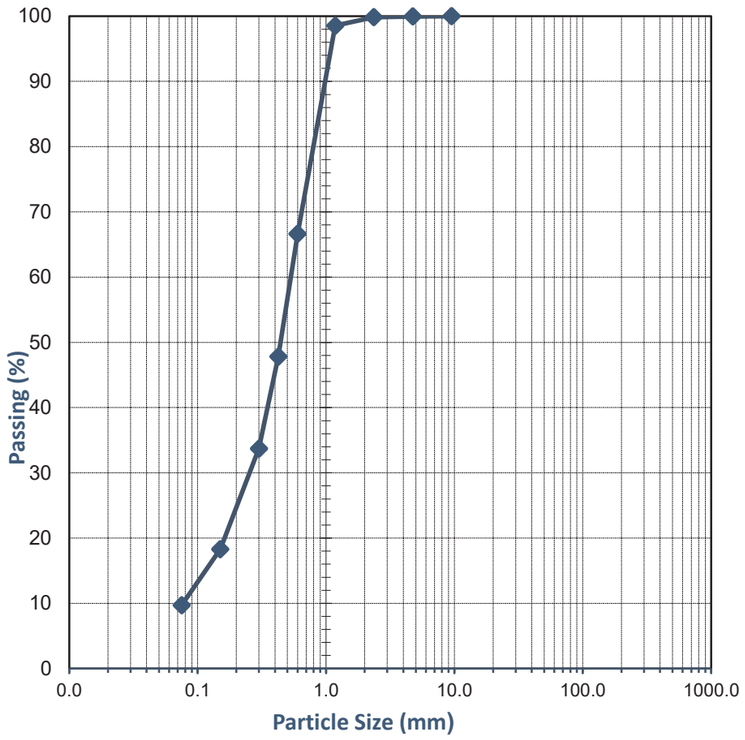
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11820_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11820
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH9	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	100
4.75	100
2.36	100
1.18	99
0.600	67
0.425	48
0.300	34
0.150	18
0.075	10



Comments:

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Name: Cody O'Neill

Date: 02/August/2022

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SOIL | AGGREGATE | CONCRETE | CRUSHING

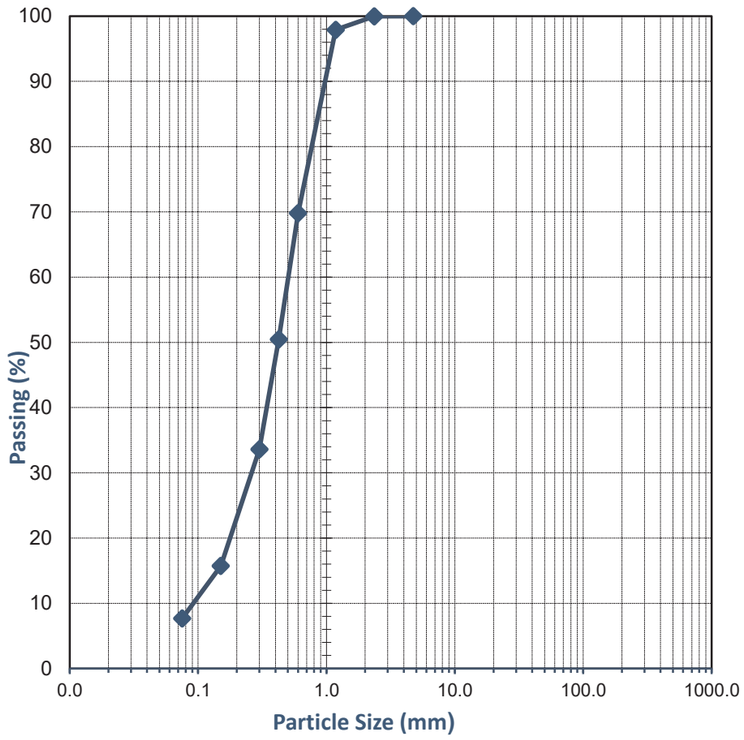
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11821_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11821
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH10	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	98
0.600	70
0.425	50
0.300	34
0.150	16
0.075	8



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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

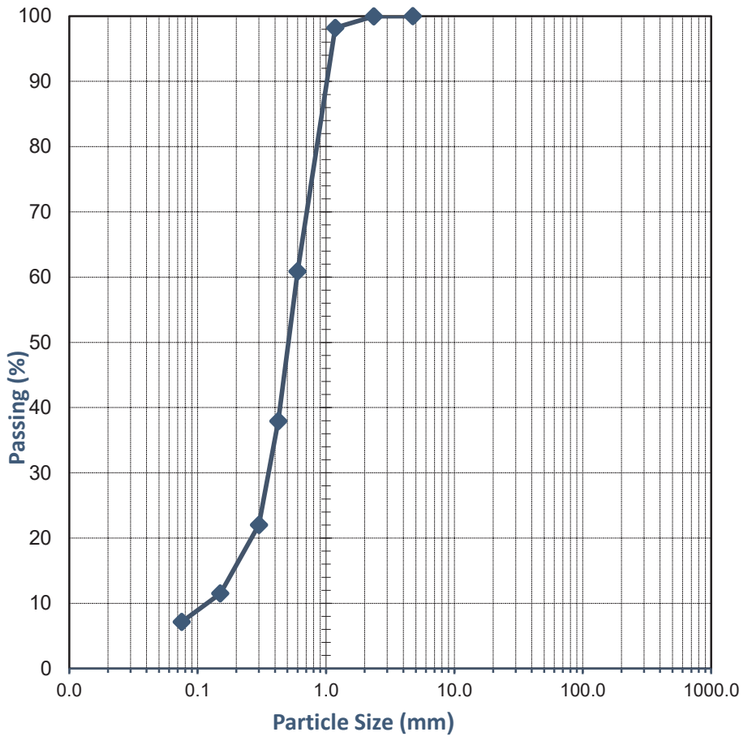
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11822_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11822
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH12	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	98
0.600	61
0.425	38
0.300	22
0.150	12
0.075	7



Comments:

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SOIL | AGGREGATE | CONCRETE | CRUSHING

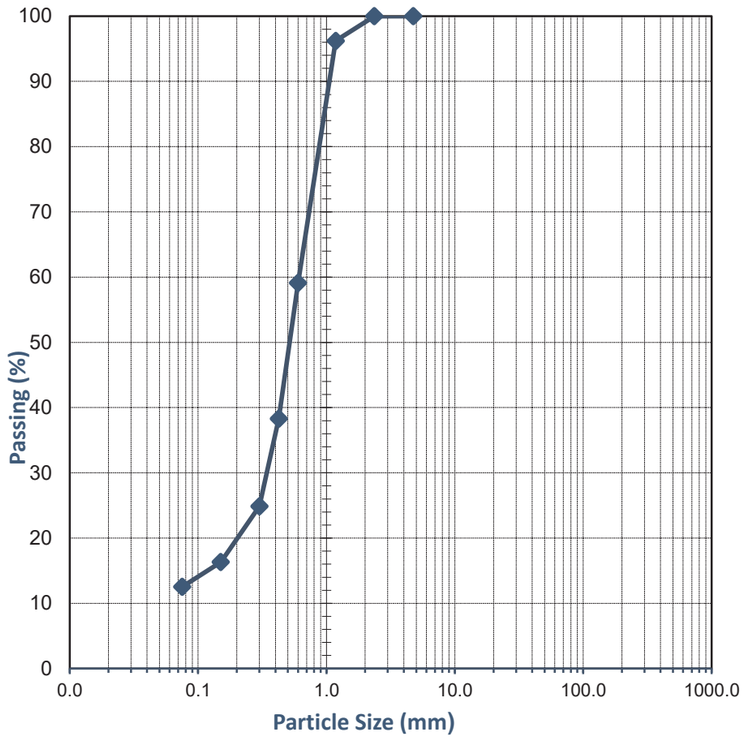
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11823_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11823
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH13	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	96
0.600	59
0.425	38
0.300	25
0.150	16
0.075	13



Comments:

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Date: 02/August/2022

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

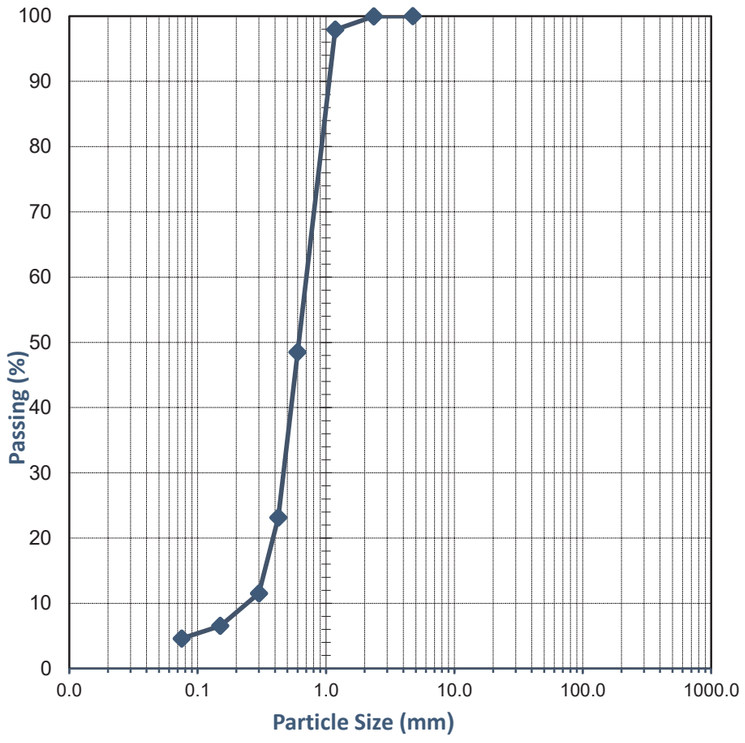
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11824_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11824
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH16	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	98
0.600	48
0.425	23
0.300	12
0.150	7
0.075	5



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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

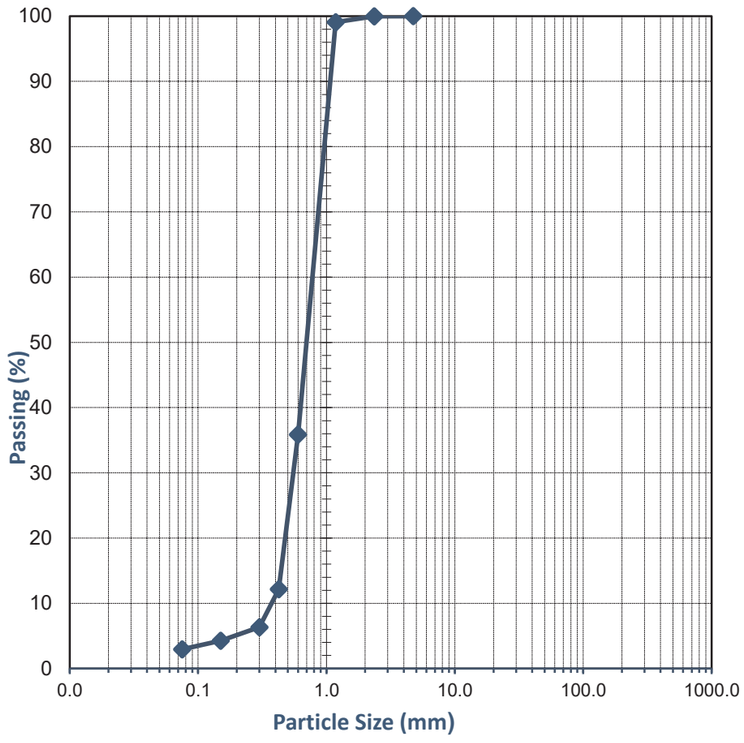
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11763_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11763
Location:	Bullsbrook	*Date Sampled:*	21/06 -20/07/2022
Sample Identification:	TH18	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	99
0.600	36
0.425	12
0.300	6
0.150	4
0.075	3



Comments:

Approved Signatory: Cody O'Neill

Name: Cody O'Neill

Date: 02/August/2022

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

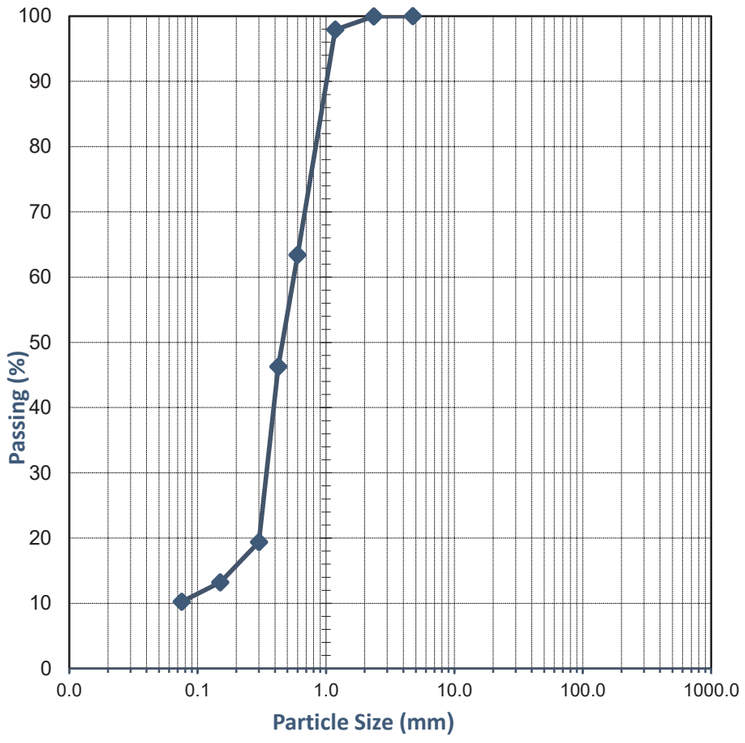
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11825_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11825
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH20	*Date Tested:*	1/8-2/8/22

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	98
0.600	63
0.425	46
0.300	19
0.150	13
0.075	10



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Date: 02/August/2022

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SOIL | AGGREGATE | CONCRETE | CRUSHING

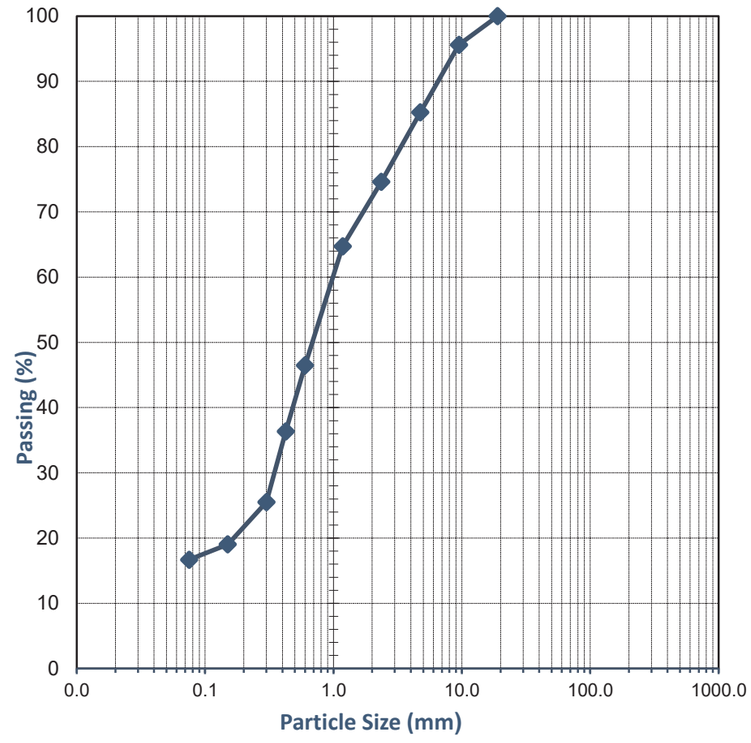
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11826_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11826
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH22	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	100
9.5	96
4.75	85
2.36	75
1.18	65
0.600	46
0.425	36
0.300	26
0.150	19
0.075	17



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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

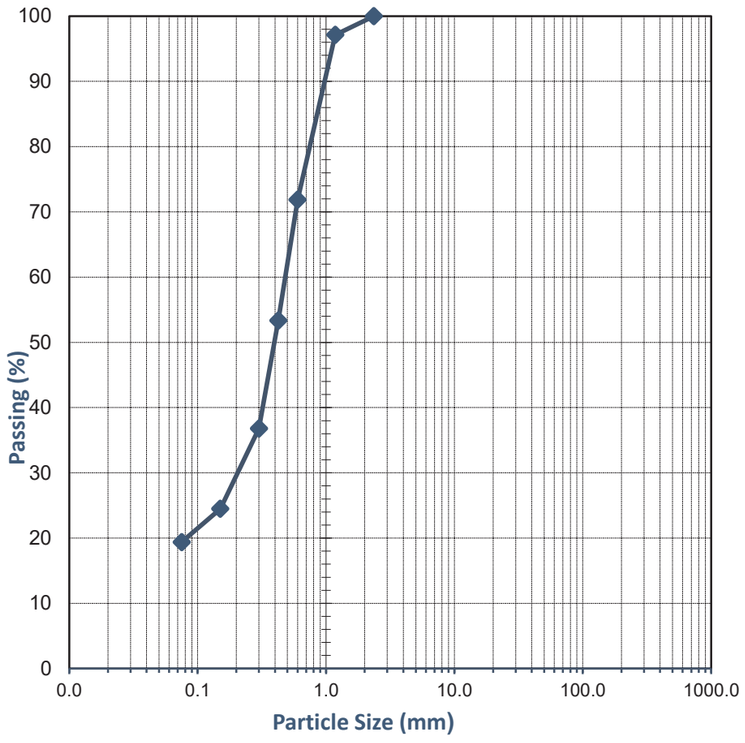
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11827_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11827
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH24	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	97
0.600	72
0.425	53
0.300	37
0.150	24
0.075	19



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SOIL | AGGREGATE | CONCRETE | CRUSHING

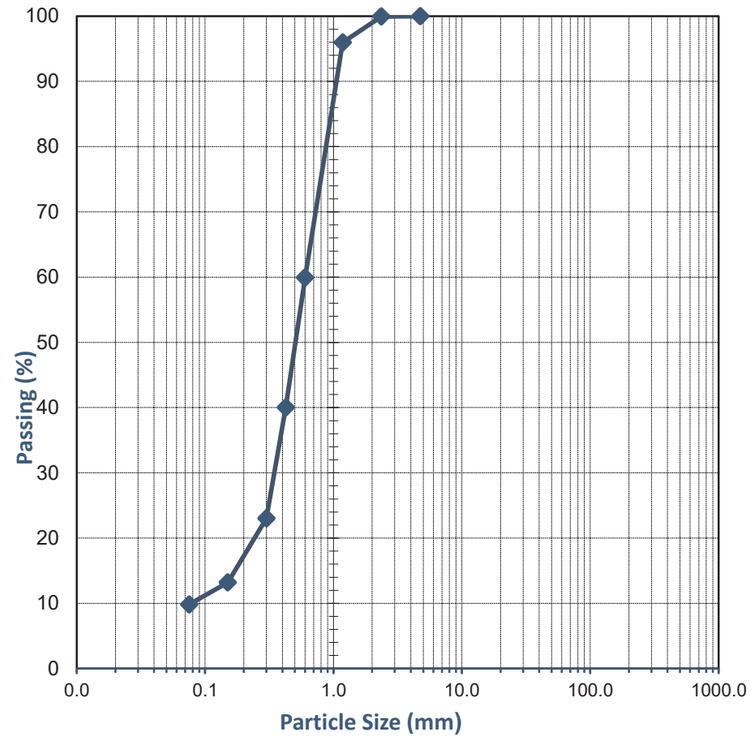
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11828_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11828
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH28	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	96
0.600	60
0.425	40
0.300	23
0.150	13
0.075	10



Comments:

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Name: Cody O'Neill

Date: 02/August/2022

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SOIL | AGGREGATE | CONCRETE | CRUSHING

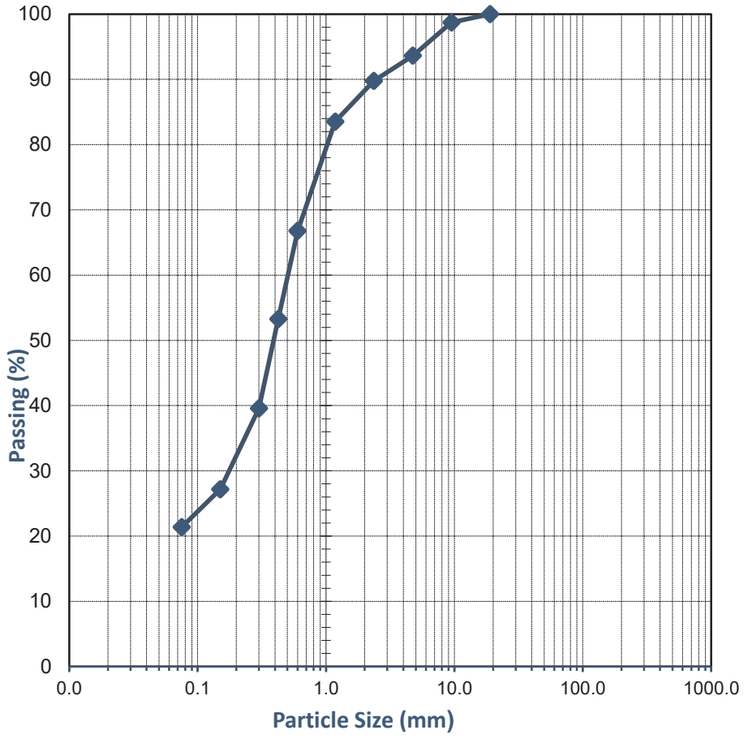
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11829_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11829
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH29	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	100
9.5	99
4.75	94
2.36	90
1.18	84
0.600	67
0.425	53
0.300	40
0.150	27
0.075	21



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Date: 02/August/2022

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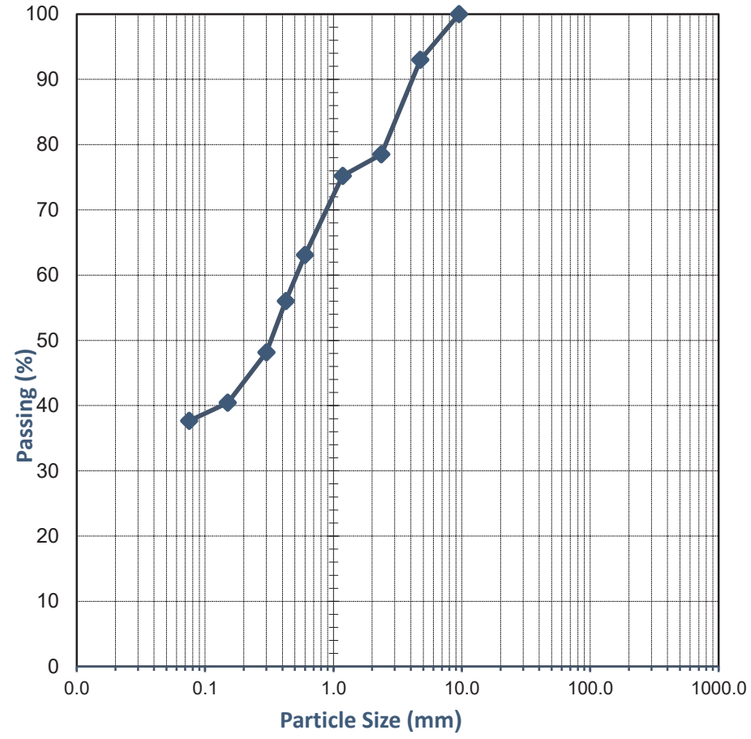
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11764_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11764
Location:	Bullsbrook	*Date Sampled:*	21/06 -20/07/2022
Sample Identification:	TH30	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	100
4.75	93
2.36	79
1.18	75
0.600	63
0.425	56
0.300	48
0.150	40
0.075	38



Comments:

Approved Signatory: Cody O'Neill

Name: Cody O'Neill

Date: 02/August/2022

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11764_1_PI
Project:	North Precinct	*Sample No.*	WG22.11764
Location:	Bullsbrook	*Date Sampled:*	21/06 -20/07/2022
Sample Identification:	TH30	*Date Tested:*	2-08-2022

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**59**
AS 1289.3.2.1	**Plastic Limit (%)**	**25**
AS 1289.3.3.1	**Plasticity Index (%)**	**34**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**15.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**Cracked, Curled**

Comments:

Approved Signatory:

Name: Natasha Bielawski
Date: 03-August-2022

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

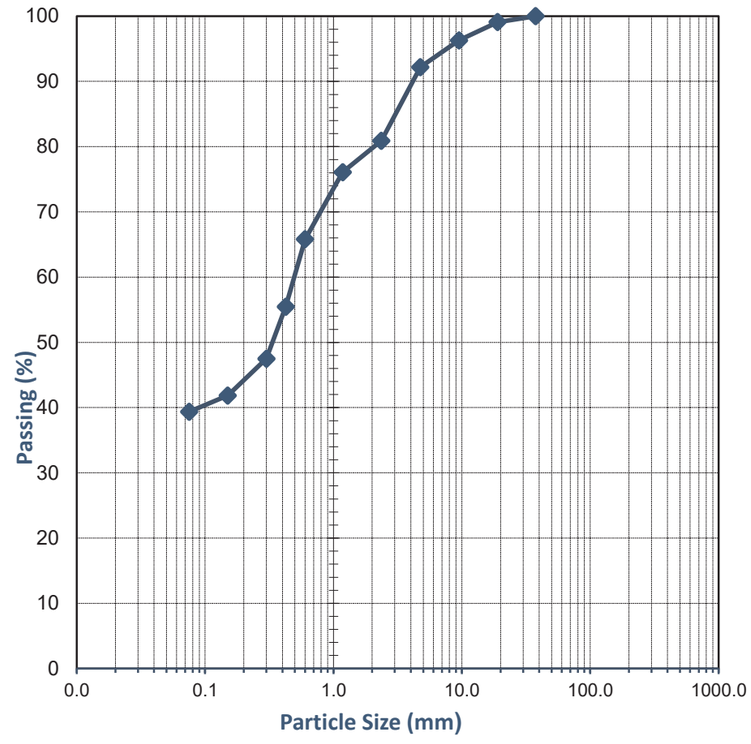
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11830_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11830
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH31	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	100
19.0	99
9.5	96
4.75	92
2.36	81
1.18	76
0.600	66
0.425	55
0.300	47
0.150	42
0.075	39



Comments:

Approved Signatory:

Name: Cody O'Neill
Date: 02/August/2022

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11830_1_PI
Project:	North Precinct	*Sample No.*	WG22.11830
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH31	*Date Tested:*	2-08-2022

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**50**
AS 1289.3.2.1	**Plastic Limit (%)**	**24**
AS 1289.3.3.1	**Plasticity Index (%)**	**26**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**13.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**Curled**

Comments:

Approved Signatory:

Name: Natasha Bielawski

Date: 03-August-2022

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SOIL | AGGREGATE | CONCRETE | CRUSHING

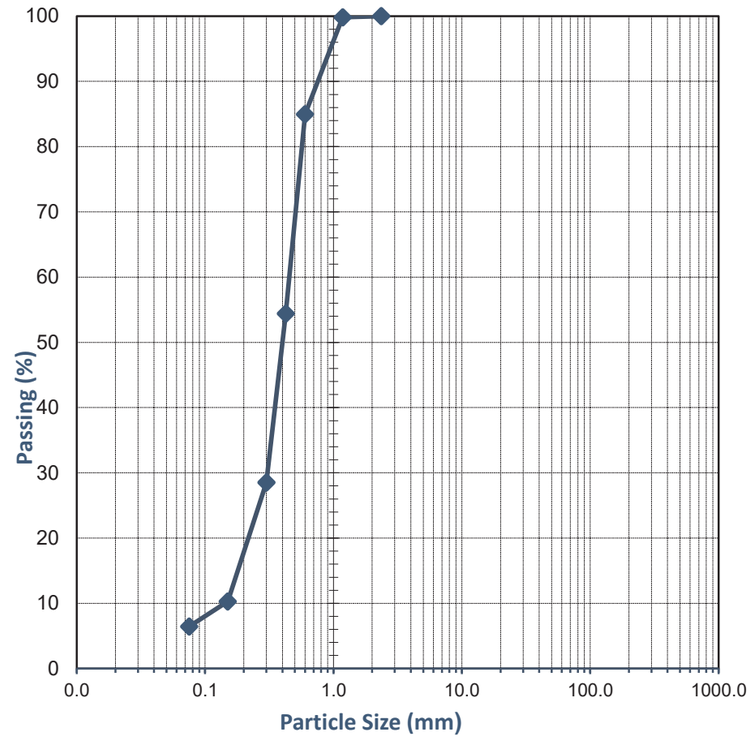
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11765_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11765
Location:	Bullsbrook	*Date Sampled:*	21/06 -20/07/2022
Sample Identification:	TH33	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	100
0.600	85
0.425	54
0.300	29
0.150	10
0.075	6



Comments:

Approved Signatory:

Name: Cody O'Neill

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SOIL | AGGREGATE | CONCRETE | CRUSHING

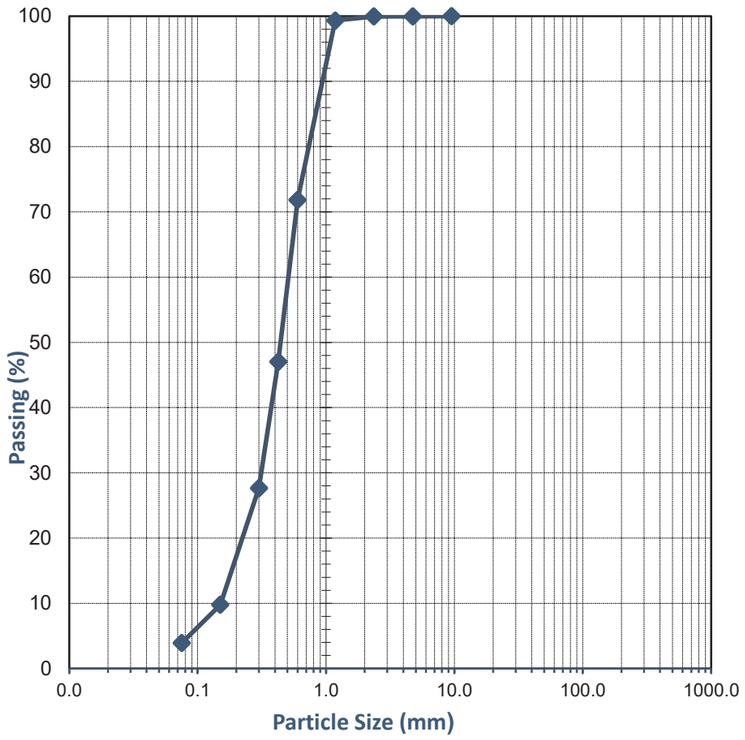
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11831_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11831
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH35	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	100
4.75	100
2.36	100
1.18	99
0.600	72
0.425	47
0.300	28
0.150	10
0.075	4



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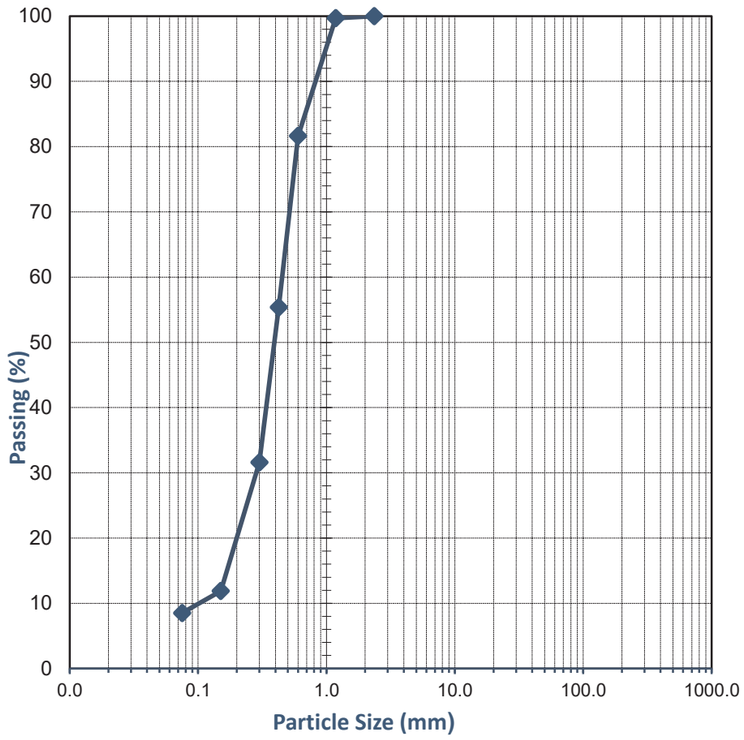
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11832_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11832
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH40	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	100
0.600	82
0.425	55
0.300	32
0.150	12
0.075	9



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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

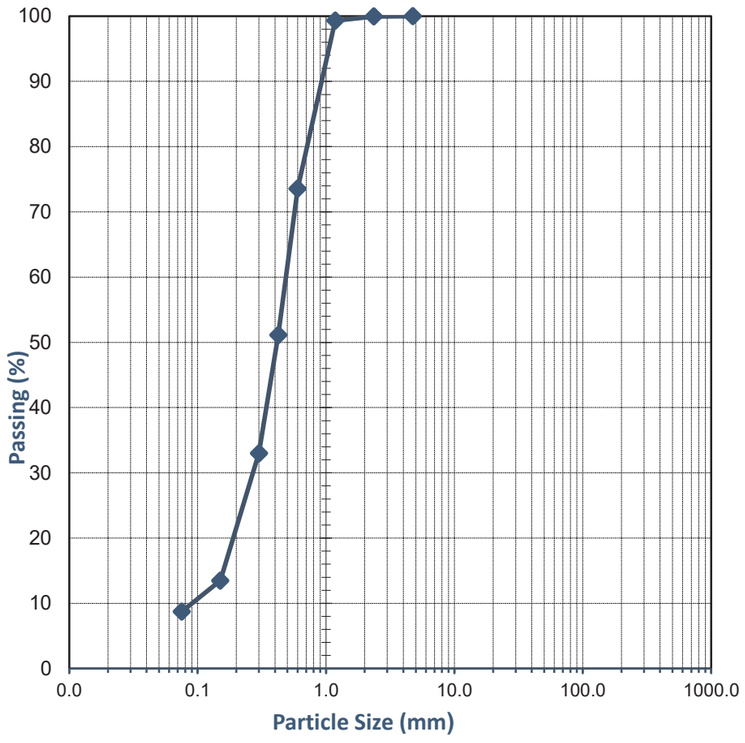
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11833_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11833
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH44	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	99
0.600	74
0.425	51
0.300	33
0.150	13
0.075	9



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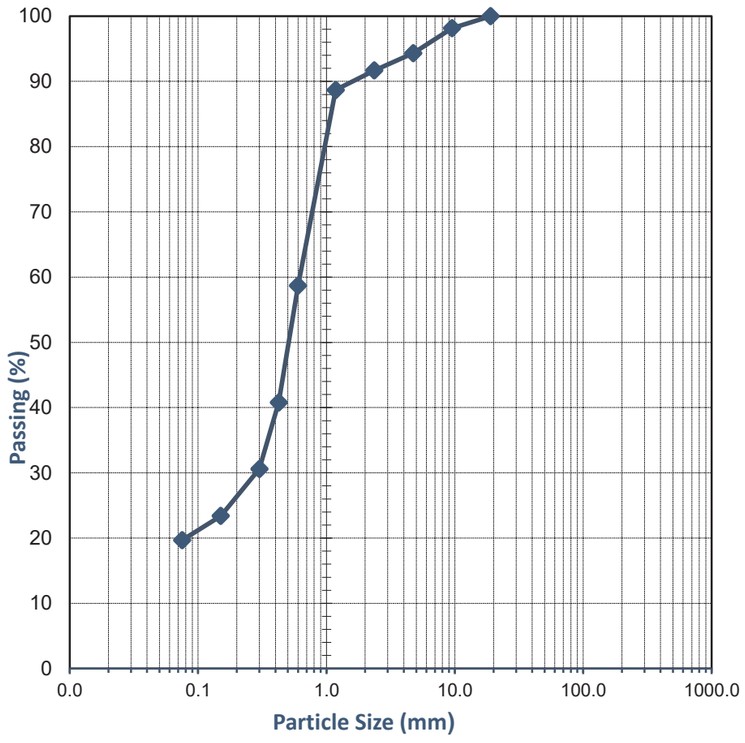
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11834_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11834
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH45	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	100
9.5	98
4.75	94
2.36	92
1.18	89
0.600	59
0.425	41
0.300	31
0.150	23
0.075	20



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SOIL | AGGREGATE | CONCRETE | CRUSHING

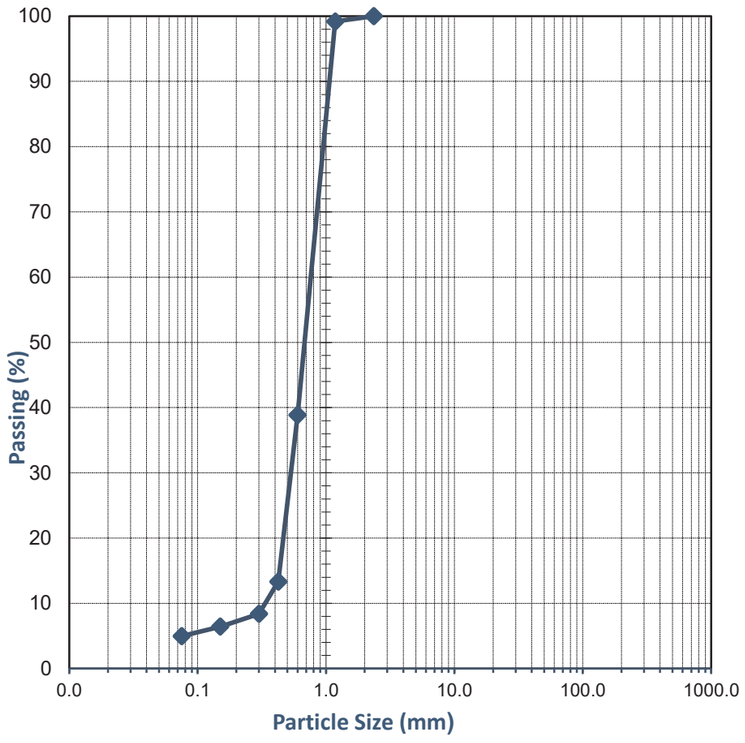
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11835_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11835
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH46	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	99
0.600	39
0.425	13
0.300	8
0.150	6
0.075	5



Comments:

Approved Signatory: Cody O'Neill

Name: Cody O'Neill

Date: 02/August/2022

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SOIL | AGGREGATE | CONCRETE | CRUSHING

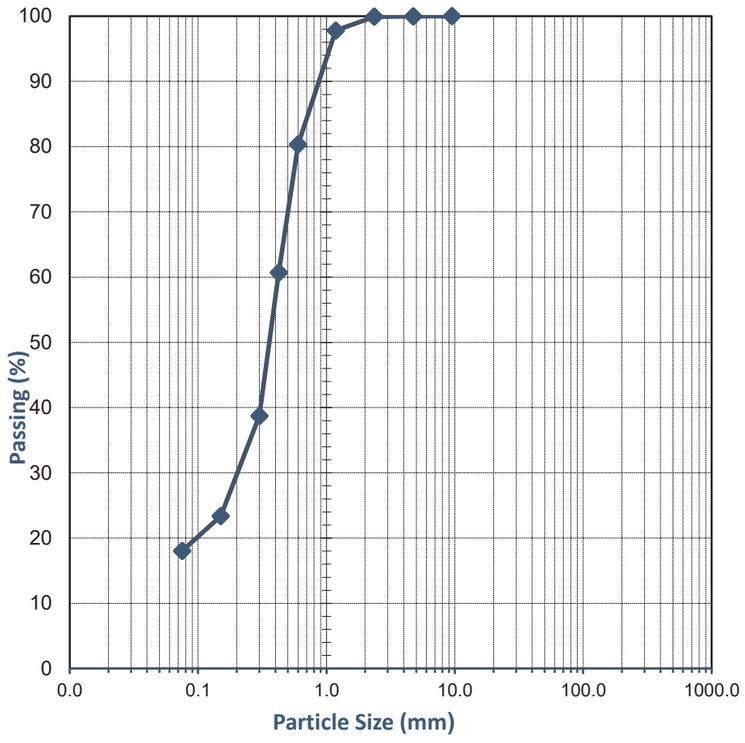
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11836_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11836
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH49	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	100
4.75	100
2.36	100
1.18	98
0.600	80
0.425	61
0.300	39
0.150	23
0.075	18



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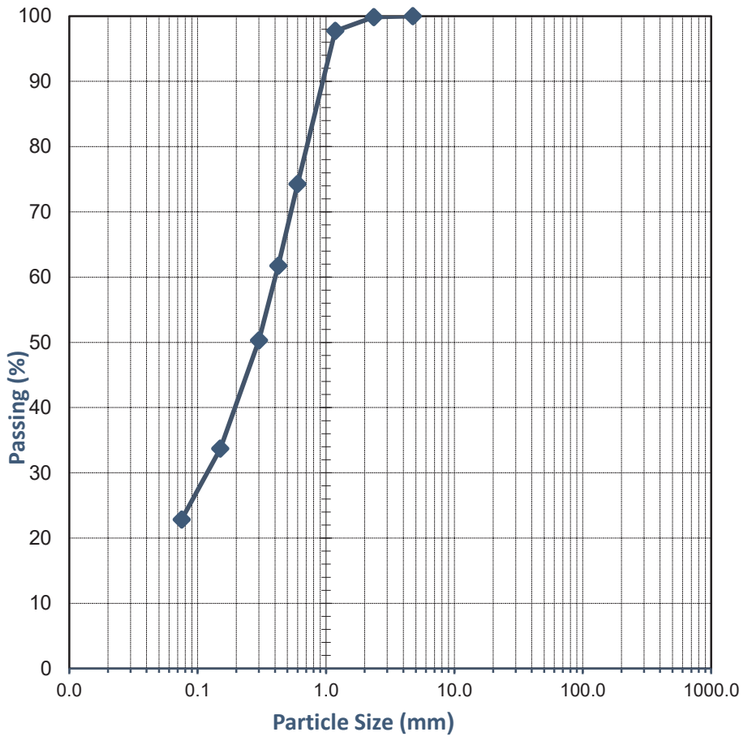
Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11837_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11837
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH52	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	98
0.600	74
0.425	62
0.300	50
0.150	34
0.075	23



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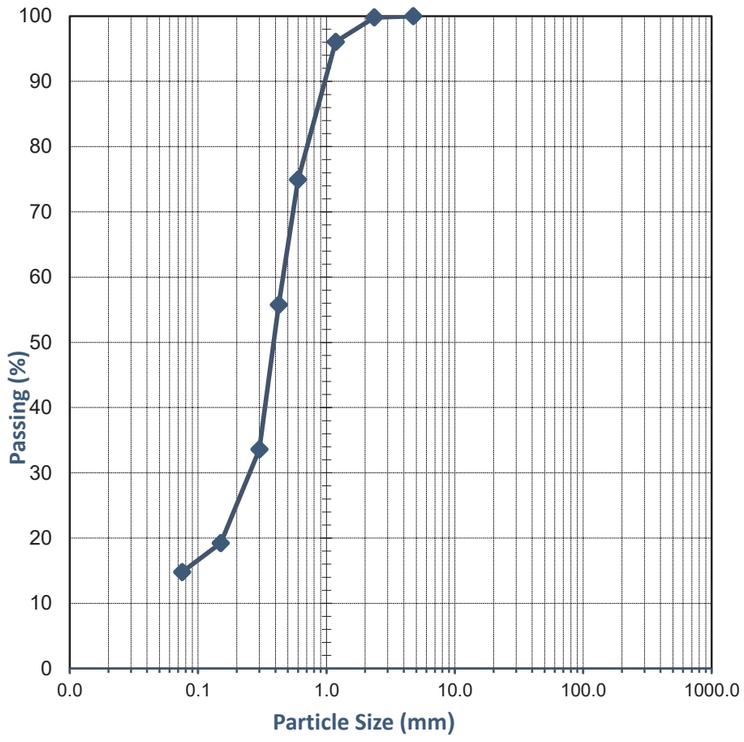
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S6956
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG22.11856_1_PSD
Project:	North Precinct	*Sample No.*	WG22.11856
Location:	Bullsbrook	*Date Sampled:*	21/06-20/07/22
Sample Identification:	TH55	*Date Tested:*	01/08 - 02/08/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	96
0.600	75
0.425	56
0.300	34
0.150	19
0.075	15



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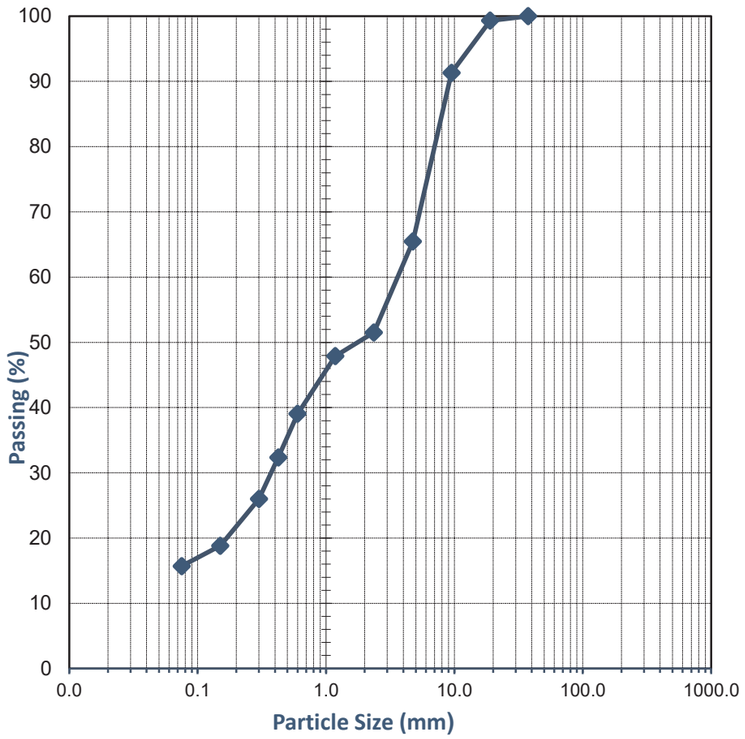
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S3653
Client Address:	PO Box 278 Como, WA, 6952	*Report No.*	WG21/9355_1_PSD
Project:	Lot 3 Ashton Road	*Sample No.*	WG21/9355
Location:	Bullsbrook	*Date Sampled:*	23-06-2021
Sample Identification:	S14 (TH67)	*Date Tested:*	30/6 - 1/7/2021

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	100
19.0	99
9.5	91
4.75	65
2.36	52
1.18	48
0.600	39
0.425	32
0.300	26
0.150	19
0.075	16



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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	Brown Geotechnical	*Ticket No.*	S3653
Client Address:	PO Box 278 Como, WA, 6952	*Report No.*	WG21/9355_1_PI
Project:	Lot 3 Ashton Road	*Sample No.*	WG21/9355
Location:	Bullsbrook	*Date Sampled:*	23/06/2021
Sample Identification:	S14 (TH67)	*Date Tested:*	1/07/2021

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	Sampled by Client, Tested as Received
History of Sample:	Oven Dried <50°C
Method of Preparation:	Dry Sieved

AS 1289.3.1.1	Liquid Limit (%)	26
AS 1289.3.2.1	Plastic Limit (%)	12
AS 1289.3.3.1	Plasticity Index (%)	14
AS 1289.3.4.1	Linear Shrinkage (%)	7.5
AS 1289.3.4.1	Length of Mould (mm)	250
AS 1289.3.4.1	Condition of Dry Specimen:	Cracked

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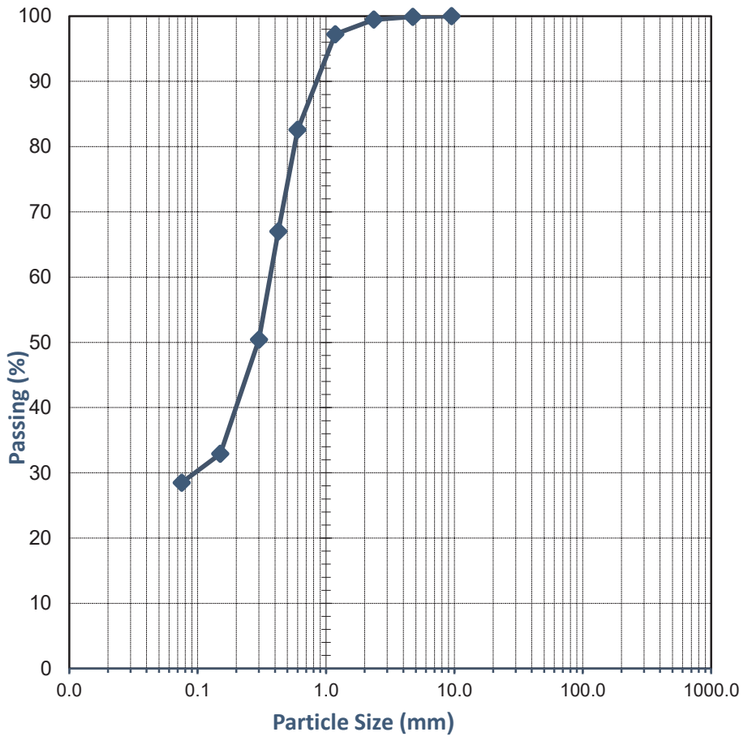
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S3653
Client Address:	PO Box 278 Como, WA, 6952	*Report No.*	WG21/9363_1_PSD
Project:	Lot 3 Ashton Road	*Sample No.*	WG21/9363
Location:	Bullsbrook	*Date Sampled:*	23-06-2021
Sample Identification:	S23 (TH69)	*Date Tested:*	30/6 - 1/7/2021

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	100
4.75	100
2.36	99
1.18	97
0.600	83
0.425	67
0.300	50
0.150	33
0.075	28



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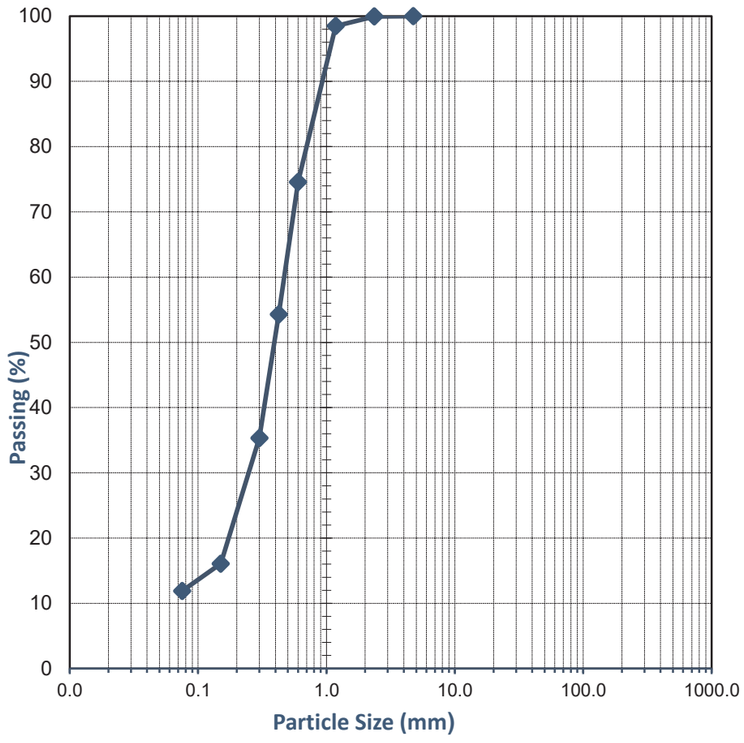
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S3653
Client Address:	PO Box 278 Como, WA, 6952	*Report No.*	WG21/9360_1_PSD
Project:	Lot 3 Ashton Road	*Sample No.*	WG21/9360
Location:	Bullsbrook	*Date Sampled:*	23-06-2021
Sample Identification:	S28 (TH71)	*Date Tested:*	30/6 - 1/7/2021

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	98
0.600	75
0.425	54
0.300	35
0.150	16
0.075	12



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SOIL | AGGREGATE | CONCRETE | CRUSHING

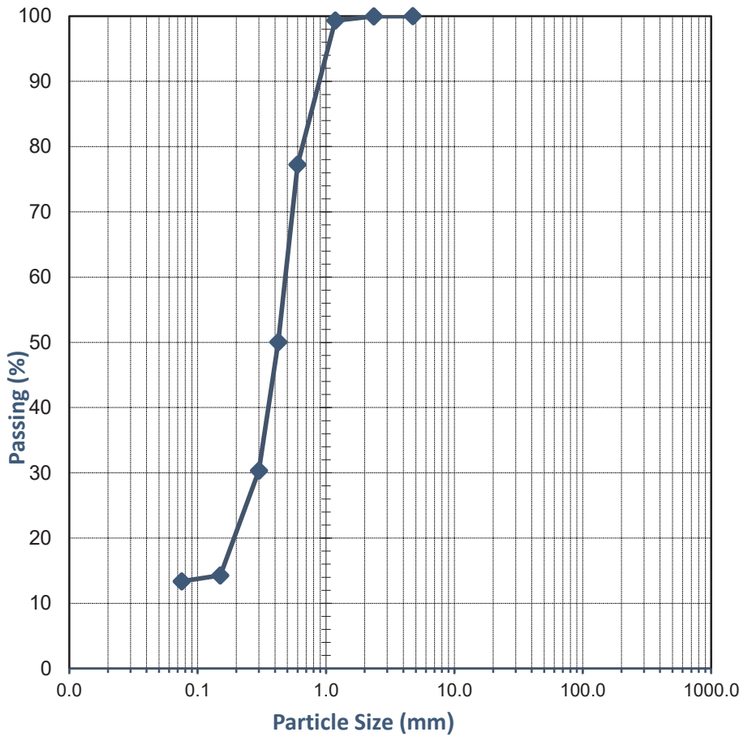
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S3653
Client Address:	PO Box 278 Como, WA, 6952	*Report No.*	WG21/9356_1_PSD
Project:	Lot 3 Ashton Road	*Sample No.*	WG21/9356
Location:	Bullsbrook	*Date Sampled:*	23-06-2021
Sample Identification:	S20 (TH74)	*Date Tested:*	30/6 - 1/7/2021

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	99
0.600	77
0.425	50
0.300	30
0.150	14
0.075	13



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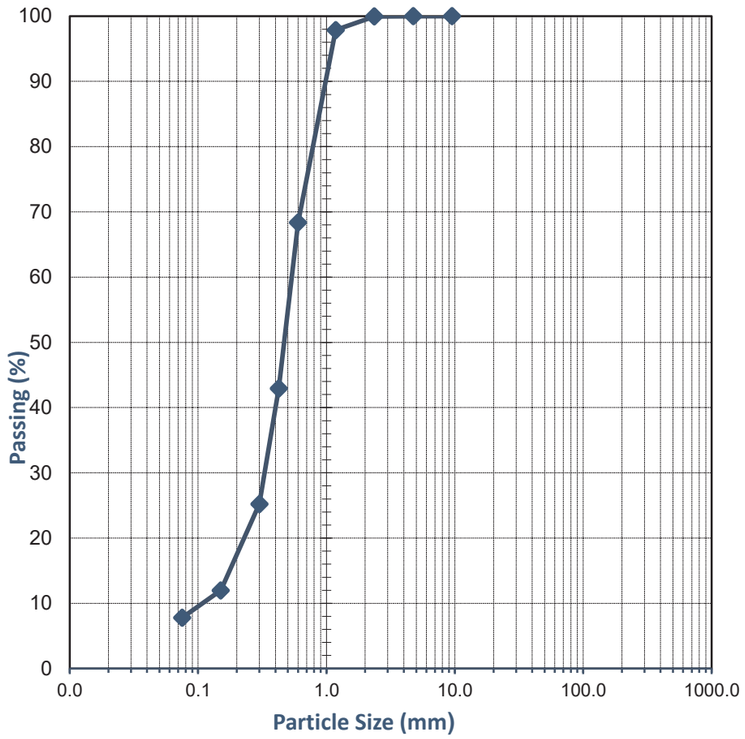
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S3653
Client Address:	PO Box 278 Como, WA, 6952	*Report No.*	WG21/9364_1_PSD
Project:	Lot 3 Ashton Road	*Sample No.*	WG21/9364
Location:	Bullsbrook	*Date Sampled:*	23-06-2021
Sample Identification:	S17 (TH75)	*Date Tested:*	29/6 - 1/7/2021

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	100
4.75	100
2.36	100
1.18	98
0.600	68
0.425	43
0.300	25
0.150	12
0.075	8



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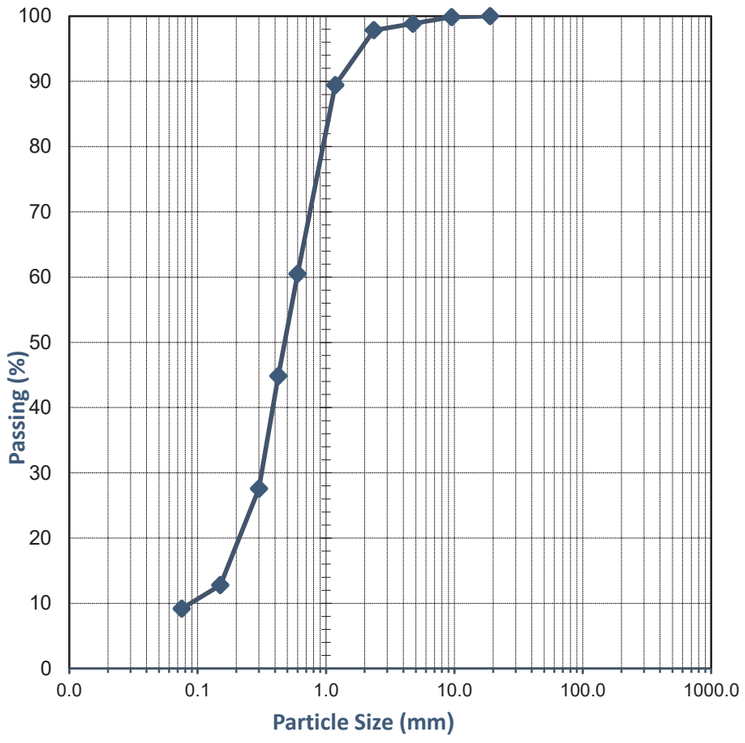
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S3653
Client Address:	PO Box 278 Como, WA, 6952	*Report No.*	WG21/9361_1_PSD
Project:	Lot 3 Ashton Road	*Sample No.*	WG21/9361
Location:	Bullsbrook	*Date Sampled:*	23-06-2021
Sample Identification:	S5 (TH77)	*Date Tested:*	30/6 - 1/7/2021

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	100
9.5	100
4.75	99
2.36	98
1.18	89
0.600	60
0.425	45
0.300	28
0.150	13
0.075	9



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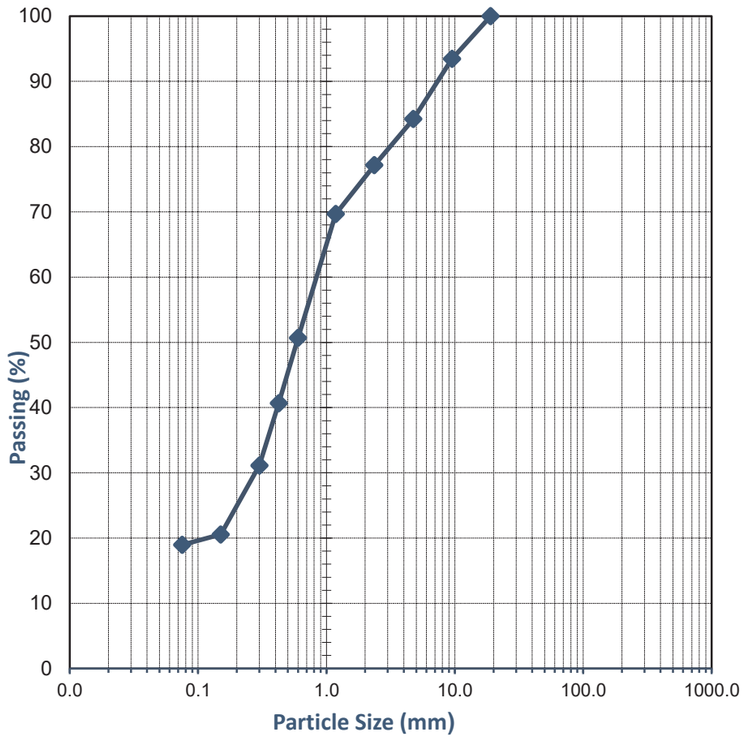
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S3653
Client Address:	PO Box 278 Como, WA, 6952	*Report No.*	WG21/9358_1_PSD
Project:	Lot 3 Ashton Road	*Sample No.*	WG21/9358
Location:	Bullsbrook	*Date Sampled:*	23-06-2021
Sample Identification:	S22 (TH79)	*Date Tested:*	30/6 - 1/7/2021

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	100
9.5	93
4.75	84
2.36	77
1.18	70
0.600	51
0.425	41
0.300	31
0.150	21
0.075	19



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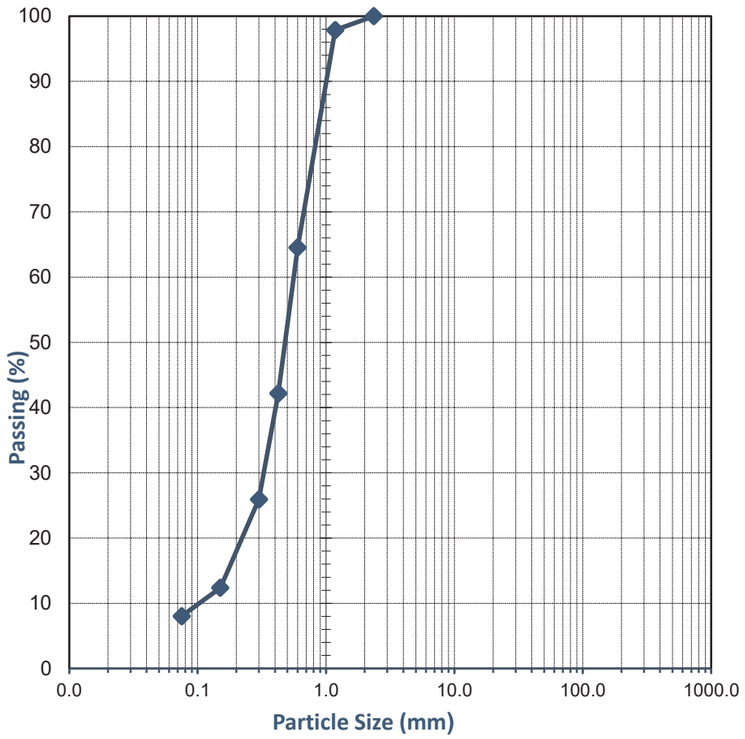
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S3653
Client Address:	PO Box 278 Como, WA, 6952	*Report No.*	WG21/9365_1_PSD
Project:	Lot 3 Ashton Road	*Sample No.*	WG21/9365
Location:	Bullsbrook	*Date Sampled:*	23-06-2021
Sample Identification:	S33 (TH80)	*Date Tested:*	30/6 - 1/7/2021

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	98
0.600	65
0.425	42
0.300	26
0.150	12
0.075	8



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6. The recommendations of this report should be considered a starting point. Recommendations should be continuously reviewed during the earthworks stage as sub-surface information and results from monitoring become available. It is strongly recommended that the Brown Geotechnical be retained to provide consultancy and/or inspections during the earthwork stages.

APPENDIX 5

District Water Management Strategy



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Prepared for:

WPG LANDHOLDINGS NO. 5 PTY LTD & BULLSBROOK INVESTMENT COMPANY PTY LTD

Bullsbrook Townsite – Northern Precinct

District Water Management Strategy



MARCH 2025

Report ref. J7057d

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Document Version No.	Issue Date
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J7057b	24 March 2023
J7057c	04 May 2023
J7057d	31 March 2025

	Name	Signature	Date
Revised By	Michael Ioannidis		31 March 2025
Checked by	Matthew Yan		31 March 2025
Approved by	Jim Davies		31 March 2025

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1. INTRODUCTION

1.1 Background

JDA Consultant Hydrologists has prepared this **District Water Management Strategy** (DWMS), for WPG Landholdings No. 5 Pty Ltd and Bullsbrook Investment Company Pty Ltd within the Bullsbrook North Urban Expansion Area, herein referenced to as the Study Area, to guide water management over the area in support of a proposal to amend the Bullsbrook Townsite District Structure Plan, Figure 1.

The amendment area/Study Area comprises of Lots 4 & 5 Great Northern Highway, Lots 21-24, 27 & 28 Kimberley Street, Lots 3, 17-19 & 80-83 Ashton Road, Lots 800-802 Morrissey Road and Lots 451 & 452 Chittering Road, Figure 1.

The Study Area is approximately 355 ha in size; situated within the City of Swan; and located approximately 38 km north-east of the Perth CBD, Figure 1. The Study Area is generally bound by Morrissey Road to the North, bushland, Chequers Golf Club and Great Northern Highway to the west, Kimberley Street and Ashton Road to the south and bushland and open pasture to the east, Figure 1. Existing access routes to lots within the Study Area are via Morrissey Road in the north and Kimberley Street and Ashton Road to the south, Figure 1.

The preparation of this DWMS is consistent with the *Better Urban Water Management* (WAPC, 2008). A copy of the DWMS Checklist (Department of Water, 2013a) is contained as Appendix A to assist agency review of this document.

1.2 Planning Context

The Study Area is currently zoned as *Rural* under the Metropolitan Region Scheme (DPLH, 2021) and *General Rural* under the City of Swan Local Planning No. 17 (City of Swan, 2021). Water Corporation's Bullsbrook WWTP is located west of the Study Area; is zoned *Public Purpose* (Commonwealth Government) and has recently ceased operations. Lot 800 Morrissey Road has approval in City of Swan (2021) for the 'Additional Uses' of a Construction Yard (maximum 4000 m^2) and a Caravan Park (maximum 22 ha).

The Study Area is located within the approved Bullsbrook Townsite District Structure Plan (City of Swan, 2018) and is classified as 'Future Investigation Area' and 'Potential Industrial'. This DWMS is prepared in support of a proposal to amend the DSP, which would identify the Study Area for residential land use, two schools, district open space and a local centre.

The recent North-East Sub-Regional Planning Framework (DPLH, 2018), which aims to accommodate for the long-term growth of the Perth and Peel regions to approximately 3.5 million people by 2050, classifies part of the Study Area as *Urban Expansion* and *Industrial Expansion*.

1.3 Proposed Structure Plan

As referenced earlier, this DWMS supports a request to amend the existing, approved Bullsbrook Townsite District Structure Plan where it applies to the Bullsbrook North Urban Expansion Area. This request seeks to:

- Identify the Study Area for 'Future Residential' land use;
- Identify two primary school sites;
- Identify a local centre;
- Identify district open space; and
- Identify a new district level road network.

A Master Plan Concept for the North Bullsbrook Precinct was prepared in support of the proposal by Rowe Group (2023) and is shown in Figure 2.

The Master Plan Concept proposes suburban living which integrates with the existing Bullsbrook Townsite to the south and also maintains the existing central waterway through the Study Area within public open space, refer Figure 2. Primary schools are proposed in the north and south with a potential Caravan Park or Lifestyle Village in the north-west adjacent to Chequers Golf Club. High quality vegetation will be retained, and stormwater drainage will be integrated into public open space.

Implementation of the DSP will facilitate the rezoning under the Metropolitan Region Scheme of Lots 21, 22, 27 & 28 Kimberley Street, Lots 17-19 & 80-83 Ashton Road to *Urban* (Stage 1) and Lots 4 & 5 Great Northern Highway, Lots 23 & 24 Kimberley Street, Lot 3 Ashton Road, and Lots 800-802 Morrissey Road to *Urban Deferred* in the short-term (Stage 2).

1.4 Principles and Objectives

In addition to Better Urban Water Management (WAPC, 2008) this DWMS uses the following documents to define its key principles and objectives:

- State Planning Policy 2.9: Water Resources (WAPC, 2006) & Draft State Planning Policy 2.9 - Planning for Water (WAPC, 2021)
- Better Urban Water Management (WAPC, 2008)
- Local Water Quality Improvement Plan Ellen Brook Catchment (SRT, 2009a)
- Swan Canning Water Quality Improvement Plan (SRT, 2009b)
- Bullsbrook Townsite Area Regional Water Management Strategy (GHD, 2012)
- Decision Process for Stormwater Management in WA (DWER, 2017); and
- Stormwater Management Manual for WA (DWER, 2022a)

This DWMS ensures that the water management strategies proposed for Bullsbrook North are consistent with the *Bullsbrook Townsite Area Regional Water Management Strategy* (WMS; GHD, 2012). The WMS is used as the foundation for developing more detailed District and Local Structure Plans. In addition, the Department of Water and Environmental Regulation (DWER) has long-term groundwater datasets within and around the Study Area which can assist in supporting structure planning of the Study Area.

JDA notes that a draft State Planning Policy (SPP) 2.9 was released for public comment in September 2021 which amalgamates and synthesises various SPPs into a single document and will eventually supersede the existing SPP 2.9 (WAPC, 2006).

The aims of this DWMS are specifically to:

- Identify the key water management elements of the Study Area.
- Describe pre-development conditions of the Study Area and its water resource management characteristics.
- Define land area requirement for conveyance and management of flood flows and protection of future urban development from peak flow events.
- Recommend management strategies for groundwater and drainage appropriate for local conditions that incorporates best practice water sensitive urban design (WSUD) measures.

- Present guiding principles and strategies for post-development management of the water resources as recommended in the *Bullsbrook Townsite Area WMS* (GHD, 2012).
- Recommend requirements and commitments for future actions including monitoring programs for water quantity and water quality pre-, during and post- development.

Table 1 provides a summary of the proposed principles and objectives for this DWMS.

TABLE 1: SUMMARY OF DWMS DESIGN OBJECTIVES

Key Guiding Principles	
• Facilitate implementation of sustainable best practice urban water management. • Provide integration with planning processes and clarity for agencies involved with implementation. • To minimise public risk, including risk of injury or loss of life. • Protection of infrastructure and assets from flooding and inundation. • Encourage environmentally responsible development.	
Category	**DWMS Objectives**
Stormwater Management	• Maintenance of pre-development hydrological regime including outflow rates. • Safe conveyance and management of stormwater runoff in accordance with *Australian Rainfall and Runoff* (Ball et al., 2019). • At source detention of first 15 mm ('small') rainfall event. • On site retention/detention of stormwater runoff up to 1% AEP storm event. Post-development peaks outflows from detention systems to waterways/outlets are consistent with pre-development peak flows. • Water quality treatment systems and water sensitive urban design structures designed in accordance with the Decision Process for Stormwater Management in Western Australia (DWER, 2017) and Stormwater Management Manual for Western Australia (DWER, 2022a) Chapter 9 (Structural Controls). • Non-structural measures to reduce applied nutrient loads.
Groundwater Management	• Ensure adequate separation, minimum of 1.2 m, between finished lot levels and groundwater levels. • Limit hydrological impact to Bush Forever and wetland sites. • Manage fertiliser and pesticide application in streetscapes and POS to reduce nutrient input.
Water Conservation and Sustainability	• Ensure non-potable water supply systems are considered as part of an integrated water supply. • Household target water use of 100 kL/person/year. • Scheme water target use of 40 to 60 kL/person/year. • Use of waterwise landscaping practices both at development and lot scale.
Water Quality	• Adopt nutrient load reduction design objectives for stormwater runoff. • Use of amended soils and ephemeral bioretention systems to treat stormwater.
Monitoring	• Pre- and post-development program to ensure water quality targets are met.

The current edition of Australian Rainfall and Runoff (ARR) (Ball et al., 2019) adopts different probability terminology from that used in ARR 1987 (IEAust, 1987). In line with Ball et al. (2019), this report adopts new terminology Exceedances Per Year (EY) and Annual Exceedance Probability (AEP) instead of previous terminology, Average Recurrence Interval (ARI) used in ARR 1987, see conversions below.

- 1 EY is equivalent to 1 Year ARI
- 20% AEP equates to 4.48 Year ARI
  (For simplicity, this report adopts 20% AEP as equivalent to 5 Year ARI)
- 10% AEP equates to 9.49 Year ARI
  (For simplicity, this report adopts 10% AEP as equivalent to 10 Year ARI)
- 2% AEP equates to 49.5 Year ARI
  (For simplicity, this report adopts 2% AEP as equivalent to 50 Year ARI)
- 1% AEP is equivalent to 100 Year ARI

2. SITE CHARACTERISTICS

2.1 Existing Land Use

The Study Area generally comprises areas of cleared pasture and native vegetation with a tributary to Ellen Brook crossing east to west across the centre of the Study Area. Approximately 50% of the Study Area has been cleared and used for grazing of cattle and sheep. The remainder generally comprises scattered trees, Figure 1. Most of the trees are re-growth with Landgate imagery from 1965 and the 1970s showing only sparse scattered trees across the Study Area.

Water Corporation's Bullsbrook WWTP including storage ponds, is located west of the Study Area (DWER, 2020a). This was recently closed and will soon be decommissioned following diversion of wastewater from the Bullsbrook sewer district to the Beenyup WWTP.

2.2 Rainfall

The Bullsbrook area is characterised by a Mediterranean climate with warm dry summers and cool wet winters. The Study Area has on average 58 precipitation days per year, which occur predominately between the months of May to and September. Rainfall data is provided by the nearby Bureau of Meteorology *Pearce RAAF* rain gauge (Site ID 009053), located 3 km south-west of the Study Area, Figure 3.

The rainfall record at the Pearce RAAF gauge dates from 1937, however, little data was recorded between 1946 and 1964. The average annual rainfall, 1965 to 2022, for Pearce RAAF was 651 mm, with a 30-year average of 623 mm, a 4% reduction. There has been a decreasing rainfall trend across south-west Western Australia since the 1970s (DoW, 2015), however, no such trend is evident at the Pearce RAAF rain gauge, either across the long- and short-term average annual rainfall nor the average monthly rainfall, Figure 3.

Average annual pan evaporation is estimated at 1,995 mm for the Study Area from pan evaporation data recorded at the Department of Primary Industries and Regional Development (DPIRD) Bindoon weather station (2013-2020). This is consistent with the estimate from Luke *et al.* (1987) for the Study Area of 1,990 mm.

2.3 Topography

The topography of the Study Area shows a general gradient from east to west to Great Northern Hwy with elevations ranging from 145 mAHD (east) to 45 mAHD (west), Figure 4.

There is a localised depression for a minor tributary through the centre of the Study Area.

2.4 Geology & Soils

Surface geology mapping by Gozzard (1982) is shown on Figure 4.

The Study Area is generally characterised by colluvial deposits of *Sand* (S6) to the east and *Sandy Silt* around the north-west boundary (Msg) and alluvial deposits of *Pebbly Silt* (Mgs1) to the south-west. Figure 4. The Sandy Silt within the Study Area, Figure 4, is mapped as colluvial fans in Gozzard (1982) although some of the deposit could have been wind-blown (Kern, 1985). The colluvial deposits are likely underlain by sandy clays and intercalated sands of the Guildford Formation (Kern, 1985).

Earlier Pleistocene deposits are represented as small pockets of *Laterite* (LA1) to the north and *Gravel* (G2) to the east. Descriptions of the key geological units in the Study Area are outlined in Table 2:

TABLE 2: KEY GEOLOGICAL UNITS WITHIN THE STUDY AREA

Geological unit	Description
Sand (S6)	SAND - light grey, fine to coarse, angular to sub-rounded, quartz with some feldspar, moderately sorted, loose, of colluvial origin
Sandy Silt (Msg)	SANDY SILT - strong brown, firm, friable, dispersive in part, occasional pebbly horizons with little matrix containing quartzite, quartz, granite, laterite, of colluvial origin
Pebbly silt (Mgs1)	PEBBLY SILT - strong brown, silt with common fine to occasionally coarse grained, sub-rounded laterite quartz, heavily weathered granite pebbles, some fine to medium-grained quartz sand, of alluvial origin
Laterite (LA1)	LATERITE - massive and cemented occasionally vesicular; up to 4m in thickness, overlain by a ferruginous gravel set in a clay-sand matrix of residual origin
Gravel (G2)	GRAVEL - strong brown, coarse, sub-rounded to rounded lateritised granite pebbles in clay-silt matrix moderately sorted, of colluvial origin
Sandy Siltstone (ST2)	SANDY SILTSTONE – pale brownish yellow, fine to medium grained, quartz and feldspar sand in siltstone matrix.

Gozzard (1982) shows the Darling Fault approximately vertically intersecting through the centre of the Study Area. The Gingin Scarp is near the northern boundary of the Study Area and is the mapped intersection of the Darling Scarp and Gingin Scarp.

A preliminary geotechnical investigation was conducted by Brown Geotechnical across the Study Area in June and July 2022 involving the excavation of 84 test holes, TH01 to TH84, soil sampling to determine soil classification and geotechnical properties, and in-situ permeability testing on all soil types encountered. Test hole locations are shown on Figure 4.

The subsurface conditions encountered in the test holes and inferred from the laboratory results are described in Brown Geotechnical (2022) as follows:

> " ***Topsoil and Fill*** *– Test holes encountered topsoil consisting of silty sand with organics, locally with roots and rootlets. The topsoil varied in thickness from 0.1 to 0.2 m, the average across the site being 0.1 m. Visual evidence suggests the topsoil quality to be poor, with estimated organic content of approx. 5%. The quality increased locally, especially in Lots with residential buildings and paddocks, where soil quality may have undergone improvement. No uncontrolled fill was encountered in the test holes.*
>
> ***Sand*** *– Sand was encountered in most test holes to at least 1.5 m depth. The material varied from fine to medium grained; to medium to coarse-grained. The other major variant was fines content, varying from low fines of 3% up to moderate fines of 40% (classified as Silty Sand). Most test holes contained 'Sand with Silt' with 5% to 12% fines or 'Silty Sand' with fines > 12%.*
>
> ***Gravel/Laterite*** *– A very dense, often cemented, sandy gravel or laterite was encountered close to or at the surface in some test holes in the northeast portion of the site. The excavator refused in the material at approximately < 0.5m.*

> ***Sandy Clay*** *– Very stiff, sandy clay was encountered at 0.5 m below silty sand in the southwest corner of the site (southern half Lot 5). Test results show the material to have a moderate fines content, intermediate to low plasticity with a low expansive nature. Very stiff, sandy clay was also encountered at the surface in the southeast corner of the site (Lot 451). Test results show the material to have a moderate fines content, intermediate to high plasticity with a moderate expansive nature.* "

A detailed geotechnical investigation is required at the LSP/LWMS stage of development.

2.5 Acid Sulphate Soils

Acid Sulphate Soils (A.S.S.) risk mapping, Figure 4, shows no known A.S.S. disturbance risk occurring less than 3 m from natural surface (DWER, 2017b). High to moderate risk and moderate to low-risk areas west of the Study Area generally align with mapped wetland areas (Section 2.6).

2.6 Wetlands and Significant Vegetation

Geomorphic Wetland mapping of the Swan Coastal Plain, Figure 5, shows no mapped wetlands within the Study Area (DBCA, 2020). The nearest mapped Conservation wetlands are 700 m down-gradient (west) of the Study Area along Great Easter Highway and there is a Multiple Use dampland 150 m up-gradient (east) of the Study Area which acts a source zone for the central waterway, Figure 5.

There are no Bush Forever sites within the Study Area although sites 291 and 292 are located north of the Study Area and site 294 is located west of the Study Area, Figure 5.

2.7 Surface Water Hydrology

2.7.1 Drainage Catchments and Infrastructure

The Study Area is located within the Ellen Brook Catchment which is a natural waterway. The Ellen Brook Catchment has the largest catchment area of all the sub-catchments on the Swan Coastal Plain (SRT, 2009a) and discharges into the upper reaches of the Swan River. The 1% AEP floodplain mapping of Ellen Brook (HARC, 2016) extends as far north as Rutland Road, Figure 6, with an approximate floodplain width of 400 to 500 m. At Rutland Road, the Study Area is 500 m east of the Ellen Brook floodplain, Figure 6. The only currently monitored gauging station on Ellen Brook, *Ellen Brook – Almeria Pde Upper Swan* (Site ID: 616189) is located at the catchment outlet 14 km south of the Study Area.

Surface water drainage catchments originate east of the Study Area, p1 to p3 on Figure 6, and have been delineated based on DoW (2008 & 2013d) 1 m gridded LiDAR.

Catchment p1 generally comprises the upper, sandy reaches of the Study Area and rainfall will generally be infiltrated. However, during larger more intense rainfall events, stormwater runoff as sheet flow will likely occur. North of Morrissey Road is denser bushland designated Bush Forever (Section 2.6 and Figure 5), and there is likely to be high interception losses across this area. A preliminary site visit by JDA staff of the p1 catchment showed no evidence of the minor watercourse mapped by DWER and shown on Figure 6 and no culverts were observed across Morrissey Road.

The central waterway within Lot 3 (image on cover page) in Catchment p2 drains from a multiple use dampland (Figure 5) east of the Study Area that forms a narrow channel westward to a series of dams near the western boundary of the Study Area. Each of these dams are connected by dual Ø600 corrugated steel pipes with outflow from the Study Area through a Ø450 concrete pipe and over a low-point within the firebreak/access road along the western boundary of the Study Area.

There is no mapped waterway within catchment p3 although a 3 x Ø750 culvert is located at the western Study Area boundary. Surface water flow is expected to be as sheet flow of both stormwater runoff and groundwater perched on silty soils (Section 2.5 and Figure 4).

Details of these catchments are presented in Table 3 and shown on Figure 6.

TABLE 3: SURFACE DRAINAGE CATCHMENTS

Catchment[1]	Area (ha)	% in Study Area	Catchment Area in Study Area (ha)	Catchment Length (km)	Estimated % Cleared
p1	228	53	122	3.2	66
p2	360	19	68	2.8	58
p3	141	96	136	2.3	74

MRWA culvert locations and sizes on Great Northern Highway are shown on Figure 6. Most of these culverts are single barrel pipes except for culverts west (down-gradient) of catchments p2 and p3.

2.7.2 Peak Flow Estimates

Preliminary 1D pre-development surface water modelling has been conducted by JDA in 1D XP-STORM based on the methodology in *Australian Rainfall and Runoff* (Ball et al., 2019) and using BoM (2016) design rainfalls. The rainfall temporal pattern was assumed spatially uniform across the catchment with storms modelled ranging from 1 hour to 72 hours. Surface water catchments were modelled with an initial loss of 42 mm and continuing loss of 4 mm/hr based on regional storm loss estimates provided by the *Australian Rainfall & Runoff Data Hub*. A Manning's 'n' of 0.03 was used for cleared areas and 0.08 for vegetated areas. Peak flow estimates in Table 4 represent the mean peak flow from the 10 temporal patterns modelled for each event frequency and duration.

Stormwater runoff in Catchments p1 & p3 was assumed to occur as sheet flow and in p2 was assumed to discharge into the mapped waterway within the centre of the Study Area. This central waterway was modelled based on eight cross-sections delineated from 1 m gridded LIDAR (DoW, 2008) with channel base width ranging from 1 m to 10 m and channel slope ranging from 0.9% to 4%. Inverts were estimated for corrugated steel pipes at dam locations and the overtop level of the dam from DoW (2008) LiDAR. A Manning's 'n' of 0.03 was used for the drainage channel

Peak flow estimates are summarised in Table 4 for 1 EY to 1% AEP events. A model long-section for the central waterway with results from the 20% and 1% AEP critical event is shown on Figure 7. Modelled peak flood depths in the central waterway are generally up to 1.1 m and are retained within the drainage channel, Figure 7. Modelling shows the dams overtop in both the 20% & 1% AEP events. Peak velocities are generally high, 1.4 to 2.5 m/s, due to steep channel slope (0.9% to 4%), Figure 7.

Catchments and preliminary stormwater modelling should be refined at the local planning stage of development for pre- and post-development based on results of pre-development monitoring to determine Study Area outflow with consideration to existing constraints identified in this DWMS.

TABLE 4: PEAK FLOW ESTIMATES

Catchment	Total Area (Ha)	Peak Inflow Estimates (m^3/s)				
		1 EY	20% AEP	10% AEP	5% AEP	1% AEP
p1	228	0.13	1.64	2.55	4.28	10.57
p2	360	0	2.88	4.76	8.25	18.00
p3	141	0.08	1.06	1.55	2.75	6.78

2.7.3 Foreshore Reserves

For the purposes of guiding the amendment in the district structure plan, a generic 30 m interim foreshore width of the left/right channel bank (total width of 60 m) has been applied to the central waterway, as shown in Figure 2. This is consistent with GHD (2012) and whilst the structure plan demonstrates sufficient area has been provided to accommodate the notional foreshore width, the width of the foreshore boundary will be refined as part of the local structure planning process in accordance with *Operational Policy 4.3: Identifying and establishing waterway foreshore areas* (DoW, 2012) and supported by a biophysical assessment of the waterway.

2.8 Groundwater Hydrology

2.8.1 Hydrogeology

The hydrogeological formations under the Study Area can be grouped into three aquifers, each being assigned the name of the major geological unit contributing to it. In descending order of depth from natural surface they are; Superficial Aquifer (unconfined), Leederville Aquifer (confined) and Yarragadee Aquifer (confined).

The Superficial aquifer is unconfined and directly recharged from direct rainfall percolation, and below the Study Area has a saturated thickness of up to 100 m. The base of the superficial aquifer is estimated to range from 15 to 40 mAHD south-west to north-east across the Study Area (Department of Environment, 2004).

Davidson (1995) shows that the superficial formations are comprised of Bassendean Sand with fringes of Guildford Clay of the Pinjarra Plain. In addition to these studies the Department of Environment (2004) Groundwater Atlas shows that the typical superficial aquifer groundwater salinity in this area ranges from fresh in the Bassendean Sand to brackish in the Guildford Clay. Salinity can range in the order of 500 to 5000 mg/L TDS.

The superficial formations are underlain by the Leederville and Yarragadee formations. The Leederville Formation is made up of the Pinjar and Wanneroo Members. The Yarragadee Formation present beneath the Study Area consists of laterally discontinuous interbedded sandstones, siltstones and shales (Davidson, 1995).

2.8.2 Groundwater Levels

There are no long-term DWER groundwater monitoring bores across the Study Area and only 12 monitoring bores within the wider Bullsbrook Townsite Area which are mostly located west of Great Northern Highway (GHD, 2012). The nearest of these bores to the Study Area is GD19, located at the south-west corner of Chequers Golf Club and 1 km west of the Study Area, see Figure 8. The maximum groundwater level at GD19 (1978-2021) is approximately 40 mAHD. Between 1978 and 2000, peak annual groundwater levels were recorded at or near surface however groundwater levels have substantially fallen in the Gnangara Mound in the last 30 years as a result of declining rainfall, groundwater abstraction for public water supply and groundwater uptake by pine plantations. Since 2010, peak annual groundwater levels at GD19 have ranged from 36.5 to 38 mAHD, 2 to 3.5 m below the long-term maximum.

The historical maximum groundwater contours presented in the *Perth Groundwater Atlas* (WRC, 1997) do not extend as far east as the Study Area. DWER has produced annual maximum and minimum groundwater contours for the Gnangara and Jandakot Mound groundwater areas sporadically since 1997. These contours cover most of the Study Area except the north-east corner. Figure 8 *left* shows contours for maximum groundwater levels recorded in 1997, the highest of the annual maximum groundwater contours produced by DWER, with groundwater levels ranging, north-east to south-west, from 50 mAHD to 36 mAHD. Annual maximum groundwater level contours for 2019 are generally 2 to 3 m lower than the 1997 contours and suggest a similar trend to that of the nearby bore GD19.

Ongoing groundwater monitoring is conducted west of the Study Area in and around RAAF Base Pearce as part of the PFAS Monitoring Program (see Section 2.10) with monitoring conducted post-winter and post-summer thereby representing approximate annual maximum and minimums groundwater levels, respectively. Groundwater contours

presented in Cardno (2021) for May 2020 are generally consistent with regional contours although the extent of these is restricted to the south-west corner of the Study Area, i.e. areas closest to RAAF Base Pearce.

Groundwater flow direction across the Study Area is expected to generally be from north-east to south-west/west to Ellen Brook, similar to regional trend.

Figure 8 *right* shows the depth to the regional water table based on 1997 maximum groundwater level contours. The depth to the regional watertable is 8 to 10 m along the western boundary rising to over 80 m in the eastern sandy up-gradient areas. There is likely to be seasonal perching of groundwater which in some areas forms surface water that sheet flows into local drainage lines.

Based on the soil types, topography and large depth to groundwater across the Study Area, site-specific groundwater monitoring will not be required. This is consistent with the approach taken to other developments within the Bullsbrook Townsite.

2.8.3 Groundwater Availability

The Department of Water and Environmental Regulation manages the groundwater of the State under the Rights in Water and Irrigation Act 1914 (RIWI Act). The Study Area is generally located within the Cockman Bluff sub-area of the Swan Groundwater Management Area for the superficial aquifer and within the Swan Confined sub-area for the Leederville aquifer. Lots 18 and 19 Ashton Road and Lots 451 and 452 Chittering Road are located within the Bandy Spring.

The DWER groundwater allocation limit and water allocations for the Study Area are shown in Table 5 and are based on a Resource Allocation Report from DWER as at 25 February 2025.

TABLE 5: DWER GROUNDWATER RESOURCE ALLOCATION AND LIMIT, FEBRUARY 2025

GW Sub -Area	Aquifer	General Allocation Limit Licensable component, (kL/yr)	Allocated (kL/yr)	Additionally Requested (kL/yr)	% Allocated, committed & requested
Cockman Bluff	Superficial Swan	841,000	771,596	51,080	98%
Bandy Spring	Superficial Swan	297,000	324,010	15,700	114%
Swan Confined	Leederville	4,746,000	5,473,644	12,250	116%

As at 25 February 2025, all aquifers within the Study Area were at or over-allocated.

The Swan Groundwater Management Area forms part of the Gnangara Groundwater Allocation Plan area. A new groundwater allocation plan (DWER, 2022b) was released in June 2022 to replace the previous DoW (2009) plan. The new plan reduced the allocation limit for the Cockman Bluff sub-area from 1,500,000 kL/year in DoW (2009) to 996,000 kL/year, a 33% reduction, but raised the allocation limit for Bandy Springs from 350,000 kL/year to 476,000 kL/year, a 36% increase.

Table 5 shows the *General* component of allocation limits. The balance of the allocation limits stated in DWER (2022b) is the *Exempt* component which accounts for groundwater used for purposes which don't require a water licence such as domestic bores and Commonwealth-owned bores. These *Exempt* components, 155,000 kL/year for Cockman Bluff and 179,000 kL/year for Bandy Springs, have been estimated in DWER (2022b) and are subject to change over time as better information on rates of instalment and average water use per bore (DWER, 2022b).

A water source will be required for the irrigation of streetscapes and establishment of vegetated areas within the POS.

The superficial aquifer is the most feasible irrigation supply for the Study Area with groundwater available through a new water licence and/or transfer of existing licences within the amendment area. Across the Study Area, there are

existing superficial groundwater licences attached to existing lots which total 160,260 kL/year. These are: GWL173019 (81,060 kL/year) at Lot 800 Morrissey Road; GWL153632 (9,200 kL/year) at Lot 5 Great Northern Highway; GWL180619 (45,000 kL/year) at Lot 21 Kimberley Street; GWL180804 (15,000 kL/year) at Lots 17 & 18 Ashton Road; and GWL50510 (10,000 kL/year) at Lot 19 Ashton Road. Licence locations and allocations are shown on Figure 9.

2.9 Groundwater & Surface Water Quality

The Ellen Brook Catchment is recognised as being one of the highest contributors of nutrients to the Swan-Canning Estuary with very high levels of phosphorus and moderate levels of nitrogen. The Ellen Brook Catchment Local Water Quality Improvement Plan (LWQIP) (SRT, 2009a) identifies the catchment as being one of eight priority catchments in the Swan Canning Catchment. The nitrogen to phosphorus ratio of approximately 4:1 in the tributary creeks and Ellen Brook identifies these waters as being highly susceptible to the growth of nitrogen fixing blue algae.

The principal source of nutrient loading within the Ellen Brook Catchment is associated with agricultural land uses. As the soils within the Study Area have poor phosphorus retention capacity, when high groundwater or perched groundwater and surface water sheet flow are established by winter rainfall, there is a significant loss of phosphorus and nitrogen from both fertiliser and animal manure into the local drainage lines, which then discharge into Ellen Brook and the Swan River.

Davidson (1995) estimates that the superficial groundwater quality for the Study Area is in the order of:

- Total Dissolved Solids: < 250 mg/L
- Dissolved Iron: 1 mg/L
- Nitrate-Nitrogen Concentration: < 1 mg/L
- Phosphorus Concentration: 0.05 mg/L

Historic monitoring results for the Ellen Brook Catchment are presented in Shams & Smith (2002) and show nutrient concentrations within surface water discharging into Ellen Brook exceed that of the superficial groundwater.

There are no groundwater monitoring bores within the Study Area apart from 5 located around the Bullsbrook WWTP (DWER, 2020b). These bores are sampled annually but the analytical results of these samples are not publicly available.

There are no DWER surface water quality monitoring sites within the Bullsbrook Townsite area. DWER has a surface water monitoring site on the Ellen Brook located close to Great Northern Highway, near the Swan River confluence. The range of annual median nitrogen and phosphorus concentrations measured between 1999 and 2015, compared with the short-term and long-term water quality improvement targets are shown in Table 6.

TABLE 6: NUTRIENT CONCENTRATIONS IN THE ELLEN BROOK CATCHMENT

Nutrients	Median Concentration (mg/L)			SRT (2009a) Targets (mg/L)	
	Groundwater	Creeks	Ellen Brook[1]	Short Term	Long Term
Total Nitrogen	0.48	2.70	1.3 – 2.5	2.0	1.0
Total Phosphorus	0.14	0.72	0.27 – 0.50	0.2	0.1

Note: 1. Ellen Brook Median Range from Swan Canning Catchment Nutrient Report Update 2015

Pre-development surface water monitoring is required for a minimum of 18 months and 2 winters per the requirement of *Better Urban Water Management* (WAPC, 2008) and is detailed in Section 7.2.1.

2.10 Contaminated Sites

A search of DWER's publicly available Contaminated Site Database (accessed April 2023) indicated no contaminated sites within or around the Study Area.

JDA notes the publicly available database only identifies 3 of the 7 contaminated sites classifications: *Contaminated – restricted use; Contaminated – remediation required; and Remediated for restricted use. The remaining classifications are Report not substantiated; Possibly contaminated – investigation required, Not contaminated – unrestricted use;* and *Decontaminated*.

RAAF Base Pearce, located south-west of the Study Area, is not listed as a contaminated site on DWER's publicly available Contaminated Site Database but has known perfluoroalkyl and polyfluoroalkyl substances (PFAS) contamination from the historical use of firefighting foams (GHD, 2016). The RAAF Base Pearce landfill was located immediately down-stream of the waterway intersecting the Study Area and is denoted as "Potential Source Area R" in GHD (2018). An investigation of the landfill in 2016 found a range of waste types present in the landfill to depths of 2 to 3.3 m below ground level with a landfill cap of approximate 0.5 m thickness overlying the landfill waste (GHD, 2018). Information from RAAF Base Pearce personnel, as reported in GHD (2008), suggested that empty or old drums of firefighting foam may have been historically disposed of in this landfill.

The landfill was assessed through monitoring of 2 bores located at the up-gradient and down-gradient landfill boundary. GHD (2018) identified PFAS in groundwater immediately beneath the waste mass (up-gradient bore) although analysis of the down-gradient bore (concentrations at or below reporting limit) suggest that the PFAS impact to groundwater appears to be localised. The capping layer is considered in GHD (2018) to restrict exposure of the waste material to receptors although there are potential risks to human health should groundwater in the vicinity of the up-gradient bore be utilised for potable or non-potable purposes. There are no existing groundwater abstraction bores within close proximity to the identified landfill PFAS contamination. Trend analysis in GHD (2021) suggests concentrations have remained stable since 2017.

In October 2021 sampling and laboratory testing of groundwater, surface water and soil undertaken within Lot 3 indicated no detectable levels of PFAS were present.

2.11 Aboriginal Heritage Sites

There is one registered Aboriginal Heritage site, *Ellen Brook: Upper Swan* (Site ID: 3525), which covers the wider Bullsbrook area including that of the Study Area, Figure 5. The central waterway as a tributary to Ellen Brook will be retained and it is anticipated this will not be impacted by development of the Study Area.

There is another nearby other heritage place, *Sounness Drive Camp* (Site ID: 20743), situated approximately 500m west of the Study Area within Chequers Golf Club. This place is represented as a 320 m diameter area and covers the south-west corner of the Golf Club including the chalets and club rooms, and is not impacted by this proposed development.

2.12 Hydrological Opportunities & Constraints

The above-described characteristics of the pre-development environment in the Study Area provide a number of key constraints and opportunities for the application of Water Sensitive Urban Design with land use change:

- Sandy soils over most of the upper reaches of the Study Area will aid the infiltration of frequently occurring storm events (i.e. the first 15 mm of rainfall) at source where possible via soakwells or other underground storage devices.
- A.S.S risk mapping (DWER, 2018) for the Study Area indicates no known risk of A.S.S. occurring within 3 m of the existing natural surface.
- A minor tributary flows east-west through the centre of the Study Area to Ellen Brook. In addition, a large culvert near the south-western corner of the Study Area suggests potential for overland flow, either of surface water or perched groundwater. Consideration in regard to the functions of these natural drainage systems and water quality is required through further foreshore assessment.
- Geomorphic Wetland mapping identifies no wetlands throughout the Study Area.
- Several landholders within the Study Area have superficial groundwater licences which could be transferred for post-development use and used for establishment and ongoing irrigation of POS.
- There is likely significant clearance (> 10 m) to regional groundwater levels across most of the Study Area and retention and infiltration of stormwater runoff is likely to be feasible management option. A detailed geotechnical investigation is required at the LSP/LWMS stage of development to determine any potential for perched groundwater or other inhibitors of infiltration. Subsoil drainage may be required for management and control of groundwater levels post-development across some areas of the Study Area.
- Historical rural land use over a large portion of the Study Area has, to varying degrees, affected groundwater quality and there are currently no water quality controls. Change in land use provides an opportunity to improve groundwater quality through application of sustainability principles and water sensitive urban design.
- Site investigations and monitoring by GHD (2016 & 2018) and Cardno (2021) of the former RAAF Base Pearce landfill site suggest there is an isolated contamination of PFAS immediately down-gradient of the Study Area.
- There is a 500 m buffer around the Bullsbrook WWTP. As the WWTP is to be decommissioned, Water Corporation advice to the City of Swan is that the buffer will be redundant and will eliminate the constraint to adjoining land being developed to urban.

These constraints and opportunities are used to assist development of a DWMS for the Study Area.

3. WATER SUPPLY & CONSERVATION STRATEGY

The supply, conservation and sustainable use of water within the proposed development are key components of the water management strategy and are described further below.

3.1 Water Supply

3.1.1 Potable Water

The Bullsbrook Townsite is serviced by the 2.5 MGL capacity Bullsbrook HL Tank, located just south of the Study Area near Chittering Road. This potable water source can service properties to an elevation of 90 mAHD or approximately two-thirds of the Study Area. A new water tank is proposed higher up the Darling Scarp at an elevation of around 190 mAHD which would support development in the higher reaches of the Bullsbrook Townsite including the Study Area. This will be confirmed at the LSP/LWMS stage of development. Most of the Study Area is likely to connect to the distribution main on Chittering Road.

3.1.2 Non-Potable Water

Water required for irrigation of POS and School areas is generally by groundwater abstraction from the superficial aquifer under licence by DWER. It is assumed the central waterway and associated buffer will be generally maintained in their present condition and establishment irrigation may be required within the buffer.

POS areas within the Study Area total approximately 49 ha with some irrigation also required within the school sites (7.2 ha). Preliminary calculations by LD Total (2023) have estimated 50% establishment irrigation and 30% ongoing irrigation for open space areas and 20% irrigation for school sites. Adopting a conservative POS irrigation rate of 6,750 kL/ha/year (DWER standard rate is 7,500 kL/ha/yr), this equates to an estimated irrigation requirement of 166,000 kL/year for establishment and 110,000 kL/year for ongoing irrigation.

A total water allocation of 160,260 kL/year is currently held by existing landowners within the Study Area (Section 2.8.3 & Figure 9), similar to the establishment irrigation requirement. There is therefore sufficient water held by existing landowners to meet the irrigation water demand for development of the Study Area.

Non-potable water source options could also be investigated at the LSP/LWMS stage of development in accordance with the *Guidelines for the approval of non-drinking water systems in Western Australia* (DWER, 2013a).

Examples of options may include:

Rainwater Tanks

Collection and storage of rainwater runoff from roof and other impervious surfaces have generally been considered of minimal value to supply or supplement irrigation demand in the Greater Perth Area at the development scale. This is due to the vast majority of annual rainfall occurring in the space of a few months when water consumption is at its lowest. It also requires the need for sufficient storage capacity to allow water to be utilised over the course of the year.

Limitations to use of rainwater tanks include reliability of rainfall, infrastructure required to store water either above or below ground, water quality considerations and cost.

Whilst use of rainwater tanks can be beneficial for supplementing non-potable water demand, it is more suitable at the household scale rather than at the development scale for irrigation of POS.

Stormwater Harvesting & Managed Aquifer Recharge

Stormwater runoff generated from the urban development can be collected and conveyed by a stormwater system (network of pipes and swales) to temporary storage areas for treatment/retention/infiltration prior to discharge into a downstream receiving environment.

Collection and reuse (harvesting) of all or part of stormwater can assist in providing an alternative non-potable water source and reduce size of infrastructure required for stormwater flood management.

Harvesting of stormwater to supply POS irrigation demand can be achieved by infiltration into underlying sandy aquifers and reuse via groundwater extraction bores. Depth to groundwater in the upper catchments is expected to be high but there may be caprock at shallow depths which could inhibit infiltration. However, there may be potential to inject deeper beneath any potential caprock. With no bores across the Study Area, the lithology with depth is unknown. Geotechnical investigations at the LSP/LWMS stage are required to assess the viability of stormwater harvesting.

Alternatively, above or below ground infrastructure for storage of stormwater for future reuse can also be used. For these storages to be effective, storage needs to be sufficiently large to contain adequate volume for irrigation requirements, with limited use dependent upon rainfall, similar to rainwater tanks. Land take for such storage systems can be generally large and expensive to install and maintain and water quality treatment may also be required.

The impact of harvesting stormwater on downstream ecological water requirements also need to be considered. Whilst stormwater harvesting at the development scale has limitations similar to rainwater tanks, it could also be used to assist in supplementing other POS water source options.

Greywater Recycling

Greywater is water collected from showers, bathrooms and laundry and is potentially available for reuse. Treated greywater is suitable for garden irrigation in accordance with the Code of Practice for the Reuse of Greywater in Western Australia. Where greywater is applied to gardens for irrigation, sandy soils need improved organic matter and soil texture to ensure excessive nutrients do not leach to the watertable.

It is generally considered that greywater can only be stored for up to 24 hours at a time without significant impacts on water quality and subsequent risks to public health. Therefore greywater generated during each day would need to be discharged, either for reuse or for disposal to the sewer network every 24 hours. A water balance would need to be performed to assess volume of water generated against supply required.

Construction of a separate pipe system within the development is required to collect and reuse greywater. A specific area will also be required to be set aside for the greywater treatment system and provision of other supporting infrastructure such as power. Responsibility for ownership and ongoing operation and maintenance of the system also need to be established upfront.

While greywater recycling could be used for development scale water supply for irrigation of POS, it may be cost prohibitive due to additional pipe infrastructure required. It is more suitable at the household scale rather than at the development scale.

Wastewater Recycling

Wastewater is all water generated in a household and includes the combination of greywater (water from showers, bathrooms and laundry) and blackwater (toilet). The collection, treatment and reuse of household wastewater can only be performed at development scale and requires construction of a purpose built on-site wastewater treatment system, commonly referred to as a decentralised wastewater recycling system.

The planning and construction of such a system requires many regulatory clearances, approvals and management plans with various government agencies including but not limited to the City of Swan, Department of Water & Environmental Regulation, Water Corporation, Department of Health and Department of Biodiversity, Conservation and Attractions.

Planning also needs to consider location with respect to environmental impacts and required buffers for adjacent land uses. Initial construction costs can be high in comparison to other non-potable water source options. It does not require construction of additional collection pipes as the standard residential sewer network should be sufficient, however responsibility for ownership and ongoing maintenance need to be determined.

A third party licenced Water Service Provider is required to provide this wastewater recycling service. The use of such a system can provide an almost guaranteed water supply with predictable volumes. This is particularly beneficial for irrigation purposes where water demand can be forecast in the POS areas. The wastewater will need to be treated to acceptable levels specified by the relative agencies. The required infrastructure and ongoing management can prove cost prohibitive and impractical in many circumstances.

3.2 Wastewater Management

Water Corporation has completed infrastructure planning across the Study Area. A new pipeline being constructed in 2022/2023 between the North Avenue Pump Station in Bullsbrook and Milllhouse Road Pump Station in Ellenbrook will cater to continued population growth across the Bullsbrook Townsite and is intended to service development as proposed of the Study Area.

3.3 Water Conservation Objectives

The objective for water conservation is to minimise use of water and maximise water use efficiency where possible. This objective can be achieved at both the development and household scale and has been identified by the State Government as part of the State Water Plan (Government of Western Australia, 2007) as a priority item for potable water. It has set a target for household water use of 100 kL/person/year, with a consumption target for scheme water of 40 to 60 kL/person/year.

Consistent with the State Water Plan, the main objectives for the development are:

- Avoid use of potable water for irrigation in POS areas;
- Household water use to be less than 100 kL/person/year;
- Minimise use of potable water where drinking water quality is not essential, particularly ex-house; and
- Household consumption targets for in-house potable water use of 40 to 60 kL/person/yr.

Improvements in water conservation and efficiency to meet these objectives at both the development and lot scale through various mechanisms and measures are described further below.

Development Scale

Development scale water conservation measures appropriate for the site include:

- Strategic planning (orientation, shape, elevation etc.) of irrigation areas such as pocket parks, active and passive public open space areas, and road reserves to minimise long-term irrigation demand.
- Where possible co-locate facilities with significant irrigation demand.
- Within irrigation areas, the use of waterwise landscaping practices including hydrozoning, mulching, soil amendments, water retention products and installation of appropriate water efficient irrigation fixtures.

- POS and turfed areas should be irrigated using groundwater from the existing licences held across the Study Area.
- Retain and where appropriate rehabilitate native bush areas and incorporate native planting in public open space and within road reserves.

Lot Scale

Lot scale water conservation measures appropriate for the site include:

- Buildings constructed to current National Construction Code standards. These include using AAA rated appliances such as toilets, washing machines, dishwashers, water saving showerheads, taps and toilets and subsurface irrigation. The Water Corporation's Waterwise Rebate Program will also assist in encouraging the purchase of waterwise AAA rated appliances.
- Initiatives to encourage waterwise landscaping of residential lots including hydrozoning, mulching, soil amendments, water retention products and installation of appropriate irrigation fixtures.
- All buildings should be encouraged and supported to implement these waterwise practices and measures within this development.

4. GROUNDWATER MANAGEMENT

4.1 Key Criteria

The key criteria for groundwater management for the Study Area as identified in the Regional WMS (GHD, 2012) are:

- Where a perched water table exists or the predicted maximum groundwater level is at or within 1.2 m of natural surface levels measures should be implemented to ensure that adequate separation of building floor slabs from groundwater is achieved. This may include lowering the groundwater levels where possible, the importation of clean fill or installation of subsoil drainage; and
- Proposals to lower groundwater levels must demonstrate no or negligible impact on groundwater dependent ecosystems. In particular where subsoil drainage is proposed within the groundwater capture zone of wetlands, designs must be developed with consideration of ecological water requirements for groundwater dependent ecosystems.

4.2 Groundwater Levels

There is generally greater than 10 m separation to the regional groundwater table across the Study Area, Figure 8 *right*. A detailed geotechnical investigation is required at the LSP/LWMS stage of development to determine if there are any soil horizons of potentially low permeability, which could impede the infiltration of stormwater and result in perched watertables. Should this occur, groundwater management in the form of additional clean sand fill and/or subsoil drainage may be required in some areas to provide a minimum separation to building floor levels from any potential perched watertables (if encountered), consistent with the criteria in the Regional WMS (GHD, 2012).

Should management of groundwater levels be required, subsoil drainage areas, inverts, discharge rates and locations are to be established in accordance with *Water Resource Considerations when Controlling Groundwater Levels in Urban Development* (DWER, 2013c) and are to further consider:

- Subsoil drainage to manage post-development rise in groundwater levels, particularly in areas where there is potential for perched watertables within 1.2 m of natural surface. Subsoil drainage should be installed at or above any low permeability soil horizon and have free-draining outlets.
- Subsoil drainage may be used to provide a controlled groundwater level (CGL) in perched watertable areas.
- Appropriate analysis should be performed to assess influence of subsoil drainage on groundwater levels, including extent of groundwater drawdown and mounding between subsoil lines.

4.3 Groundwater Quality

Key factors to maintain or improving existing groundwater quality are:

- Drainage inverts set at or above existing groundwater levels or any impeding layer if encountered to minimise nutrient export.
- Stormwater runoff from road reserves during frequently occurring rainfall events (15 mm) are to be treated and retained in bio-retention areas.
- Use of a combination of soil amendments and landscape design (native vegetation, minimising turf areas, etc.) to limit fertiliser and pesticide application in public open space areas.

Specific details on the local scale of application, and responsibilities for individual best management practices will be appropriately addressed during later planning stages (LWMS/UWMP) in accordance with *Better Urban Water Management* (WAPC, 2008) requirements.

5. STORMWATER MANAGEMENT

5.1 Key Design Objectives

The key objectives for surface water management for the Study Area as identified in the *Decision Process for Stormwater Management in Western Australia* (DWER, 2017a) are for the implementation of water sensitive urban design to:

- Protect public health and safety.
- Protect public and private infrastructure and buildings from flooding.
- Protect and enhance sensitive receiving environments by managing the water cycle, water quality, habitat diversity and biodiversity.
- Enable economically sustainable construction, maintenance and renewal/replacement costs.
- Achieve good urban amenity.

These objectives can be achieved using best practice stormwater management strategies as presented in the Stormwater Management Manual for Western Australia (DWER, 2022a) which include:

- Retain, restore and/or replicate the functions of the natural drainage system including waterways, wetland and groundwater features and regimes, and integrate these elements into the urban landscape.
- Design of stormwater management system to maintain pre-development hydrological regime as close as possible in wetlands, waterways and discharge from the Study Area.
- Use of vegetation and amended soils within infiltration swales and bioretention areas to treat stormwater runoff and improve the quality of stormwater infiltrating to the groundwater.
- Use of a strategic drainage network comprised of swales, pipe drainage and the arrangement of road and grading to convey major storm events away from houses and other key infrastructure to designated flood management areas.
- Management of rainfall events up to the 1% AEP on site by integrating flood management areas into Public Open Spaces.

Stormwater drainage system to be designed in accordance to the City of Swan's *"Handbook of Stormwater Drainage Design"* (2012) and *"Development Design Specification D5 - Stormwater Drainage Design"* (2002).

The design criteria for stormwater management detailed in the Regional WMS (GHD, 2012) are consistent with the objectives in DWER (2017a) and DWER (2022a) as detailed above and the FAWB (2009) guidelines for swales/vegetated bio-retention systems.

5.2 Catchments

Preliminary earthwork design indicates the Study Area can be divided into 27 surface drainage catchments as shown in Figure 10.

Stormwater runoff within each catchment will drain to a drainage management area at the catchment low-point. A detailed geotechnical investigation of the Study Area is required at each local structure planning stage to determine the suitability for infiltration, particularly within the sandy upper catchments. Drainage management areas are to retain and infiltrate stormwater runoff up to the major storm event (1% AEP), where feasible, otherwise stormwater runoff is to be detained and either discharged to existing waterways and outlets or piped to the down-gradient

drainage management areas prior to outflow from the Study Area. Post-development flow rates from the Study Area are to be consistent with pre-development flow rates.

The land use breakdown for each catchment is presented in Table 7 and covers the wider amendment area.

Table 7: Catchment Land Use Breakdown

Catchment	Land Use Breakdown Area (ha)						Total Area (ha)
	Residential Lots	Road Reserve	School	POS/ Reserve	Local Centre	Potential Caravan/ Lifestyle	
1	12.1	4.5		0.1			16.7
2	3.1	1.9		2.8			7.8
3	9.3	6.1		7.6			23.0
4	20.7	5.5		1.5			27.7
5	3.2	2.4		2.2			7.8
6	4.8	2.6		0.5			7.9
7			3.6	0.5			4.1
8	23.5	10.1		0.6			34.2
9		0.0				18.9	18.9
10	11.1	5.1		10.4			26.6
11		0.2		8.7			8.9
12	17.6	7.2		2.5			27.3
13	1.7	0.9		0.5			3.1
14	1.7	0.9		1.0			3.6
15	4.0	1.9		0.8	2.0		8.7
16	0.7	0.4		0.1			1.2
17	5.3	2.2		0.4			7.9
18	3.9	3.5					7.4
19	18.4	10.5		1.8			30.7
20			3.6	0.5			4.1
21	4.6	2.3		1.1			8.0
22	8.9	4.7		0.4			14.0
23	13.6	4.7		1.4			19.7
24	2.7	2.1		0.8			5.6
25	11.2	3.6		0.6			15.4
26	3.3	1.7		0.8			5.8
27	5.3	2.5		1.8			9.6
Total	190.8	87.5	7.2	49.5	2.0	18.9	355.7

Note: All values are to 1 decimal place.

5.3 Stormwater Quantity

Stormwater system design should adopt the following design criteria:

- Pre-development flows entering and leaving the Study Area are to be maintained. Stormwater management systems are to be designed to retain the 'Small' (first 15 mm of rainfall) and retain, where feasible, or detain stormwater runoff for the Minor (20% AEP) and Major (1% AEP) storm events.

- Small event runoff is to be managed by a combination of infiltration structures (swales, underground cells, tree pits, permeable pavers, etc.) on the majority of roads in the catchments prior to reaching bio-retention (vegetated treatment) areas in downstream drainage management areas.
- Utilise overland (pipeless) system where possible including roadside or median swales in neighbourhood connector roads.
- Minor and Major event runoff is to be managed within the catchment using roadside or median swales, POS, tree pits, flush kerbing adjacent to POS or underground storage to minimise drainage management areas in the downstream POS.
- Drainage management areas proximal to the central waterway are to be integrated into areas outside of the waterway foreshore buffer using road and pedestrian crossings as stormwater attenuation points to create living streams. Additional drainage management areas can be located throughout the upper catchment as required. These are to either infiltrate or discharge into the downstream drainage management areas.
- Post-development flows attenuated to pre-development flow rates (see Table 4) by detention of runoff in stormwater management areas. These can be located in landscaped POS, linear multiple use corridors or drainage reserve areas.
- A drainage management area must be located at each catchment outlet to ensure stormwater runoff is retained and infiltrated, where feasible, or attenuated to pre-development flow rates prior to leaving the Study Area.
- Finished floor levels to have a of 0.5 m clearance from the 1% AEP water level of the central waterway and be at least 0.3 m above the 1% AEP overland flow flood level and drainage management area flood level.

Water storage volume and area required for each drainage catchment has been estimated as follows:

- Runoff coefficient of 50% for residential lots, school sites and potential lifestyle village/caravan park, 80% for road reserve, 10% for POS, and 90% for local centre.
- Bio-retention area provides storage for road runoff only for the small event (first 15 mm of rainfall).
- Storage area for bio-retention area calculated on an assumed water depth of 0.5 m.
- Minor Events (20% AEP), storage volume based on 1 m^3 for 40 m^2 of contributing impervious area.
- Major Events (1% AEP), storage volume based on 1 m^3 for 20 m^2 of contributing impervious area.
- Storage area for detention basin is calculated assuming a water depth of 1.0 m.
- No discharge off-site.

Estimated water storage volumes and areas based on assumptions above are in Table 8. Whilst a conservative approach has been adopted in these estimates, the structure plan demonstrates sufficient area is provided for management of drainage. These estimated drainage areas are to be refined in further local structure planning.

TABLE 8: CATCHMENT WATER STORAGE VOLUMES AND AREAS

Catchment	Equivalent Impervious Area (ha)	Storage Volume (m^3)			Storage Area (m^2)		
		Small Event	Minor Event	Major Event	Small Event	Minor Event	Major Event
1	9.7	540	2,400	4,900	1,080	2,400	4,900
2	3.3	230	800	1,700	460	800	1,700
3	10.3	730	2,600	5,100	1,460	2,600	5,100
4	14.9	660	3,700	7,500	1,320	3,700	7,500
5	3.8	290	900	1,900	580	900	1,900
6	4.5	310	1,100	2,300	620	1,100	2,300
7	1.9	-[3]	500	900	-[3]	500	900
8	19.9	1,220	5,000	10,000	2,440	5,000	10,000
9	9.4	-[3]	2,400	4,700	-[3]	2,400	4,700
10	10.7	610	2,700	5,300	1,220	2,700	5,300
12	14.8	870	3,700	7,400	1,740	3,700	7,400
13	1.6	110	400	800	220	400	800
14	1.6	110	400	800	220	400	800
15	5.4	230	1,300	2,700	460	1,300	2,700
16	0.7	40	200	300	80	200	300
17	4.5	270	1,100	2,200	540	1,100	2,200
18	4.7	420	1,200	2,400	840	1,200	2,400
19	17.8	1,260	4,500	8,900	2,520	4,500	8,900
20	1.9	-[3]	500	900	-[3]	500	900
21	4.3	280	1,100	2,100	560	1,100	2,100
22	8.2	560	2,100	4,100	1,120	2,100	4,100
23	10.7	560	2,700	5,300	1,120	2,700	5,300
24	3.1	250	800	1,500	500	800	1,500
25	8.6	440	2,100	4,300	880	2,100	4,300
26	3	200	800	1,500	400	800	1,500
27	4.8	300	1,200	2,400	600	1,200	2,400
Total (26)	184.1	10,490	46,200	91,900	20,980	46,200	91,900

Notes:
1. Major event area and volume includes Minor event; EIA values are in 1 decimal place; Storage Volume and Area are in 2 significant figures;
2. Catchment 11 comprises predominantly waterway/reserve only and will be retained post-development.
3. Small Event requirement for Catchments 7, 9 and 20 to be detailed at LWMS/UWMP.

Drainage management areas required to store the major event in each catchment are shown in Figure 10, to demonstrate these drainage areas can be accommodated within the amendment area. Note that drainage shapes and locations shown are indicative only.

Further details on the adopted measures including sizing and location of drainage infrastructure is to be detailed in the LWMS to assist each of the local structure planning processes. Drainage management areas are to be located outside of the central way foreshore reserve.

5.4 Stormwater Quality

Stormwater quality is to be managed through implementation of best management practices in a treatment train approach to achieve water sensitive urban design. These include structural and non-structural measures to assist in reducing applied nutrient loads such as:

- Use of soakwells and/or other underground storage devices on residential lots to retain the small event (15 mm) at source, where groundwater separation and geotechnical conditions permit.
- Gross pollutant trap (GPT) to be installed on catchment stormwater system pipe outlets to remove pollutants including sediment and hydrocarbons prior to discharge.
- Road catchment stormwater runoff from the small rainfall event (15 mm) to be treated by bio-retention areas / amended soils / rain gardens / tree pits / permeable pavers / median or roadside swales / flush kerbing adjacent to POS in the upper catchment prior to infiltration or discharge to downstream environment.
- Overland (pipeless) conveyance systems including living streams, roadside and median swales planted with vegetation to increase roughness and reduce peak stormwater flows to remove sediment and increase nutrient uptake. These are to be incorporated into the neighbourhood connector roads.

Implementation and appropriate design suitability of these measures will be further investigated in the LWMS.

6. WATER QUALITY MANAGEMENT

Nutrient input will change with change in land use from existing rural grazing areas to urban development. Preliminary assessment of the impact of this change based on the proposed district structure plan amendment land use across the Study Area is presented below.

6.1 Post Development Nutrient Inputs

NiDSS is a tool developed by JDA Consultant Hydrologists to assist in land use management planning and to allow quantitative estimation of nutrient input rates and the potential reduction in nutrient input (including costings) for various combinations of water sensitive urban design (WSUD) water quality management measures. NiDSS focuses on the adoption of an integrated catchment approach to water quality management, including measures to minimise nutrient inputs at source, and provides a logical framework for the evaluation of the effectiveness of various best management practices for nutrient input management.

It calculates the total expected nutrient input for a particular development proposal based on aggregating individual nutrient inputs from different land uses (lots, POS, road reserves, conservation areas) prior to implementation of stormwater management measures. The impact of individual source and in-transit controls on nutrient input can then be determined by either turning on/off individual controls or varying the effectiveness of these measures. The results present information on:

- Estimates of Total Phosphorus (TP) and Total Nitrogen (TN) application to an area.
- Estimates of reductions due to source control measures (education, street sweeping).
- Estimates of reductions due to in-transit controls (Gross Pollutant Traps).
- Estimates of the cost of removal (in PV terms) for a selected WSUD program.

NiDSS was applied to the Study Area to model existing land use and the land use shown on the proposed amendment to the DSP. Nutrient application rates were adopted from the Southern River Urban Water Management Strategy (JDA, 2002), which based application rates on a nutrient input survey conducted by JDA of medium density residential areas, and on previous work of Gerritse et al (1991,1992) on rural residential lots.

Pre-development and post-development estimates of nutrient input rates from NiDSS are shown in Table 9 and detailed in Appendix B.

In summary, the proposed land use change would result in a significant increase in total nitrogen and total phosphorus input without implementation of any water sensitive urban design (WSUD) measures. These inputs can be reduced to similar or better than pre-development levels by encouraging community education on 1 in 2 lot owners on landscape design on the lot, i.e. replacing exotic gardens and lawn areas, and fertiliser application consistent with manufacturers frequency and rate (see Appendix B). This can be implemented through purchase incentives and information packages at the lot sale stage.

TABLE 9: PRE- AND POST-DEVELOPMENT NUTRIENT INPUT ANALYSIS USING NIDSS MODEL

Nutrient	Pre-development Input		Post-development Input			
			Without WSUD		With WSUD	
	t/yr	kg/ha/yr	t/yr	kg/ha/yr	t/yr	kg/ha/yr
Total Nitrogen	14.7	41.4	70.9	199.7	15.6	43.9
Total Phosphorus	4.83	13.6	17.8	50.1	3.0	8.5

6.2 Non-Structural Controls

Non-structural source controls to reduce nutrient export from the site focus on reducing the need for nutrient inputs into the landscape. At the lot scale, this includes an emphasis on community education to ensure appropriate landscape design (i.e. replacing exotic gardens and lawn areas with native vegetation) and fertiliser application. This can occur with purchaser information packages at the lot sale stage.

Similarly, use of native vegetation in public open space and streetscape areas, with nutrient application based on actual plant requirement from appropriate soil and leaf tissue testing should be adopted.

The impact of non-structural controls on nutrient input reduction is demonstrated in the NiDSS assessment presented in Section 6.1 and in Appendix B.

6.3 Structural Controls

Structural source controls are proposed to complement the non-structural source controls and provide a complete treatment train for stormwater.

The Stormwater Management Manual for Western Australia (DWER, 2022a) outlines expected pollutant removal efficiencies for structural controls vegetated swales and detention/retention systems that can be incorporated into the stormwater management strategy.

While DWER (2022a) does not provide expected pollutant removal efficiencies for all Best Management Practices (BMPs), application of a treatment train approach by using a combination of non-structural and structural measures will assist in achieving design objectives for water quality. Note that use of bioretention areas instead of vegetated swales provide increased nutrient reduction performance.

Table 10 presents the expected nutrient output reduction for these structural controls which are proposed to be incorporated in this stormwater management strategy. These structural controls meet the pollutant reduction targets specified in the Regional WMS (GHD, 2012).

TABLE 10: BMP WATER QUALITY PERFORMANCE IN RELATION TO DESIGN CRITERIA

Parameter	Structural Controls Nutrient Output Reduction [1]	
	Vegetated Swales	Detention/ Retention Measures
Total Suspended Solids	60-80%	65-99%
Total Phosphorus	30-50%	40-80%
Total Nitrogen	25-40%	50-70%
Gross Pollutants	-	>90%

1. Typical Performance Efficiencies via DWER (2022a).

Other structural water quality control measures such as the use of swales, constructed wetlands, living streams, floating wetlands, rain gardens, tree pits, permeable pavers, bioretention areas etc. can also be included and the impact of which can be assessed with DWER's "Urban Nutrient Decision Outcomes" (UNDO) decision support tool at the LWMS stage.

6.4 Water Quality Targets

Water quality management for the Study Area is to determine existing water quality by monitoring, establishing targets, implementing water quality measures to achieve targets, and monitoring post development to assess performance.

Pre-development surface water monitoring is required to be conducted (inclusive of 2 winter periods) to establish baseline target nutrient concentrations (see Section 7.2.1).

Notwithstanding, surface water quality monitoring should aim to meet the short- and long-term targets established for the Ellen Brook from SRT (2009a) as detailed in Table 11.

TABLE 11: ELLEN BROOK WATER QUALITY TARGETS

Guideline for Ellen Brook	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)
Short-term	2	0.2
Long-term	1	0.1

7. IMPLEMENTATION FRAMEWORK

7.1 Local Structure Planning

The water management planning requirements for the various stages of land use planning are set out in Better Urban Water Management (WAPC, 2008) and include a Local Water Management Strategy (LWMS) in support of the Local Structure Plan and an Urban Water Management Plan (UWMP) as a condition of subdivision approval. The design objectives outlined in this DWMS form the basis for design criteria to be developed and reported in the future LWMSs. The design criteria of each of the LWMSs are implemented through the final design concept presented in the UWMP.

Specific issues raised in the DWMS that need to be further investigated as part of a LWMS include:

- Hydrological management of the central waterway and protection of environmental assets (Stage 2).
- Survey of waterways and retention of existing flow paths and natural drainage systems located throughout the Study Area and preparation of a biophysical assessment for the central waterway.
- Definition of waterway foreshore buffers in accordance with *Operational Policy 4.3: Identifying and establishing waterway foreshore areas* (DoW, 2012) to the satisfaction of DWER (Stage 2).
- Refinement of pre-development modelling based on results of pre-development monitoring and field survey.
- Irrigation supply and water efficiency measures for irrigation of POS.
- Detailed site geotechnical investigation and earthwork and fill strategy.
- Refine drainage catchment areas, location of drainage infrastructure, flood storage volumes, levels and areas and discharge rates to maintain pre-development flows entering and leaving the site. Assess opportunities to implement further water sensitive urban design.
- Provide further detail on the groundwater management strategy including subsoil drainage design.
- Surface water monitoring to inform the LWMSs and refine the post-development monitoring program.

7.2 Monitoring Requirements

A detailed groundwater and surface water monitoring program has not been undertaken specifically for the Study Area. Pre-development monitoring of groundwater and surface water quality is recommended to be undertaken at each Structure Plan stage to establish baseline water quality to assess the hydrological impacts of proposed development, support the planning and engineering design, and assist in establishing targets and a contingency action plan with associated trigger values for specified parameters.

The nature of post development monitoring, including the scope and extent of monitoring, will be determined based on the type, form, and staging of development ultimately proposed in each of the Local Structure Plans, and will be undertaken in accordance with DWER requirements. Specific details of proposed post-development monitoring program are to be included in the LWMS. All water quality testing must be conducted by a National Association of Testing Authorities (NATA) accredited laboratory.

7.2.1 Pre-Development Monitoring

Pre-development monitoring is usually required for at least 18 months (2 winters) prior to development. Due to the significant depth to the regional groundwater table (Figure 8), pre-development groundwater monitoring is not considered necessary.

Pre-development surface water monitoring is required at the LSP/LWMS stage of development across a minimum of 2 winters (18 months). Monitoring sites, parameters and frequency are summarised in Table 12.

Interim trigger values for surface water monitoring are summarised in Table 13 based on SRT (2009a) short-term targets for Ellen Brook (Section 6.4) and ANZECC & ARMCANZ (2000) trigger values for upland river ecosystems in south-west Australia. Interim trigger values are to be updated based on the results of the pre-development monitoring program.

Monitoring results and analysis will assist in preparation of the LWMS/UWMP and at the end of the pre-development monitoring program, a summary report will be submitted to DWER and the City of Swan.

TABLE 12: PRE-DEVELOPMENT MONITORING REQUIREMENTS

Monitoring Type	Number of Sites	Frequency & Timing	Parameter
Surface Water Quality	central waterway [p2]: (upstream and downstream boundary of Study Area) southern waterway [p3]: (downstream outlet)	Maximum three times per year (when flowing)	In-situ: pH, EC, TSS, temp Lab: nutrients, selected metals and cations & anions
Surface Water Flow		Water level data loggers and rating curves – minimum of 2 years prior to approval of the LSP	Continuous Flow rate

TABLE 13: INTERIM WATER QUALITY TRIGGER VALUES

Parameter	Surface Water Sites
pH[2]	6.5-8.0
EC (µS/cm)[2]	0.12-0.3
TN (mg/L)[1]	2
NO_x_N (mg/L)[1]	0.02
TP (mg/L)[1]	0.2
PO_4_P (mg/L)[1]	0.01

Notes: 1. Swan Canning Water Quality Improvement Plan (SRT,2009) nitrogen and phosphorus targets.
2. ANZECC & ARMCANZ (2000) trigger values for slightly disturbed upland river ecosystems.

7.2.2 Post Development Monitoring

Post-development monitoring will be required to allow a quantitative assessment of the hydrological impacts of the proposed development within the Study Area. Table 14 summarises the proposed post-development monitoring programme. Monitoring will cover a minimum of 2 winters (minimum 18 months) and be presented in annual summary reports. The post-development monitoring program should be further refined at the LWMS stage.

TABLE 14: POST-DEVELOPMENT MONITORING REQUIREMENTS

Monitoring Type	Number of Sites	Frequency & Timing	Parameter	Reporting
Surface Water Quality	Outlets of all proposed detention basins	Maximum three times per year (when flowing)	In-situ: pH, EC, TSS, temp Lab: nutrients, selected metals and cations & anions	Annual Summary Report
Surface Water Outflow	Selected water courses downstream boundary of Study Area	Water level data loggers and rating curves based on discharge measurements using Velocity Area Method for 2 years then review	Continuous Flow rate	

7.3 Ongoing Responsibilities

Table 15 provides a summary of key implementation actions and responsibilities in accordance with the WAPC (2008) requirements.

Further specific detail of responsibilities will be appropriately defined and refined at LWMS stage.

TABLE 15: IMPLEMENTATION AND RESPONSIBILITIES

IMPLEMENTATION	RESPONSIBILITY		
Action	Developer	DWER	City of Swan
Conduct Pre-Development Monitoring Program and Reporting	✓		
Preparation of a Local Water Management Strategy to support local structure planning	✓		
Review and Approval of LWMS		✓	✓
Preparation of an Urban Water Management Plan for individual development stages	✓		
Review and Approval of UWMP			✓
Construction of stormwater system and maintenance post construction until council handover	✓		
Long term stormwater system operation and maintenance			✓
Conduct Post-Development Monitoring Program and Annual Reporting	✓		
Review of Monitoring Data and Annual Reports			✓

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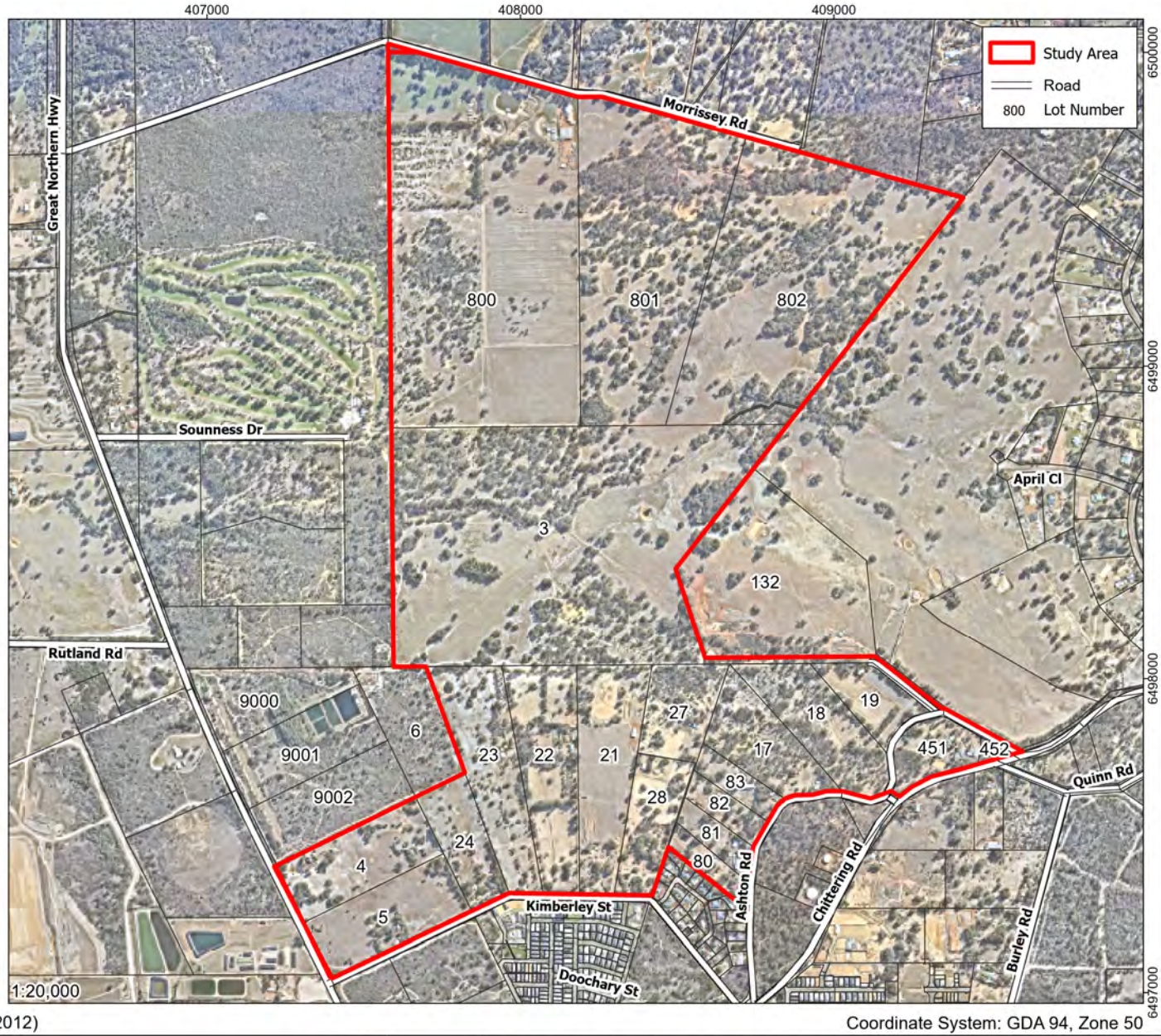
FIGURES







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Bullsbrook Townsite - Northern Precinct: District Water Management Strategy

Figure 1: Location Plan

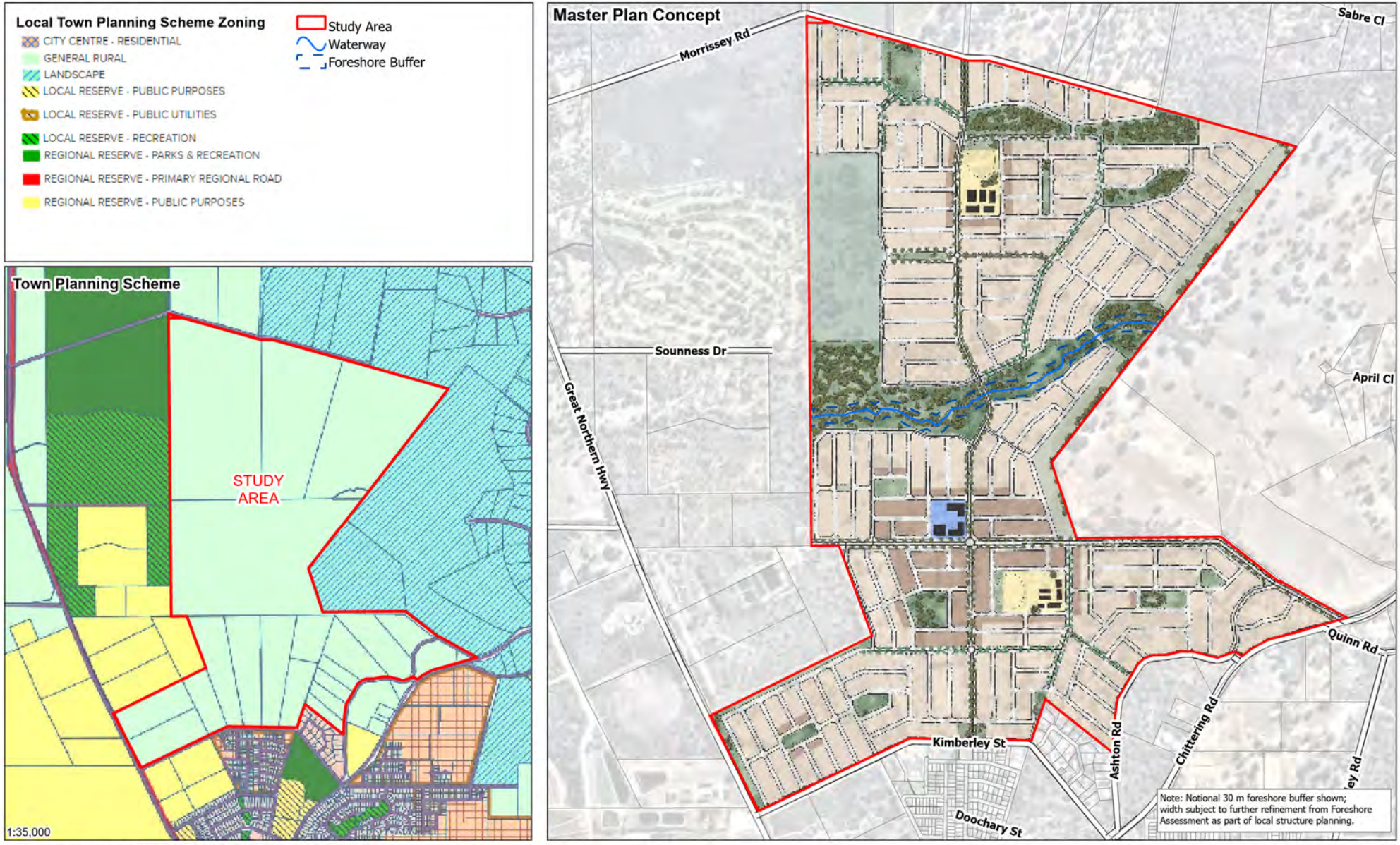

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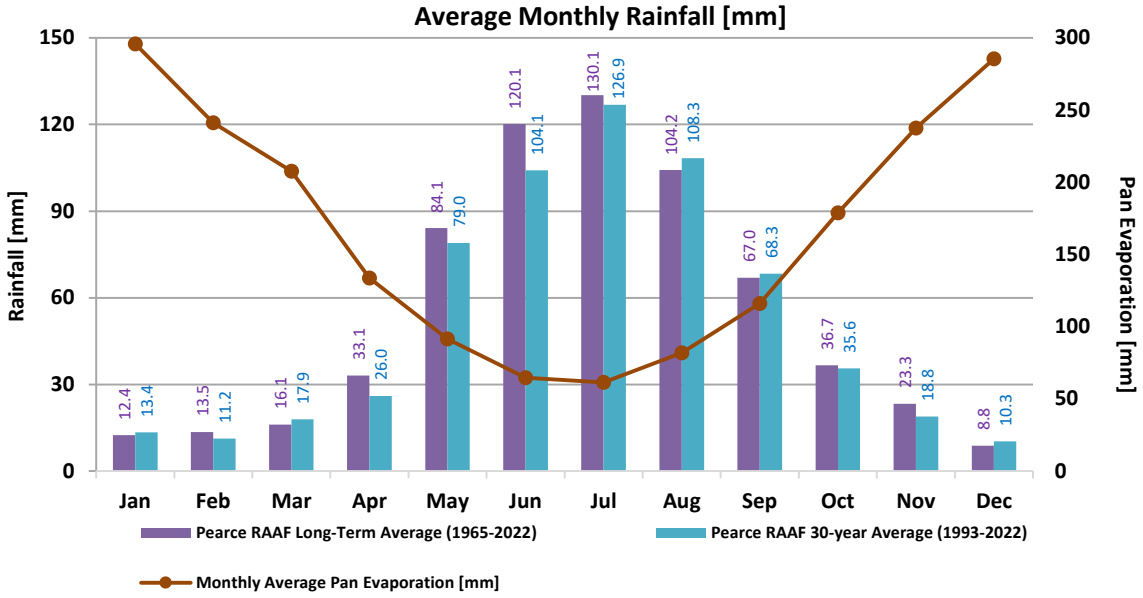
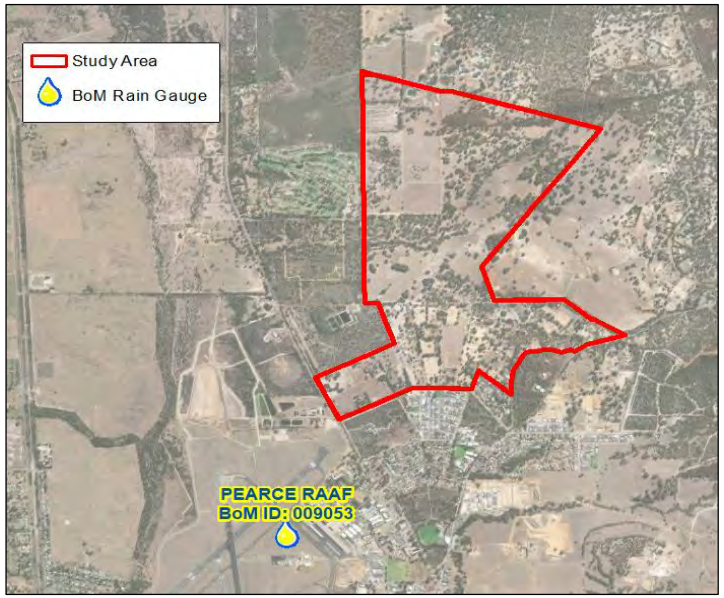
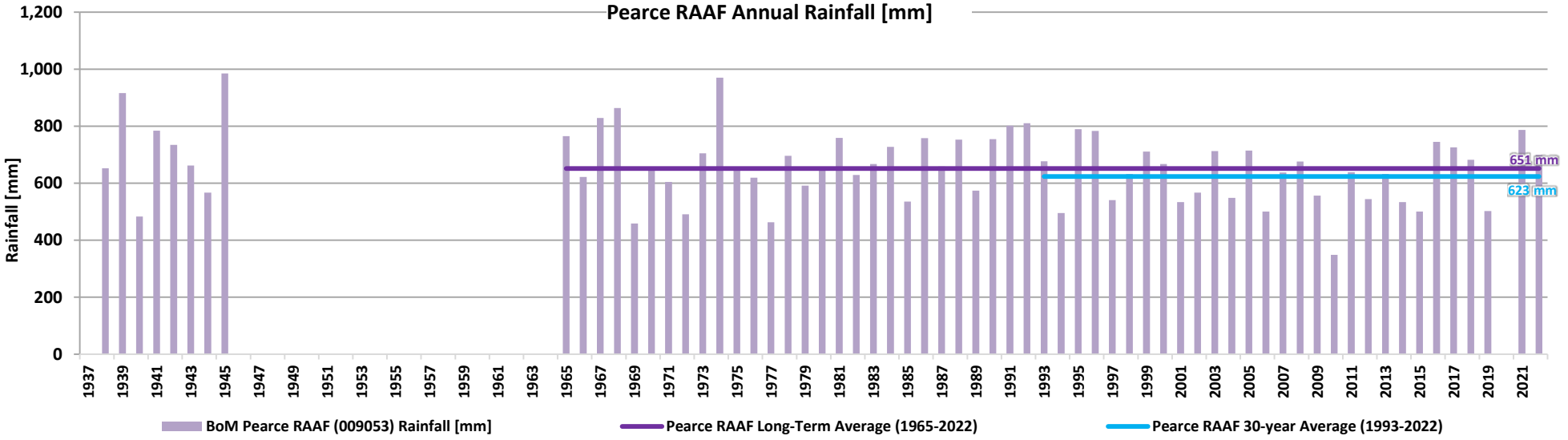
Figure 2: Master Plan Concept







Data Source: Bureau of Meteorology (2023) *Pearce RAAF (009053) Rainfall Gauging Stations* ; DPIRD (2022) Pan Evaporation, Bindoon Weather Station

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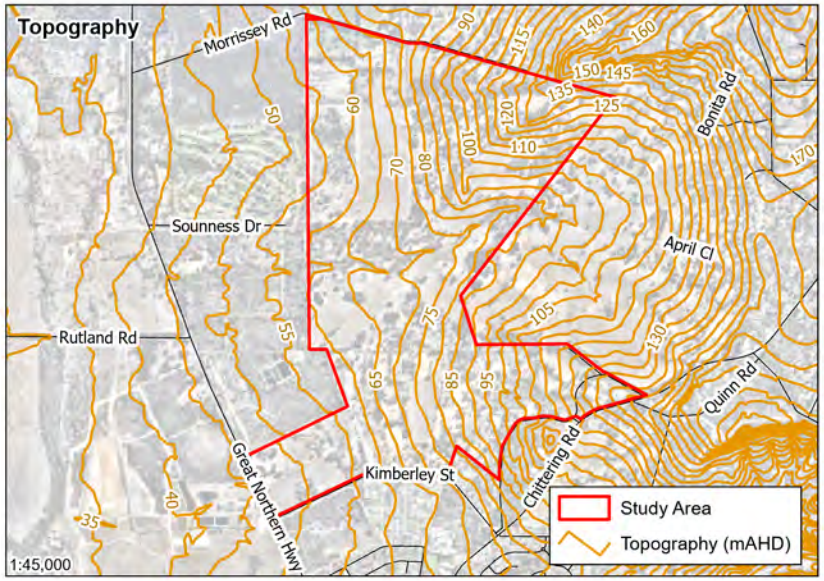
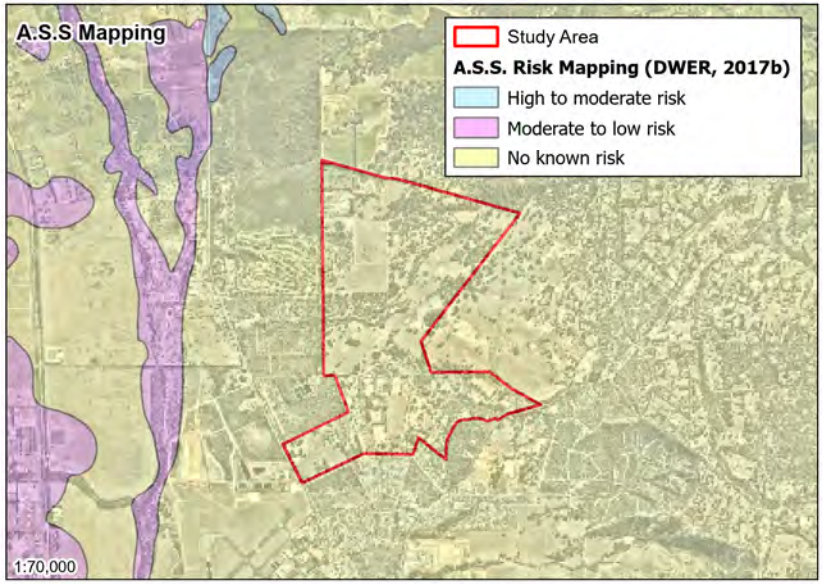
Figure 3: Rainfall and Evapoation





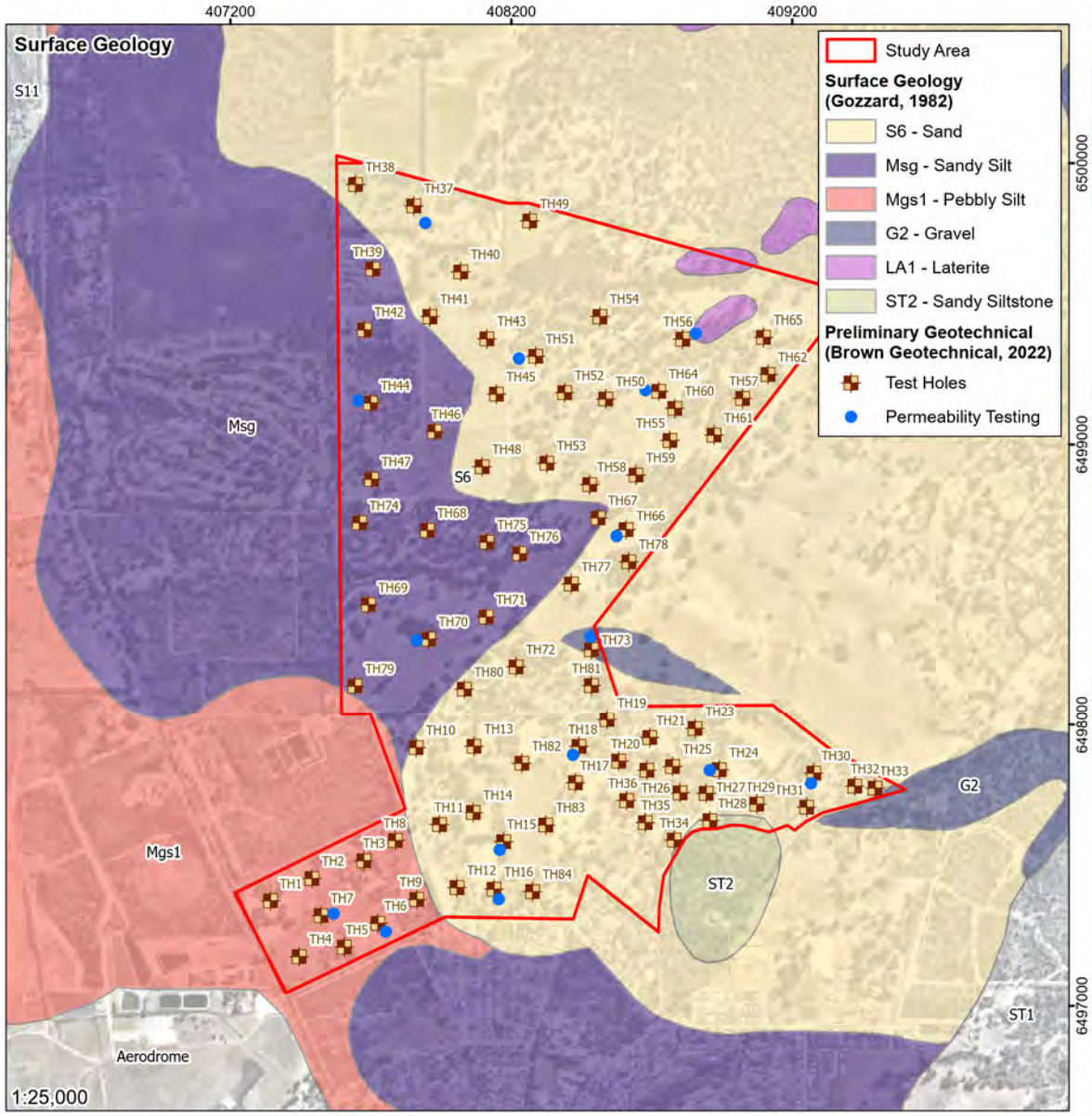


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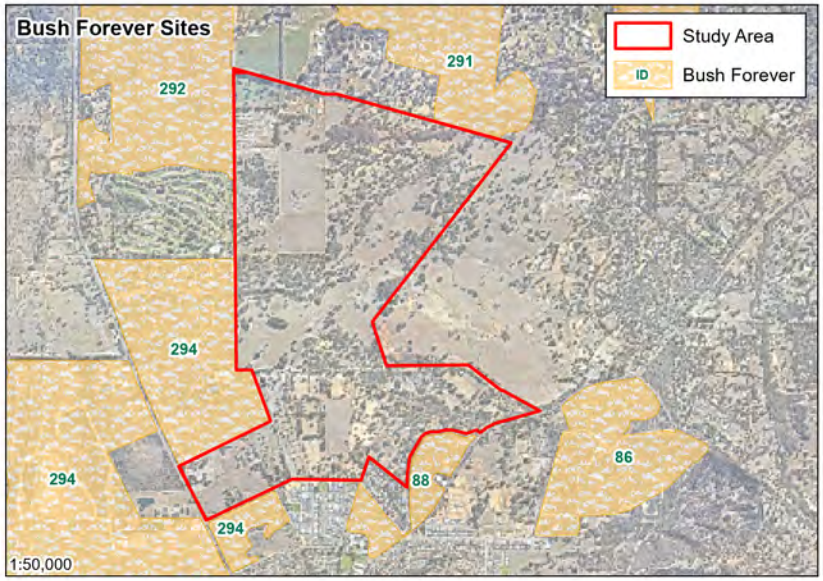
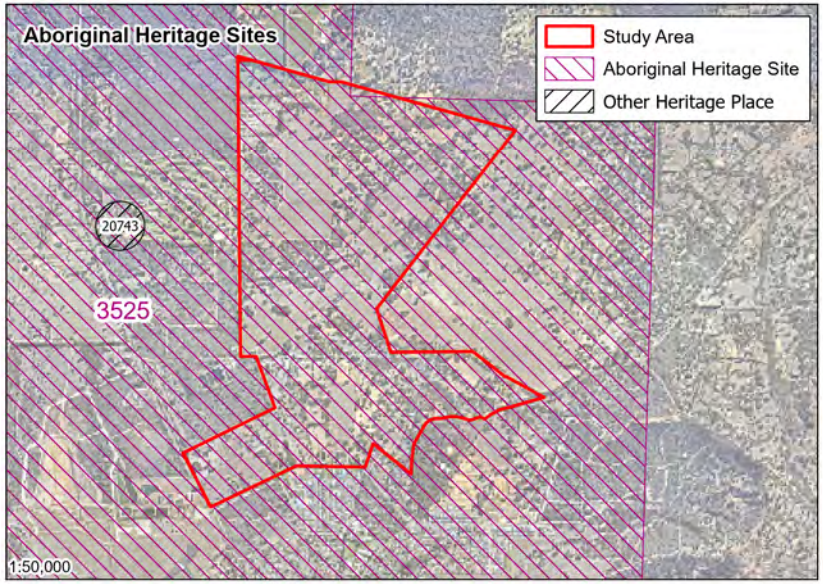
Figure 4: Topography and Surface Geology





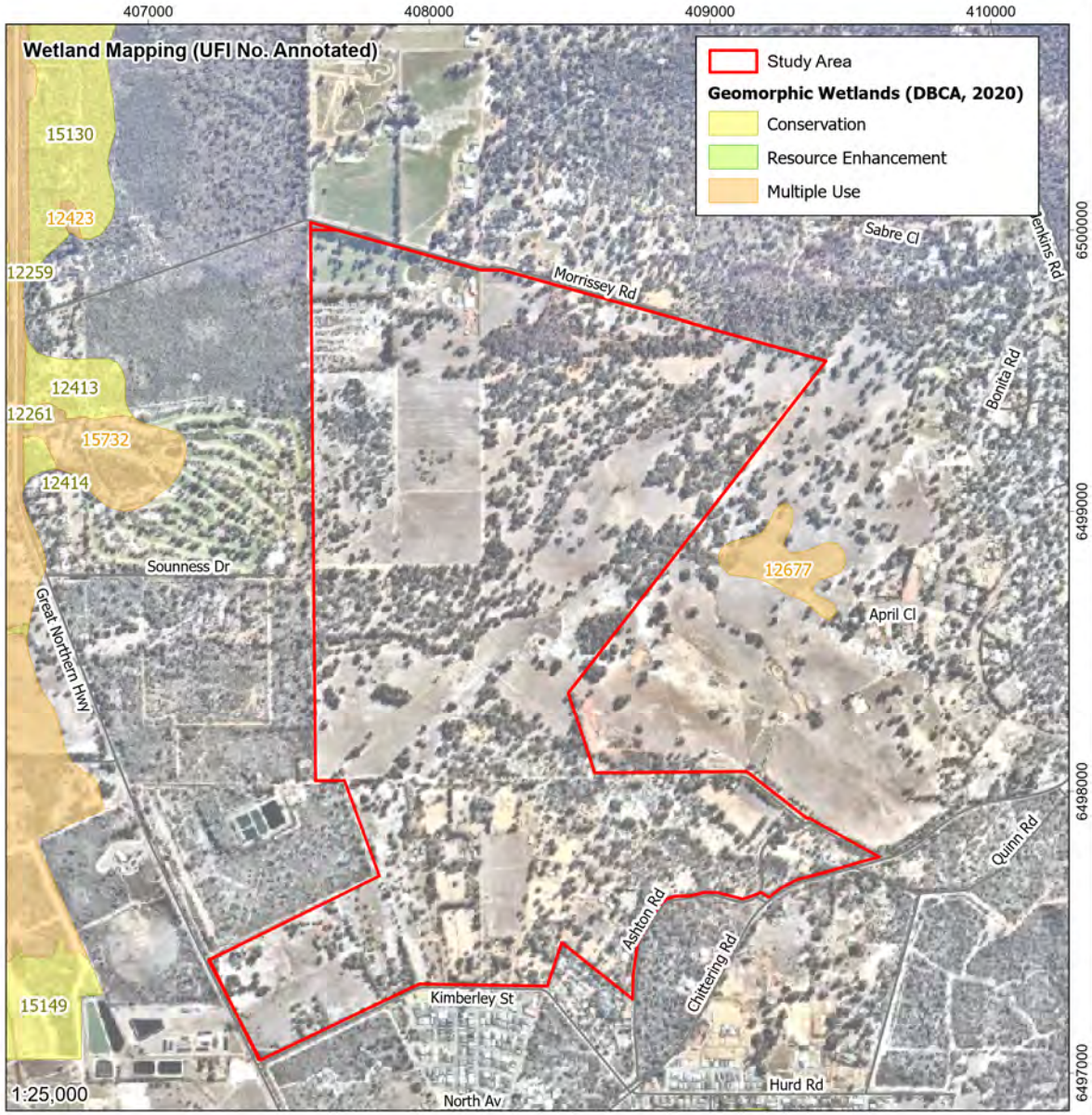


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Figure 5: Environmental Factors

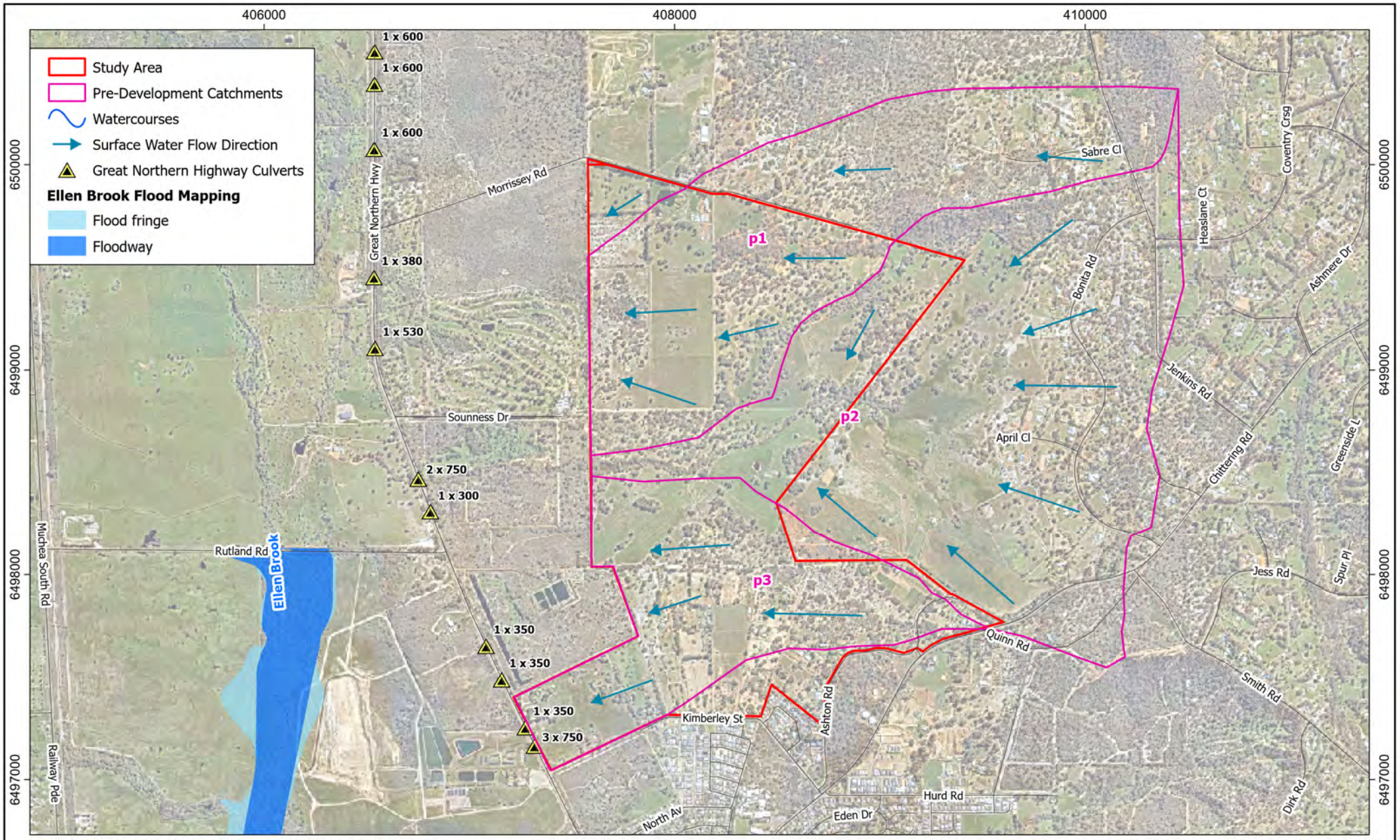

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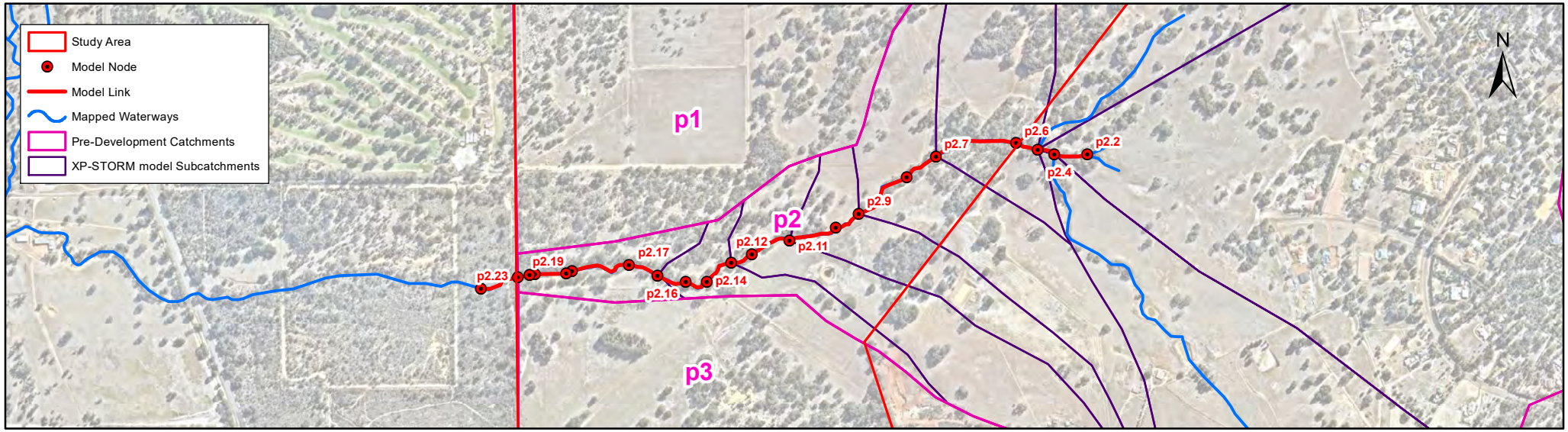
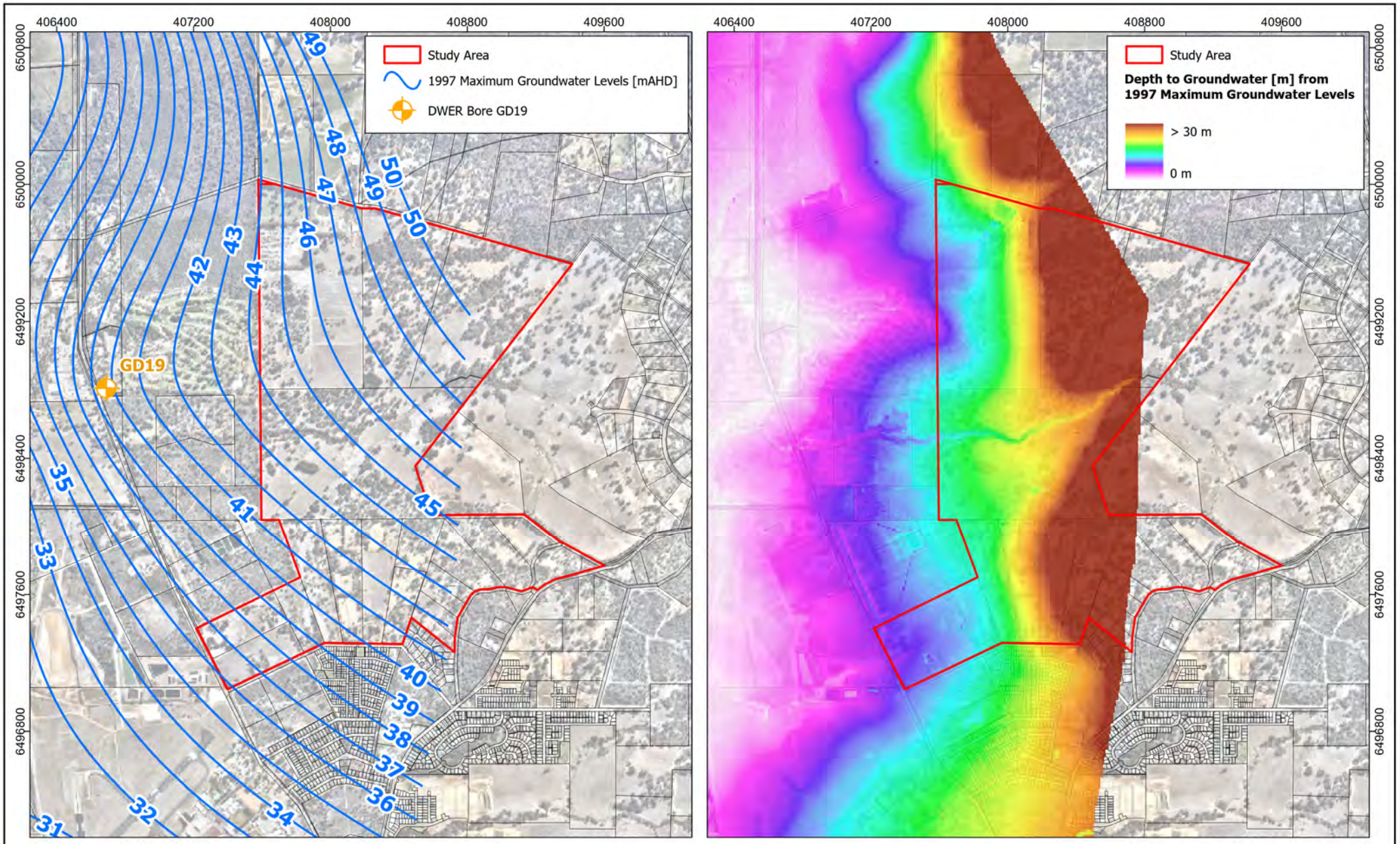
Figure 6: Surface Water Drainage



	p2.2	p2.4	p2.5	p2.6	p2.7	p2.8	p2.9	p2.10	p2.11	p2.12	p2.13	p2.14	p2.15	p2.16	p2.17	p2.18	p2.19	p2.20	p2.21	p2.22	p2.23
1% AEP Velocity (m/s)	1.81	2.35	2.17	2.36	2.35	2.40	2.67	2.29	2.13	2.38	2.46	2.23	1.74	2.78	1.61	2.77		2.00			1.58
20% AEP Velocity (m/s)	1.17	1.50	1.26	1.33	1.55	1.50	1.98	1.61	1.43	1.67	1.74	1.46	1.03	1.64	0.66	2.72		1.36			0.84
1% AEP Flow (m3/s)	6.08	9.23	13.23	14.22	14.20	15.55	15.54	16.21	16.20	17.49	17.49	17.78	17.77	18.06	18.05	18.01		18.00			18.00
20% AEP Flow (m3/s)	1.00	1.68	2.37	2.58	2.58	2.88	2.87	3.00	3.00	3.26	3.26	3.32	3.31	3.36	3.36	2.90		2.89			2.88
1% AEP TWL (mAHD)	83.58	82.42	82.42	81.28	81.28	80.31	80.31	75.25	75.25	73.98	73.98	71.64	71.64	70.27	70.27	68.73	68.73	66.81	66.81	65.55	65.55
20% AEP TWL (mAHD)	83.22	82.06	82.06	80.94	80.94	80.00	80.00	74.78	74.78	73.50	73.50	71.21	71.21	69.83	69.83	68.24	68.24	66.51	66.51	65.26	65.26
Invert (mAHD)	82.90	81.65	81.65	80.71	80.71	79.79	79.79	74.35	74.35	73.07	73.07	70.50	70.50	69.03	69.03	67.40	67.40	65.96	65.96	64.72	64.72

	p2.15	p2.16	p2.17	p2.18	p2.19	p2.20	p2.21	p2.22	p2.23
1% AEP Velocity (m/s)	1.74	2.78	1.61	2.77		2.00			1.58
20% AEP Velocity (m/s)	1.03	1.64	0.66	2.72		1.36			0.84
1% AEP Flow (m3/s)	17.77	18.06	18.05	18.01		18.00			18.00
20% AEP Flow (m3/s)	3.31	3.36	3.36	2.90		2.89			2.88
1% AEP TWL (mAHD)	62.67	62.67	61.57	61.57	60.38	60.38	60.04	60.04	59.23
20% AEP TWL (mAHD)	62.29	62.29	61.22	61.22	59.97	59.97	59.60	59.60	58.95
Invert (mAHD)	61.66	61.66	60.93	60.93	59.65	59.65	57.90	57.90	57.70



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Job No. J7057

Scale: 1:30,000 @A4

0 400 800 1,200 1,600 Metres

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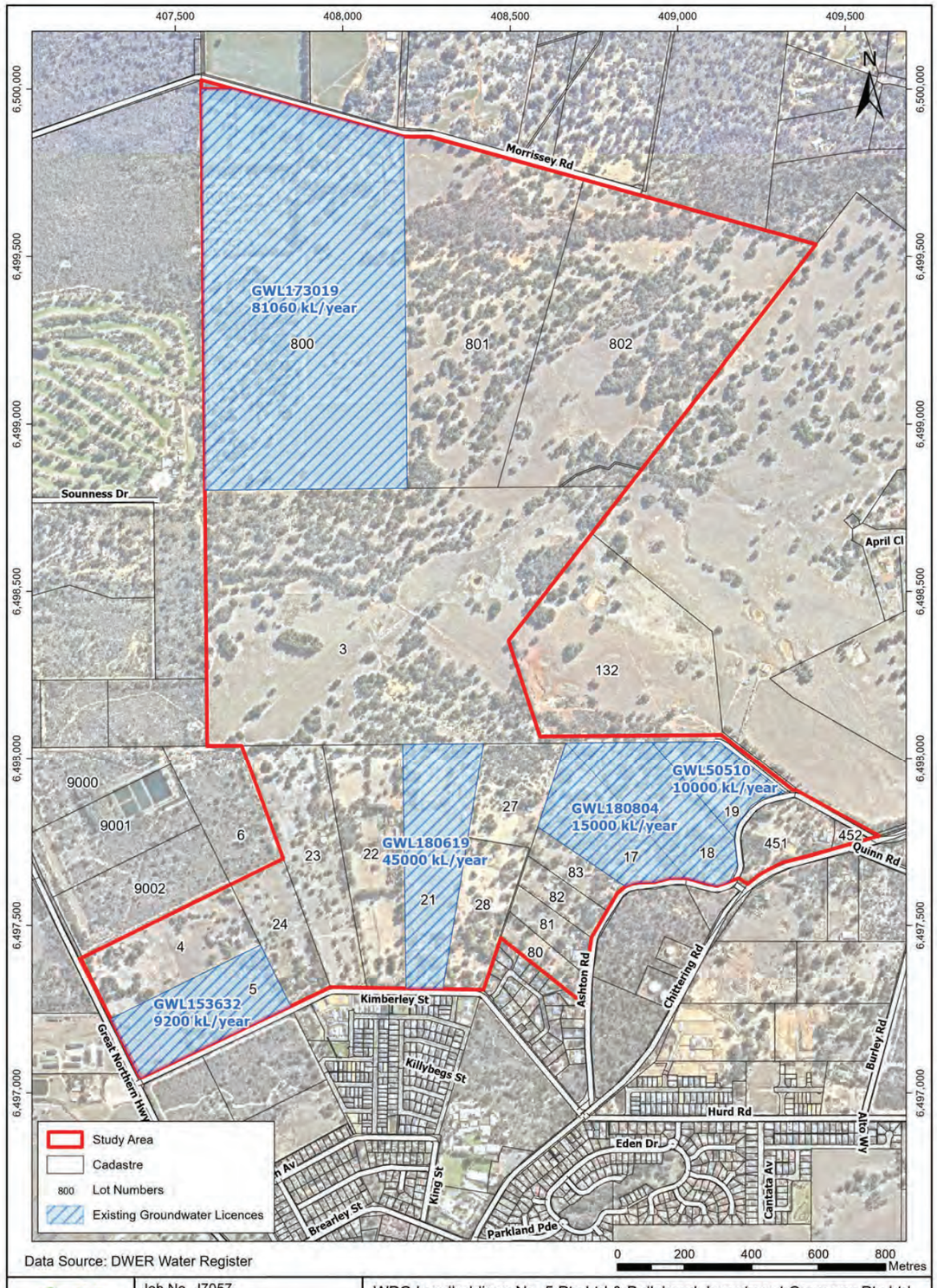
WPG Landholdings No. 5 Pty Ltd & Bullsbrook Investment Company Pty Ltd

Bullsbrook Townsite - Northern Precinct: District Water Management Strategy

Figure 8: Groundwater Levels and Depth to Groundwater



Data Source: DWER Water Register

JDA

Job No. J7057
Scale: 1:15,000 @A4
Coordinate System: GDA 1994 MGA Zone 50
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WPG Landholdings No. 5 Pty Ltd & Bullsbrook Investment Company Pty Ltd
Bullsbrook Townsite - Northern Precinct: District Water Management Strategy

Figure 9: Groundwater Licensing

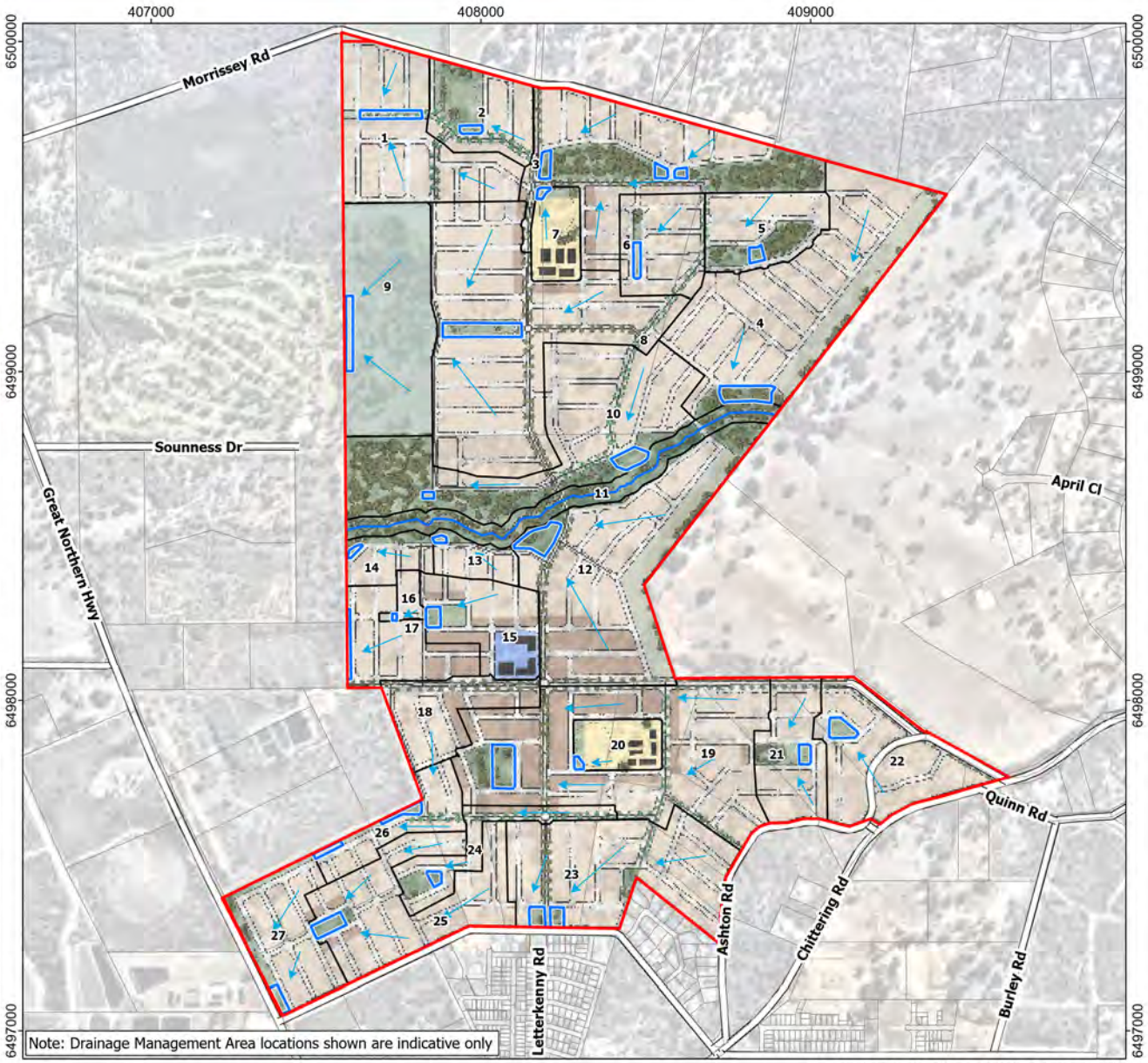
- Study Area
- Major Event Drainage Management Areas
- Indicative Post-Development Catchments
- Waterway
- Flow Direction

Storage Volume:
Small Event: First 15mm rainfall to be stored for road impervious area.
Minor Event: Assuming $1m^3$ to be stored for per $40m^2$ impervious area.

Storage Area:
Small Event: Bioretention Storage Area calculated assuming 0.5m average water depth.
Minor and Major Event: Detention Storage Area calculated assuming 1.0m average water depth.

Catchment	Equivalent Impervious Area (ha)	Storage Volume (m^3)			Storage Area (m^2)		
		Small Event	Minor Event	Major Event	Small Event	Minor Event	Major Event
1	9.7	540	2,400	4,900	1,080	2,400	4,900
2	3.3	230	800	1,700	460	800	1,700
3	10.3	730	2,600	5,100	1,460	2,600	5,100
4	14.9	660	3,700	7,500	1,320	3,700	7,500
5	3.8	290	900	1,900	580	900	1,900
6	4.5	310	1,100	2,300	620	1,100	2,300
7	1.9	-[3]	500	900	-[3]	500	900
8	19.9	1,220	5,000	10,000	2,440	5,000	10,000
9	9.4	-[3]	2,400	4,700	-[3]	2,400	4,700
10	10.7	610	2,700	5,300	1,220	2,700	5,300
12	14.8	870	3,700	7,400	1,740	3,700	7,400
13	1.6	110	400	800	220	400	800
14	1.6	110	400	800	220	400	800
15	5.4	230	1,300	2,700	460	1,300	2,700
16	0.7	40	200	300	80	200	300
17	4.5	270	1,100	2,200	540	1,100	2,200
18	4.7	420	1,200	2,400	840	1,200	2,400
19	17.8	1,260	4,500	8,900	2,520	4,500	8,900
20	1.9	-[3]	500	900	-[3]	500	900
21	4.3	280	1,100	2,100	560	1,100	2,100
22	8.2	560	2,100	4,100	1,120	2,100	4,100
23	10.7	560	2,700	5,300	1,120	2,700	5,300
24	3.1	250	800	1,500	500	800	1,500
25	8.6	440	2,100	4,300	880	2,100	4,300
26	3	200	800	1,500	400	800	1,500
27	4.8	300	1,200	2,400	600	1,200	2,400
Total (26)	184.1	10,490	46,200	91,900	20,980	46,200	91,900

Notes:
1. Major event area and volume includes Minor event; EIA values are in 1 decimal place; Storage Volume and Area are in 2 significant figures.
2. Catchment 11 comprises predominantly waterway/reserve only and will be retained post-development.
3. Small Event requirement for Catchments 7, 9 and 20 to be detailed at LWMS/UWMP.



Data Source: Rowe Group (2023)

Coordinate System: GDA 94, Zone 50

JDA Consultant Hydrologists

Job No. J7057
Scale: 1:20,000 @A4

0 200 400 600 800 Metres

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WPG Landholdings No. 5 Pty Ltd & Bullsbrook Investment Company Pty Ltd
Bullsbrook Townsite - Northern Precinct: District Water Management Strategy

Figure 10: Stormwater Management

APPENDIX A

DWMS Checklist

Appendices

Appendix 1 – District water management strategy guide

Use the guide below to assist with the completion of the DWMS. Tick the box where items have been met. If the item is not applicable to the DWMS, include N/A with explanation in the notes column. Provide any other relevant comments briefly in the notes column.

District water management strategy item	☑	Notes
Executive summary		
Describe proposed water management objectives and how the objectives will be met.	☒	Chapter 1 and Table 1
Planning background and previous studies		
Map the location of the site.	☒	Location or site context plan Figure 1
State which planning document the strategy is supporting.	☒	District structure plan if available Chapter 1 and Figure 2
Provide references to the key state and/or local policies, guidelines, strategies and their relevance.	☒	Chapters 1.1, 1.2 & 1.4
Design criteria		
Recognise water management principles, objectives and design criteria.	☒	Chapter 1.4
Design objectives from previous water strategies and/or plans.	☒	Chapter 1.4
Pre-development environment (identification of assets, risks and constraints)		
Describe site characteristics: provide preliminary desktop assessments and/or field investigations (if required)	☒	Include existing data Chapter 2.1
Describe climate.	☒	Description Chapter 2.2 and Figure 3
Describe and map topography, landform and geotechnical conditions.	☒	Aerial photo Geotechnical plan Acid sulfate soil risk mapping Chapters 2.3, 2.4 & 2.5 and Figure 4

District water management strategy item	☑	Notes
Describe the existing land use.	☒	Description Chapter 2.1
Identify environmental assets and their significance.	☒	Environmental plan plus supporting data where available Chapter 2 and Figure 5
Detail the social, cultural and heritage considerations.	☒	Chapter 2.11 and Figure 5
Describe the hydrology and hydrogeology of the area: ☐ surface water ☐ groundwater ☐ water-dependent ecosystems ☐ water resource issues.	☒	Surface water hydrology plan Chapters 2.7 & 2.11 and Figure 6 Groundwater and topographic contours plan (or depth to groundwater) Chapters 2.8 & 2.11 and Figure 7 Waterways and wetlands plan Chapters 2.7, 2.99 & 2.11 and Figure 5 and 6 Indicative water balance (pre- and post-development water balances can be presented together – see below)
Describe existing drainage infrastructure and other infrastructure likely to affect management of water resources.	☒	Arterial drainage plan (if available) including local drainage Chapter 2.7 and Figure 6
Post-development water management		
Identify the proposed broad scale management strategies that will address water resource issues and meet the objectives and design criteria.	☒	Chapters 4.1, 5.1 & 6.4
Calculate an indicative water balance.		Indicative water balance. May be presented as a diagram including pre- and post-development volumes with explanatory notes
Describe the impacts to water resources and/or impacts to proposed change in land use from water issues.		Chapters 3, 4 ,5 & 6
Surface water – Estimate land requirements for water management. – Identify water quality issues and scope for improvement. – Describe proposed strategy for management of small, minor and major surface flows.	☒	Include any existing data Chapters 5 & 6, and Figure 8
Describe groundwater levels, use, management and maintenance.	☒	Include data if available Chapter 4

District water management strategy item	☑	Notes
Identify water-dependent ecosystems	☒	Chapters 5.2 & 5.3, and Figure 8
Identify contamination issues – high risk acid sulfate soils, contaminated sites or areas with historical high nutrient and/or non-nutrient contaminants.	☒	Include data or plans if available Chapter 5.4
Water services and efficiency initiatives		
Describe potable water supply – options including details of technical, environmental and regulatory feasibility – regulatory approvals, technical investigations and any obtained written approvals – recommendations for water efficiency and conservation	☒	Written evidence if obtained Chapters 3.1.1 and 3.3
Identify wastewater servicing – options including preferred option, location, treatment process, level of treatment, disposal, buffers and infrastructure – approvals and investigations required and any obtained written approvals – recommendations for water efficiency and conservation	☒	Written evidence if obtained Chapter 3.2
Identify non-potable (fit-for-purpose) water supply – non-potable water source options. Highlight preferred option with consideration of pre and post development water balance – approvals and investigations required and any obtained written approvals – recommendations for water efficiency and conservation	☒	Written evidence if obtained Chapters 3.1.2 and 3.3

District water management strategy item	☑	Notes
Implementation framework		
Describe commitments and obligations for the next stage of the planning process (e.g. LWMS). Identify issues that need specialised investigation and management for the subsequent LWMS. Make recommendations for implementing the DWMS.	☒	Commitments and obligations may be displayed in table format Chapter 7

APPENDIX B

Nutrient Input Analysis using NiDSS Model

NiDSS — Nutrient Input Decision Support System
Version 2.0 March 2005 - OTH 1.01
JDA Consultant Hydrologists
Report Date : 28-Mar-22

Bullsbrook North Landowners	
Total Nutrient Input - No WSUD (kg/yr)	9,630
Reduction due to WSUD (kg/yr)	0
Percentage Overall Reduction	0.0%
Pecentage Development Reduction	0.0%
Cost of Selected Program ($/kg/yr)	$0

○ Total Phosphorus
◉ Total Nitrogen

Catchment Name Bullsbrook North Landowners
Option Description Pre-development scenario
Catchment Area 321 ha

Land Use Breakdown

Residential : ~R15	0.0%	lower density residential areas (excludes road reserve area)
Residential : ~R35	0.0%	higher density residential areas (excludes road reserve area)
Road Reserves : Minor	0.0%	maintainance of verge by landowners
Road Reserves : Major	0.0%	maintainance of verge by local authority
POS : Active	0.0%	grassed areas
POS : Passive / Basins	50.0%	native vegetation
Rural : Pasture	50.0%	general pasture
Rural : Residential ~R2.5/R5	0.0%	low density
Rural : Poultry	0.0%	specific high nutient input land use
Commercial/Industrial	0.0%	town centre etc

Total Residential 0.0%
Total Area 100.0%

Nutrient Input Without WSUD

Residential	Garden	64.90	kg/net ha/yr	0.00	kg/gross ha/yr	0	kg/yr	0.0%
	Lawn	92.40		0.00		0		0.0%
	Pet Waste	15.72		0.00		0		0.0%
	Car Wash	0.04		0.00		0		0.0%
	Sub Total			0.00		0		0.0%
POS	Garden/Lawn	73.40	kg/ha POS/yr	0.00	kg/gross ha/yr	0	kg/yr	0.0%
	Pet Waste	0.00		0.00		0		0.0%
	Sub Total			0.00		0		0.0%
Road Reserve	Major Roads	29.36	kg/ha RR/yr	0.00	kg/gross ha/yr	0	kg/yr	0.0%
	Minor Roads	132.00		0.00		0		0.0%
	Sub Total			0.00		0		0.0%
Rural	Pasture	60.00	kg/ha Rural/yr	30.00	kg/gross ha/yr	9,630	kg/yr	100.0%
	Poultry Farms	175.00		0.00		0		0.0%
	Residential (R2.5/R5)	15.20		0.00		0		0.0%
	Sub Total			30.00		9,630		100.0%
			Total	**30.00**	kg/gross ha/yr	**9,630**	kg/yr	**100.0%**

Residential Areas (R15-R35) : Nutrient Removal via Source Control

☐ Native Gardens (Lots - Garden) ☐ Native Gardens (Lots - Lawn) ☐ Native Gardens (POS) ☐ Street Sweeping
☐ Community Education : Fertiliser ☐ Community Education : Pet Waste ☐ Community Education : Car Wash

Education Effectiveness 20%

	% Area of Influence	Removal kg/gross ha/yr	Removal kg/yr	Removal %	Capital Cost $	Operating Cost $/yr	Cost $/kg/yr
Native Gardens (Lots - Garden)	20%	0.00	0	0.0%	$0	$0	$0.0
Native Gardens (Lots - Lawn)	20%	0.00	0	0.0%	$0	$0	$0.0
Native Gardens (POS)	100%	0.00	0	0.0%	$0	$0	$0.0
Community Education : Fertiliser	100%	0.00	0	0.0%	$0	$0	$0.0
Community Education : Pet Waste	100%	0.00	0	0.0%	$0	$0	$0.0
Community Education : Car Wash	0%	0.00	0	0.0%	$0	$0	$0.0
Street Sweeping	0%	0.00	0	0.0%	$0	$0	$0.0
Totals		**0.00**	**0**	**0.0%**	**$0**	**$0**	**$0.0**

Residential Areas (R15-R35) : Nutrient Removal via In-Transit Control

☐ Gross Pollutant Trap ☐ Water Pollution Control Pond

	% Area of Influence	Removal kg/gross ha/yr	Removal kg/yr	Removal %	Capital Cost $	Operating Cost $/yr	Cost $/kg/yr
Gross Pollutant Traps	100%	0.00	0	0.0%	$0	$0	$0.0
Water Pollution Control Ponds	50%	0.00	0	0.0%	$0	$0	$0.0
Total		**0.00**	**0**	**0.0%**	**$0**	**$0**	**$0.0**

Net Nutrient Input

	kg/gross ha/yr	kg/yr	%
Nutrient Input : Residential Area without WSUD	0.00	0	0.0%
Nutrient Input : Rural Area	30.00	9,630	100.0%

	Capital Cost $	Operating Cost $/yr	Cost $/kg/yr
Removal via Source Control	$0	$0	$0.0
Removal via In-Transit Control	$0	$0	$0.0
Total Removal	$0	$0	$0.0

Net Nutrient Input	**30.00**	**9,630**	**100.0%**

NiDSS

Nutrient Input Decision Support System
Version 2.0 March 2005 - OTH 1.01

JDA Consultant Hydrologists
Report Date : 28-Mar-22

Bullsbrook North Landowners	
Total Nutrient Input - No WSUD (kg/yr)	3,210
Reduction due to WSUD (kg/yr)	0
Percentage Overall Reduction	0.0%
Pecentage Development Reduction	0.0%
Cost of Selected Program ($/kg/yr)	$0

(•) Total Phosphorus
( ) Total Nitrogen

Catchment Name Bullsbrook North Landowners
Option Description Pre-development scenario
Catchment Area 321 ha

Land Use Breakdown

Residential : ~R15	0.0%	lower density residential areas (excludes road reserve area)
Residential : ~R35	0.0%	higher density residential areas (excludes road reserve area)
Road Reserves : Minor	0.0%	maintainance of verge by landowners
Road Reserves : Major	0.0%	maintainance of verge by local authority
POS : Active	0.0%	grassed areas
POS : Passive / Basins	50.0%	native vegetation
Rural : Pasture	50.0%	general pasture
Rural : Residential ~R2.5/R5	0.0%	low density
Rural : Poultry	0.0%	specific high nutient input land use
Commercial/Industrial	0.0%	town centre etc

Total Residential 0.0%
Total Area 100.0%

Nutrient Input Without WSUD

Residential	Garden	29.70	kg/net ha/yr	0.00	kg/gross ha/yr	0	kg/yr	0.0%
	Lawn	14.00		0.00		0		0.0%
	Pet Waste	3.96		0.00		0		0.0%
	Car Wash	0.13		0.00		0		0.0%
	Sub Total			0.00		0		0.0%
POS	Garden/Lawn	2.60	kg/ha POS/yr	0.00	kg/gross ha/yr	0	kg/yr	0.0%
	Pet Waste	0.00		0.00		0		0.0%
	Sub Total			0.00		0		0.0%
Road	Major Roads	1.04	kg/ha RR/yr	0.00	kg/gross ha/yr	0	kg/yr	0.0%
Reserve	Minor Roads	20.00		0.00		0		0.0%
	Sub Total			0.00		0		0.0%
Rural	Pasture	20.00	kg/ha Rural/yr	10.00	kg/gross ha/yr	3,210	kg/yr	100.0%
	Poultry Farms	75.00		0.00		0		0.0%
	Residential (R2.5/R5)	4.00		0.00		0		0.0%
	Sub Total			10.00		3,210		100.0%
	Total			**10.00**	kg/gross ha/yr	**3,210**	kg/yr	**100.0%**

Residential Areas (R15-R35) : Nutrient Removal via Source Control

☐ Native Gardens (Lots - Garden) ☐ Native Gardens (Lots - Lawn) ☐ Native Gardens (POS) ☐ Street Sweeping
☐ Community Education : Fertiliser ☐ Community Education : Pet Waste ☐ Community Education : Car Wash

Education Effectiveness 20%

	% Area of Influence	Removal kg/gross ha/yr	Removal kg/yr	Removal %	Capital Cost $	Operating Cost $/yr	Cost $/kg/yr
Native Gardens (Lots - Garden)	20%	0.00	0	0.0%	$0	$0	$0.0
Native Gardens (Lots - Lawn)	20%	0.00	0	0.0%	$0	$0	$0.0
Native Gardens (POS)	100%	0.00	0	0.0%	$0	$0	$0.0
Community Education : Fertiliser	100%	0.00	0	0.0%	$0	$0	$0.0
Community Education : Pet Waste	100%	0.00	0	0.0%	$0	$0	$0.0
Community Education : Car Wash	0%	0.00	0	0.0%	$0	$0	$0.0
Street Sweeping	0%	0.00	0	0.0%	$0	$0	$0.0
Totals		**0.00**	**0**	**0.0%**	**$0**	**$0**	**$0.0**

Residential Areas (R15-R35) : Nutrient Removal via In-Transit Control

☐ Gross Pollutant Trap ☐ Water Pollution Control Pond

	% Area of Influence	Removal kg/gross ha/yr	Removal kg/yr	Removal %	Capital Cost $	Operating Cost $/yr	Cost $/kg/yr
Gross Pollutant Traps	100%	0.00	0	0.0%	$0	$0	$0.0
Water Pollution Control Ponds	50%	0.00	0	0.0%	$0	$0	$0.0
Total		**0.00**	**0**	**0.0%**	**$0**	**$0**	**$0.0**

Net Nutrient Input

	kg/gross ha/yr	kg/yr	%	Capital Cost $	Operating Cost $/yr	Cost $/kg/yr
Nutrient Input : Residential Area without WSUD	0.00	0	0.0%			
Nutrient Input : Rural Area	10.00	3,210	100.0%			
Removal via Source Control	0.00	0	0.0%	$0	$0	$0.0
Removal via In-Transit Control	0.00	0	0.0%	$0	$0	$0.0
Total Removal	0.00	0	0.0%	$0	$0	$0.0
Net Nutrient Input	**10.00**	**3,210**	**100.0%**			

NiDSS

Nutrient Input Decision Support System
Version 2.0 March 2005 - OTH 1.01

JDA Consultant Hydrologists
Report Date : 27-May-22

Bullsbrook North Landowners	
Total Nutrient Input - No WSUD (kg/yr)	33,853
Reduction due to WSUD (kg/yr)	25,364
Percentage Overall Reduction	74.9%
Pecentage Development Reduction	74.9%
Cost of Selected Program ($/kg/yr)	$0

( ) Total Phosphorus
(•) Total Nitrogen

Catchment Name Bullsbrook North Landowners
Option Description Post-development scenario
Catchment Area 285 ha

Land Use Breakdown

Residential : ~R15	35.0%	lower density residential areas (excludes road reserve area)
Residential : ~R35	10.0%	higher density residential areas (excludes road reserve area)
Road Reserves : Minor	18.0%	maintainance of verge by landowners
Road Reserves : Major	7.0%	maintainance of verge by local authority
POS : Active	5.0%	grassed areas
POS : Passive / Basins	15.0%	native vegetation
Rural : Pasture	0.0%	general pasture
Rural : Residential ~R2.5/R5	0.0%	low density
Rural : Poultry	0.0%	specific high nutient input land use
Commercial/Industrial	10.0%	town centre etc

Total Residential 45.0%
Total Area 100.0%

Nutrient Input Without WSUD

Residential	Garden	68.83	kg/net ha/yr	30.98	kg/gross ha/yr	8,828	kg/yr	26.1%
	Lawn	97.53		43.89		12,509		36.9%
	Pet Waste	25.68		11.56		3,293		9.7%
	Car Wash	0.04		0.02		5		0.0%
	Sub Total			86.44		24,634		72.8%
POS	Garden/Lawn	73.40	kg/ha POS/yr	3.67	kg/gross ha/yr	1,046	kg/yr	3.1%
	Pet Waste	57.23		2.86		815		2.4%
	Sub Total			6.53		1,861		5.5%
Road	Major Roads	29.36	kg/ha RR/yr	2.06	kg/gross ha/yr	586	kg/yr	1.7%
Reserve	Minor Roads	132.00		23.76		6,772		20.0%
	Sub Total			25.82		7,357		21.7%
Rural	Pasture	60.00	kg/ha Rural/yr	0.00	kg/gross ha/yr	0	kg/yr	0.0%
	Poultry Farms	175.00		0.00		0		0.0%
	Residential (R2.5/R5)	15.20		0.00		0		0.0%
	Sub Total			0.00		0		0.0%
	Total			**118.78**	kg/gross ha/yr	**33,853**	kg/yr	**100.0%**

Residential Areas (R15-R35) : Nutrient Removal via Source Control

☑ Native Gardens (Lots - Garden) ☑ Native Gardens (Lots - Lawn) ☑ Native Gardens (POS) ☐ Street Sweeping
☑ Community Education : Fertiliser ☑ Community Education : Pet Waste ☐ Community Education : Car Wash

Education Effectiveness 33%

	% Area of Influence	Removal kg/gross ha/yr	Removal kg/yr	Removal %	Capital Cost $	Operating Cost $/yr	Cost $/kg/yr
Native Gardens (Lots - Garden)	100%	30.98	8,828	26.1%	$0	$0	$0.0
Native Gardens (Lots - Lawn)	100%	43.89	12,509	36.9%	$0	$0	$0.0
Native Gardens (POS)	100%	3.67	1,046	3.1%	$0	$0	$0.0
Community Education : Fertiliser	100%	5.70	1,625	4.8%	$0	$1,461	$0.9
Community Education : Pet Waste	100%	4.76	1,356	4.0%	$0	$2,658	$2.0
Community Education : Car Wash	0%	0.00	0	0.0%	$0	$0	$0.0
Street Sweeping	0%	0.00	0	0.0%	$0	$0	$0.0
Totals		**88.99**	**25,364**	**74.9%**	**$0**	**$4,118**	**$0.2**

Residential Areas (R15-R35) : Nutrient Removal via In-Transit Control

☐ Gross Pollutant Trap ☐ Water Pollution Control Pond

	% Area of Influence	Removal kg/gross ha/yr	Removal kg/yr	Removal %	Capital Cost $	Operating Cost $/yr	Cost $/kg/yr
Gross Pollutant Traps	100%	0.00	0	0.0%	$0	$0	$0.0
Water Pollution Control Ponds	50%	0.00	0	0.0%	$0	$0	$0.0
Total		**0.00**	**0**	**0.0%**	**$0**	**$0**	**$0.0**

Net Nutrient Input

	kg/gross ha/yr	kg/yr	%	Capital Cost $	Operating Cost $/yr	Cost $/kg/yr
Nutrient Input : Residential Area without WSUD	118.78	33,853	100.0%			
Nutrient Input : Rural Area	0.00	0	0.0%			
Removal via Source Control	88.99	25,364	74.9%	$0	$4,118	$0.2
Removal via In-Transit Control	0.00	0	0.0%	$0	$0	$0.0
Total Removal	88.99	25,364	74.9%	$0	$4,118	$0.2
Net Nutrient Input	**29.79**	**8,490**	**25.1%**			

NiDSS

Nutrient Input Decision Support System
Version 2.0 March 2005 - OTH 1.01

JDA Consultant Hydrologists
Report Date : 27-May-22

Bullsbrook North Landowners	
Total Nutrient Input - No WSUD (kg/yr)	**8,071**
Reduction due to WSUD (kg/yr)	**6,585**
Percentage Overall Reduction	**81.6%**
Pecentage Development Reduction	**81.6%**
Cost of Selected Program ($/kg/yr)	**$1**

(•) Total Phosphorus
( ) Total Nitrogen

Catchment Name Bullsbrook North Landowners
Option Description Post-development scenario
Catchment Area 285 ha

Land Use Breakdown

Residential : ~R15	35.0%	lower density residential areas (excludes road reserve area)
Residential : ~R35	10.0%	higher density residential areas (excludes road reserve area)
Road Reserves : Minor	18.0%	maintainance of verge by landowners
Road Reserves : Major	7.0%	maintainance of verge by local authority
POS : Active	5.0%	grassed areas
POS : Passive / Basins	15.0%	native vegetation
Rural : Pasture	0.0%	general pasture
Rural : Residential ~R2.5/R5	0.0%	low density
Rural : Poultry	0.0%	specific high nutient input land use
Commercial/Industrial	10.0%	town centre etc

Total Residential **45.0%**
Total Area **100.0%**

Nutrient Input Without WSUD

Residential	Garden	31.50	kg/net ha/yr	14.18	kg/gross ha/yr	4,040	kg/yr	50.1%
	Lawn	14.78		6.65		1,895		23.5%
	Pet Waste	6.47		2.91		830		10.3%
	Car Wash	0.13		0.06		17		0.2%
	Sub Total			23.80		6,782		84.0%
POS	Garden/Lawn	2.60	kg/ha POS/yr	0.13	kg/gross ha/yr	37	kg/yr	0.5%
	Pet Waste	14.42		0.72		206		2.5%
	Sub Total			0.85		243		3.0%
Road Reserve	Major Roads	1.04	kg/ha RR/yr	0.07	kg/gross ha/yr	21	kg/yr	0.3%
	Minor Roads	20.00		3.60		1,026		12.7%
	Sub Total			3.67		1,047		13.0%
Rural	Pasture	20.00	kg/ha Rural/yr	0.00	kg/gross ha/yr	0	kg/yr	0.0%
	Poultry Farms	75.00		0.00		0		0.0%
	Residential (R2.5/R5)	4.00		0.00		0		0.0%
	Sub Total			0.00		0		0.0%
		Total		**28.32**	kg/gross ha/yr	**8,071**	kg/yr	**100.0%**

Residential Areas (R15-R35) : Nutrient Removal via Source Control

☑ Native Gardens (Lots - Garden) ☑ Native Gardens (Lots - Lawn) ☑ Native Gardens (POS) ☐ Street Sweeping
☑ Community Education : Fertiliser ☑ Community Education : Pet Waste ☐ Community Education : Car Wash

Education Effectiveness 33%

	% Area of Influence	Removal kg/gross ha/yr	Removal kg/yr	Removal %	Capital Cost $	Operating Cost $/yr	Cost $/kg/yr
Native Gardens (Lots - Garden)	100%	14.18	4,040	50.1%	$0	$0	$0.0
Native Gardens (Lots - Lawn)	100%	6.65	1,895	23.5%	$0	$0	$0.0
Native Gardens (POS)	100%	0.13	37	0.5%	$0	$0	$0.0
Community Education : Fertiliser	100%	0.95	271	3.4%	$0	$1,461	$5.4
Community Education : Pet Waste	100%	1.20	342	4.2%	$0	$2,658	$7.8
Community Education : Car Wash	0%	0.00	0	0.0%	$0	$0	$0.0
Street Sweeping	0%	0.00	0	0.0%	$0	$0	$0.0
Totals		**23.10**	**6,585**	**81.6%**	**$0**	**$4,118**	**$0.6**

Residential Areas (R15-R35) : Nutrient Removal via In-Transit Control

☐ Gross Pollutant Trap ☐ Water Pollution Control Pond

	% Area of Influence	Removal kg/gross ha/yr	Removal kg/yr	Removal %	Capital Cost $	Operating Cost $/yr	Cost $/kg/yr
Gross Pollutant Traps	100%	0.00	0	0.0%	$0	$0	$0.0
Water Pollution Control Ponds	50%	0.00	0	0.0%	$0	$0	$0.0
Total		**0.00**	**0**	**0.0%**	**$0**	**$0**	**$0.0**

Net Nutrient Input

	kg/gross ha/yr	kg/yr	%	Capital Cost $	Operating Cost $/yr	Cost $/kg/yr
Nutrient Input : Residential Area without WSUD	28.32	8,071	100.0%			
Nutrient Input : Rural Area	0.00	0	0.0%			
Removal via Source Control	23.10	6,585	81.6%	$0	$4,118	$0.6
Removal via In-Transit Control	0.00	0	0.0%	$0	$0	$0.0
Total Removal	23.10	6,585	81.6%	$0	$4,118	$0.6
Net Nutrient Input	**5.22**	**1,486**	**18.4%**			

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APPENDIX 6

Economic Justification Report



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Bullsbrook North

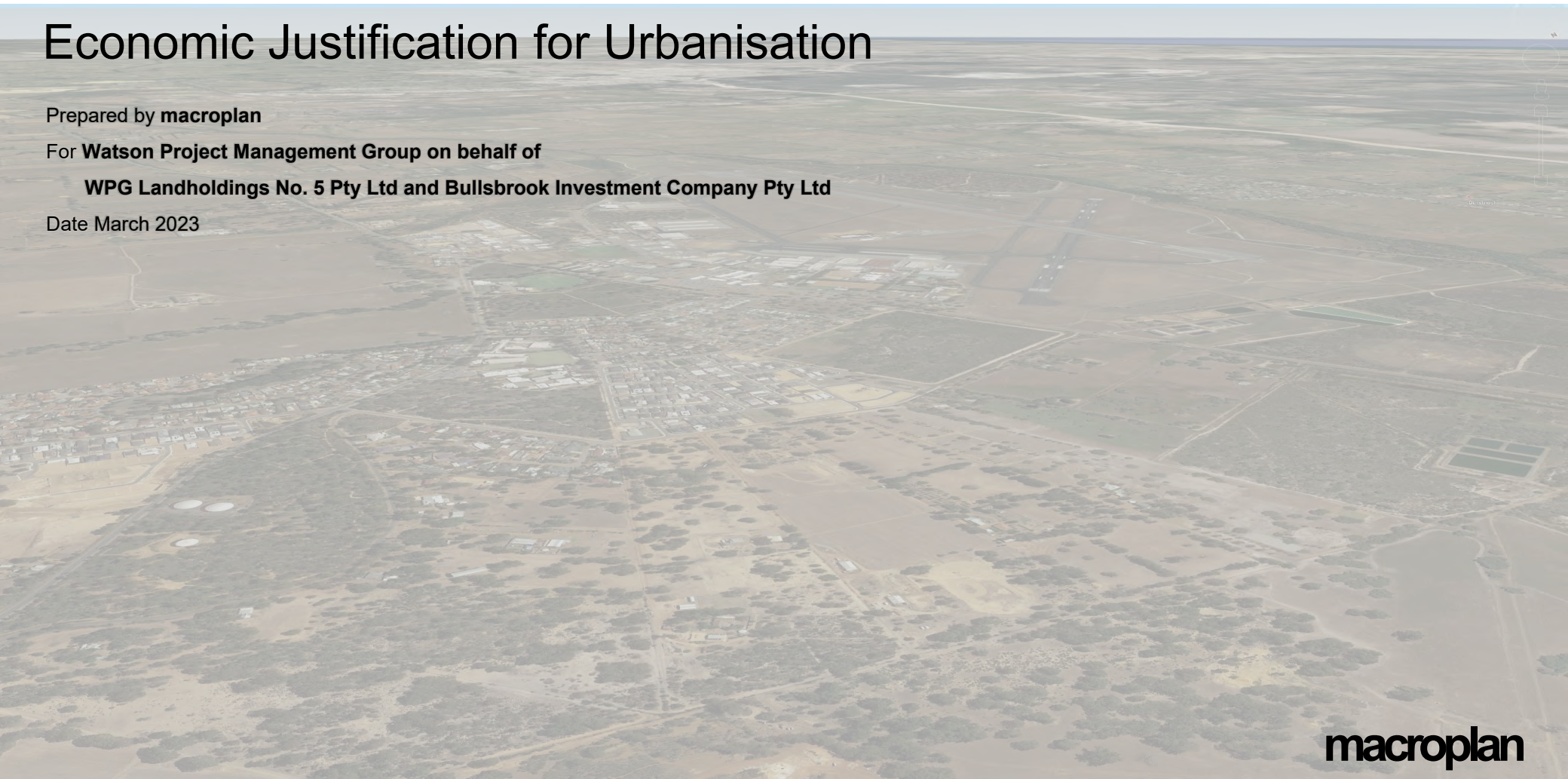
Economic Justification for Urbanisation

Prepared by **macroplan**

For **Watson Project Management Group on behalf of**

WPG Landholdings No. 5 Pty Ltd and Bullsbrook Investment Company Pty Ltd

Date March 2023



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Cover image: Bullsbrook aerial photograph (Google Earth)

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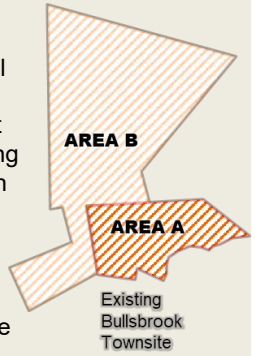
Executive summary

Bullsbrook North

Bullsbrook North covers an area of approximately 355 hectares of land within the Bullsbrook Townsite District Structure Plan (DSP) boundary. The area is designated as 'urban expansion/industrial expansion' in the WAPC's North-East Sub-region Planning Framework, and 'future residential/future investigation area' in the City of Swan's Bullsbrook Townsite District Structure Plan.

Land uses in Bullsbrook will be de-constrained when the Bullsbrook wastewater treatment plant is closed (due in 2023). The Water Corporation is in the process of upgrading both water and sewer services to the area to facilitate future development.

This report supports a proposal to amend the Metropolitan Region Scheme for the subject site from the current rural zoning to urban for "Area A" and urban deferred for "Area B" (see Map 1). The proposal also includes amendments to the Bullsbrook Townsite DSP to identify the land as predominantly for future residential development.



Overview

This report aims to:

- Determine the need for Bullsbrook North to deliver additional residential land in Perth's North-East Sub-region;
- Determine the need for additional industrial development as identified for the proposed Bullsbrook North Industrial Area;
- Estimate the quantifiable economic benefits and comment on the qualitative economic benefits to be created by the development of Bullsbrook North; and
- Discuss the contribution of the Bullsbrook North development to the economic and employment objectives of state and local government planning strategies and structure plans.

Need for Bullsbrook North

Residential land supply

Bullsbrook North is needed to make up for the Western Australian Planning Commission's (WAPC) forecast fall in lot supply in the City of Swan. The WAPC's *Urban Land Development Outlook 2020/21* (ULDO) shows a shortfall of *at least* 1,750 lots across the City of Swan in the medium term. That means out to around 2030 there is a forecast under-supply of residential land in the corridor. The ULDO for 2020/21 identifies that the 22 active estates in the Swan urban corridor will drop to just nine by 2025/26.

Strong demand for lots over 2020/21 and 2021/22 has resulted in an acceleration of land development in the short-term. This now means many estates have sold out or are coming near to completion. However, insufficient new estates are planned to replace them in the short to medium term.

With the completion of Bullsbrook Heights and Bullsbrook Landing, there will be only one major estate left in Bullsbrook – Kingsford Estate. These lots are priced at the about the same level as the Perth median lot price and therefore do not contribute to the affordable land supply.

There is an urgent need to get more residential land to the market to maintain prices at affordable levels.

Economic benefits

Affordable land supply

The urbanisation of Bullsbrook North will add affordable residential land and increased competition to the corridor. This will have the benefit of containing land prices to levels that promote home ownership.

Support industry/employment growth

The investment in land development, infrastructure servicing, and dwelling construction will produce economic benefits for the sub-region. Over its projected 25-year development timeframe, Bullsbrook North will generate $5.8 billion in total economic output and create 12,410 job-years during construction.

Industrial land supply

There is a surplus of industrial land in the corridor, with existing identified areas (including zoned and expansion areas) having more than 2,700 hectares of developable land, which even at very high take-up rates of 30 hectares per year, is enough to meet the expected demand until beyond 2100. Therefore, there is no need for additional industrial land as identified in the Bullsbrook Townsite DSP.

Consistency with planning objectives

This proposal is consistent with the City of Swan's *Commercial and Activity Centres Strategy 2017*. The Bullsbrook North centre is included in that strategy, and the additional household expenditure from future residents will help the existing Bullsbrook centre to become a district centre as planned.

Bullsbrook North will contribute directly to the City of Swan's Economic Development Strategy by increasing the local workforce (without having a negative effect on employment self-sufficiency) and by helping to increase household expenditure retained in the City of Swan.

Bullsbrook had employment self-containment of 85% in 2016 (the latest available year for employment data). This assessment demonstrates that this employment self-sufficiency can be maintained in the future, therefore meeting the target set in the *North-East Sub-region Planning Framework 2018*.

Recommendations

- Bullsbrook North ("Area A") should be rezoned to begin its staged urban development as soon as possible to:
  - Meet high demand from land buyers and provide a safety buffer for peak demand periods;
  - Fill the gap left by estates in the City of Swan that are coming to a completion;
  - Make up some of the lot shortfall anticipated in the ULDO 2020/21 for medium term lot development; and
  - Provide competition and choice in the Bullsbrook area to compensate for the single estate in the area (Kingsford).
- Bullsbrook North Expansion area and the Bullsbrook North Industrial Investigation Area ("Area B") should be identified as urban deferred/future urban because: (1) there is a substantial surplus of industrial land in the corridor; (2) additional residential land is needed in the medium term to replace estates that are coming to the end of their development life; and (3) the removal of the wastewater buffer constraint allows a higher and better use of the land.
- Planned residential densities for Bullsbrook North should be reviewed to aim for 25 dwellings per net lot hectare of urban zoned land which reflects a more appropriate density outcome than the current assumption of 22 dwellings per net hectare.

Proposal

Proposed MRS amendments

"Bullsbrook North" as referenced in this report, covers an area of approximately 355 hectares of land within the Bullsbrook Townsite District Structure Plan (DSP). The area is designated as 'urban expansion/industrial expansion' in the WAPC's North-East Sub-region Planning Framework, and 'future residential/future investigation area' in the City of Swan's Bullsbrook Townsite District Structure Plan.

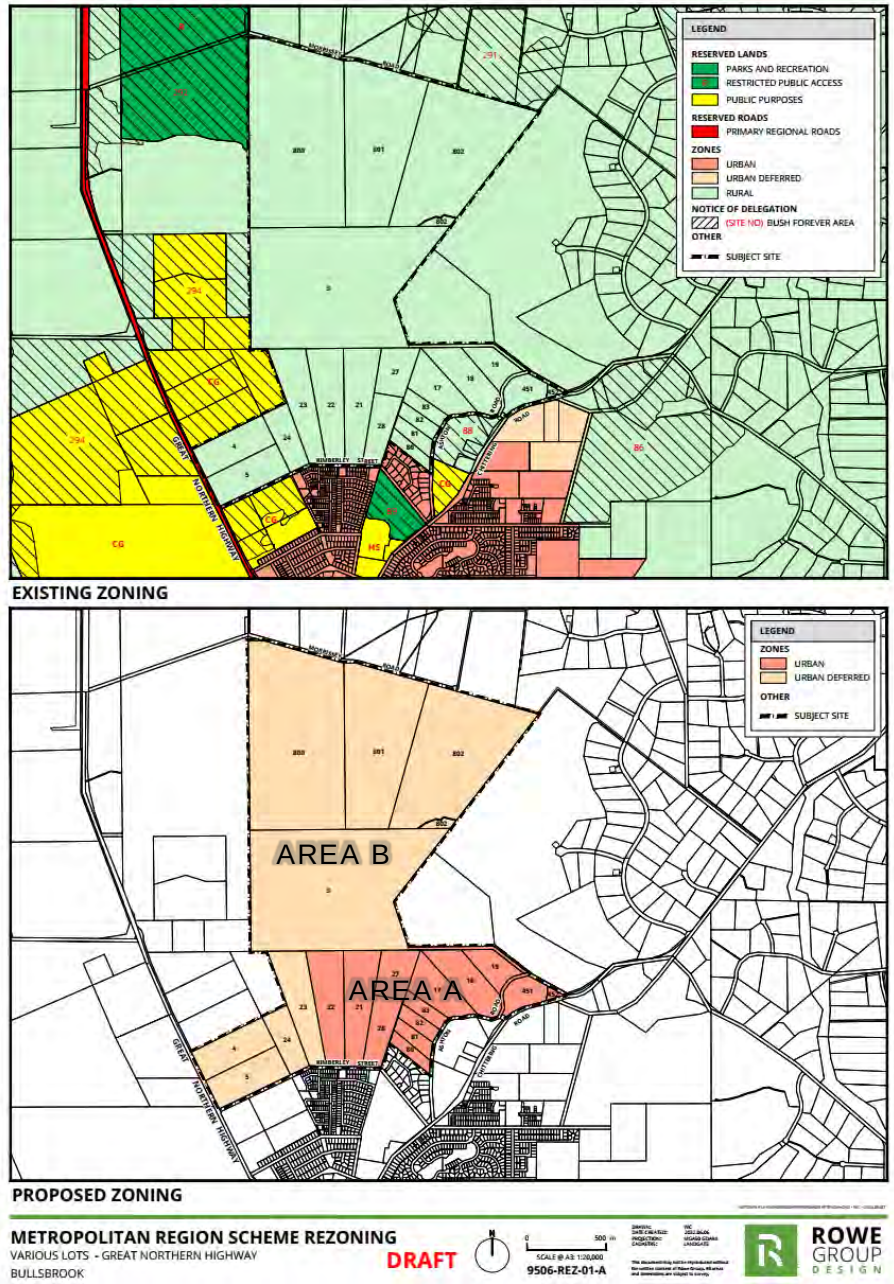
Land uses in Bullsbrook will be de-constrained when the Bullsbrook wastewater treatment plant is closed (due in 2023).

The Water Corporation is in the process of upgrading both water and sewer services to the area to facilitate future development.

This report supports a proposal to amend the Metropolitan Region Scheme for the subject site from the current rural zoning to:

- Urban for "Area A"
- Urban deferred for "Area B".

Map 1 Proposed MRS amendment



Proposed DSP amendment

Bullsbrook Townsite District Structure Plan (DSP) 2018

The Bullsbrook Townsite DSP was endorsed in 2018 to guide the continued residential and industrial growth of the existing townsite, including the expansion/investigation of additional land for rezoning for residential and industrial uses. The DSP also sets the vision for the activity centres in the area and for the existing Bullsbrook centre to increase its development to a District Centre level.

At the time the DSP was prepared, the buffer for the Bullsbrook wastewater treatment plant to the north of the townsite meant that the land was constrained from being developed at its highest and best use.

Given those constrains, the DSP projected that approximately 126 ha of Bullsbrook North could be developed as residential lots and yield 2,777 dwellings (at an average density of 22 lots per net site hectare) and a resident population of 7,776 people (at 2.8 persons per dwelling).

This report supports the proposal to amend the DSP over the subject site to:

- Remove the notional “Potential Industrial” and buffer areas under the DSP
- Change the bulk of the Subject Site to be “Future Residential”
- Increase the dwelling yield to around 4,500 dwellings.

Notes to the map

* The existing 500 metre clay quarry buffer may be reduced in the future, upon agreement of all relevant parties. This buffer is subject to detailed mapping.

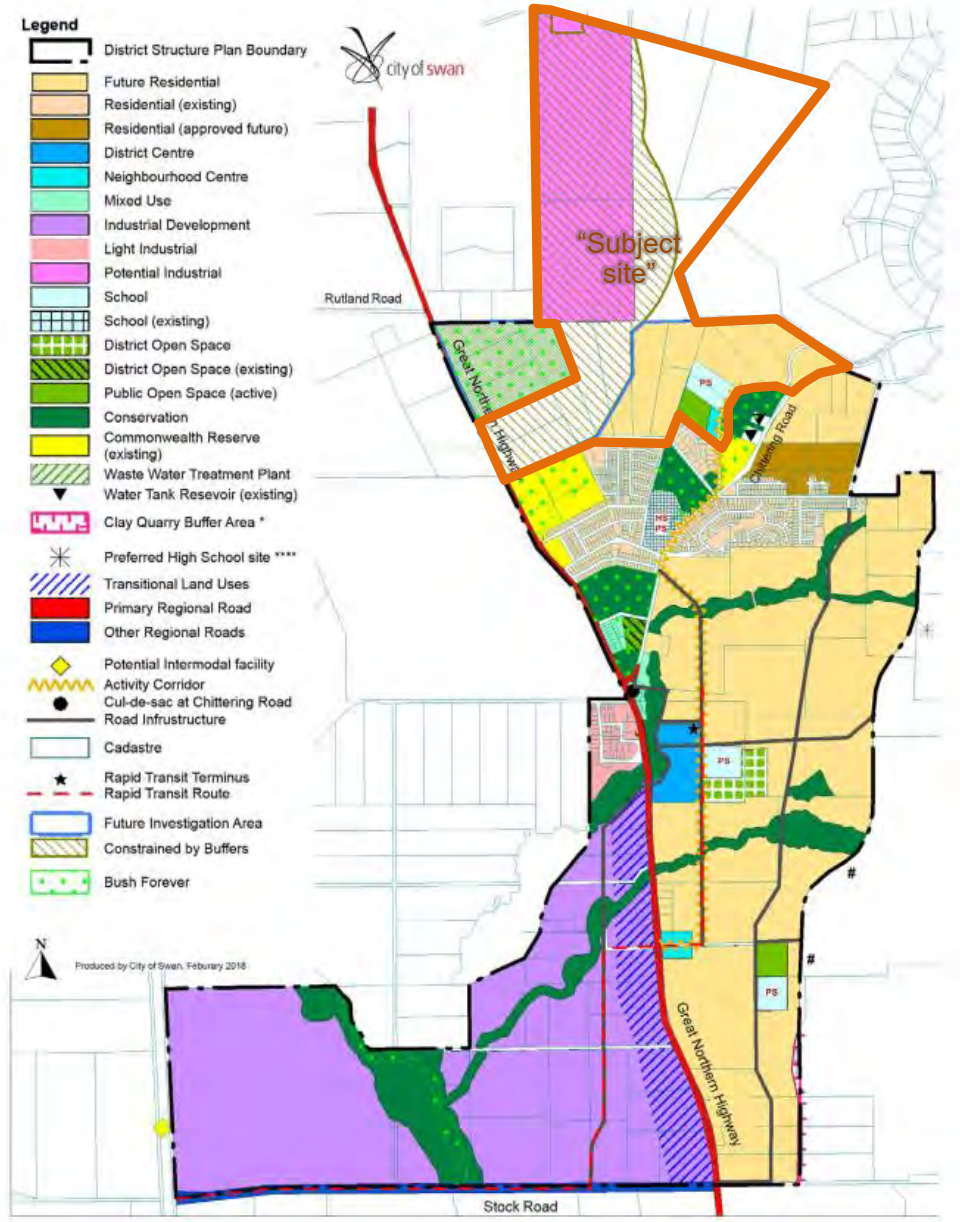
** Transitional land uses are required along the western edge of the Great Northern Highway (refer Section 3.1.2 of the Bullsbrook Townsite District Structure Plan report).

*** The location, design and size of the DOS is to be refined through the local structure planning stage.

**** In the event that an additional high school site is required, its siting and location should be determined prior to supporting the first major structure plan. Refer to Section 3.6.1 of the Bullsbrook Townsite District Structure Plan report.

\# It is noted that an existing approved rural local structure plan overlaps in this area. This issue needs to be adressed in future local structure plans.

Figure 1.2 Bullsbrook Townsite DSP 2018



Source: City of Swan Bullsbrook Townsite DSP 2018

1_Planning and economic context

- Bullsbrook is strategically important for its long term industrial land supply, RAAF Base Pearce, the new Centre for National Resilience (quarantine centre), and agribusiness. The economic future of the area will transform as it becomes the principal industrial centre in the City of Swan with the development of the Bullsbrook Freight and Industrial Area.

- The State Government's planning framework for Bullsbrook is laid out in *Perth and Peel @3.5million* and the *North-East Sub-regional Planning Framework 2018*. The latter document sets a density target across structure planned, urban deferred and expansion areas of 15 dwellings per gross hectare of Metropolitan Region Scheme (MRS) urban zoned land.

- The City of Swan's *Economic Development Strategy 2017-2022* aims to increase its resident skilled workforce, encourage activity centres to provide higher-level employment, and retain more of the household expenditure by providing more goods and services within the City.

1.1 National and State economic context

National and State economic context

The current and future economic growth plans for Bullsbrook and the North-East Sub-region include the emerging major industrial areas (Muchea, Bullsbrook South/Intermodal Terminal, and the Bullsbrook Freight and Industrial Area). These areas provide both a physical and economic connection to the State's primary production and resource industries.

Major road upgrades have already contributed to improved access, safety, and better separation of freight and passenger traffic in the sub-region.

The State's high-level economic development framework includes the:

- *State Planning Strategy 2050*;
- Diversify WA economic development framework; and
- Draft State Infrastructure Strategy

The relevance of these high-level plans to Bullsbrook is that these documents all identify the importance of primary production, resources, and freight by connecting regional Western Australia with the Greater Perth and export markets. These are all economic sectors directly relevant and partly dependent on Bullsbrook's urban growth.

RAAF Base Pearce

RAAF Base Pearce is reportedly the busiest RAAF air base in Australia with over 100,000 aircraft movements annually. It is used as a training school for RAAF and the Republic of Singapore Air Force, which make up most of the air traffic.

RAAF Base Pearce is the only permanent operational base in Western Australia, so it has a significant logistics role.

A higher-than-average number of residents in Bullsbrook are defence force employees. In 2021, 6.3 per cent of the Bullsbrook SA2 population aged 15 and over were serving, or had previously served, in the defence force, compared to a national benchmark of 3.0 per cent.

Centre for National Resilience – Perth (Bullsbrook COVID-19 quarantine facility)

The Commonwealth Government funded a $200 million 500-bed quarantine facility in Bullsbrook which was completed in mid-2022. The WA Government is responsible for operational costs for the first year. However, as quarantine is no longer required for interstate or international travel (at the time of writing this report), it is not required for its original intended purpose. Other potential options are to use the centre as accommodation during natural disasters (bushfire or cyclone). The former Australian coalition government ruled out using the facility as a detention centre. However, the new Government has not yet made any announcement on the potential alternative uses for the facility.

Given the facility is developed there may be private sector interest in the repurposing it for such uses as accommodating skilled migrants to work in the resources or health sectors to meet high demand for additional employees. Although the future use of the facility is uncertain, it may provide an economic stimulus for the area if an ongoing use can be determined.

1.2_Perth and Peel@3.5million and North-East Sub-regional Planning Framework 2018

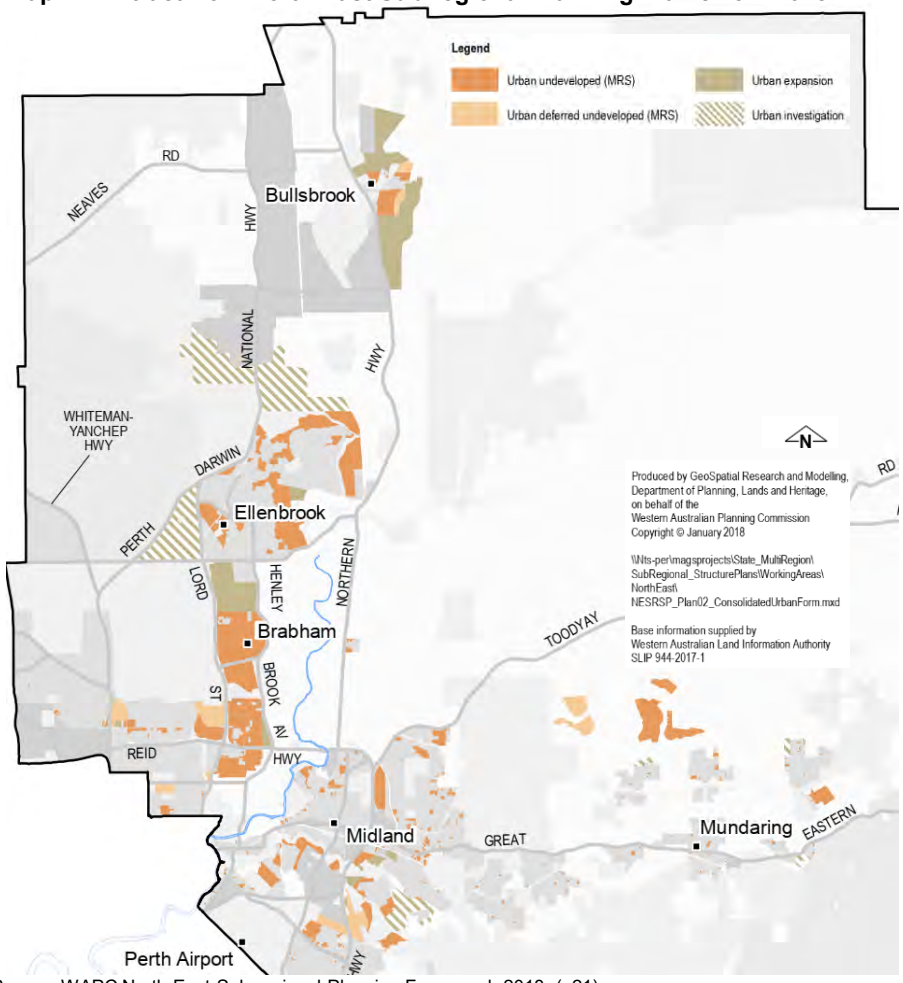
Perth and Peel @3.5million and the *North-East Sub-regional Planning Framework 2018* provide strategic planning guidance for the greater metropolitan area. They also set the planning direction at a localised level to provide substantial guidance for the growth of Bullsbrook.

The relevant objectives of the Framework for Bullsbrook North are outlined in the action plan of the strategy which includes the following aims:

- Promote consolidation of urban form which encourages the contiguous expansion of existing urbanised areas and the planning/investigation of identified new urban areas.
- Increase densities across undeveloped land (including urban deferred and expansion/investigation areas) to reach an average density of 15 dwelling units per gross hectare of MRS urban zoned land.
- Review endorsed structure plans with a view to achieve a minimum average density of 15 dwellings per gross urban hectare.
- Promote employment opportunities for people to live and work in the same sub-region. This requires more high-level employment within Midland Strategic Metropolitan Centre and industrial precincts.
- Increase the role of activity centres to provide a wider range of services to the community.

The Framework identified approximately 110 hectares of Bullsbrook North as 'industrial expansion' (Bullsbrook Town-Site Precinct North) and designated another 226 hectares for 'urban expansion'.

Map 1.1 Extract from North-East Sub-regional Planning Framework 2018



Source: WAPC North-East Sub-regional Planning Framework 2018 (p21)
Note: Not to scale

1.3 City of Swan planning and policy context (cont.)

Economic Development Strategy 2017-2022

The City of Swan's *Economic Development Strategy 2017-2022* provides guidance for the future expansion of the Bullsbrook Townsite. This document recognises that Bullsbrook's economic base is transitioning to a State-significant intermodal hub, agricultural production, and a wholesaling precinct.

The strategy has identified eight actions relevant to Bullsbrook to help the City achieve the economic and planning vision for the areas. Actions no. 13, 14, 15 & 16 focus on attracting the investment in transport infrastructure and industrial development to enable this economic transition.

Action 26 of the strategy notes the need for more residents and skilled workers to meet the needs of the industry growth in the City. The risk of not achieving this outcome is a constraint on business productivity and investment attraction.

Action 28 reflects a concern that households within the City of Swan are making a relatively high proportion of their household expenditure outside of the City (aka 'escape expenditure'). A direct way to address this is to develop higher order activity centres providing a greater range of goods and services to meet the discretionary and non-discretionary spending of the community.

The remaining two actions (29 & 30) refer to general actions that relate to all geographic areas across the City of Swan.

Table 1.1 Actions specific to Bullsbrook from the Economic Development Strategy

Strategic Objective	#	Action	Place	Rationale	Timeframe	Potential Partners	Measure of Success
				unlock further development potential in Hazelmere.			
Strategic Objective 2 – liveable and workable places Support sustainable development outside of the established business precincts, while protecting and enhancing liveability and amenity	13	Lobby for the development of an intermodal hub at Bullsbrook.	Bullsbrook	The location is strategically located on the State highway and rail network, accesses low-cost land and is currently free of residential encroachment.	Medium to long	Swan CC; freight operators; DAFWA; land owners; Agribusiness enterprises	Establishment of IMH
	14	Fast-track the planning and establishment of a nationally-significant Agribusiness Precinct, possibly in Bullsbrook that will include agricultural value adding processors and intensive producers, e.g. hydroponics.	Bullsbrook	The location is strategically located on the State highway and rail network, accesses low-cost land and is currently free of residential encroachment.	Medium	Swan CC; freight operators; DAFWA; land owners; Agribusiness enterprises	Establishment of precinct
	15	Assuming a precinct is to be established, assign an ED team member to build relationships with external agricultural producers and value-adders who could potentially relocate to the Agribusiness Precinct.	Bullsbrook	This will help ensure the success of the Precinct.	Medium	DAFWA	No. agribusiness producers who relocate
	16	Investigate the potential for the Agribusiness Precinct to include a Perth-region fruit and vegetable wholesale market.	Bullsbrook	This will help ensure the success of the Precinct.	Medium to long	DAFWA; DOP; wholesalers	Completion of business case
Strategic Objective 4 - entrepreneurial workforce The City has a resilient, adaptable and entrepreneurial resident workforce	26	Research and prepare a population attraction and retention strategy to target key segments identified as missing from the resident population.	All	The skills deficit in Swan will have an impact of local business productivity and investment attractiveness.	Medium	NA	Population growth in key segments
Strategic Objective 5 – Swan the innovator The Council is known, as an innovative, business-friendly partner	28	Investigate the volume, direction and trend in escape expenditure by industry in Swan to identify opportunities for new business investment.	All	More robust evidence will better target investment attraction efforts, focusing on business opportunities with demonstrable prospects. It will also support business cases for infrastructure funding.	Short	NA	Quantification of reduction in escape expenditure by industry
	29	Expand cooperation with neighbouring Councils to more effectively lobby for regional infrastructure priorities.	All	Regional cooperation strengthens the case with State and Federal infrastructure funding agencies.	Short to long	Other EMRC members	Volume of secured infrastructure investment in the region
	30	Maintain publication of SwanBiz newsletter.	All	It is important to have accessible and regular information outputs to the business community.	Ongoing	NA	Readership numbers

Source: City of Swan Economic Development Strategy 2017-2022

1.3 City of Swan planning and policy context (cont.)

Local Commercial and Activity Centres Strategy 2017

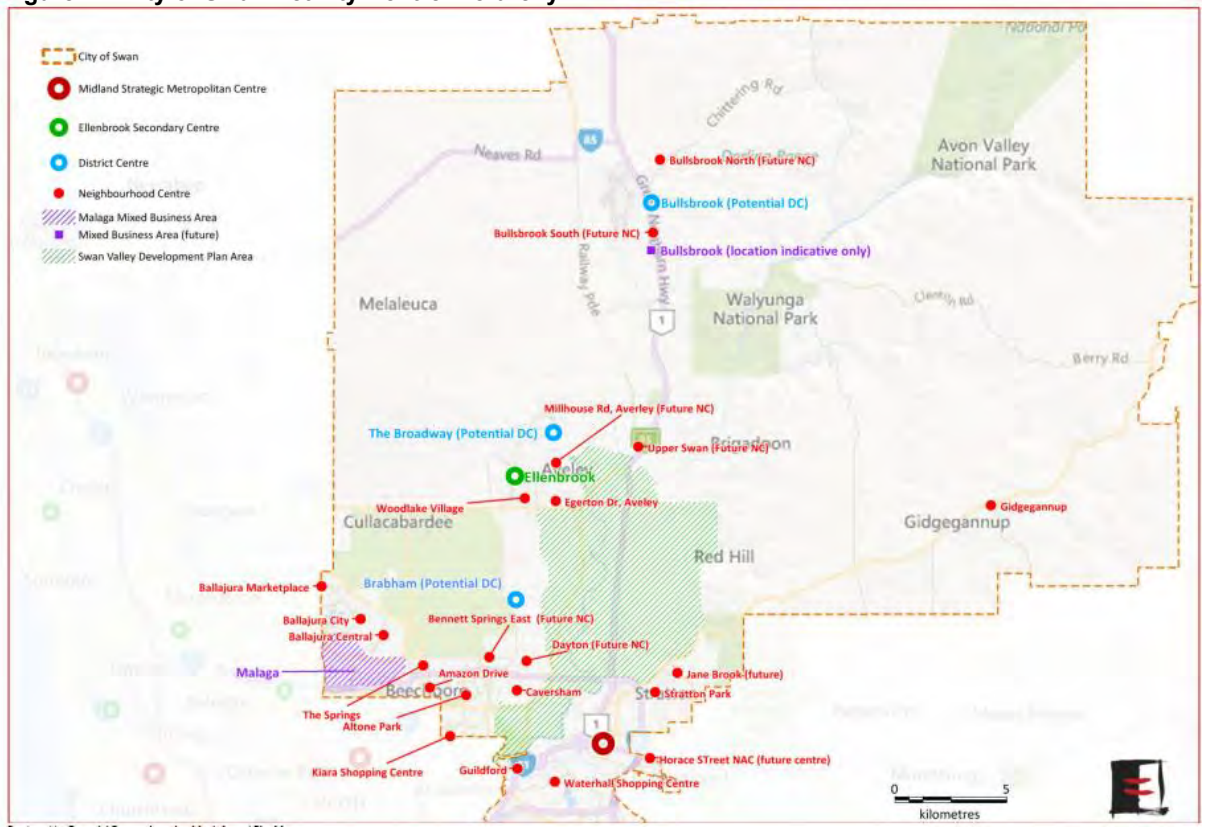
The City of Swan's *Local and Commercial Development Strategy 2017*, plans the future activity centre hierarchy across the local government area. The relevant parts of that strategy are that the existing Bullsbrook Neighbourhood Centre is designated as a future district centre and Bullsbrook North is designated as a future neighbourhood centre.

The future Bullsbrook District Centre is expected to provide for the daily and weekly needs of residents for goods and services. Even though they are focused to principally serve the local community then can still have a range of uses. The strategy identifies suitable uses within a district centre as including a retail core, combined with a potential mix of cultural, recreation, healthcare, education, community facilities, tourism and/or mixed-used residential development.

The action in the strategy for the future of the Bullsbrook District Centre is to:

> Seek to maximise exposure for the future Bullsbrook district centre to the Great Northern Highway and the 'activity corridor' identified in the Bullsbrook Masterplan that connects Chittering Road and the Great Northern Highway. (Local and Commercial Development Strategy 2017, p42)

Figure 1.2 City of Swan Activity Centre Hierarchy



Source: City of Swan Local and Commercial Development Strategy 2017

1.3 City of Swan planning and policy context (cont.)

Local Commercial and Activity Centres Strategy 2017

The City of Swan's *Local and Commercial Development Strategy 2017* describes the preferred role of the current/proposed centres in Bullsbrook. The relevance to this assessment is that the urban development of Bullsbrook North is consistent with the planned activity centre hierarchy in the Swan *Local and Commercial Development Strategy 2017*.

The City of Swan is currently reviewing and updating this strategy. The implications for Bullsbrook are unknown but the focus of the new strategy is likely to be the new activity centres around the station precincts for the Morley-Ellenbrook Line.

Additional demand for goods and services through household expenditure from the urbanisation of Bullsbrook North will help trigger the growth of both the existing Bullsbrook centre and the Bullsbrook North centre. This will provide the existing and future Bullsbrook community with additional local shopping amenity (including retail goods, and services such as healthcare).

District centres as defined in the *Local and Commercial Development Strategy 2017*, can have a wide range of uses that meet needs of a growing community but also help to provide economic development opportunities and jobs for the local community.

Figure 1.3 City of Swan activity centre role and examples

Centre Hierarchy/Centre	Role/Description	Examples of Centre Features
District Centre • Brabham (future DC) • Bullsbrook (future DC) • The Broadway, Ellenbrook (future DC)	District centres have a greater focus on servicing the daily and weekly needs of residents. Their relatively smaller scale catchment enables them to have a greater local community focus and provide services, facilities and job opportunities that reflect the particular needs of their catchments.	Examples of services and facilities provided in District Centres: • Retail: Range of convenience based retailing, with at least one large supermarket and a variety of convenience based speciality retailing. Opportunities for Discount Department Stores and tourism focus retail also exists in some instances. • Cultural, recreation and entertainment facilities: Including restaurants/cafes, small scale arts centres/galleries, local sporting facilities, gymnasiums, etc • Health: Including medical centres and allied health services (ie. dental, physiotherapy, podiatry, etc). • Education: Including pre-school, primary and secondary schools and potentially adult training and education. • Community facilities: Including libraries, child-care, community and youth centres, public halls, religious buildings, etc. • Visitor facilities: Potential for tourism infrastructure may exist for those centres with a tourism focus. • Residential: Including intensification of residential development. *Recommended share of floorspace allocated to mixed uses in District Centres of 20,000-50,000m², as identified in SPP 4.2, is 30%, and for centres of 10,000-20,000m² is 20%.*

Source: City of Swan Local and Commercial Development Strategy 2017 (page 21)

Centre Hierarchy/Centre	Role/Description	Examples of Centre Features
Neighbourhood Centre • Altone Park • Amazon Drive • Ballajura Central • Ballajura City • Ballajura Marketplace • Bennett Springs East (future NC) • Bullsbrook North (future NC) • Bullsbrook South (future NC) • Caversham • Dayton (future NC) • Egerton Drive Averley • Gidgegannup • Guildford • Horace Street (potential NC) • Jane Brook (potential NC) • Kiara Shopping Centre • Stratton Park • The Springs • Upper Swan (future NC) • Waterhall Shopping Centre • Woodland Village	Neighbourhood Centres have a more limited role in providing convenience retailing and community facilities for an immediate surrounding catchment. Usually, these centres are anchored by a supermarket. In some cases, these centres also serve a tourist market.	Examples of services and facilities provided in Neighbourhood Centres: • Retail: Limited range of convenience based retailing, including a supermarket and a variety of convenience based speciality retailing. Opportunities for tourism focus retail also exists in some instances. • Health: May include medical centres and allied health services (ie. dental, physiotherapy, podiatry, etc). • Education: May include pre-school, primary and secondary schools. • Community facilities: May include a library, child-care, community and youth centres, public halls, religious buildings, etc. • Visitor facilities: May include tourism infrastructure in for those centres with a tourism focus. This may involve small scale visitor accommodation.

Source: City of Swan Local and Commercial Development Strategy 2017 (page 22)

2_Needs analysis for Bullsbrook North

This section discusses the rationale to justify the urbanisation of Bullsbrook North. Relevant issues addressed include:

- Urbanisation of Bullsbrook will help address the need for more affordable land supply for Perth's growth. Additional market affordable housing will help address the State Government's housing priorities.
- There is a surplus of industrial land in the sub-region which will meet the demand for over 100 years' of growth. Therefore, there is no need for additional industrial land in Bullsbrook North.
- Bullsbrook's population has been growing faster than the WAPC WA Tomorrow median (band 'C') projection, showing that the rate of land/dwelling take up is also higher than forecast.
- The City of Swan's dwelling and population projections assume that Bullsbrook Townsite North proceed in the 'short-to-medium term and that the Bullsbrook North Expansion Ares is a 'long-term' development.

2.1_Population growth

Population growth is both a driver and a result of economic growth. Therefore, this section on economic development starts with trend population growth in the Bullsbrook SA2.

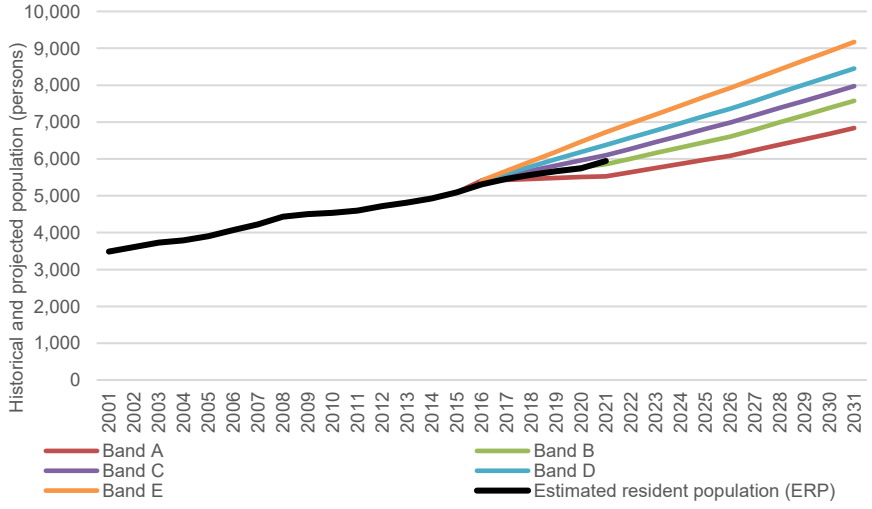
The figures below show the estimated resident population (ERP) growth from 2001 to 2021 and the projected growth from 2016 to 2031 (ie. the ERP and projections overlap for five years).

The projected growth includes the five bands identified in *WA Tomorrow* which reflect the uncertainty of projecting future growth. The estimated resident population for the years 2017 to 2021 has been tracking close to the median projection band (C) from *WA Tomorrow* (WAPC 2019). Given that the broader population growth has been low for 2020 and 2021 due to the impacts of COVID-19 and subsequent lockdowns, this growth outcome is relatively strong and suggests that – subject to residential land availability – Bullsbrook will grow at or above the Band C projection band with the reopening of the interstate and international borders.

WA Tomorrow also includes the components of population growth. The following chart shows the increasing proportion of growth from overseas migration. By 2031, 75 per cent of all new residents in the Bullsbrook SA2 are projected to come from overseas. Most of this growth component is from the skilled migration program and therefore tends to be adults in relatively well-paid and secure employment.

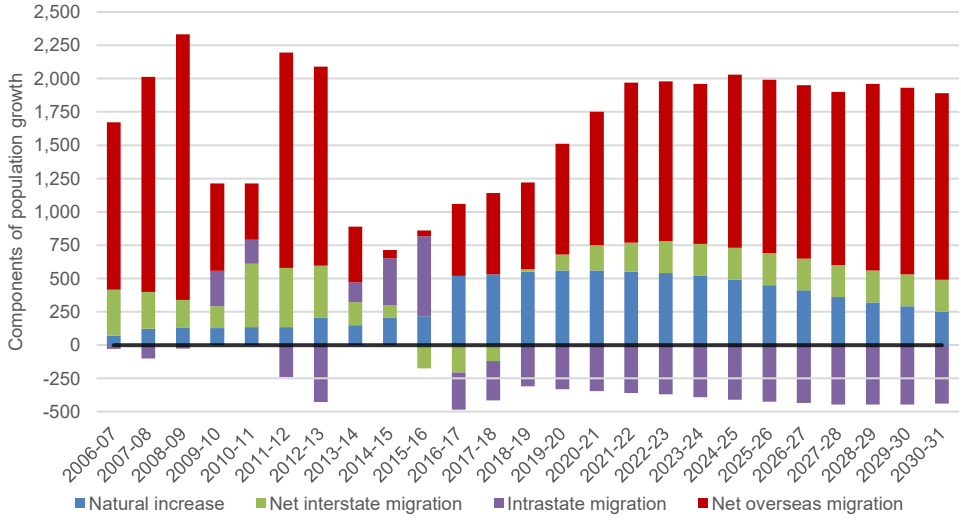
Note that population projections incorporate an estimate of supply to determine the realistic rate of dwelling development and the ultimate dwelling capacity based on zoned and potential future development land.

Figure 2.1 Historical and projected population growth – Bullsbrook SA2



Source: ABS estimated resident population 2001-2021; WAPC WA Tomorrow 2019

Figure 2.2 Population growth components– Bullsbrook SA2



Source: WAPC WA Tomorrow 2019

2.1_Population growth (cont.)

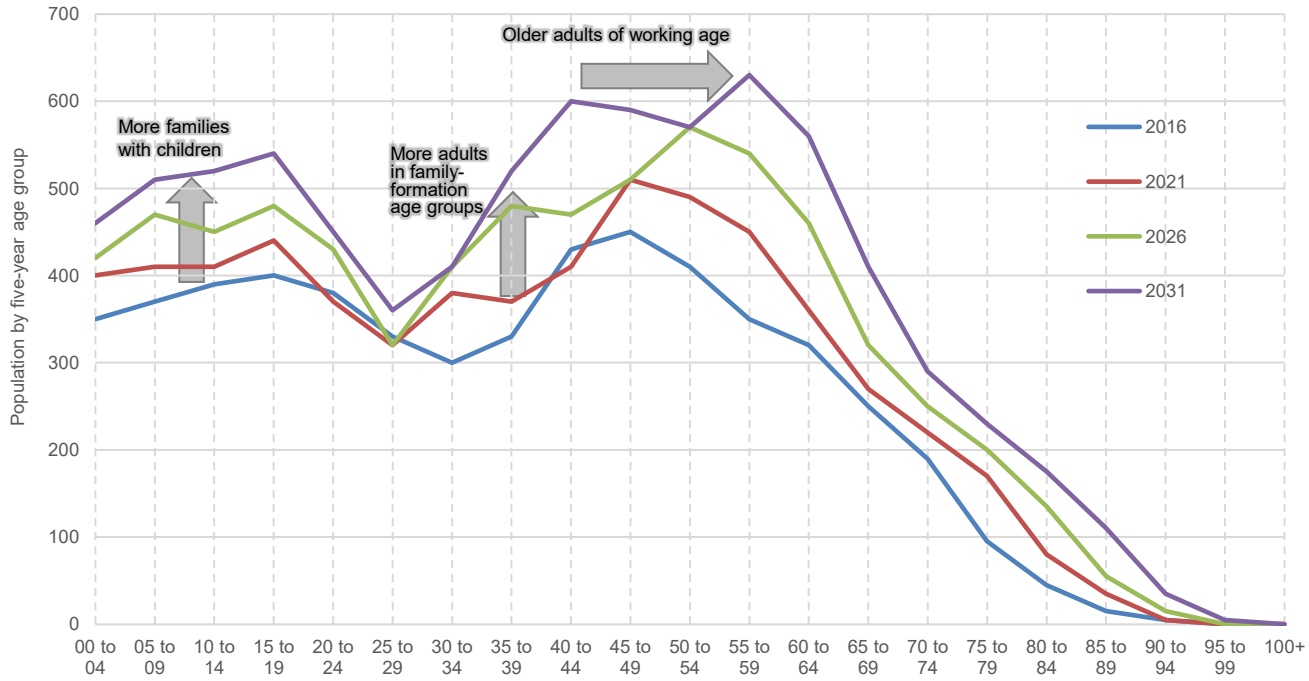
The figure on the right shows the WAPC WA Tomorrow projections (band C) by five-year age group for the Bullsbrook SA2. The projections indicate considerably more families moving into the area with more children and youth (aged 0 to 19 years) and more adults 35 to 64 years of age.

One implication of this growth is adults in aged 35 and older tend to have higher earning capacity that younger adults. This suggests that future incomes and household expenditure could be relatively high for the future residents.

The working age population (defined as people aged between 15 and 65 years) in the Bullsbrook SA2 is projected to increase from 4,100 people in 2021 to 5,230 people by 2031. The compound annual growth of this cohort is 2.5 per cent per annum over the decade to 2031.

The number of people 65 and over is expected to increase substantially, by around 500 residents between 2021 and 2031, representing an annual compound growth rate over 4.0 per cent.

Figure 2.3 Projected population by five-year age group – Bullsbrook SA2



Source: ABS estimated resident population 2001-2021; WAPC WA Tomorrow 2019

2.1_Population growth (cont.)

City of Swan (ForecastID) dwelling and population projections

The City of Swan's population projections, prepared by ForecastID, assume:

- Average growth of 800 dwellings per annum from 2017-2051, with the majority of development to occur in the longer term.
- Short-to-medium-term development areas:
  - Bullsbrook Heights
  - Bullsbrook Landing
  - Kingsford (Okeland Bullsbrook Central)
  - **Bullsbrook Townsite North ("Area A" in this proposal)**
- Medium-to-long-term development areas:
  - Bullsbrook Townsite South
  - Bullsbrook Townsite Hurd Road
  - Hepburn East and Hepburn West
- Long-term development areas
  - East Gnangara
  - North Bennett Springs Marshall
  - **Bullsbrook North Investigation Area ("Area B" in this proposal)**
  - Ellenbrook North in the long term
- Low-moderate level of infill and future unknown sites (10-15 dwellings per annum).

Table 2.1 Dwelling, household and population projections – Bullsbrook small area (ForecastID definition)

Bullsbrook	Forecast year							
Summary	2016	2021	2026	2031	2036	2041	2046	2051
Population	5,246	6,322	9,119	13,628	23,725	42,557	64,097	85,216
Change in population (5yrs)	--	1,076	2,798	4,509	10,096	18,832	21,540	21,120
Average annual change	--	3.80%	7.60%	8.37%	11.73%	12.40%	8.54%	5.86%
Households	1,790	2,183	3,251	4,711	8,055	14,336	21,612	28,919
Average household size	2.87	2.84	2.77	2.86	2.92	2.95	2.95	2.93
Population in non private dwellings	114	114	114	165	216	267	318	369
Dwellings	1,908	2,301	3,357	4,864	8,315	14,799	22,309	29,852
Dwelling occupancy rate	93.82	94.87	96.84	96.85	96.87	96.87	96.88	96.87

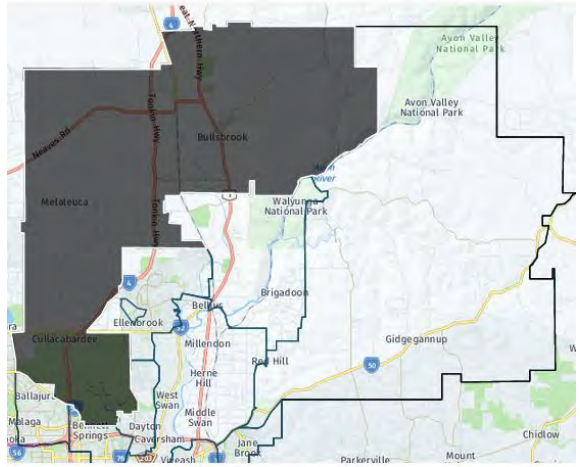
Source: City of Swan / ForecastID May 2019

The City of Swan's forecasts use a ground-up approach to determine the development rate and total capacity for each residential development area/estate. As stated in the forecasts:

> **".id's forecasters worked with Council planners to understand the likely development activity in each small area. This forms the development assumptions for the forecasts."**
>
> **"Residential development forecasts assume the number of dwellings in Bullsbrook will increase by an average of 798 dwellings per annum to 29,852 in 2051."**

https://forecast.id.com.au/swan/residential-development?mYear1=2046&mYear3=2051&themtype=Year1&WebID=720

Figure 2.4 Bullsbrook small area (ForecastID definition)



2.1_Population growth (cont.)

City of Swan (ForecastID) dwelling and population projections

Dwelling projections from the City of Swan prepared in 2019 show all the major growth areas in Ellenbrook and the Urban Growth Corridor (the area between Whiteman Park and the Swan Valley along the new rail corridor), have peaked in terms of dwelling construction. The high demand resulting from the COVID-19 housing stimulus has exhausted available lots.

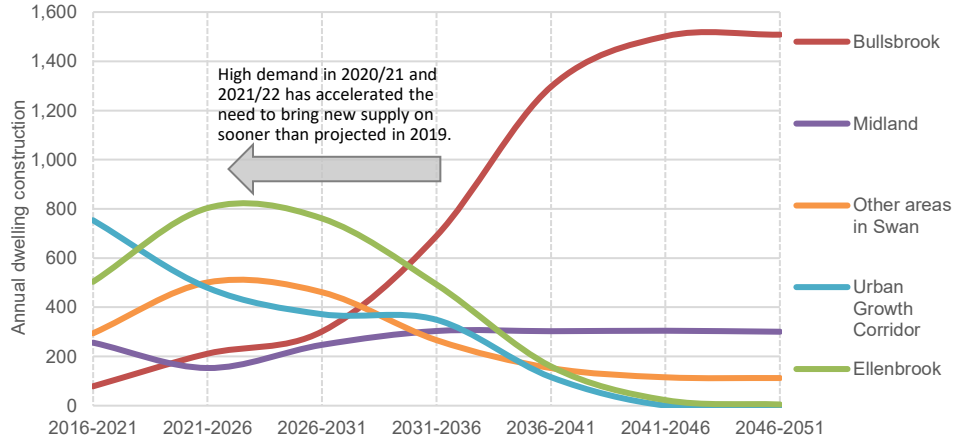
The projections show there are only two areas forecast to increase development to make up for the build-out of the previous high urban growth areas in the City of Swan:

- Bullsbrook – which (as defined by in the ForecastID projections) includes North Ellenbrook development areas as well as the Bullsbrook Townsite expansion areas (north and south); and
- Midland (suburb and CBD) – which relies on increasing dwelling densities, major infill, and redevelopment projects in existing developed areas.

The figure on the right shows that the rate of dwelling development in Bullsbrook was projected to average 210 dwellings per annum over 2021 to 2026. This is projected to increase to 300 dwellings over the 2026 to 2031 period. From 2031 to 2036, the projections show an average of 690 new dwellings in Bullsbrook each year.

The table on the right shows the cumulative number of dwellings in each of the small areas as defined by ForecastID and the City of Swan. This shows the relative role of each area's contribution to the total residential land and dwelling supply and highlights the primary role of the Bullsbrook area to meet demand for future growth (which is larger in scale than Ellenbrook by 2051).

Figure 2.5 Annual dwelling projections – City of Swan small areas (ForecastID definition)



Source: City of Swan / ForecastID May 2019

Table 2.2 Cumulative dwelling projections – City of Swan small areas (ForecastID definition)

Area	2016	2021	2026	2031	2036	2041	2046	2051
Altone	8,021	8,243	8,660	9,293	9,622	9,812	9,852	9,877
Ballajura	6,648	6,728	7,101	7,526	7,841	7,938	8,013	8,088
Bullsbrook	1,908	2,301	3,357	4,864	8,315	14,799	22,309	29,852
Ellenbrook	14,406	16,630	20,036	23,390	25,573	26,353	26,463	26,485
Gidgegannup	1,074	1,248	1,432	1,624	1,858	2,098	2,338	2,578
Guildford - Hazelmere	2,588	2,975	3,625	4,267	4,562	4,652	4,727	4,802
Midland	6,558	7,724	8,271	9,022	9,907	10,743	11,563	12,363
Swan Valley	1,928	1,953	1,978	2,003	2,028	2,053	2,078	2,103
Swan View	3,883	4,337	5,087	5,390	5,468	5,548	5,628	5,708
Upper Swan	597	724	828	912	966	1,006	1,046	1,086
Urban Growth Corridor	3,506	7,277	9,674	11,533	13,278	13,856	13,856	13,856
Ellenbrook Town Centre	362	654	1,263	1,713	1,991	2,006	2,006	2,006
Midland CBD	779	892	1,109	1,592	2,222	2,897	3,597	4,297

Source: City of Swan / ForecastID May 2019

2.2_Residential land demand

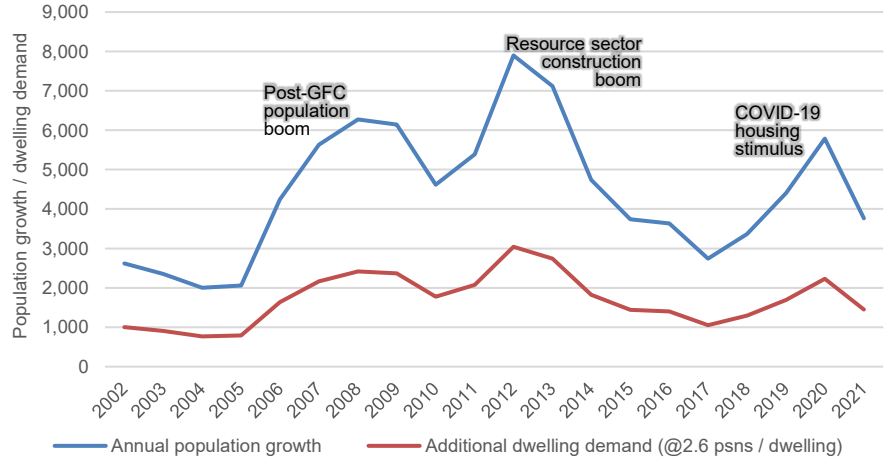
North-East Sub-region – population growth and dwelling demand

The annal population growth of the North-East Sub-region has been quite volatile in the past two decades. From a low of 2,000 people per annum in 2004 to a high of nearly 8,000 in 2012, the sub-region's growth has been through a series of booms that correlate directly with the broader State economy, national economic conditions (principally interest rates) and government policy.

At an average household size of 2.6 persons per dwelling (as it was in the 2021 Census) for this area, the annual dwelling demand has varied from around 790 dwellings in 2004, up to more than 3,000 in 2012.

The implication for Bullsbrook North is that the volatility of residential land demand requires a sufficient supply pipeline of lots readily available to meet peak demand periods. It also means that high demand from home buyers stimulated by the COVID-19 response has depleted stocks of developed lots.

Figure 2.6 North-East Sub-region – population growth & dwelling demand



Source: Macroplan using ABS estimated resident population data 2001-2021

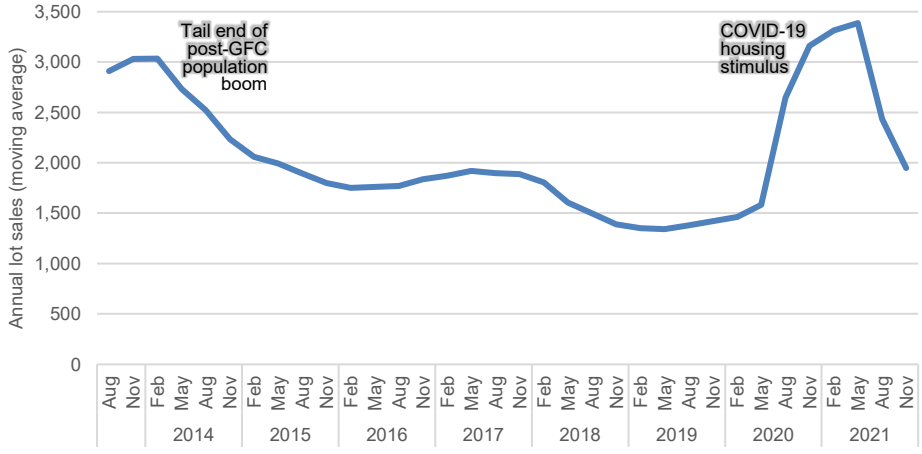
North-East Sub-region – residential lot sales

Residential lot sales for the North-East Sub-region show a similar variability in the sales from year to year. The figure below shows ten years' of residential lot sales across the North-East Sub-region.

Annual sales have varied from a low of around 1,350 lots in 2018/19 to a high of 3,390 in 2020/21. On average over the past decade, 2,100 lots have sold each year.

The recent increase in lot sales was catalysed by the Federal and State Government housing stimulus (grant) programs as a response to COVID-19. This shows the recent increase in demand was the highest demand period in at least the past ten years. Since the peak of mid-2021, recent sales have declined, however this measure is currently constrained by lack of availability of lots for purchase, and developers are currently advertising lots prior to titles being issued.

Figure 2.7 North-East Sub-region – residential lot sales



Source: Macroplan using APM/Domain.com.au data 2022

2.3_Residential land supply

Lot sales

The residential lot sales over the past decade show the importance of Bullsbrook in providing a substantial part of the overall supply of land for new housing.

Sales of 667 lots in the ten years up to May 2022 in Bullsbrook ranked the suburb seventh in the Swan urban corridor in terms of new lot sales. Sales in 2021/22 up to the end of May 2022, show that Bullsbrook ranked fourth in total sales.

Many of the suburbs that have dominated lot sales in the past are coming to the end of their development phase and will start to wind down over the next few years. Examples are Aveley and Caversham which are nearing completion.

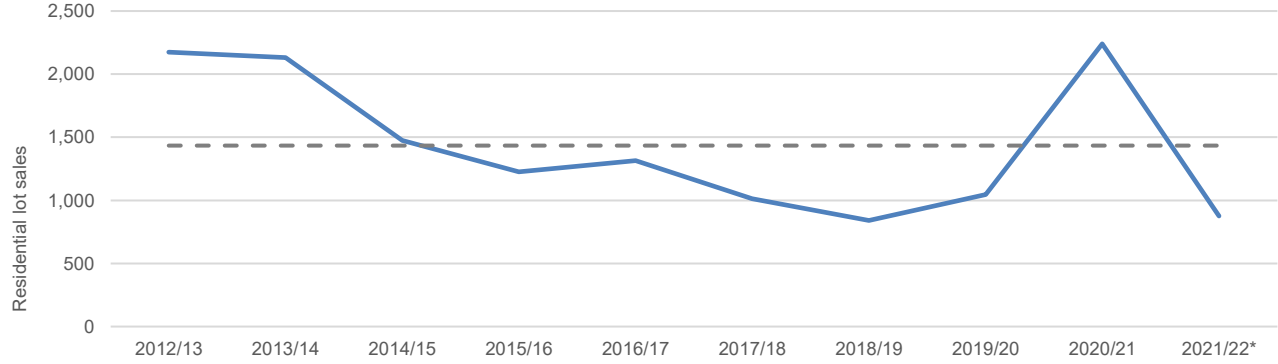
Over the past decade an average of 1,450 lots have sold each year in the Swan greenfield growth growth corridor and sales have ranged from a low of 840 in 2018-19 to a high of 2,240 in 2020/21. The past decade has been one of weak population and dwelling growth following the resource construction boom. Therefore, the future demand is likely to be higher as the forecast population growth returns to longer-term average levels. This will see residential lot and dwelling demand increase in the corridor.

Table 2.3 Top 10 suburbs in Swan greenfield growth corridor for residential lot sales

Rank	Suburb	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22 (to May)	10-year total
1	Brabham	254	250	230	310	361	254	221	304	573	190	**2,947**
2	Aveley	462	488	332	287	299	202	177	166	326	123	**2,862**
3	Ellenbrook	543	526	278	145	105	98	67	115	245	100	**2,222**
4	Dayton	333	180	171	178	190	156	128	164	358	55	**1,913**
5	Caversham	213	263	153	134	162	89	54	53	177	87	**1,385**
6	The Vines	124	159	88	59	48	63	31	41	87	5	**705**
7	Bullsbrook	54	127	91	32	42	22	41	53	108	97	**667**
8	Bennett Springs	23	11	17	2	27	47	32	51	104	28	**342**
9	Jane Brook	64	38	24	23	12	4	23	33	53	24	**298**
10	Henley Brook	4	8	7	4	4	3	5	8	37	57	**137**
-	Other suburbs	99	79	82	52	64	75	63	57	172	110	**853**
TOTAL		**2,173**	**2,129**	**1,473**	**1,226**	**1,314**	**1,013**	**842**	**1,045**	**2,240**	**876**	**14,331**

Source: Macroplan using APM/Domain.com.au data 2022
Note: Data for 2021/22 is year to date up to the end of May 2022.

Figure 2.8 Swan urban corridor - residential lot sales



Source: Macroplan using APM/Domain.com.au data 2022
Note: *Data for 2021/22 is year to date up to the end of May 2022.

2.3_Residential land supply

Bullsbrook residential lot sales

The number of residential lots sold in Bullsbrook over the past decade has varied from a low of 20 lots per year in 2018, to a high of over 120 lots per year (2014 and 2021/22).

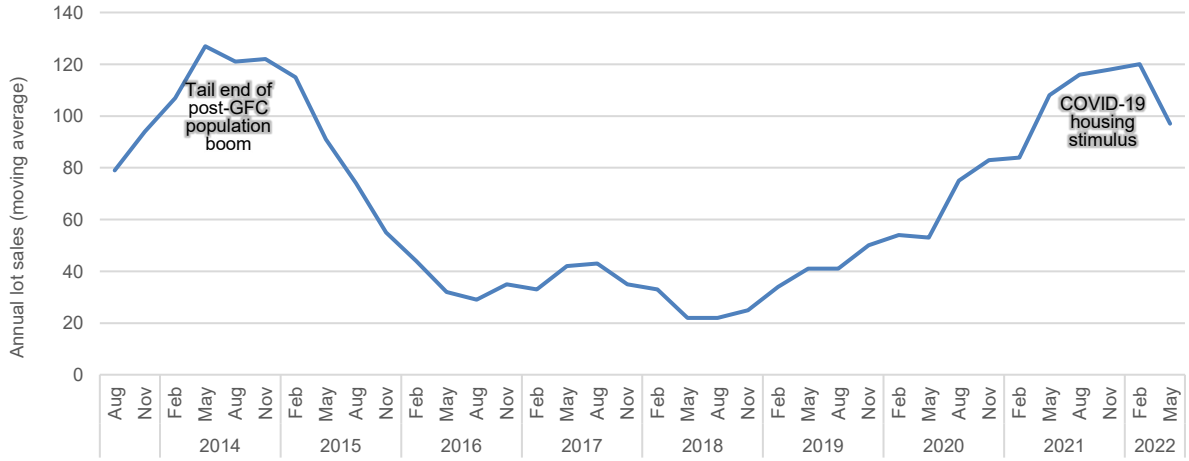
At this small geographic scale, the supply constraint becomes more evident, and the number of sales depends not only on demand, but also on land being available for sale.

The sales data below show the important role that Bullsbrook has had in meeting peak demand periods in the early 2010s and early 2020s.

The drivers behind these demand peaks have been quite different (the resources boom, and the COVID-19 stimulus). The dip in sales between mid 2015 to the end of 2019 reflects a general slowdown in the Perth residential land market which was a period of record low population growth following the mining construction boom.

The process of bringing additional land to the market involves many years of planning and development coordination before the land is ready to meet demand. This requires a forward view of at least three to five years and justifies a precautionary approach to ensure future land stocks do not fall short of demand.

Figure 2.9 Bullsbrook – residential lot sales



Source: Macroplan using APM/Domain.com.au data 2022

Bullsbrook residential estates

The most recent land estates in Bullsbrook are:

- **Bullsbrook Landing** – this estate is fully subdivided and dwelling construction on the final stage lots is well-advanced.
- **Bullsbrook Heights** – currently in the final stages of release and lot sales. This estate is likely to be fully developed (including dwelling construction) by around 2023/24.
- **Kingsford Estate** – understood to have sold around 300 lots to date of the expected total of 2,432 lots. Median lot sizes are 481m^2 with an inter-quartile range of 465-545m^2. Median lot prices as of mid 2022 are $245,000 which is close to the Greater Perth median price of $251,000 (REIWA). The interquartile range for prices is $240,000 to $259,000 which represents a relatively narrow pricing band.

Once the Bullsbrook Heights development is completed and Kingsford Estate becomes the only major land provider, there will be no competition for residential land in Bullsbrook. The nearest option for buyers will be the future Ellenbrook North (east and/or west) developments.

Staged release of Bullsbrook North can help meet future demand peaks, provide price competition and greater choice for land buyers in the area.

2.3_Residential land supply

Urban Land Development Outlook 2020/21

The WAPC published the most recent *Urban Land Development Outlook* (ULDO) in 2020/21. This provides a long-term outlook for the urban development of Perth and Peel, including greenfield developments and many of the smaller infill and apartment projects.

The ULDO shows estate development data in five-year bands for the short (0-5 years), medium (5-10 years) and long-term (10+ years) outlook. Rather than predict the future development, it is useful to ensure there is sufficient land in the forward pipeline to meet future demand.

The table on the right shows estates in the north-east corridor:

- Estates that are in their final stages, such as Vale in Aveley, Ariella Private Estate, Whiteman Edge in Brabham, and Taylor Private Estate in Caversham. In total, the ULDO identified 13 estates that were projected to be fully developed and sold by 2021/25. However, many are likely to be sold out much sooner given the high demand land in response to the COVID-19 stimulus.
- The ULDO identified only one new estate commencing in the medium term (Bennett Quarter in Bennett Springs). This estate commenced first sales in July 2022, and at the current demand, this is likely to be fully developed and sold by 2024/25.

The ULDO identified Bullsbrook North as a long-term project (beyond 2030/31), with a total yield of 200 dwelling units.

Table 2.4 Urban Land Development Outlook 2020/21 – Swan urban growth corridor

Suburb	Estate/precinct name	Project ID	Development information	Short-term dwellings 2020/21-2024/25	Medium-term dwellings 2025/26-2029/30	Long-term dwellings 2030/31+	TOTAL DWELLINGS
Aveley	Vale	E32	SD	466	0	0	**466**
Bennett Springs	Iluma Private Estate	E334	SD	209	168	0	**377**
	West Swan West	E363	SD	0	0	768	**768**
	NA	E30B	RV	0	0	40	**40**
	Bennett Springs	E400	SD,COM	0	187	0	**187**
Brabham	Ariella Private Estate	E344	SD	348	0	0	**348**
	Avonlee Estate	E229	SD	198	0	0	**198**
	Brabham Estate	E346	SD	875	478	1,269	**2,622**
	Flamewood	E345	SD	155	0	0	**155**
	Whiteman Edge	E35	SD, COM	304	0	0	**304**
Brigadoon	Avon Ridge	E120	RR	42	34	0	**76**
Bullsbrook	Bullsbrook Heights	E284	SD	67	0	0	**67**
	Bullsbrook Landing	E285	SD,GD	108	0	0	**108**
	Bullsbrook North	E332	SD	0	0	200	**200**
	Kingsford	E333	SD,COM	417	850	1,165	**2,432**
Caversham	Balwyn Private Estate	E313	SD,SR	95	0	0	**95**
	Taylor Private Estate	E269	SD,SR,MD,COM	277	0	0	**277**
Dayton	Mataro Private Estate	E399	SD	34	0	0	**34**
	St Leonards Private Estate	E231	SD,COM	257	400	400	**1,057**
	NA	E349	SD	41	0	0	**41**
	NA	E360	SD	0	0	35	**35**
	NA	E411	COM	0	0	0	**0**
	NA	E412	SD	31	0	0	**31**
Ellenbrook	Ellenbrook	E18	SD,GD,MD,COM	668	510	517	**1,695**
Henley Brook	Brooklands Private Estate	E398	SD	300	300	2,900	**3,500**
Jane Brook	Highland Range	E239	SD	120	0	0	**120**
The Vines	The Reserve	E55	SD	32	0	0	**32**
Upper Swan	Clementine	E359	SD, COM	310	670	670	**1,650**
Total				**5,354**	**3,597**	**7,964**	**16,915**

Source: WAPC *Urban Land Development Outlook 2020/21*
Notes: SD – single dwelling; GD – group dwelling, RV – retirement village; RR – rural residential; SR – special residential; COM – commercial; MD – multiple dwelling

2.3_Residential land supply

Urban Land Development Outlook 2020/21

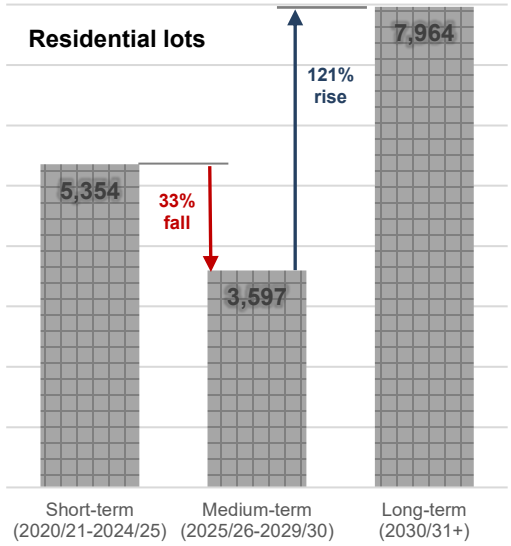
The ULDO identified a significant shortfall in the future land supply pipeline in the City of Swan. This forecast was developed before the stimulus impacts of COVID-19 created a significant increase in land sales and dwelling construction activity. Therefore, the development outlook for the medium-term outlook for lot supply has worsened since the ULDO was published.

The figures on the right show the outlook for the number of lots and residential estates in the north-east corridor:

- **22 active estates in the short term (2020/21 to 2024/25) will fall to just nine active estates in the medium term (2025/26 to 2029/30).**
- **5,354 lots anticipated for development in the short term (2020/21 to 2024/25) will reduce by nearly 1,750 lots to 3,597 in the medium term (2025/26 to 2029/2030)**
- **In the longer term (beyond 2030/31) there is a substantial pipeline of future lots (nearly 8,000). However, these are concentrated across a relatively small number of very large estates.**

The following map (overleaf) shows the future urban growth areas from the ULDO in more detail.

Table 2.10 Urban Land Development Outlook for lots and estates – City of Swan



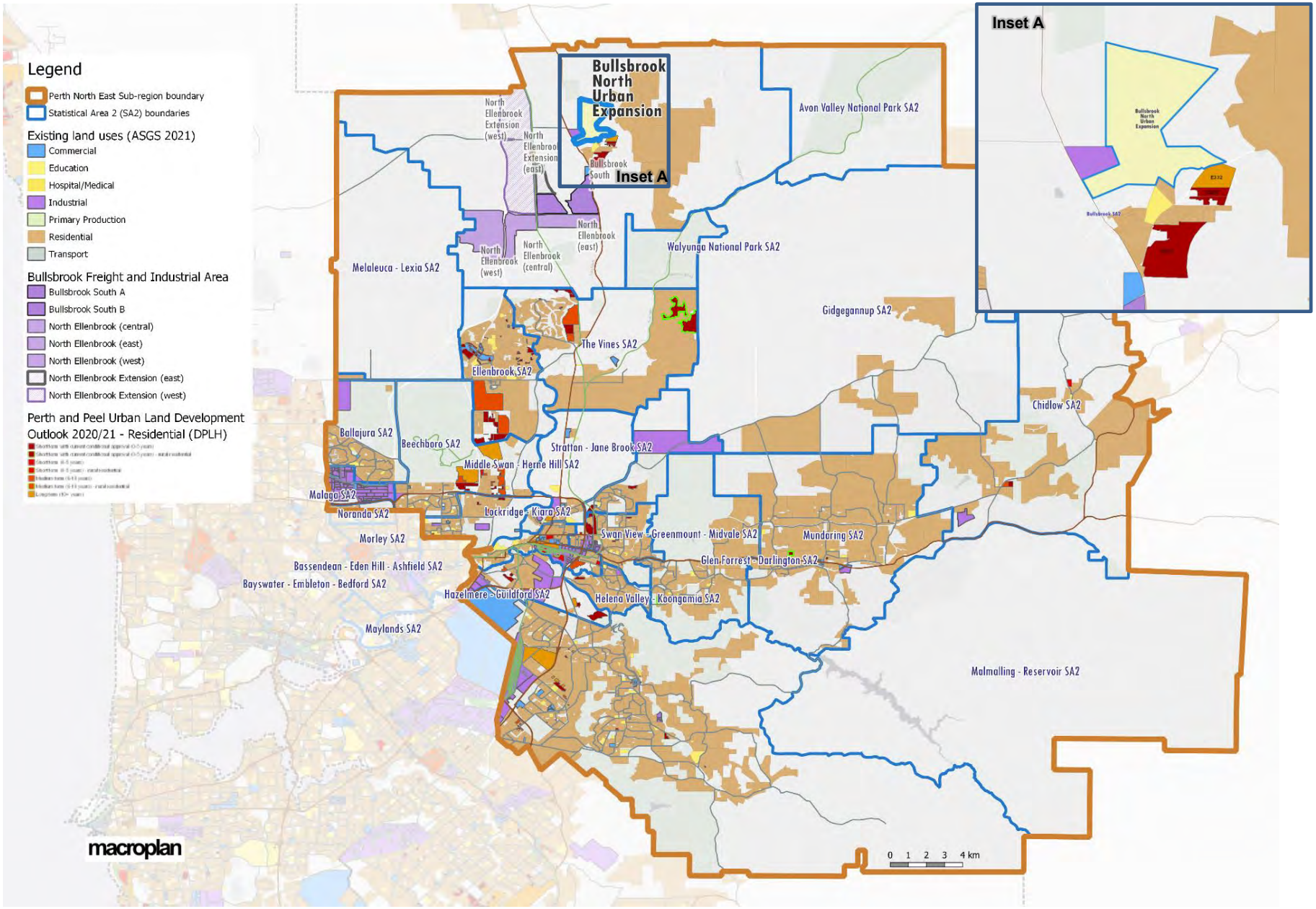


Source: WAPC Urban Land Development Outlook 2020/21

The obvious way to address the shortfall of lots and estates in the medium term is to review all the major projects currently identified as 'long-term' and consider which development areas can be appropriately brought forward into the medium-term development timeframe (such as Bullsbrook North)

A shortfall of residential lots for sale represents a potential economic risk that demand during peak periods could be substantially higher than supply, inflating land prices and putting lots beyond the buying capacity of first home buyers. This happened in 2006 in Perth.

Map 2.1 Bullsbrook North – North-East Sub-regional context



2.4_Need for additional industrial land

The North-East Sub-regional Planning Framework identifies a future substantial employment node referred to as the Bullsbrook Freight and Industrial Area, which consists of four major precincts across a total of 2,650 hectares:

- Bullsbrook South A (300 ha gross) – zoned industrial in the MRS and is called the Northern Gateway Industrial Park (Bullsbrook);
- Bullsbrook South B (100 ha gross) – zoned industrial in the MRS;
- North Ellenbrook (900 ha gross) – identified as 'industrial expansion' in the Perth and Peel @3.5 million – North-East Sub-regional Planning Framework; and
- North Ellenbrook Extension (industrial investigation) (1,350 ha gross) - identified as 'industrial investigation' in the Perth and Peel @3.5 million – North-East Sub-regional Planning Framework.

The developable yield for the area has yet to be determined, however, environmental constraints and infrastructure requirements in the area mean that the likely development yield may be around 50-70 per cent of the gross area or between 1,325 and 1,855 hectares.

Based on the projected take-up of industrial land and the employment land uses identified in the draft DSP an average employment density of 30 jobs per net developable hectare is likely to be achieved when fully developed. Macroplan's assessment is that this area alone will support more than 50,000 jobs once fully developed.

Given that the 400-hectare Bullsbrook South precinct is already zoned industrial in the MRS and on the market, these employment opportunities are only subject to industrial land users establishing businesses in the area.

The Bullsbrook Freight and Industrial Area could have two development fronts catering to different industrial needs (one focusing on freight and logistics and the other providing land for general and light industrial uses) and potentially achieve an average take-up of up to 20 hectares per annum. This would imply a development timeframe of at least 70 years across the whole area, although increases in employment land use intensity over that timeframe are likely to extend the supply beyond 2100.

Competition for the development comes from existing industrial areas that have substantial expansion capacity as well as from new areas. These include Muchea, Meridian Park (Neerabup), Latitude 32 (for intermodal freight) and Hazelmere South. The Muchea Employment Node and Industrial Park are attracting investment which will meet many of the heavy transport and freight demands. The role of Muchea is likely to be focused on primary production, logistics and freight operations and provide for regional demand.

One of the fundamental economic growth challenges for the sub-region will be to ensure that there is a sufficient local resident workforce to meet the employment demand from businesses investing in the Bullsbrook Freight and Industrial Area. Therefore, the challenge is not to create jobs for these residents, but to provide urban growth areas that can provide enough housing for workers to live close to their place of work.

Other employment opportunities in surrounding industrial areas

Major employment nodes at the Muchea Industrial Park and Malaga will also provide additional opportunities for employment self-sufficiency within the corridor (even though by strict definition Muchea is not part of the Perth North-East Sub-region). These precincts include a range of existing and short-term industrial development areas, as well as long-term.

Timeframe	Industrial estate
Immediate and near-term development precincts	• Muchea Industrial Park • Whiteman • Hazelmere South • Wattle Grove • Vacant land within other MRS industrial
Medium-term opportunities	• South Bullsbrook – which is zoned MRS industrial land on the market, but still at the early stages of development
Long-term employment land	• North Ellenbrook Investigation Area • Bullsbrook South Investigation Area

2.4 Need for additional industrial land

Industrial land supply and take-up

The table below shows Macroplan's projected industrial land development in the North-East Sub-region and the Muchea Industrial Park through to 2046. This is based on the realistic take-up for industrial land in the sub-region based on the past rates of development across Greater Perth.

The table also shows the total land area for each precinct, the total estimated developable areas (after environmental and infrastructure requirements), and the total estimated number of years' supply beyond 2041.

Macroplan projects an average industrial land take-up of 30 hectares per annum in the North-East Sub-region that between 2016 and 2046.

This take-up rate higher than the past rates and recognises that industrial land supply in other sub-regions (such as Central and South-East) have largely been developed and that some of that demand pressure would move to the North-east sub-region. This high take-up rate provides a conservative assessment of how long the industrial supply will last.

Given the ample supply of industrial precincts across the City of Swan (plus Muchea), even at a high take-up rate of 30 hectares per year, and low development area ratios, the industrial land supply in the North-East Sub-region will last beyond 2100.

Therefore, there is no need for additional industrial lands as proposed in 'Bullsbrook Town-Site Precinct North' as identified in the Bullsbrook Townsite DSP.

Table 3.7 North-east corridor – projected land area developed (cumulative hectares) and long-term supply

Precinct	2016	2021	2026	2031	2036	2041	2046	Total area (ha)	Estimated developable area (ha)	Estimated undeveloped land area as of 2041 (ha)	Estimated years of supply beyond 2041 (at 30ha/yr take-up)
Existing zoned precincts											
Hazelmere South	0	32	32	32	32	32	32	**41**	**32**	0	0.0
Wattle Grove	0	8	32	32	32	32	32	**46**	**33**	1	0.0
Whiteman	16	40	40	40	40	40	40	**69**	**40**	0	0.0
Muchea Employment Node	0	24	64	104	144	184	224	**1,116**	**476**	252	8.4
MRS Undeveloped Industrial	0	32	72	112	152	176	176	**232**	**176**	0	0.0
Bullsbrook South	0	0	20	70	120	170	220	**471**	**317**	97	3.2
Potential / proposed new precincts										0	0.0
North Ellenbrook	0	0	0	0	0	0	20	**868**	**608**	588	19.6
North Ellenbrook Investigation Area	0	0	0	0	0	0	0	**1,314**	**788**	788	26.3
Bullsbrook South Investigation Area	0	0	0	0	0	10	60	**397**	**238**	178	5.9
Total	**16**	**136**	**260**	**390**	**520**	**644**	**804**	**4,554**	**2,708**	**1,904**	**63.5**

Source: Macroplan using data from DevelopmentWA and the Department of Planning, Lands and Heritage

3_Economic and employment benefits

- The urbanisation of Bullsbrook North will add affordable residential land and increased competition to the corridor. This will have the benefit of containing land prices to levels that promote home ownership. The ULDO for 2020/21 identifies that the 22 active estates in the Swan urban corridor will drop to just nine in the medium term (by 2025/26). The resulting lack of competition for residential land will have a negative effect on lot prices in the area and reduce buyer choice.

- Additional dwelling stock will also increase the availability of rental properties in the area. In each of the 24 months to September 2022, there have been no more than three dwellings listed for rent in the postcode area 6084 (Bullsbrook). This represents the tightest rental market in Bullsbrook in at least 15 years (since comparable data was first collected). This tight market is an indicator of very high demand for additional dwellings in the area which is not being met by the available (or new) supply.

- The investment in land development, infrastructure servicing, and dwelling construction will produce economic benefits for the sub-region. Over its projected 25-year development timeframe, Bullsbrook North will generate $5.5 billion in total economic output and create 11,860 job-years during construction.

3.1_Quantifiable economic benefit

The table below shows the economic and jobs benefits from the urbanisation of Bullsbrook North.

All figures relate to the dwellings, population, dollars and jobs that are created within each five-year period. Therefore, the numbers in the table are not cumulative.

As this assessment is based on construction investment, the jobs benefits last for the period of construction. Therefore, the benefit is expressed in job-years, which is based on one full-time equivalent (FTE) job lasting for one year..

This assessment assumes:

- 25-year progressive development of 4,500 dwellings based on a potential net residential development area of 203.6 hectares developed at an average density of around 22 dwelling per net site hectare (the same assumption as used in the Bullsbrook Townsite DSP 2018).
- All dollar amounts are 2022 constant figures
- The combined land development and dwelling construction cost average $425,000 per lot/dwelling (in 2022 dollar values); and
- The total non-residential building construction costs for the activity centre, two schools, etc, will be around $91 million.

The staging and yields are all indicative to provide a very high-level assessment of the economic benefits from an urban development.

The assessment uses an input-output model based on the ABS Australian National Accounts, which includes the:

- Total additional economic contribution of the project including multipliers from the ABS national input-output tables; and
- Number of direct and indirect jobs created during subdivision, servicing, and construction

Table 3.1_Economic and employment impact from urban development

Measure	Assumption / source	Development by five-year timeframe				
		1-5	6 - 10	11 - 15	16 - 20	21 - 25
Dwellings (LHS)	Estimated development rate	450	650	900	1,200	1,300
Total resident population	2.8 persons per dwelling	1,260	1,820	2,520	3,360	3,640
Residential construction ($M)	$425,000/lot + dwelling	630	910	1,260	1,680	1,820
Non-residential construction ($M)	Estimated					
Total investment per five-year timeframe ($M)		$191.3	$276.3	$382.5	$510.0	$552.5
Economic multipliers		$9.56	$13.81	$19.13	$25.50	$27.63
Economic output direct ($M)	Input-Output model	**$200.8**	**$290.1**	**$401.6**	**$535.5**	**$580.1**
Economic output flow-on ($M)	Input-Output model					
Economic output – total ($M)	Input-Output model	$479.6	$692.8	$959.2	$1,278.9	$1,385.5
Job generated during construction phase		$100.7	$145.5	$201.4	$268.6	$291.0
Job years - direct	Input-Output model	**$580.3**	**$838.2**	**$1,160.6**	**$1,547.5**	**$1,676.5**
Job years - indirect	Input-Output model					
Job years - total	Input-Output model	422	609	843	1,125	1,218

Source: Macroplan using data from Bullsbrook Townsite DSP 2018; ABS National Accounts (input-output tables) 2022

3.1_Quantifiable economic benefits (cont.)

The figure and table on the right show the cumulative construction investment and benefits over the assumed 25-year development timeframe.

The cumulative number of dwellings and job-years created are shown on the left hand scale, while the total economic output is shown in billions on the right hand scale.

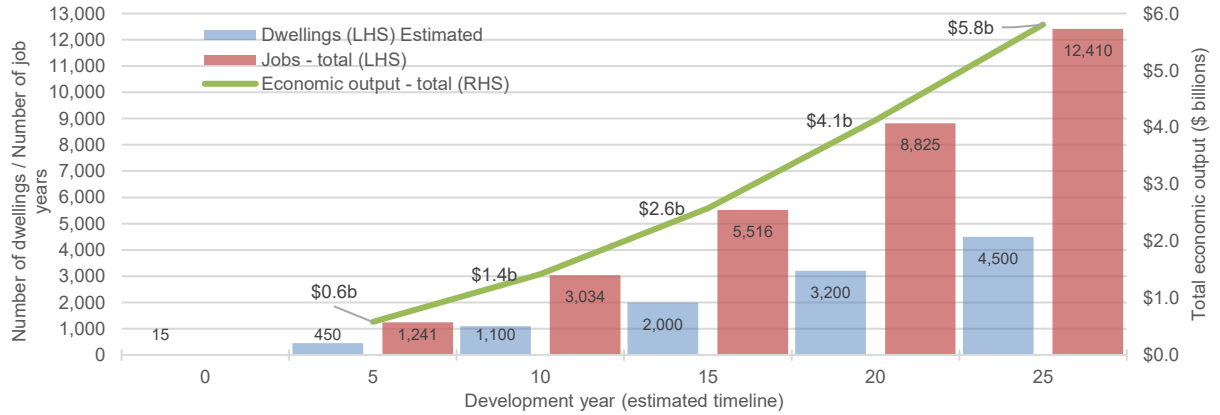
The table provides similar impacts, and it shows the estimated cumulative investment and benefits over the total period of the project.

This information shows that over the whole development life of Bullsbrook North, it will attract around $2.01 billion in development investment and return total economic output of $5.8 billion. In addition, over this construction period, it will create 12,410 job years (1 FTE for 1 year).

Note that these most of these benefits are directly proportional to the number of dwellings built (with the exception of the non-residential construction). Any changes to the eventual yield will therefore either increase or decrease the benefits accordingly.

All impacts are contemporaneous with the investment as the money spent is paid out in purchasing materials and labour.

Figure 3.1_Economic and employment impact from urban development – cumulative



Source: Macroplan using data from Bullsbrook Townsite DSP 2018; ABS National Accounts (input-output tables) 2022

Table 3.2_Economic and employment impact from urban development – cumulative

		Cumulative development by year				
Measure	**Assumption**	**5**	**10**	**15**	**20**	**25**
Dwellings (LHS)	Estimated	450	1,100	2,000	3,200	4,500
Total resident population	2.8 persons per dwelling	1,260	3,080	5,600	8,960	12,600
Residential construction ($M)	$425,000/lot+dwelling	$191.3	$467.5	$850.0	$1,360.0	$1,912.5
Non-residential construction ($M)	Estimated	$9.56	$23.38	$42.50	$68.00	$95.63
Total investment – cumulative ($M)		**$200.8**	**$490.9**	**$892.5**	**$1,428.0**	**$2,008.1**
Economic multipliers						
Economic output direct ($M)	Input-Output model	$0.5	$1.2	$2.1	$3.4	$4.8
Economic output flow-on ($M)	Input-Output model	$0.1	$0.2	$0.4	$0.7	$1.0
Economic output - total ($M)	Input-Output model	**$0.6**	**$1.4**	**$2.6**	**$4.1**	**$5.8**
Job generated during construction phase						
Job years - direct	Input-Output model	422	1,031	1,874	2,999	4,217
Job years - indirect	Input-Output model	819	2,003	3,641	5,826	8,193
Job years - total	Input-Output model	**1,241**	**3,034**	**5,516**	**8,825**	**12,410**

Source: Macroplan using data from Bullsbrook Townsite DSP 2018; ABS National Accounts (input-output tables) 2022

3.2_Household expenditure

Another quantifiable economic benefit is the retail expenditure that is generated by residents living in Bullsbrook North. This is a direct benefit to activity centres and will be mainly spent in the local and (proposed) district centres in Bullsbrook on food, liquor and groceries. This expenditure therefore supports local employment at those respective activity centres. By completion, residents of the Bullsbrook North development are expected to spend around $216 million each year (in 2022 dollars) on retail goods and services.

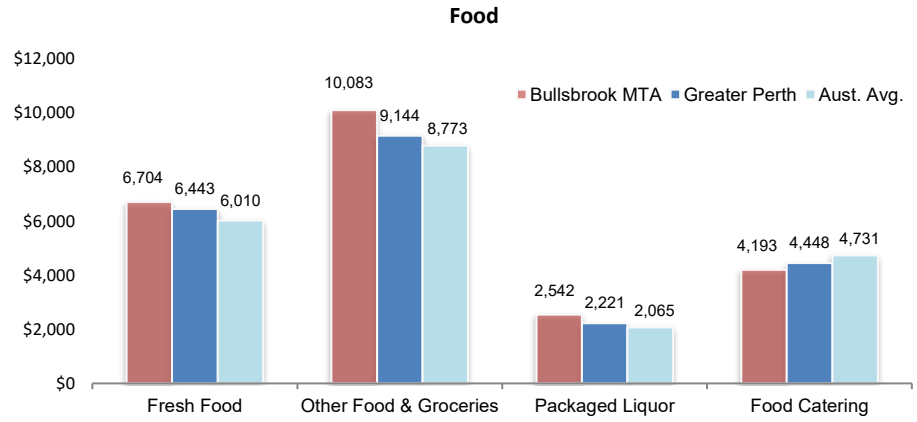
Household expenditure in Bullsbrook is typically higher than the Greater Perth and Australian averages because of the larger households in Bullsbrook. Expenditure on food and groceries will help to underpin the Bullsbrook activity centres with anchor supermarkets, while expenditure on other categories will support additional local businesses, particularly the general retail and retail services categories.

Table 3.3 Annual retail expenditure urban development

Measure	Assumption	Cumulative development by year				
		5	10	15	20	25
Dwellings (LHS)	Estimated	450	1,100	2,000	3,200	4,500
Total resident population	2.8 persons per dwelling	1,260	3,080	5,600	8,960	12,600
Household expenditure – annual retail spend ($M pa)		**$21.6**	**$52.8**	**$96.1**	**$153.8**	**$216.3**

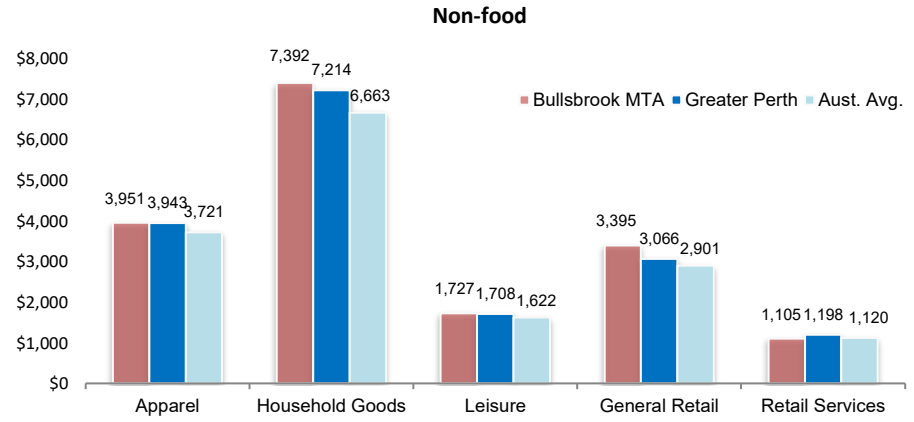
Source: Macroplan using data from MarketInfo; ABS

Figure 3.2 Expenditure per capita on food items – Bullsbrook SA2 2021



Source: Macroplan using data from MarketInfo; ABS

Figure 3.3 Expenditure per capita on non-food items – Bullsbrook SA2 2021



3.3 Non-quantifiable economic benefits

The benefits expressed in section 3.1 are not necessarily unique or net benefits at regional or state level. There is an argument that the same (or very similar benefits) would be generated by undertaking the same scale of residential development elsewhere in Greater Perth. So, while the investment in construction and the ongoing expenditure by households provide a local economic and job benefit, it does not represent a unique, net benefit to Greater Perth or WA.

The impacts above also highlight the costs of not proceeding with the urbanisation of Bullsbrook North. By not having urban land developed at Bullsbrook within reasonable timeframe, it may constrain potential business investment in the industrial area given there is currently only a small locally based workforce.

There are some outcomes that can be considered net benefits:

- The Bullsbrook Freight and Industrial Area represents 100+ years' industrial land supply to meet the future economic growth needs of the State. A resident workforce in proximity to the industrial area will help to facilitate both its initial construction and its ongoing operational requirements. A similar benefit applies to the Muchea Industrial Area.

- Available land supply for residential development – as a fundamental economic resource, development-ready land to enable population growth is essential for the broader economy. Therefore, having more land available provides an opportunity for development. Similarly, the more land that is available to satisfy high demand periods without causing a substantial increase in land prices. The risk of not having sufficient land to meet demand produced a relative shortage of developed lots in the mid-2000s which resulted in substantial price increases in the Perth market.

- The WAPC's WA Tomorrow projections show most of the future population of Bullsbrook is forecast to come from overseas migration. This population growth component provides net benefit to the State as it adds capacity to the labour force. Most overseas migration is predominantly through the skilled migration program, therefore it brings people into the country with skills that are in demand and cannot be filled from the existing labour force.

- City of Swan dwelling projections show that all the past high growth areas (Ellenbrook, and the Urban Growth Corridor around the new rail alignment) have already peaked as of 2022 in dwelling development. This leaves only one area – Bullsbrook – to increase development to meet the need for new dwellings.

3.4_Employment self-sufficiency

Achieving the *Perth and Peel @3.5 million Sub-regional Planning Framework 2018* targets for employment self-sufficiency in the sub-region will require the creation of approximately 104,100 additional jobs by 2050.

Employment self-sufficiency

The North-east Sub-regional Framework uses an assumption that approximately half of the population are in the workforce. This is supported by the latest data from the 2016 Census which identified that the Swan Statistical Area 3 had a total workforce of 66,600 workers and a resident population of 128,500 people. The following table from the Framework demonstrates the challenge to create more jobs in the sub-region to gradually increase the employment self-sufficiency from the 80.3 percent ratio in 2011, up to 85.8 percent by 2050.

A total of 1,894 people had a place of work in the Bullsbrook SA2 in 2016. This number of jobs was sufficient to employ 84.9 per cent of the working residents that lived in the same SA2. This ratio represents the employment self-sufficiency.

Table 3.4 Population, labour force and jobs assumptions for the North-East Sub-region

Indicator	2011	2050	Total change	Total % change
Population	209,150	450,580	241,430	115%
Labour force	102,610	224,860	122,250	119%
Jobs	82,380	192,950	110,570	134%
Employment self-sufficiency	**80.3%**	**85.8%**	**5.5%**	-

Source: WAPC, *North-East Sub-regional Framework, 2018*

Table 3.5 Employment self-containment in 2016 in Bullsbrook SA2

Measure	2016	Comment
Jobs based in the Bullsbrook SA2	1,894	
		Employment self-sufficiency of 84.9%
Working residents living in the Bullsbrook SA2	2,231	

Source: ABS 2016 Census of Population and Housing; Macroplan

3.5_Jobs assessment

The employment demand will be met by jobs across four main groups:

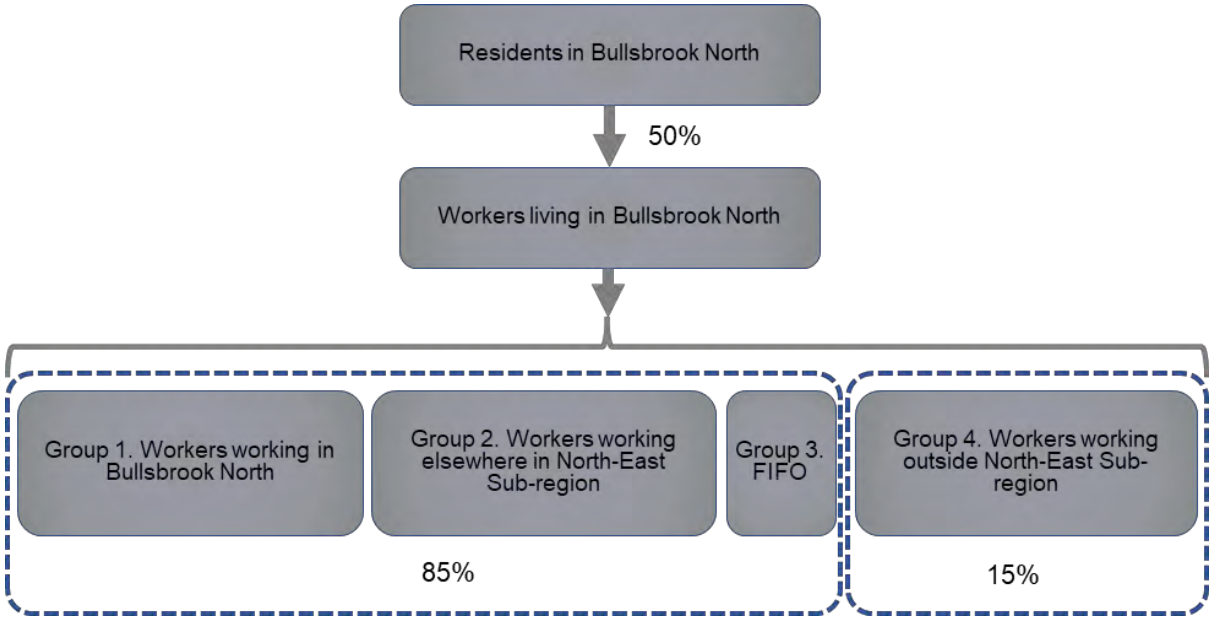
Group 1: Jobs within the Bullsbrook North area – population-based employment including activity centres based around retail businesses, schools, local shops, and childcare.

Group 2: Jobs in the North-East Sub-region - Major employment nodes including commercial centres and industrial centres. It also includes jobs within the sub-region that are not fixed to a regular place of work (ie. construction workers), but that are still predominantly within the sub-region.

Group 3: Fly-in-fly-out jobs that are physically located outside of the metropolitan region, so they do not put a day-to-day load on the metropolitan transport system and therefore should count towards the employment self-sufficiency target. The only relevant travel involved is typically to and from Perth Airport (which borders the North-East Sub-region) and those trips only occur every two to four weeks (depending on the rota).

Group 4: Jobs outside the North-East Sub-region, including jobs the Perth Central Area, other strategic metropolitan centres and/or specialised centres.

Figure 2.5 Jobs flow chart target for Bullsbrook North



3.5_Jobs assessment (cont.)

Group 1: Jobs within the Bullsbrook North Sub-region

The following table shows Macroplan's estimate of the number of jobs that will be created by the population demand within Bullsbrook North. These jobs represent the estimated employment within the area created by the demand from the local population.

These jobs reflect the localised permanent jobs created within Bullsbrook North, in addition to the jobs created in the existing Bullsbrook area via the increased household expenditure on good and services within the local area. This will include expenditure primarily on the daily and weekly needs of households, including food & groceries, personal services, healthcare, childcare, and education.

The local employment also draws on evidence from the ABS Census of Population and Housing about people that work at home. The 2016 Census showed that 6.6% of the total resident workforce in Bullsbrook SA2 worked at home (in response to the travel to work question). Note this does not include any of the people that *from* home, such as trades people and construction workers as this people have no fixed place of work.

The jobs ratios use the Department of Planning, Lands and Heritage, *Land Use and Employment Survey 2015-2017* evidence of the number of jobs for different land uses.

Table 3.6 Population-driven employment within Bullsbrook North – at buildout

Sector	Number of sites / facilities	FTE (each site / facility)	Total employment
Education			
Childcare (full day care and before/after school care)	3	6	18
Primary school	2	42	84
Total education			102
Tourism / Ageing			
Caravan park / lifestyle village	1	5	5
Total tourism / ageing			5
Health			
Small medical centre / allied healthcare	1	8	8
Total health			8
Activity Centre			
Bullsbrook North Local centre (2,000 sqm)	1	68	68
Service and convenience shops (not in activity centre)			
Convenience (service stations, other convenience)	1	5	5
Food	3	8	24
Non-food	3	4	12
Total Service Retail			41
Urban employment			
Public safety & emergency services	1	12	12
Transport	25	1	25
Human services (gyms, trainers, hair dressers, beauticians)	2	4	8
Total Regional Distribution			45
Work at home			
Home-based employment (estimated at 6.6% of total employment)			395
Total direct jobs in Bullsbrook North			664
Indirect jobs	1,067	0.30	106
Total Direct and Indirect Jobs in Bullsbrook North	1,067	1.30	863
Other employment within Bullsbrook			
Bullsbrook District Centre (proposed)	1	185	185
Display village	1	3	3
Shared workplaces	1	60	60
Total Direct and Indirect Jobs in Bullsbrook North			**1,111**

Source: Macroplan using data from DPLH Land Use and Employment Survey 2015-2017; ABS Census and other industry sources.

3.5_Jobs assessment (cont.)

Industrial land supply & employment

Bullsbrook North Industrial Investigation Area

Employment in industrial areas is based on an estimated 30 jobs per developable hectare of land which is the average across Perth's industrial areas (as measured by the DPLH *Land Use and Employment Survey 2015-2017*).

The table on the right shows the total number of new additional jobs in the North-East Sub-region that could be created based on the projected industrial land take-up.

Macroplan has modelled the types of jobs likely to be created in the Bullsbrook Freight and Industrial Area using:

- the proposed mix of land uses including logistics, general industrial, light industrial, service commercial and business park uses; and
- actual employment densities (jobs per hectare by industry) achieved in comparable industrial estates in Perth through the DPLH Land Use and Employment Survey.

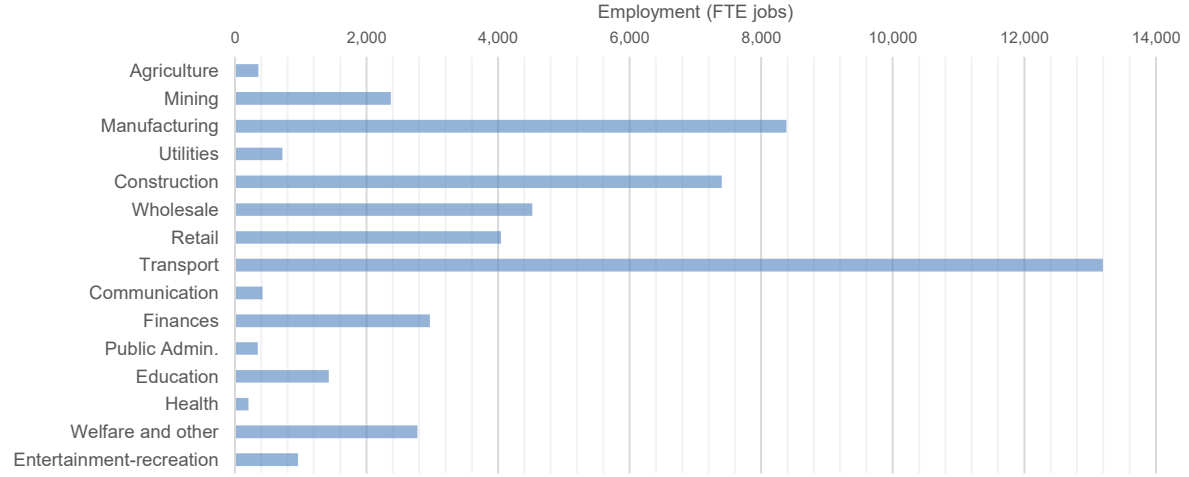
Given the ample supply of industrial precincts across the City of Swan, this provides a substantial opportunity for employment across a broad range of industry sectors. This directly affects the employment opportunities available to residents of the proposed Bullsbrook North development.

Table 3.8 North-east corridor – projected additional employment (number of jobs)

Precinct	2016	2021	2026	2031	2036	2041	2046
Existing zoned precincts							
Hazelmere South	0	960	960	960	960	960	960
Wattle Grove	0	240	960	960	960	960	960
Whiteman	480	1,200	1,200	1,200	1,200	1,200	1,200
Muchea Employment Node	0	720	1,920	3,120	4,320	5,520	6,720
MRS Undeveloped Industrial	0	960	2,160	3,360	4,560	5,280	5,280
Bullsbrook South	0	0	600	2,100	3,600	5,100	6,600
Potential / proposed new precincts							
North Ellenbrook	0	0	0	0	0	0	600
North Ellenbrook Investigation Area	0	0	0	0	0	0	0
Bullsbrook South Investigation Area	0	0	0	0	0	300	1,800
Total	**480**	**4,080**	**7,800**	**11,700**	**15,600**	**19,320**	**24,120**

Source: Macroplan using data from the Department of Planning, Lands and Heritage

Table 3.7 Projected employment by industry in the Bullsbrook Freight and Industrial Area – at buildout



Source: MacroPlan 2022, based on DPLH Land Use and Employment Survey and consultation with Development WA

3.5_Jobs assessment (cont.)

Group 3: FIFO jobs

Macroplan has used the 2016 Census to estimate the number of fly-in-fly-out (FIFO) workers that will live in Bullsbrook SA2. In 2016, across the whole of the North-East Sub-region 5 per cent of the workforce worked in the mining sector. The ratio for Bullsbrook SA2 was twice the sub-regional benchmark (10.2% of all workers worked outside of the Perth Metropolitan Region). On this basis, Macroplan has adopted an estimate of 10 per cent of the total workforce in Bullsbrook North will be FIFO workers.

Supply of jobs required to meet demand

The following table summarises the jobs supply numbers analysed in this section of the report:

Group 1 employment – population-servicing jobs: These jobs show the total employment that would be generated by the population living in the area. This is based on actual employment numbers from similar greenfield developments. It demonstrates that at capacity, the Bullsbrook North area would have around 1,400 local jobs including those in the Bullsbrook activity centres, schools and tourism/retirement sectors, as well as jobs that are more mobile, but sill generated and located within the local area (human services, emergency services, home-based aged care, etc).

Group 2 employment – workers elsewhere in the sub-region: These jobs include a wide range of employment opportunities in the sub-region, particularly within the Midland Strategic Metropolitan Centre for the higher-level jobs (health and medical services, professional services, higher-level education, etc) and in strategic industrial employment nodes. The assessment shows that the existing and planned industrial development in Muchea, Bullsbrook, and Ellenbrook will create around 12,000 jobs by 2046. Strictly, Muchea Industrial Area is outside of the North-East Sub-region, however, for the purposes of the employment self-sufficiency assessment, Macroplan argues that it represents a special case given it is ‘counter commuting’ away from the Perth Metropolitan Area. Based on this assessment, around 27 per cent or 3,000 of workers living in Bullsbrook SA2 are estimated to work in one of these major employment centres within the sub-region. Based on the Census data another 5 per cent of all Bullsbrook North residents are forecast to work directly or indirectly (as contractors) at RAAF Base Pearce.

Group 3 employment – FIFO workers: These jobs are essentially contained within the sub-region because the point of travel is primarily to Perth Airport, and it is infrequent (ie. one trip every two to four weeks, depending on the rota). Therefore, these workers do not put an undue strain on the transport network on a daily/weekly basis.

Table 3.9 Jobs balance sheet for Bullsbrook North

Bullsbrook North	Assumption	Year 0	Year 5	Year 10	Year 15	Year 20	Year 25 (build-out)
Dwellings	Estimated at 194ha @ 22 dwell./ha from Bullsbrook Townsite DSP 2018	15	450	1,100	2,000	3,200	4,500
Total resident population	2.8 persons per dwelling from Bullsbrook Townsite DSP 2018	42	1,260	3,080	5,600	8,960	12,600
Employed residents	50% of population from North-East Sub-regional Planning Framework 2018	21	630	1,540	2,800	4,480	6,300
Sub-regional jobs required to meet self-sufficiency target	85% of all workers from North-East Sub-regional Planning Framework 2018)	18	536	1,309	2,380	3,808	5,355
Group 1: Workers within Bullsbrook North	See separate table	*0*	*111*	*272*	*494*	*790*	*1,111*
Group 2: Workers elsewhere in NE Sub-region							
Midland Activity centre (and other activity centres in the sub-region)	12% of all workers from ABS Census of Population and Housing 2016	3	76	185	336	538	756
Industrial centres and RAAF Base Pearce	32% of all workers from ABS Census of Population and Housing 2016	8	158	385	700	1,120	1,575
Construction workers	15% of all workers from ABS Census of Population and Housing 2016	3	95	231	420	672	945
Other workers in Sub-region (transport, maintenance, etc)	5% of all workers from ABS Census of Population and Housing 2016	2	32	77	140	224	315
Group 2: Subtotal		*16*	*359*	*878*	*1,596*	*2,554*	*3,591*
Group 3: FIFO workers	10% from ABS Census of Population and Housing 2016	*2*	*63*	*154*	*280*	*448*	*630*
Sub-regional jobs (subtotal Groups 1, 2 and 3)		**18**	**533**	**1,303**	**2,370**	**3,792**	**5,332**
Estimated employment self-sufficiency (North-East Sub-region)		**87%**	**85%**	**85%**	**85%**	**85%**	**85%**
Group 4: Workers working elsewhere in the Perth Metropolitan Region (other sub-regions)	15% of all workers from ABS Census of Population and Housing 2016	3	97	237	430	688	968
Total workers (residents of Bullsbrook North)		**22**	**631**	**1,541**	**2,801**	**4,481**	**6,301**

Source: Macroplan based on data from ABS; DPLH; and other industry sources

4_Conclusions

- The WAPC has identified an impending shortage of residential lots in the short to medium term in the Swan Urban Growth corridor. The ULDO 2020/21 shows the number of estates in the corridor dropping from 22 to nine by 2025/26 and the number of lots available to the market reducing by around 1,750 beyond 2025/26.
- Bullsbrook North is consistent with the planning framework and the economic development objectives of the State and the City of Swan. It will facilitate population growth, particularly for skilled migrant population growth (as projected in *WA Tomorrow*) and add additional household expenditure to the sub-region.
- Existing and projected high levels of employment-self containment show that Bullsbrook already satisfies the 2050 target of 85% employment self-sufficiency in the North-East Sub-region (ie. only 15% of the workers living in Bullsbrook travel outside of the North-East Sub-region for work).
- Residential development of Bullsbrook North will provide a local resident workforce to support the planned industrial development of the Bullsbrook Freight and Industrial Area, Muchea and other strategic employment centres.
- Bullsbrook North needs to commence staged development and sales by 2023/24 to meet the demand from homebuyers and fill the shortfall in residential land supply.

4.1._Conclusion

This assessment considers the potential economic and employment benefits generated by the urbanisation of Bullsbrook North. The primary economic benefits include the increase in residential land supply, and then subsequent economic output from land development and building construction of a local centre, two primary schools and approximately 4,500 dwellings on the estimated residential area of 203.6 hectares at an average of 22 dwellings per hectare (as assumed in the Bullsbrook Townsite DSP 2018).

Data availability and statistical areas

- Employment data is not yet available from the 2021 Census of Population and Housing. Therefore, this assessment uses the 2016 Census. Despite it being older, the 2016 Census is potentially more reliable than the 2021 Census because of the impacts of COVID-19 on people working from home and the state international border lockdowns affecting normal migration and work patterns. While some additional Census data will become available in October 2022, the place of work data, which is critical for journey to work assessments, will not be published until mid-2023.

- This assessment uses the Bullsbrook Statistical Area 2 (SA2) as the basis for the employment and economic statistics used for analysis. This area incorporates the existing Bullsbrook Townsite, RAAF Base Pearce, and an area of rural land to the west.

Land supply

- The WAPC's ULDO 2020/21 forecasts a significant shortfall in land supply as the number of active residential estates in the corridor falls from 22 in the short term (2020/21 – 2024/25) to nine estates by 2025/26. The number of lots available to the market is expected to by 1,750 lots in the medium term, at a time when land sales have been recovering after a long period of relatively low activity (in response to weak population growth across WA).

Forecast lot supply in City of Swan growth corridor



Source: WAPC Urban Land Development Outlook 2020/21

- The City of Swan's dwelling and population projections show that Bullsbrook area (as defined by ForecastID) is the only greenfield growth area

4.1._Conclusion

Employment growth

- The Bullsbrook SA2 had relatively high employment self-containment (60 per cent in 2016) and self-sufficiency (85 per cent in 2016. Therefore, the employment self-sufficiency within the Bullsbrook SA2 in 2016 met the 2050 target for the whole subregion as defined in the North-East Sub-regional Planning Framework 2018.

- In 2016, Bullsbrook residents were twice as likely to be fly-in-fly-out workers than the average across Greater Perth. Residents also had a 70 per cent higher propensity to work from home. These factors help to reduce the demand on the transport network to commute to work.

- Bullsbrook North is ideally located to service the employment needs of the Bullsbrook Freight and Industrial Area which will consist of a full range of employment opportunities including logistics, general industrial, light industrial, service commercial and business park uses. At full development, this industrial node alone will support an estimated 50,000 jobs.

- One of the fundamental economic growth challenges for the sub-region will be to ensure that there is a sufficient local resident workforce to meet the employment demand from businesses investing in the Bullsbrook Freight and Industrial Area.

- Across all industrial precincts in the sub-region and the Muchea Industrial Park, Macroplan projects a take-up of 30 hectares per annum through to 2046. This development would accommodate an additional 1,070 permanent jobs each year between 2016 and 2046.

- Macroplan estimates that:

    - population-driven jobs will employ about 1,390 people within Bullsbrook North itself and another 300 people in the existing Bullsbrook Townsite;

    - strategic employment across the North-East Sub-region will employ another 7,170 people. This includes employment at RAAF Base Pearce, the Bullsbrook Freight and Industrial Area, Midland Strategic Metropolitan Centre, other activity centres across the sub-region and workers in the construction and transport industries.

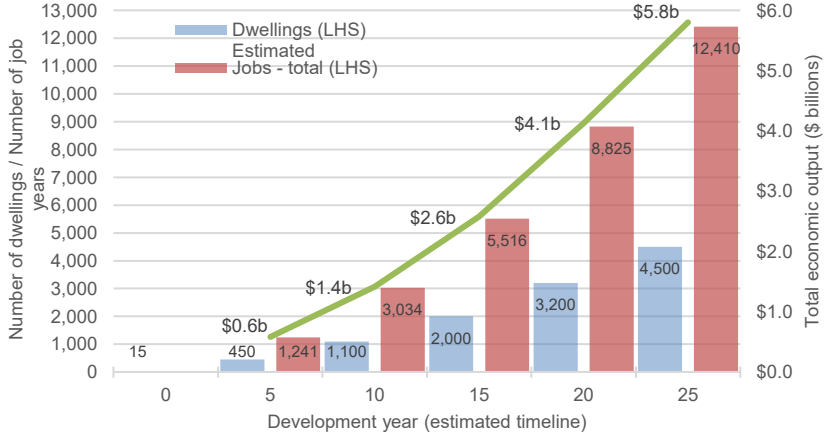
    - fly-in-fly-out workers will continue to make up 10 per cent of the total workforce.

- Based on this assessment, Macroplan estimates that Bullsbrook North will exceed the 2050 employment self-sufficiency target (of 85 per cent) throughout its whole development phase to eventual build out.

Economic benefits

- The Bullsbrook North development will attract an estimated $2.01 billion in investment in residential land development and dwelling construction. It is also expected to attract about $95.6 million in non-residential construction (local centre, schools, childcare centres and other non-residential buildings). The direct and flow-on economic benefits from this investment will return about $5.8 billion to the economy and create 12,410 job years (one full-time-equivalent job for one year) over the construction phase of the development.

Cumulative economic and employment impact from urban development



Household expenditure

The 4,500 households in Bullsbrook North will spend approximately $216 million annually on retail goods and services. This will support local jobs in Bullsbrook and other activity centres within the North-East Sub-region. This expenditure will support local activity centre jobs and broaden the range of goods and services available locally within Bullsbrook.

Recommendations

- Bullsbrook North should be accelerated to begin its staged urban development as soon as possible to:
  - Meet high demand from land buyers and provide a safety buffer for peak demand periods;
  - Fill the gap left by estates that are coming to a completion;
  - Make up some of the lot shortfall anticipated in the ULDO 2020/21 for medium term lot development; and
  - Provide competition and choice in the Bullsbrook area to compensate for the single estate in the area (Kingsford).

- The indicative industrial area for Bullsbrook North should instead be developed as urban due to the (1) substantial supply of industrial land (over 100 years' supply); (2) satisfy the need for a local resident workforce; (3) satisfy demand for residential land; and (4) develop the subject land for highest and best use.

- Planned residential densities for Bullsbrook North should be reviewed to aim for at least 15 dwellings per gross hectare of urban zoned land as per the target in the *North-East Sub-regional Planning Framework 2018*.

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APPENDIX 7

Landscape Master Plan



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Landscape Concept Plan

Bullsbrook North

LEGEND:

- Public Open Spaces, various sizes and hierarchies. Overall POS coverage is approx. 14%
- Opportunity for existing trees to be retained within POS and within road reserve
- Opportunity for existing water bodies to be retained and kept as features within the landscape
- Nodes for play, seating and amenity
- Green Boulevards with median's and tree's provide green corridors throughout the landscape

MORRISSEY ROAD

BUSH FOREVER

PRIMARY SCHOOL

LIFESTYLE VILLAGE / CARAVAN PARK

LOCAL CENTRE

BUSH FOREVER

BUSH FOREVER

BUSH FOREVER

BUSH FOREVER

BUSH FOREVER

ASHTON ROAD

CHITTERING ROAD

GREAT NORTHERN HIGHWAY

KIMBERLEY STREET

POTENTIAL FOR RETAINED TREES ON SCHOOL SITES & LIFESTYLE VILLAGE /CARAVAN PARK. SUBJECT TO FUTURE PLANNING

POTENTIAL FOR EXISTING TREES TO BE RETAINED ALONG BOULEVARDS

HIGH QUALITY VEGETATION TO BE RETAINED AND SUPPLEMENTED CREATING GREEN CORRIDORS

EXISTING DAM TO BE RETAINED FOR FEATURE. EXISTING WATERCOURSE PROVIDES OPPORTUNITY FOR WALKING TRAILS AND VEGETATION CORRIDOR TO CONNECT BUSH FOREVER SITE

LINEAR POS CREATE WIDENED BOULEVARDS AND OPPORTUNITY FOR MEANDERING PATHS

HIGH QUALITY VEGETATION TO BE RETAINED

RURAL TRANSITION LOTS PROVIDE OPPORTUNITY TO CREATE VEGETATION CORRIDOR TO NORTHERN BUSH FOREVER SITE BY REGULATING BUILDING ENVELOPES

SHARED ACTIVE SPACE BETWEEN SCHOOL AND COMMUNITY

HIGH QUALITY VEGETATION TO BE RETAINED

ENTRY STATEMENT



POS placement provides opportunity for retaining existing trees, providing instant shade and habitat for fauna. Additional opportunity for existing landscape features to be retained, for example the dam.



Opportunity for existing trees to be retained within streetscape corridors, providing established tree canopy, and fauna corridors for, in particular Black Cockatoos.



POS's to retain existing trees and vegetation. This ethos can carry over to play, and designs can look to utilise nature play to compliment the bush feel.





Existing creek line to be retained and enhanced with walking trails, revegetation planting and potential for lookout nodes. Natural creekline provides a unique asset in this landscape.



Wide boulevard streets with median's provide opportunity for avenue style tree planting and green corridors.



Areas of managed landscape will be located in area's without existing vegetation. Opportunity for additional trees to be planted to supplement the existing trees.



Small parks flanking either side of the boulevard provides future opportunity for entry statements but also a green entry that sets the tone for the proposed rezoning.



Area's of retained vegetation act as buffers to major roads, providing natural acoustic qualities. Buffer planting also assists in providing fauna corridors.

APPENDIX 8

Traffic Impact Assessment



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TRANSPORT IMPACT ASSESSMENT

North Bullsbrook – Amendment to Bullsbrook Townsite District Structure Plan

July 2024
Rev C



HISTORY AND STATUS OF THE DOCUMENT

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Transport Impact Assessment
KC01293.000 North Bullsbrook – Amendment to Bullsbrook Townsite District Structure Plan

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Transport Impact Assessment

1. Executive Summary

Site Context

- The Amendment Area encompasses 350ha of land identified for urban expansion under the subregional framework. The Amendment Area is generally bound by Chittering Road, Kimberley Street, Morrisey Road, Bullsbrook Natural Reserve and Great Northern Highway (please refer to Appendix 1).
- At present, the land is zoned as ''Rural'' under the Metropolitan Region Scheme and ''General Rural'' per the City of Swan's Local Planning Scheme No.17. Most of the subject lots are currently vacant or occupied by a single residential dwelling with ancillary facilities.
- The proponents seek to amend the approved Bullsbrook Townsite DSP to include the subject land within the Future Residential Zone. At present, it is assumed that upon completion, the subject area will feature approximately 4,118 residential dwellings, two Primary Schools, a Neighbourhood Centre, a Light Industrial/ Service Commercial area and a number of Public Open Spaces with a potential for an additional use as a Lifestyle (retirement) Village/ Caravan Park. Please refer to Appendix 1.
- Subsequent MRS Amendments, seeking urban and urban/deferred zonings, are to follow.

Technical Findings

- The total additional traffic impact of the Amendment area (with reciprocity between the proposed land uses applied) is expected to be approximately 34,647 vehicular trips per day, 3,608 vehicular trips per hour in the AM peak hour and 3,658 vehicular trips per hour in the PM peak hour.
- According to the WAPC Guidelines, all developments generating above 100 VPH can be deemed to have a high impact on the surrounding road network. The future road network will be developed to adequately cater for the anticipated impact.
- Proposed high-order intersections satisfy spacing requirements. The internal network will be developed as per Liveable Neighbourhoods at a later stage.
- As the initial consultation showed that East-West corridor cannot connect to the planned Rutland Rd / Great Northern Hwy roundabout due to spatial and environmental constraints, a separate intersection of East-West corridor and Great Northern Hwy was proposed.
- Development of this connection will see Kimberley Street remaining cul-de-sac road, with no direct connection to Great Northern Highway.
- The Amendment accounts for the other known and committed upgrades to the external network, and the only additional upgrade proposed is the re-configuration of the Asthon Street / Chittering Road intersection.

Transport Impact Assessment
KC01293.000 North Bullsbrook – Amendment to Bullsbrook Townsite District Structure Plan

Conclusion

- Great Northern Highway is classified as Primary Distributor per MRWA classification. Currently, there are around 10,600 vehicles per day on weekdays. Considering traffic from the Amendment Area, growth in passing traffic and the impact of other developments, around 39,000 VPD can be expected on Great Northern Highway near Chittering Road in 2041. BFILUS planning already anticipates the upgrade of Great Northern Highway to a four-lane carriageway, which should appropriately cater to the anticipated traffic.
- Chittering Road and Rutland Road are at present classified as Regional Distributors as per MRWA classification, with the maximum desirable volume of over 1,000 vehicles per day. Currently, there are around 6,000 vehicles per day on weekdays on Chittering Road and around 5,000 vehicles per day on Rutland Road (west of Great Northern Highway). In the ultimate scenario, around 3,000 VPD on Chittering Road and around 15,000 VPD on Rutland Road could be expected. The intersection of Chittering Road and Great Northern Highway will be terminated, while the proposed East West connector will form a three way intersection (roundabout) with Great Northern Highway. Rutland Road is expected to be classified as an Integrator B (or equivalent).
- The proposed East-West Connector will directly connect Chittering Road and Great Northern Highway and further to the planned Intermodal Facility, Industrial Area and Tonkin Highway extension. As a section of Ashton Road will form a portion of the East-West Connection, the intersection of Ashton Road and Chittering Road will need to be constructed to cater for relatively high traffic volumes.
- Kimberley Street and Morrissey Road are Access Roads as per MRWA classification, with the maximum desirable volume of up to 3,000 vehicles per day. Currently, there are no available traffic data for these roads. Both connections would have to be upgraded/constructed to an urban standard to facilitate development as contemplated.
- As of writing this report, the PTA does not have any concrete plans to extend the public transport network further north. According to the information received from the PTA, low population density and the area's relative isolation from the urban core make Bullsbrook a low priority for service improvements. The small number of potential passengers and the current low usage of existing bus services make it challenging to justify additional services or more frequent schedules. Furthermore, any new services would require a suitable route network with roads that are wide enough for buses, as well as the availability of necessary resources. Consequently, it is unlikely that the subject site will receive public transport services in the near future. Therefore, continued liaison during the next planning phase is essential, and potential opportunities for expanding the public transport network within the Amendment Area should be thoroughly reviewed.
- Long Term Cycling Network plan does not anticipate expansion of the cycling network north of Kimberley Street and east of Great Northern Highway; however, as per the above, in the next planning phase, liaison with the Department of Transport should continue to review opportunities for expansion.
- In summary, KCTT believes that the proposed development will not negatively impact the surrounding road network, should the network be appropriately upgraded as per BTLUMP.

2. Introduction and Background

2.1 Proposal

WPG Landholdings No 5 Pty Ltd and Bullsbrook Investment Company Pty Ltd engaged KCTT to prepare a Transport Impact Assessment for the proposed Bullsbrook Townsite DSP Amendment (and associated future MRS Amendments). The Amendment Area comprises several lots (as listed in the following sections) currently zoned "Rural" (MRS) or "General Rural" (City of Swan LPS No 17). The proponent seeks to rezone the land to urban, and expand the residential zone as defined by the approved Bullsbrook Townsite DSP.

The proposed development comprises approximately 4,118 residential dwellings, two Primary Schools, a Neighbourhood Centre, a Light Industrial/ Service Commercial area and a number of Public Open Spaces with a potential for an additional use as a Lifestyle (retirement) Village/ Caravan Park. The Amendment introduces two key road corridors. North-South Connector will connect Kimberley Street and Morrisey Road, while the East-West Connector will connect Great Northern Highway and Chittering Road, allowing heavy vehicles coming from Chittering to access Great Northern Highway without traversing Bullsbrook Town Site.

This report will primarily address the requirements for integration of the proposed development with the surroundings, namely the existing and planned road network and mitigation strategies to accommodate generated traffic.

Given this is a District Structure Plan, key network elements will be discussed in detail (as available) while the local network will be reviewed at the Local Structure Plan level.

2.2 Location

Lot Numbers/ House Number	The subject site comprises multiple lots, as follows: - Lot 800 (No 168) Morrissey Road - Lot 801 Morrissey Road - Lot 802 Morrissey Road - Lot 3 (No 135) Ashton Road - Lot 4 (No 2748) Great Eastern Highway - Lot 5 (No 2710) Great Eastern Highway - Lot 24 (No 94) Kimberley Street - Lot 23 (No 82) Kimberley Street - Lot 22 (No 72) Kimberley Street - Lot 21 (No 68) Kimberley Street - Lot 27 (No 48) Kimberley Street - Lot 28 (No 58) Kimberley Street - Lot 80 (No 49) Ashton Road - Lot 81 (No 59) Ashton Road - Lot 82 (No 69) Ashton Road - Lot 83 (No 71) Ashton Road - Lot 17 (No 81) Ashton Road - Lot 18 (No 93) Ashton Road - Lot 19 (No 131) Ashton Road - Lot 451 (No 247) Chittering Road - Lot 452 (No 261) Chittering Road
Suburb	Bullsbrook

Description of Site	The Amendment area includes the lots listed above, all zoned as ''Rural'' under the MRS and ''General Rural'' under the City of Swan's LPS No.17, with Lot 800 being included in Additional Use Zone 40 (Caravan Park and Transport Depot). Most of the subject lots are currently vacant or occupied by a single residential dwelling with ancillary facilities. Preliminary assumptions are that the Amendment area will feature approximately 4,118 residential dwellings, two Primary Schools, a Neighbourhood Centre, a Light Industrial/ Service Commercial area and a number of Public Open Spaces with a potential for an additional use as a Lifestyle (retirement) Village/ Caravan Park.

2.3 Technical Literature Used

Local Government Authority	City of Swan
Type of Development	Amendment to Bullsbrook Townsite Northern Precinct Master Plan Concept, Bullsbrook Townsite District Structure Plan & Proposed Metropolitan Region Scheme Amendment (Rezoning of subject Lots)
Are the R-Codes referenced?	NO (at this stage of planning)
Is the NSW RTA Guide to Traffic Generating Developments Version 2.2 October 2002 (referenced to determine trip generation/attraction rates for various land uses) referenced?	YES
Which WAPC Transport Impact Assessment Guideline should be referenced?	Volume 2 - Planning Schemes, Structure Plans & Activity Centre Plans
Are there applicable LGA schemes for this type of development? *If YES, Nominate:* Name and Number of Scheme	YES City of Swan - Local Planning Scheme No.17

2.4 Land Uses

Are there any existing Land Uses within the Scheme Amendment Area?	YES - Assumed 21 residential dwellings with ancillary facilities
What zone is the scheme amendment (rezoning) area zoned in accordance with the LPS / TPS?	All lots within the proposed District Plan Area are currently zoned ''General Rural'' per the City of Swan's Local Planning Scheme No.17.

What is the current zoning of the subject site per the Metropolitan Region Scheme (MRS)?	All lots within the proposed Amendment Area are currently zoned ''Rural''.

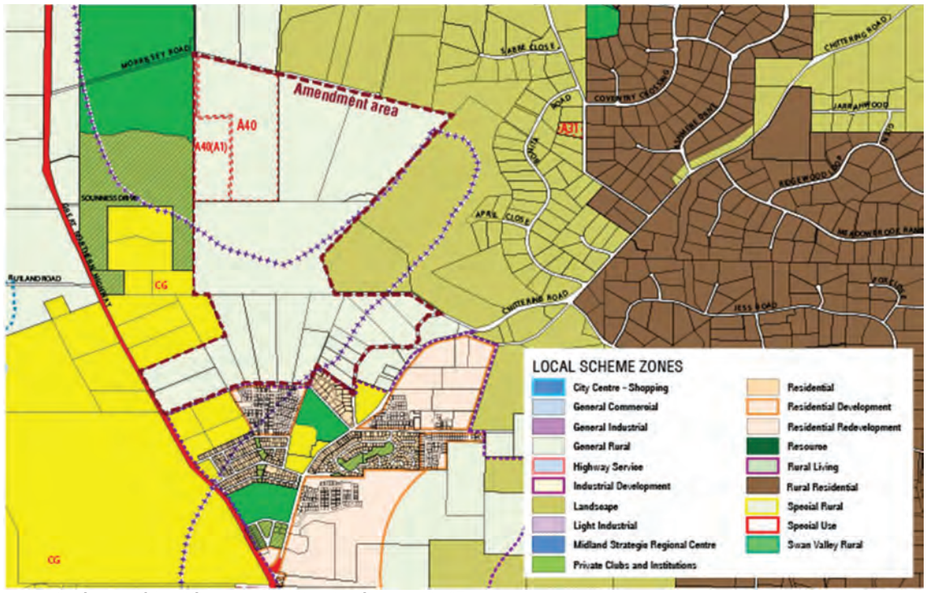

Figure 1 - Source: City of Swan's Local Planning Scheme No.17

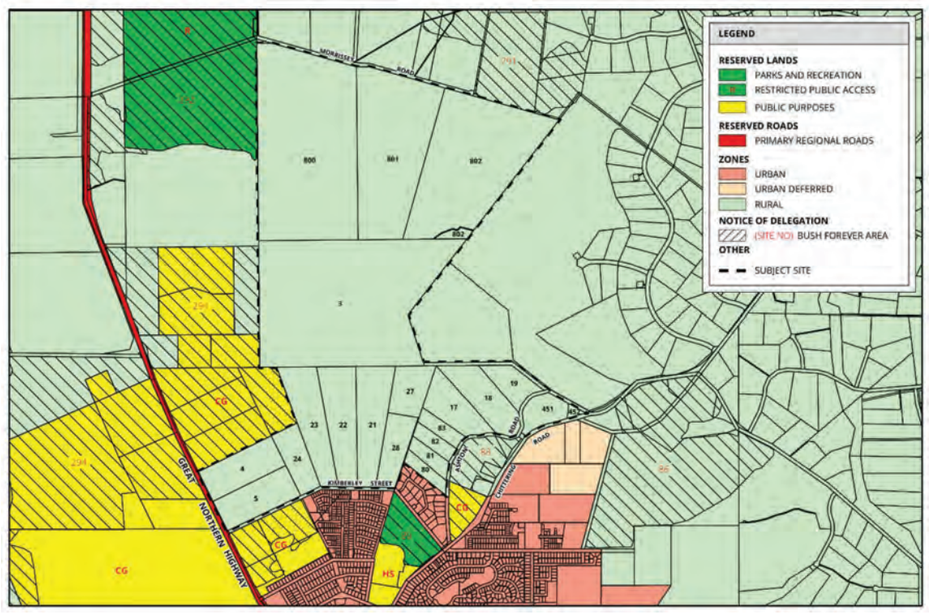

Figure 2 - Source: Metropolitan Region Scheme (MRS)

The Amendment Area is required to be rezoned to 'Development' zone under the City of Swan Local Planning Scheme No. 17 prior to endorsement of a local structure plan. The proposed MRS rezoning within the Amendment area is seeking for ''Urban'', ''Urban Deferred'' and ''Light Industry'' zones.

Existing land uses surrounding the Scheme Amendment Area	General Rural Zone, Landscape, Residential, Residential Development, Residential Redevelopment, Public Purposes, Recreation, Parks and Recreation

Proposed Amendment to District Structure Plan

Nominate the proposed zoning of Lots within the proposed Amendment Area	Existing rural landholdings will be developed as Residential, 2xPrimary Schools, Neighbourhood Centre, Light Industrial/Service Commercial and Public Open Space, with potential for a Lifestyle Village or Caravan Park

Nominate land use type and yield	- **Residential** (Current estimates assume 4,118 dwellings in Bullsbrook North, based on the generally developable land area).
	- **Primary School**
	  - Proposed School 1 app. 4.1ha (3.6ha+0.5ha) (estimated no. of children 500)
	  - Proposed School 2 app. 4.1ha (3.6ha+0.5ha) (estimated no. of children 500)
	- **Neighbourhood Centre** app.2ha (Assumed 5,910m^2 GFA)
	- **Light Industrial/Service Commercial**
	- **Public Open Space**
	- Potential for additional land use - Lifestyle Village/Caravan Park* within Lot 800 Morrissey Road.

Note*- Amendment No. 1 to the Bullsbrook Townsite District Structure Plan states: *Having regard to the existing Additional Use zoning on Lot 801 Morrissey Road, a potential' 'Lifestyle Village" or' 'Caravan Park" has been included on the DSP Amendment Plans and will be explored further at Local Structure Plan stage.*

Is the proposed amendment zoning complementary to the surrounding land-uses?	YES The area to the northeast and east of the site, stretching to Chittering Road, falls within the 'Landscape' and 'Rural Residential' zones. Sections of the land between the site and the Great Northern Highway are designated for 'Public Recreation,' 'Recreation,' and 'Public Purposes.' To the south of the site, the zoning allows for 'Residential Development' and 'Residential' purposes.

2.5 Review of Available Planning Documents

2.5.1 Bullsbrook Townsite Land Use Master Plan – Relevant Information
(Prepared by Transcore for City of Swan (November 2017))

Road Network

"The internal road network indicated in the 2014 BTLUMP (see Figure 2) can be further refined to reflect approved South Bullsbrook Industrial Precinct – Local Structure Plan 1 and 2 (SP17-033 and SP17-040). Figure 8 incorporates that South Bullsbrook Industrial Precinct road network and highlights the potential future extension of Rutland Road east of Great Northern Highway.
A key component of the BTLUMP road network in the 2014 BTLUMP report is the recommendation for Chittering Road to be closed off on the eastern side of GNH and a new connection to be constructed using the Maroubra Avenue alignment between Chittering Road and GNH."

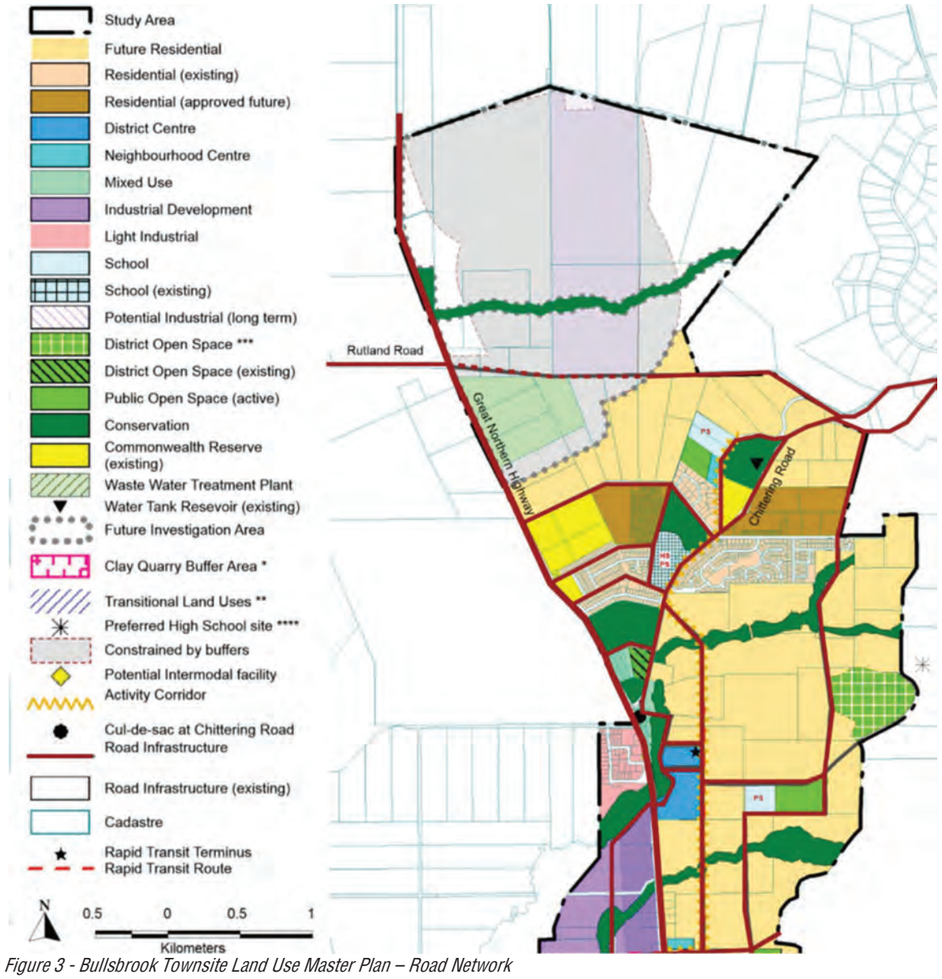

Figure 3 - Bullsbrook Townsite Land Use Master Plan – Road Network

Road Hierarchy

"The proposed hierarchy of roads in and around the BTLUMP study area is illustrated in Figure 9 using the road hierarchy defined in the Western Australian Planning Commission Liveable Neighbourhoods (LN) policy (and WAPC Policy DC 4.1 – Industrial Subdivision).

The classification of roads in Figure 9 is based on preliminary analysis of future traffic flows at section 7.3 of this report. All of the roads identified form sufficiently long and continuous routes to be classified as integrator arterials or neighbourhood connectors.

***Great Northern Highway** is classified as a primary distributor and the future reservation for this road is defined by the Primary Regional Roads reservation in the MRS, which allows for future upgrade to dual carriageway standard in future.*

***Stock Road** west of GNH is classified as an Integrator A and the future reservation for this road is defined by the 60m-wide Other Regional Roads reservation in the MRS, which allows for future upgrade to dual carriageway standard in future.*

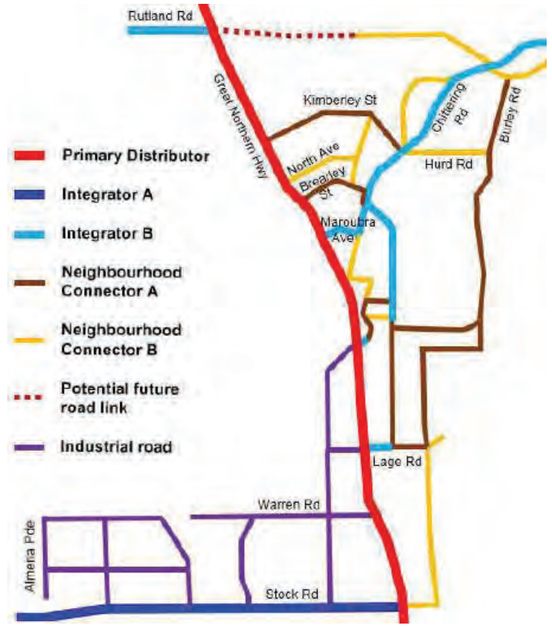

Figure 4 - Road Hierarchy (BTLUMP)

***Integrator B** roads are suitable for traffic flows up to 15,000vpd and can accommodate traffic flows up to 20,000vpd with suitable intersection treatments.*

***Neighbourhood Connector A** roads are suitable for up to 7,000vpd but some degree of flexibility with this upper limit may be appropriate in localised situations to avoid overdesigning some lengths of road. The main difference between Integrator B and Neighbourhood Connector A cross-sections is only the width of the median (6m versus 2m) and Liveable Neighbourhoods policy does allow for the median of an Integrator B to be reduced in width on sections that do not require right turn lanes in the median. Some roads may carry higher traffic flows in the medium-term future (eg. prior to long-term future extension of Rutland Road east of GNH) but should take into consideration the final traffic flows that they will carry in the longer term.*

***Neighbourhood Connector B** roads are suitable for traffic flows up to 3,000vpd but again some degree of flexibility with this upper limit should be considered appropriate in localised situations.*

Standard cross-sections from the WAPC Liveable Neighbourhoods policy for these Integrator B and Neighbourhood Connector A and B roads are shown in Appendix A. The standard integrator arterial B and neighbourhood connector road reserve widths for new roads in Liveable Neighbourhoods are as follows:

- *29.2m Integrator B*
- *24.4m Neighbourhood Connector A*
- *19.2m Neighbourhood Connector B.*

Further discussion of potential reduction of these road reserve widths is also included in Appendix A.
However, there are a number of existing roads with existing 20m road reservations. Where these roads are constrained by existing development or other constraints such as Bush Forever land that cannot be cleared it is recommended that compromises can be made in the required road design to fit within the available 20m road reserve."

Intersection Controls

"2014 BTLUMP report provides an indication of type of intersection treatments at each intersection along Great Northern Highway within the study area. This was based on the recommendations of the Great Northern Highway West Swan to Muchea Access Strategy (Main Roads WA, Nov 2011), modified to reflect discussions with Main Roads WA in relation to the closure of Chittering Road on the eastern side of GNH and new connection via Maroubra Avenue instead. A number of those intersections were identified as future traffic signals.

The South Bullsbrook Industrial Precinct local structure plans (SP17-033 and SP17-040) also specify a number of intersections along Stock Road as future traffic signals, as well as a number of other intersections specified as full movement T-intersections or left in / left out only intersections.

Planning for these intersections as future traffic signals was in accordance with Main Roads WA practice up until about 2015 but more recently Main Roads WA has adopted a preference for roundabouts instead, with any proposed traffic signals having to be demonstrated as a superior option compared to a roundabout.

Generally, traffic analysis indicates better performance from a roundabout than a signalised intersection, so it should now generally be assumed that Main Roads WA will not approve traffic signals at most of these intersections and planning should therefore be based on construction of roundabouts.



Figure 5 - Intersection controls

Where traffic signals were previously specified in the 2011 GNH Access Strategy or SP17-033 and SP17-040 they are marked as "Traffic signals (or roundabout)" on Figure 10 but it should be anticipated that Main Roads WA are likely to require roundabouts at these intersections."

Roads and Intersections

'The proposed future road network of the BTLUMP area has been detailed in section 4.0 of this transport impact assessment including the proposed road hierarchy (see Figure 9) down to neighbourhood connector roads and anticipated type of intersection treatments along the major roads (GNH, Stock Road and Chittering Road – see Figure 10).

The traffic model results at Appendix B indicate that Great Northern Highway 2031 traffic volumes are expected to be above 20,000vpd south of the district centre intersection, approximately 20,000vpd between the district centre intersection and Maroubra Avenue, and less than 14,000vpd north of Maroubra Avenue.
As noted in Liveable Neighbourhoods, a two-lane divided road is able to accommodate traffic flows in the 15,000-20,000vpd range subject to appropriate treatments of intersections, parking and public transport. Therefore it is anticipated that Great Northern Highway will ultimately need to be upgraded to four lanes divided (dual carriageway standard) south of the district centre intersection but would be able to remain at two lanes divided standard north of this intersection."

2.5.2 Bullsbrook Townsite District Structure Plan (BTDSP) – Relevant Information

(Prepared by the City of Swan (Approved April 2018))

Movement Network

" West of Great Northern Highway

- *Existing Stock Road to link to GNH via a new 4 way signalised intersection.*
- *Existing Warren Road to link to GNH via a 3 way un-signalised left-in left-out intersection.*
- *Existing Lage Street to link across GNH into existing Dewar Road via a new 4 way signalised intersection linking southwards to Stock Road.*
- *Existing Butternab Road to link to GNH via a new 3 way un-signalised left-in left-out intersection.*
- *A proposed new road extending south of Ki-It Monger Brook, to link across GNH to Taylor Road via a new 4 way signalised intersection, extending southwards to Warren Road.*
- *Existing Brig Way to link to GNH via a new 3 way unsignalized left-in left-out intersection.*
- *Existing Bullsbrook Road to link to GNH via a 3 way signalised intersection.*

East of Great Northern Highway

- *A proposed north south arterial route through the townsite between existing Chittering Road to the north and existing Lage Road to the south.[55]*
- *A proposed north south arterial route through the townsite, connecting existing Chittering Road to Stock Road via Burley Road and Alto Way.[56]*
- *Existing Maroubra Avenue to the north to be linked to GNH via a new 3 way un-signalised intersection.*
- *Existing Chittering Road to be converted to a cul-de-sac just prior to its existing intersection with GNH.*
- *Existing Brearley Street to the north to be linked to GNH via a new 3 way un-signalised intersection.*
- *Existing Lage Road to the south to be linked to GNH via a new 4 way signalised intersection.*
- *A new east west link to GNH from the existing unsealed Taylor Road linking southward via the arterial connector to a future 4 way signalised intersection.*
- *North of Brearley Street, existing North Avenue to link to GNH via a new 3 way un-signalised left-in left-out intersection.*
- *North of existing North Avenue, existing Kimberley Street to link to GNH via a new 3 way un-signalised intersection.*
- *A new road from existing Rutland Road linking eastward across GNH via a future 4 way signalised intersection, continuing eastwards to meet Chittering Road via Crocker Road.*
- *Existing Lage Road to be extended to the north-east, eventually linking to Clarkson Road, east of the study area.[57]*

Note 55 - Refer 'Activity Corridor and Public Transport'.

Note 56 - The traffic volume expected on this road will increase substantially from just south of existing Nocturne Rise (as new development occurs). This road is likely to reflect a 'District Distributor' road as classified within the Main Roads WA Road Hierarchy for Western Australia. During initial stages of development, it is likely that this route will carry much of the heavy vehicle traffic through from Chittering Road to GNH via Stock Road. Once the proposed Rutland Road extension is constructed, heavy vehicle traffic will be encouraged to use this route to access GNH and PDNH via Rutland/Neaves Road. Confirmation of and details relating to the District Distributor classification will be determined via detailed traffic modelling provided in association with future structure plans for the area.

Note 57 - This road connection is required as part of the adjacent approved 'Marlin Bullsbrook Structure Plan'-SP-011, approved subject to conditions in 2012, with subsequent modifications in March 2014).

"Activity Corridor and Public Transport

The Activity Corridor will be along the proposed arterial connector road from Lage Road to Chittering Road.

The corridor will provide a central spine for movement and activity within the townsite. It will link the south Bullsbrook industrial area, shopping centres, schools and community facilities for residents and visitors. The Activity Corridor will accommodate the future public transport route, whilst also accommodating footpaths, cycling lanes and a focus point for medium/high density residential development.

The District Structure Plan identifies a public transport link to Bullsbrook via a possible future Rapid Transit Service extension to the line which is intended to service the Swan Urban Growth Corridor and Ellenbrook. Details are to be discussed and explored with the Public Transport Authority and the Department of Transport at the detailed planning stages.

The public transport link is proposed to follow the PDNH route to the north of Ellenbrook and then service the proposed south Bullsbrook Industrial area via Stock Road and Bullsbrook town centre via the District Structure Plan Activity Corridor. The intention of the Rapid Transit Route is to identify the long term need for the proposed Bullsbrook town centre to be linked to the regional public transport network. Whilst the reference of a 'Rapid Transit Route' may be interpreted in different ways, the projected population of Bullsbrook is considered to be of a size that will only support a bus system (bus route that may in the long term, at best, include priority interchanges). A rapid transit terminus is proposed on the edge of the District Centre, along the Activity Corridor, to serve as a central passenger collection and distribution point. Additional bus services would also be provided within the new residential areas, connecting into the Activity Corridor."

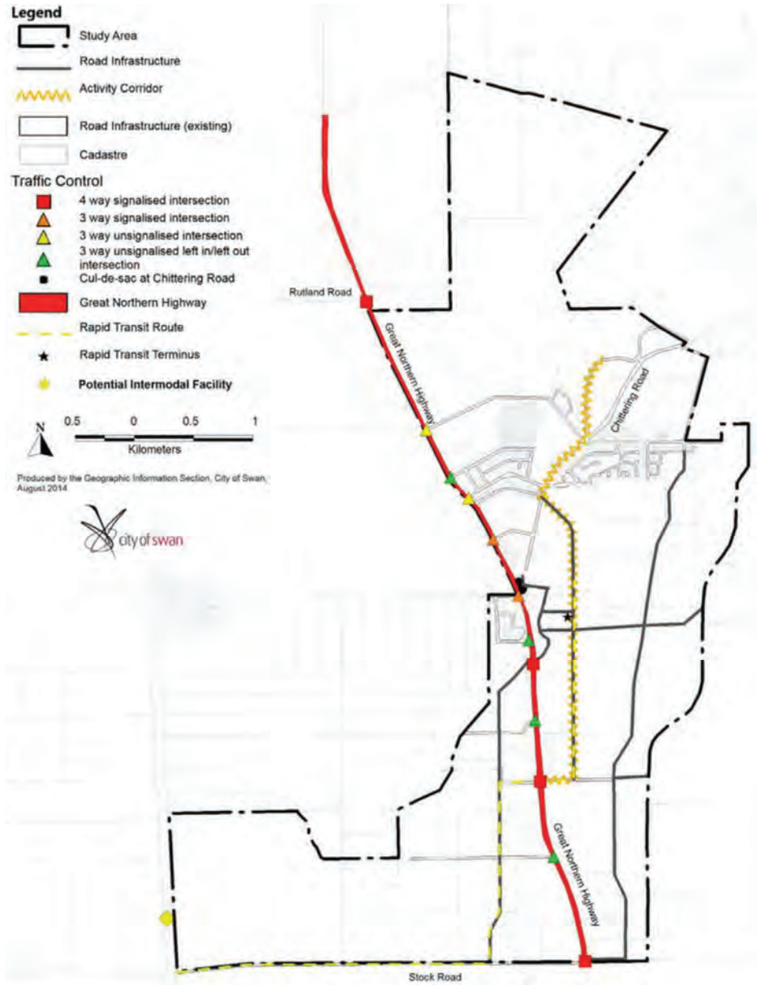

Figure 6 - Bullsbrook Townsite District Structure Plan:Traffic Movement Network

Transport Impact Assessment
KC01293.000 North Bullsbrook – Amendment to Bullsbrook Townsite District Structure Plan

Summary and Relevance

In summary, according to the District Structure Plan, the Great Northern Highway will remain a significant link. However, another activity corridor route will be introduced internally to the Bullsbrook Town Site Area to distribute local traffic and provide residents with a direct connection to the higher-order network.

Kimberley Street is designated as a Neighbourhood Connector A, while Chittering Road is designated as Intergator B road through the Town Site. These documents foreshadow the requirement to dual Great Northern Highway carriageway to accommodate anticipated growth in traffic (passing, residential and industrial)

The intersection of Chittering Road and Great Northern Highway will be terminated, while the intersections of Great Northern Highway with Maroubra Avenue and Kimberley Street were to be established.

The proposed DSP amendment initally accounted for all of those infrastrucutre elements; however, in the initial consultation period it transpired that the extension of Rutland Road east of Great Northern Highway may not be physically possible in foreseable future due to land ownership and environmental constraints.

The design team responded to the initial comments with amended DSP plan, showing the link to Great Northern Highway south of the intersection with Rutland Road, where the link can be feasibly implemented.

Therefore key amendments proposed by the revised DSP plan are:

- Rutland Road / Great Northern Highway intersection will remain three-way intersection that is due for upgrade to a roundabout;
- The East-West Connector will form a separate three-way connection to the Great Northern Highway, configured as a roundabout. This connection will enable heavy vehicles from Chittering to access Great Northern Highway in a more direct manner, not requiring them to travvel through Bullsbrook Town Centre.
- The proposed Kimberley Street / Great Northern Highway intersection will become redundant with the introduction of East-West Connector intersection; therefore, Kimberley Street will not be connected to the Great Northern Highway. Kimberley Street will become a local street, catering only to the local traffic.

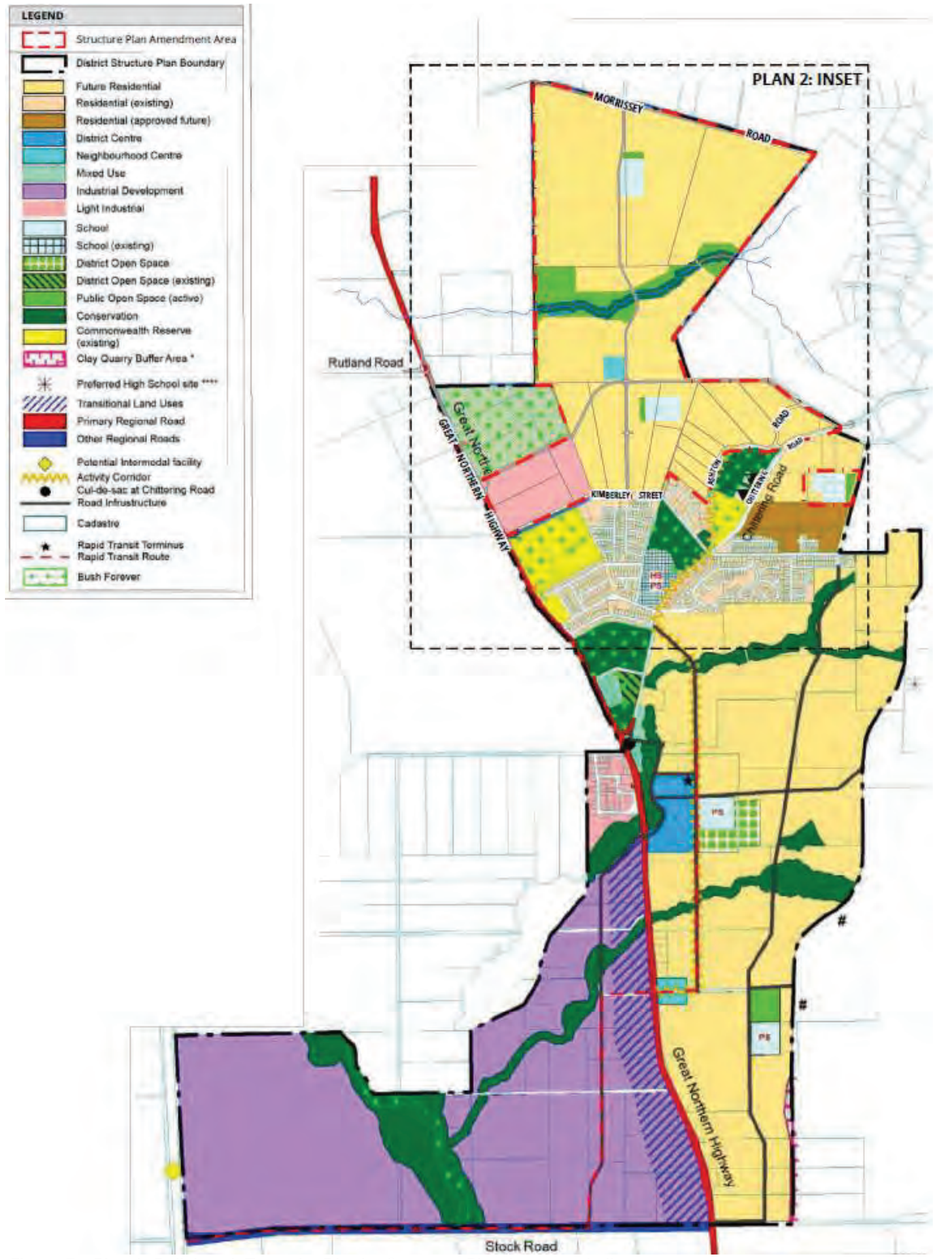

Figure 7 - Plan 1: Bullsbrook Townsite District Structure Plan (as amended)

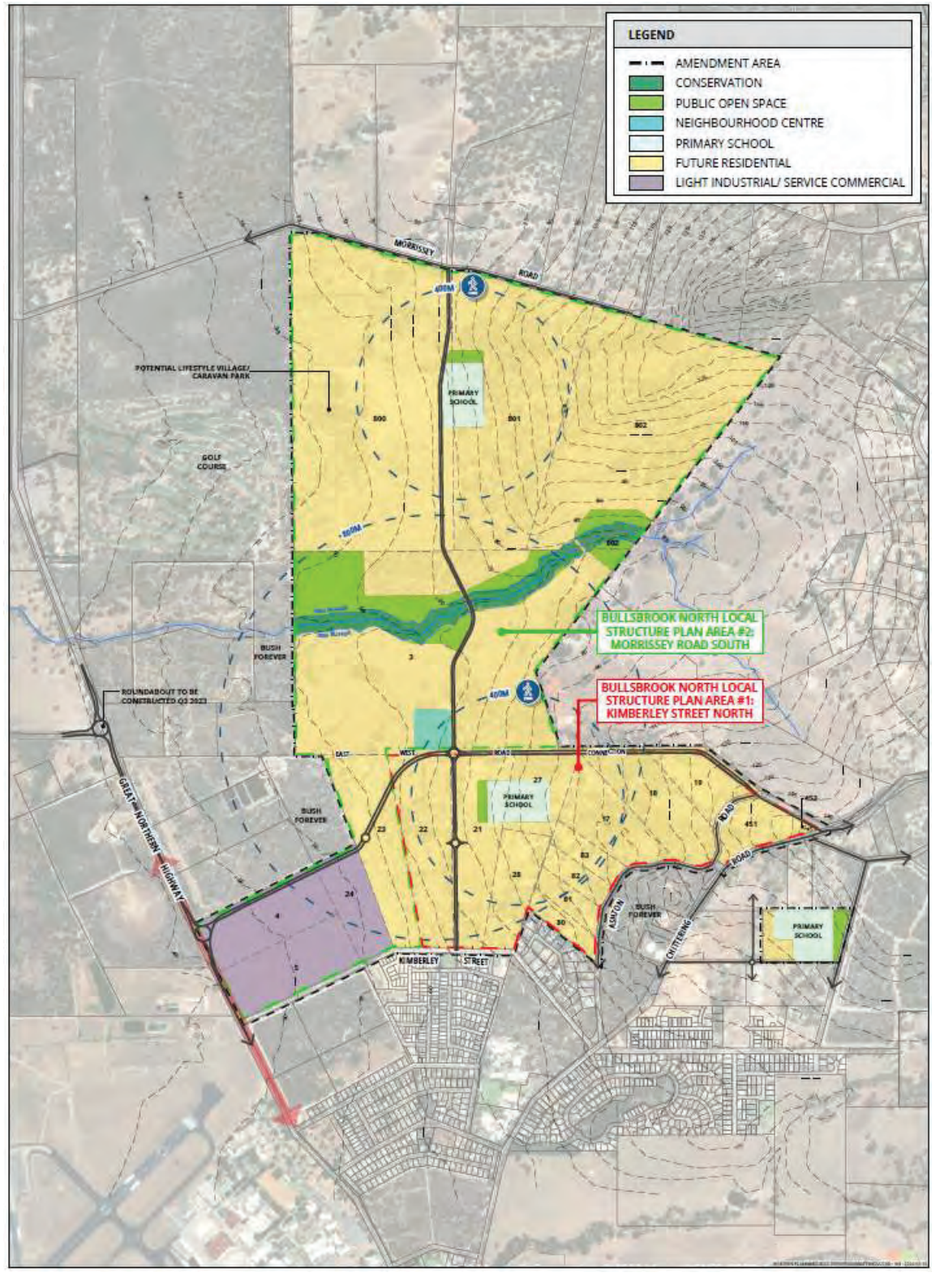

Figure 8 – Plan 2: Bullsbrook Townsite District Structure Plan (as amended)

2.5.3 Bullsbrook Freight and Industrial Land Use Strategy (BFILUS) – Relevant Information
(Appendix E – Strategic Transport Strategy – prepared by GHD for DPLH (October 2021))

The Department of Planning, Lands and Heritage designated the land west of the subject site as Intermodal Terminal (or "dry port") for container handling. Extensive infrastructure will be built to support this land use, which is estimated to generate more than 200,000 vehicular trips per day.

Key points pertaining to the infrastructure interfacing with the subject development and the road network are extracted below:

Executive Summary:

The key recommendations of this report are included in Table 12 and summarised as follows:

- *Ultimate construction and upgrade of Stock Road to dual carriageway. This should include grade separation of Stock Road over the railway line and a connection to Great Northern Highway (GNH).*
- *Create a new north-south spine road through the precinct by extending Sawpit Road northward to connect to Neaves Road. The road would pass by the western side of the proposed IMT and accommodate RAV 7 over size/over mass (OSOM) vehicles (north of Stock Road). This is because the Stock Road/Tonkin Highway interchange does not have sufficient clearance for over size vehicles to travel from Stock Road to the north.*
- *Realign Neaves-Rutland Roads with a bridge over the railway line so that they provide a direct connection between Tonkin Highway and GNH. The section between GNH and north-south spine road to be designed for RAV 7 and OSOM vehicles.*
- *Extension of Almeria Parade to the south to connect to the new Lot 300 industrial area.*
- *Undertake a comprehensive review of all railway level crossings in the study area (private, public, formal, and informal) to identify whether these should be retained, consolidated, closed or grade separated.*

Proposed speed limits and road hierarchy (functional classification)

The current 100 km/h speed limit on GNH through South Bullsbrook (i.e., between Stock Road and Butternab Road) is likely to reduce when activity intensification in the area warrants the change. Traffic speeds will also be influenced by upgrades to intersections, including the signalisation of Stock Road/GNH.

Great Northern Highway

With the completion of the Tonkin Highway extension and the construction of the proposed north-south spine road, 2051 traffic volumes on GNH (just south of Stock Road) are forecast to be around 65,000 vpd and around 20% heavy vehicles and 15,800 vpd north of Stock Road (27-42% heavy vehicles).

Minor upgrades will be required at existing and/or new intersections created by the development of the industrial land on the western side of GNH between Warbrook Road and Brig Way. Duplication of the southern approach to the Bullsbrook town site is being considered by Main Roads WA, but there is currently no funding commitment. In addition, changes to the intersection with Stock Road will be required to support increased traffic volumes at this location as well as its inclusion in the RAV network….

…Main Roads WA has advised that GNH would need to remain as a HWL/OSOM route as the Stock Road interchange with Tonkin Highway does not cater for the largest of HWL/OSOM loads (10 m x 10 m)19. Whilst the section of Stock Road west of the proposed IMT site will not provide a 10 m x 10 m clearance, there is potential to design and construct the section of Stock Road between GNH and the intersection with the north-south spine road to provide such clearance.

Analysis of internal networks

GNH is proposed as a dual carriageway with two lanes in each direction. Forecast daily volumes of 60,500 vpd on GNH just south of Stock Road are above LoS C capacity (54,400 vpd from Road Reserves Review Table 7) but below the practical capacity of the road.

As traffic volumes approach full development levels, intersection treatments at Warbrook Road/GNH and Warren Road/GNH will require major upgrade, e.g., roundabout/signals. Warbrook Road provides an important road in the

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network with forecast volumes to 20,000 vpd indicating this road should remain open to serve the development with access across the rail line.

Road Network - Great Northern Highway

GNH will remain as an important transport route, though most freight traffic will be reallocated to Tonkin Highway. It is expected that truck traffic to and from the Eastern States would continue to use the more direct route via GNH unless regulatory controls were instituted. The largest HWL and OSOM vehicles are proposed to be directed to the new north south Spine Road, bypassing the Bullsbrook town centre. GNH is expected to be duplicated at some point in the future, which will replace the intermittent overtaking provisions south of the Bullsbrook townsite.

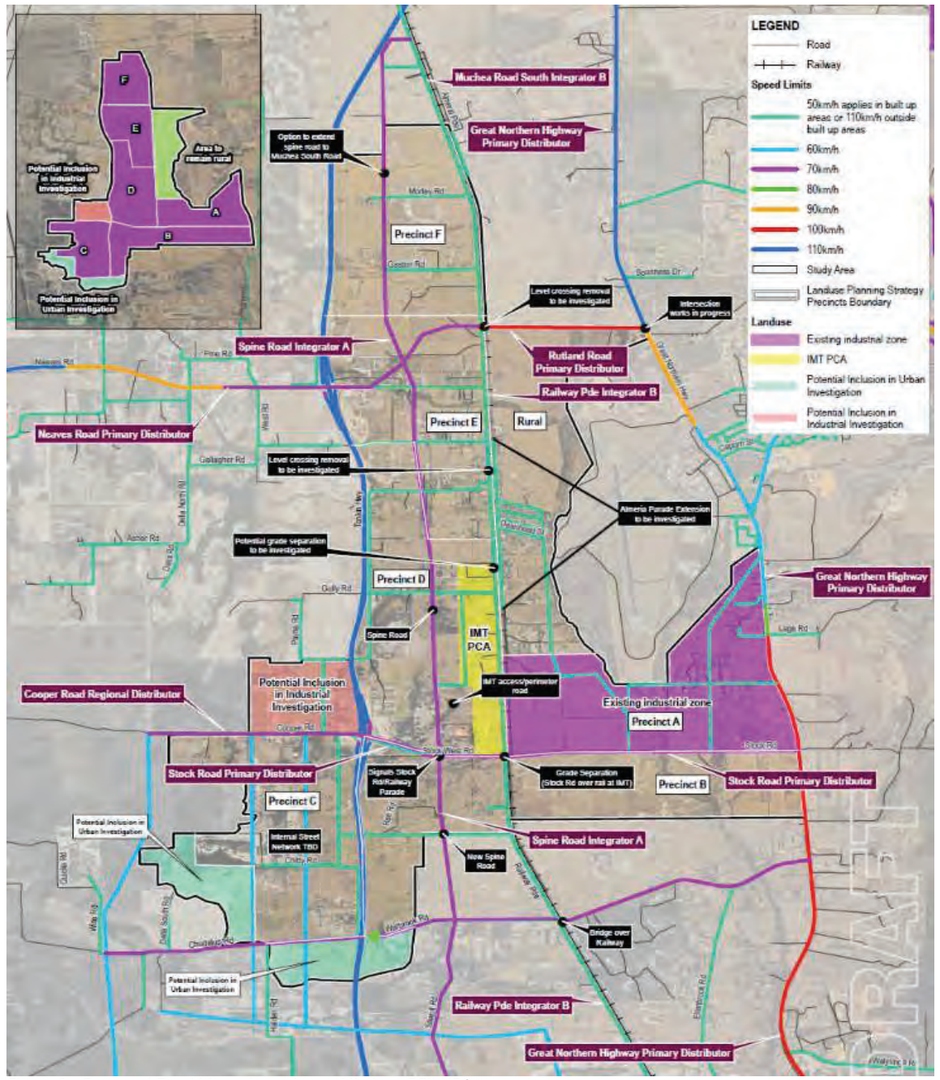


Figure 9 - Proposed Road hierarchy and speed limits – BFILUPS

Summary and Relevance

In summary, BFILUS Strategic Transport Strategy confirms that the proposed development (Intermodal Terminal) will significantly impact the existing road network and the network will require significant upgrades to accommodate the demand. This impact was foreshadowed in BTLUMP.

The Strategy confirms that Great Northern Highway will remain the key High-Wide-Load (HWL)/ Over-Size-Over-Mass (OSOM) route as Stock Route / Tonkin Hwy interchange was not constructed to support OSOM vehicles. Great Northern Highway carriageway will be duplicated south of Rutland Road, as it is expected to carry more than 65,000 vehicles per day south of Stock Road. The Strategy acknowledges that amendments to the intersections along Great Northern Highway will have to be made; however, it provides conflicting advice on the extent of amendments and upgrades.

The Intermodal Terminal Precinct will feature a north-south distributor running between Great Northern Highway and Tonkin Highway, while Rutland Road will provide the connection between the two Highways.

The Strategic Transport Strategy did not seem to consider the planned expansion of Bullsbrook Town Centre appropriately. The proponent prepared the submission to the DPLH during the consultation period; however, as of the writing of this report, an updated Strategic Transport Strategy was not made publicly available.

2.6 Local Road Network Information

Name of Roads Fronting Amendment Area / Road Classification and Description:

Road Name	**Morrissey Road**
Number of Lanes	two way, one lane (no linemarking), undivided
Road Reservation Width	App. 20m
Road Pavement Width	App.6m (Portion of the road directly adjacent to the subject area is currently unsealed)
Classification	Access Road
Speed Limit	50kph or State Limit
Bus Route	NO
If YES Nominate Bus Routes	-
On-street parking	NO

Road Name	**Great Northern Highway**
Number of Lanes	two way, one lane each direction, undivided
Road Reservation Width	App. 25m and above
Road Pavement Width	App.10m
Classification	Primary Distributor
Speed Limit	60-110kph
Bus Route	
If YES Nominate Bus Routes	-
On-street parking	NO

Road Name	**Kimberley Street**
Number of Lanes	two way, one lane (no linemarking), undivided
Road Reservation Width	App. 20m and above
Road Pavement Width	App.7m
Classification	Access Road
Speed Limit	50kph or State Limit
Bus Route	NO
If YES Nominate Bus Routes	-
On-street parking	NO

Name of Other Roads within 2km radius of site, or roads likely to take increased traffic due to the development:

Road Name	**Chittering Road**
Number of Lanes	two way, one lane each direction, undivided
Road Reservation Width	App. 20m and above
Road Pavement Width	7.4m
Classification	Regional Distributor
Speed Limit	90kph
Bus Route	NO
If YES Nominate Bus Routes	-
On-street parking	NO

2.7 Traffic Volumes

Road Name	Location of Traffic Count	Vehicles Per Day (VPD)	Vehicles per Peak Hour (VPH)				Heavy Vehicle %	Date of Traffic Count	*If older than 3 years multiply with a growth rate*
			AM Peak Time	AM Peak VPH	PM Peak Time	PM Peak VPH	*If HV count is Not Available, are HV likely to be in higher volumes than generally expected?*		
Great Northern Highway	South of Bullsbrook Road (SLK 25.05)	8,333	07:00–647		15:30–734		19.9	2020 /21	–
	South of Rutland Road	7,541	07:15–652		15:30–747		10.0	May 2022	–
	North of Rutland Road	3,815	07:15–294		15:30–362		11.0	May 2022	–
	North of Wandena Road (SLK 33.50)	2,344	08:30-180		15:45 - 210		25.0	2021 /22	–
	North of Chittering Road	5,940	08:00–470		15:45–549		12.0	May 2022	–
	South of Chittering Road	10,614	08:00–803		15:45–1,050		9.0	May 2022	–
Chittering Road	East of Great Northern Highway	5,836	08:00–459		15:45–607		5.0	May 2022	–
Rutland Road	West of Great Northern Highway	5,010	07:15–464		15:30–537		8.0	May 2022	–

Note – All traffic counts were obtained through Main Roads.

2.8 Vehicular Crash Information

Is Crash Data Available on Main Roads WA website?	YES
If YES, nominate important survey locations:	
Location 1	Great Northern Highway (SLK 28.20 to 26.56)
Location 2	Morrissey Road (SLK 0.00 to 2.49)
Location 3	Kimberley Street (SLK 0.00 to 1.07)
Location 4	Great Northern Highway & Rutland Road
Location 5	Kimberley Street & Chittering Road
Period of crash data collection	01/01/2019 - 31/12/2023

Road Name	SLK	Road Hierarchy	Speed Limit	Crash Statistics			
				No of KSI Crashes	No of Medical Attention Crashes	No of PDO Major Crashes	No of PDO Minor Crashes
Great Northern Highway	28.20 to 26.56	Primary Distributor	110kph	0	0	2	0

MR Type	Involving Overtaking	Involving Parking	Involving Animal	Involving Pedestrian	Entering / Leaving Driveway	Other / Unknown
Count	0	0	0	0	1	1

No of MVKT Travelled at Location	app.7,500 VPD*365 *5 years*1.69 km = 22.45MVKT
KSI Crash Rate	0 KSI crashes/MVKT
All Crash Rate	2 crashes /22.45 MVKT = 0.089 crashes/MVKT
Comparison with Crash Density and Crash Rate Statistics	All crashes rate of 0.089 is significantly lower than the network average of 0.37 Crashes per MVKT for Metropolitan State Roads Network

Morrissey Road	0.00 to 2.49	Access Road	50kph or State Limit	1	0	0	0

MR Type	Involving Overtaking	Involving Parking	Involving Animal	Involving Pedestrian	Entering / Leaving Driveway	Other / Unknown
Count	0	1	0	0	0	0

Kimberley Street	0.00 to 1.07	Access Road	50kph or State Limit	0	0	0	0

MR Type	Involving Overtaking	Involving Parking	Involving Animal	Involving Pedestrian	Entering / Leaving Driveway	Other / Unknown
Count	0	0	0	0	0	0

Intersection Name	SLK	Road Hierarchy	Speed Limit	Crash Statistics			
				No of KSI Crashes	No of Medical Attention Crashes	No of PDO Major Crashes	No of PDO Minor Crashes
Great Northern Highway & Rutland Road	28.20 (GNH)	Primary Distributor / Regional Distributor	110kph / 100kph	1	5	16	9

MR Type	Involving Overtaking	Involving Parking	Involving Animal	Involving Pedestrian	Entering / Leaving Driveway	Other / Unknown
Count	0	0	0	0	0	31

No of MVKT Travelled at Location	App.13,000 VPD*365* 5 years * 0.3 km = 7.12 MVKT
KSI Crash Rate	1 KSI crash / 7.12 MVKT = 0.14 KSI crashes/MVKT
All Crash Rate	31 crashes / 7.12 MVKT = 4,35 crashes/MVKT
Comparison with Crash Density and Crash Rate Statistics	KSI crash rate of 0.14 is **higher** than the network average of 0.03 KSI Crashes per MVKT for Metropolitan State Roads Network. All crashes rate of 4.35 is **significantly higher** than the network average of 0.85 Crashes per MVKT for Metropolitan State Roads Network

Note: MRWA plans to upgrade this intersection from a sign-controlled to a roundabout to address the existing safety record. As a result, the approach speed will be reduced to 80km/h.

Great Northern Highway & Chittering Road	25.51 (GNH)	Primary Distributor / Regional Distributor	110kph / 60kph	0	1	2	4

MR Type	Involving Overtaking	Involving Parking	Involving Animal	Involving Pedestrian	Entering / Leaving Driveway	Other / Unknown
Count	0	0	0	0	0	7

No of MVKT Travelled at Location	App.15,500 VPD*365*5 years*0.3 km = 8.49MVKT
KSI Crash Rate	0 KSI crashes/MVKT
All Crash Rate	7 crashes / 8.49 MVKT = 0.82 crashes/MVKT
Comparison with Crash Density and Crash Rate Statistics	All crashes rate of 0.82 is lower than the network average of 0.85 Crashes per MVKT for Metropolitan State Roads Network

Note: All of the recorded incidents at this location are rear-end crashes. The crash pattern is typical of a signalised intersection. This intersection is planned to be removed in 2026 (per BTLUMP).

Kimberley Street & Chittering Road	0.00 (KS)	Access Road / Access Road	50kph / 50kph	0	0	1	0

MR Type	Involving Overtaking	Involving Parking	Involving Animal	Involving Pedestrian	Entering / Leaving Driveway	Other / Unknown
Count	0	0	0	0	0	1

No of MVKT Travelled at Location	App.8,000 VPD*365 * 5 years * 0.3 km = 4.38 MVKT
KSI Crash Rate	0 KSI crashes/MVKT
All Crash Rate	1 crash / 4.38 MVKT = 0.23 crashes/MVKT
Comparison with Crash Density and Crash Rate Statistics	All crashes rate of 0.23 is lower than the network average of 0.85 Crashes per MVKT for Metropolitan State Roads Network.

The following tables shows crash rates and crash densities in Perth Metropolitan area on local roads and state roads for the period from 2018 to 2022, as obtained from Main Roads WA on the 31st May 2022 by email request:

Crash Density and Crash Rate on Metropolitan Local Roads Network only

	All Crashes		Serious Injury Crashes (Fatal+Hospital)	
	Average Annual Crash Density (All Crashes/KM)	Average Annual Crash Rate (All Crashes/MVKT)	Average Annual Crash Density (Ser. Inj. Crashes/KM)	Average Annual Crash Rate (Ser. Inj. Crashes/MVKT)
Metro Local Roads - Midblock	2.51	0.95	0.12	0.05
Metro Local Roads - All	5.23	1.98	0.24	0.09

Note: Based on 5-years data for the period 2017 to 2021.

Crash Density and Crash Rate on Metropolitan State Roads Network only

	All Crashes		Serious Injury Crashes (Fatal+Hospital)	
	Average Annual Crash Density (All Crashes/KM)	Average Annual Crash Rate (All Crashes/MVKT)	Average Annual Crash Density (Ser. Inj. Crashes/KM)	Average Annual Crash Rate (Ser. Inj. Crashes/MVKT)
Metro State Roads - Midblock	20.12	0.37	0.89	0.02
Metro State Roads - All	46.28	0.85	1.80	0.03

Note: Based on 5-years data for the period 2017 to 2021.

Definitions of acronyms and terms used in this analysis can be found below:

- PDO Crash - a crash that results in property damage only (major or minor) and does not require hospitalisation or medical treatment, as listed in Main Roads WA's Crash Analysis Reporting System (CARS).
- KSI Crashes - Killed and serious injury crash
- MVKT - Million Vehicle Kilometres Travelled.

In order to identify black spots being the locations noted for a high incidence of crashes involving death and injury, it is important to conduct the crash criteria analysis as shown in the table below. If the below crash criteria are met, there is a way to measure the cost-effectiveness of the proposed treatment. It is called BCR and it ensures that the black spot exhibits a significant number of crashes that are correctable by infrastructure treatment.

Table 3.1: Crash criteria for the State Black Spot Program

Crash Criteria	*Highway and Main Roads*		*Local Roads*	
	Metro	*Rural*	*Metro*	*Rural*
Intersection or Mid-block or Short road section (<3km)	*10 crashes over 5 years*	*3 crashes over 5 years*	*5crashes over 5 years*	*3 crashes over 5 years*
Road length (>3km)	*Average of 3 crashes per km over 5 years*	*Average of 1 crash per km over 5 years*	*Average of 2 crashes per km over 5 years*	*Average of 1 crash per km over 5 years*
Benefit-cost ratio (BCR)	*1*			

(Main Roads/ WALGA 2004)

Being a metro road with 2 crashes over 5 years period, the analysed section of Great Northern Highway does not qualify as a Black Spot Location.

The intersection of Great Northern Highway with Rutland Road, with 31 KSI crashes over 5 years, does qualify as a Black Spot Location.

As previously mentioned, MRWA intends to enhance safety at the junction of Great Northern Highway and Rutland Road by converting it from a sign-controlled intersection to a roundabout, as shown in the figure below. This modification will necessitate a reduction in approach speed to 80km/h.

MRWA has advised that construction for the enhancement of the intersection at Great Northern Highway and Rutland Road (west of Great Northern Highway) into a single-lane roundabout is scheduled to begin in October 2024. The anticipated completion date for the project is estimated to be in March 2025.

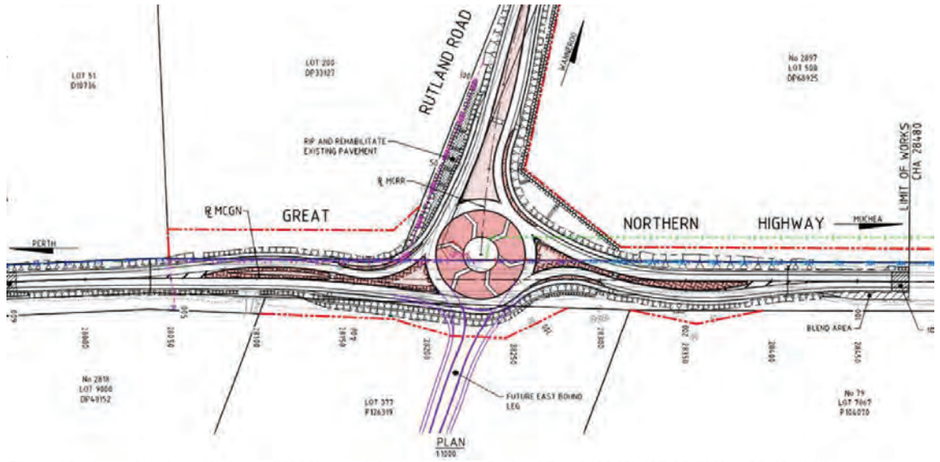


Figure 10 - Great Northern Highway (H006) roundabout design at Rutland Road (0045) (27.95 SLK to 28.48 SLK)

As discussed above, the plans included an allowance for the fourth leg of the roundabout that would allow for East-West road connection; however, upon initial consultation period it transpired that the connection is not implementable due to significant spatial and environmental constraints.

3. Proposed Internal Transport Networks

Are there any changes/additions to the existing road network?	YES The proposed Amendment Area layout indicates 2 proposed district-level roads (East-West Road Connection & North-South Road Connection). East-West Road Connection connects the Amendment Area with Great Northern Highway to the east and Chittering Road to the west. This connection will permit heavy vehicles coming from Chittering to access Great Northern Highway without travel through Bullsbrook Town Centre. North-South Road Connection connects the Amendment Area with Kimberly Street to the south and Morrissey Road to the north. Lower order network will be developed around these key connections.

	Please refer to Appendix 1 for the proposed road layout within the Amendment area and its connection to the existing road network.
Were there any discussions/agreements with MRWA regarding intersections with, or direct access onto roads under their jurisdiction?	YES The project team had a discussion with MRWA pertaining to road and corridor planning in the area in the first half of 2022. The MRWA was made aware of the intention to extend Rutland Road east of GNH, and that the future Rutland Road / Great Northern Highway roundabout should have four legs in the ultimate configuration. However, during the subsequent consultation with other stakeholders, it transpired this connection is not feasible in the foreseeable future due to environmental and ownership constraints. As a result of the consultation, the project team amended the road configuration to retain Rutland Road / Great Northern Highway as three-way intersection and introduce a new connection south of Rutland Road / Great Northern Highway.
Are there any pedestrian/cycling networks and crossing facilities proposed for the roads within the Amendment Area?	YES The proposed road network will be designed in line with the Liveable Neighbourhoods, and it will create a coherent network of pedestrian and cycling connections. This will be discussed in greater detail during the LSP phase.
Were there any discussions/agreements with the local authority over local road networks and pedestrian and cycle facilities?	NO *Note - Not at the date of submission of this report; however, discussion is anticipated during the application processing.*
Were there any discussions/agreements with PTA / Transperth on new bus services or extensions/alterations to existing bus services to serve the Amendment Area?	YES In December 2021, KCTT received confirmation from a PTA representative that Transperth does not have plans to operate future public transport routes on or near Morrissey Road in Bullsbrook. In March 2024, KCTT liaised with PTA once more and received the following response: *"Currently, Transperth operates the Route 311 bus service between Midland Station and Bullsbrook via Great Northern Hwy, Chittering Rd, Brearley St, Truscott St to a terminus on North Ave.* *For the completion of the Morley Ellenbrook Line this service will be realigned to travel slightly more north via King St and North Ave in Bullsbrook (still terminating on North Ave).* *It is worth noting that Kimberley St is currently too narrow to operate a bus service in some sections. Kimberley Street had previously been considered for an extension of the Route 311.* *Due the low density and relative isolation from the urban front any service improvements in Bullsbrook are considered a low priority as it is difficult to justify the provision of further services and greater frequency due to the small passenger catchment and current low patronage of the existing bus services. Further, any*

	new services will be dependent on a suitable route network (with road widths suitable for a bus) and the availability of resources. For these reasons, it is unlikely that the subject site will be served by public transport for some time." However, it is anticipated that the PTA may change their position once the land is rezoned for urban use, considering the expected changes in land use. This rezoning would likely increase the population density and passenger catchment area, making it more feasible to justify the provision of additional services and increased frequency. The anticipated urban development could create a stronger case for extending bus routes and improving public transport infrastructure. Therefore, it is crucial that future planning processes include ongoing liaison with the PTA to ensure that transport services are aligned with the evolving needs of the community and the projected growth of the area. This collaborative approach will help to ensure that public transport provisions are effectively integrated into the overall urban development plan, facilitating better connectivity and accessibility for future residents.

4. Changes to External Transport Networks

Are there any proposed changes of the road network?	• This proposal accounts for all the transport network changes BTLUMP and BFILUS foreshadowed. Morrisey Road may have to be upgraded to an urban road standard (kerbed and drained). • In addition to changes anticipated by BTLUMP and BFILUS, this Amendment proposes a reconfiguration of the Chittering Road / Ashton Road intersection.
Are there any proposed changes of the intersection controls?	• The intersection of Great Northern Highway and Chittering Road is scheduled for closure in 2026, although the timeframes are general in nature. (foreshadowed by BTLUMP and BFILUS) • The Great Northern Highway and Rutland Road intersection will be reconfigured to a roundabout independently of this project. (foreshadowed by BTLUMP and BFILUS) • The Great Northern Highway / East-West Connector intersection to be established as a three-way roundabout. • Chittering Road / Ashton Road intersection is to be reconfigured, as Ashton Road will become a part of East-West connector. • The BTLUMP foreshadows construction of the Great Northern Highway / Kimberley Street intersection; however, with the inclusion of Great Northern Highway / East-West Connector intersection, Great Northern Highway/Kimberley

Street intersection is deemed redundant. The amendment proposes that the Kimberly Street remains a cul-de-sac catering to the local traffic only.

Are there any proposed changes of the pedestrian/cycle networks and crossing facilities?	NO - *Not at the date of submission of this report; however, the discussion is anticipated during the consultation period.* The external network, particularly the key roads, maintains a distinct rural character. These roads are traditionally designed to cater primarily to vehicular traffic and lack dedicated pedestrian or cyclist facilities. This absence is a reflection of their initial purpose and the low-density population distribution typical of rural areas. However, as the community grows and evolves, the infrastructure needs to be developed to ensure safety and accessibility for all road users. Presently, there are no pedestrian facilities along many of the roads surrounding subject site area. This includes the absence of sidewalks, designated crossing points, and safety features that are standard in more urbanized settings. The lack of these facilities presents significant challenges for pedestrians and cyclists, particularly in areas where vehicle speeds are higher, and visibility may be limited. With the potential another primary school located approximately 400m from the southeast boundary of the subject area, the demand for safe and accessible pedestrian facilities will significantly increase in the surrounding area. Currently, Chittering Road cannot cater to this additional foot traffic safely. Therefore, it is imperative to consider comprehensive improvements, including: · Constructing continuous sidewalks along Chittering Road to ensure a safe path for students and other pedestrians. · Introducing well-marked pedestrian crossings, potentially with traffic calming measures such as raised crosswalks or pedestrian refuges to ensure safe passage across the road. · Developing dedicated cycling paths or lanes to encourage cycling as a safe and viable mode of transportation, reducing reliance on cars and enhancing overall traffic safety. *Long Term Cycling Network (LTCN) shows* Chittering Road (south of Kimberley Street) and Kimberley Street as a future local route. Additionally, Primary Cycling Route is planned along the Tonkin Highway extension, while Rutland Road and Great Northern Highway (south of Rutland Road) are future secondary routes.
Are there any proposed changes of the public transport services? *(These changes could be those committed or proposed by others, MRWA or local authority, or by the proponent as part of the structure plan.)*	As of the time of writing this report, the PTA does not have any concrete plans to extend the public transport network further north. However, continued liaison during the next planning phase is essential, and potential opportunities for expanding the public transport network within the Amendment Area should be thoroughly reviewed.

At the date of this report's submission, no further discussions were anticipated during the consultation period.

5. Integration with Surrounding Area

Are there any existing major residential generators of traffic within a minimum of 800 metres from the boundaries of the Amendment Area?	YES Directly to the south of the Amendment area is predominately residential land use.
Are there any existing major non-residential attractors of traffic within a minimum of 800 metres from the boundaries of the Amendment Area?	YES Bullsbrook College is directly to the south of the Amendment Area. While one proposed school is approximately 400m from the southeast boundary of the subject area.
Identify any proposals for major changes to the land uses within 800 metres of the boundaries of the Amendment Area.	The Intermodal Facility (Dry Port) will be built immediately west of the subject Amendment Area. Given this will become one of the strongest employment generators in the area, the residential precinct will be an attractive option for prospective employees.
What are the main desire lines between the Amendment land uses and these external attractors/generators?	Proposed North-South Road Connector, Kimberley Street and Chittering Road are attractive connections to the Bullsbrook Town Centre. The proposed East-West Connector offers access to Great Northern Highway, the Intermodal Facility precinct, and further via Rutland Road to Tonkin Highway.
Will the existing transport networks and any proposed changes adequately match these desire lines, particularly for pedestrians, cyclists and public transport users?	Yes, the proposed networks (inclusive of known and committed upgrades to the existing network) will adequately cater to the demand vehicular demand. All internal streets will be planned in accordance with Liveable Neighbourhoods, catering for pedestrians and bicycle riders alike. Connection to the external network may prove to be a challenge in short to medium term due to the nature of roads (high speed, high order rural roads).
Identify any deficiencies or areas for improvement in the surrounding transport networks and/or areas where improvements could be made.	Improvements can be made in public transport availability, particularly considering local connections to the future employment generators in the area.
Propose remedial measures to address these deficiencies.	During the consultation phase, options for improvement will be discussed with the PTA and the City of Swan. BTLUMP already anticipates Rapid Transit Corridor with a terminus almost 2km south of the Amendment Area. This plan should be revisited at the next stage of planning. Furthermore, potential connections between the residential areas and the industrial precinct should be investigated. Even a local

shuttle would help reduce car dependency and offer convenient access to residents employed at the Intermodal Facility.

6. Analysis of Internal Transport Networks

6.1 Calculation of Amendment area Generated / Attracted Traffic

What are the likely hours of operation?	• Residential land uses - the hours of operation are not applicable. • School - 08:00-17:00 on weekdays • Neighbourhood Centre – it is expected to be open in period 09:00-20:00. • Light Industry - 07:00 - 19:00
What are the likely peak hours of operation?	AM 08:00 to 09:00 PM 16:30 to 17:30
Do the development-generated peaks coincide with existing road network peaks? *If YES, Which:*	YES Partially both [AM Peak and PM Peak]
Guideline Document Used	**WAPC Transport Assessment Guidelines for Developments**
Rates from above document:	***Residential*** *– 0.8 vehicle trips per dwelling for the AM and PM peak hours. A 25% IN / 75% OUT split has been adopted for the AM peak and a 67% IN / 33% OUT split for the PM peak hour.* ***Schools*** *- The rates are based on data from the PARTS surveys that indicate that around 65% - 70% of children are driven to primary school, with an average occupancy of around 1.4 - 1.5 children per car. This equates to 0.5 trips per child to school and 0.5 trips per child from school in each of the AM and PM peak hours. For secondary schools the PARTS data indicate that the proportion driven to school is generally a little lower but, to simplify the process of determining the level of assessment required and for the broad assessment of structure plans, it is suggested that the above primary school rates be used for all schools.*
Guideline Document Used	**NSW RTA Guide to Traffic Generating Developments**
Rates from above document:	***Residential -*** *The NSW RTA Guide to Traffic Generating Developments suggests developments of this type in Sydney tend to generate between 4 and 5 vehicular trips per dwelling for medium to high density developments. In Perth, the Department of Planning and Infrastructure conducted a series of studies in the late 1990's / early 2000's which showed that higher density dwellings tended to average closer to 5.5 vehicle trips per day. These studies assumed that anywhere between 50% and 70% of commuters were travelling to the work by car as a driver.*

The Amendment area will accommodate approximately 4,118 dwellings. This would equate to low-medium density, and therefore we propose a traffic generation rate of 8 vehicular trips per day per residence. Given the existing residences within the subject area, an average of 9 vehicular trips per day per residence is used.

Industry
Daily vehicle trips = 5 per 100 m^2 GFA
Morning peak hour vehicle trips = 1 per 100 m^2 GFA

Warehouses
Daily vehicle trips = 4 per 100 m^2 GFA
Morning peak hour vehicle trips = 0.5 per 100 m^2 GFA

Guideline Document Used	**Transportation Engineers (ITE) Common Trip Generation Rates (9th edition)**
Rates from above document:	**Elementary School** Students: 1.29 vehicular trips per day per student KCTT suggest using 2 vehicular trips per day per student **General Light Industrial -** 6,97 VPD per KSF2 = 7.5 VPD per 100m2 GFA AM Peak – 0.92 VPH per KSF^2 = 0.99 VPH per 100m^2 GFA PM Peak – 0.97 VPH per KSF^2 = 1.04 VPH per 100m^2 GFA
Does the site have existing trip generation/attraction?	YES

Land Use Type	Rate above	Yield	Daily Traffic Generation VPD	Peak Hour Traffic Generation	
				AM VPH	PM VPH
Existing land uses					
Residential	9 VPD per unit Peak - 0.8 VPH per unit	Assumed 21 units	189	17	17
Total Assumed Existing traffic – A^0			**189**	**17**	**17**
Proposed land uses					
Residential	8 VPD per unit Peak - 0.8 VPH per unit	4,118 units	32,944	3,294	3,294
Primary School	2 VPD per student Peak – 1 VPH per student	1000 students* (Assumed 500 students per School)	2,000	1,000	1,000
		*With reciprocity applied**	400	200	200
Neighbour-hood Centre	121 VPD per 100m^2 AM – 2.5 VPH per 100m^2 PM – 10 VPH per 100m^2	5,910m^2 GFA**	7.151	148	591
		*With reciprocity applied***	715	15	59
Light Industrial	Daily - 5 VPD per 100m^2 GFA AM - 0.99 VPH per 100m^2 GFA PM - 1.04 VPH per 100m^2 GFA	58,750m^2 GFA (25% of the total area)***	2,938	582	611
		*With reciprocity applied****	588	116	122
Total traffic with reciprocity applied – A'			**34,647**	**3,625**	**3,675**
Total traffic without reciprocity - A			**45,033**	**5,024**	**5,496**

Total expected additional traffic with reciprocity applied – A'- A⁰	**34,458**	**3,608**	**3,658**

Note * - *It is anticipated that only 20% of school trips will be generated from outside of the subject area for 2 of the proposed primary schools.*
Note ** - *It is anticipated that only 10% of Neighbourhood Centre trips will be generated from outside of the subject area.*
Note *** - *It is anticipated that up to 80% of Light Industrial trips will be generated from outside of the subject area.*

What is the total expected additional impact of the new land uses expected to be proposed within the Amendment area?

According to WAPC guidelines, all developments generating above 100 VPH can be deemed to have a high impact on the surrounding road network and require a Transport Impact Assessment level of reporting.

6.2 Aimsun Traffic Modelling

The basic model was prepared to assess the impact of the development on the existing road network. Once the project progresses into more detailed stages of planning, the model should be further refined. This section will outline the basic parameters and assumptions for the model.

6.2.1 Base Model Calibration and Validation

Model Assumptions

How many zones were created for the model?	-	16 zones for the Base 2022 model (all external; no proposed development); - 29 zones for the Future 2041 model (16 external; 13 internal DSP zones). Refer to Appendix 3 and Appendix 4 for a graphic representation of the Zones.

Nominate external zones (Base and Future Models)	- **16 zones external to the subject development:**	
	Zone 1.	Great Northern Highway (North of Morrissey Rd)
	Zone 2.	Great Northern Highway (South of Stock Road)
	Zone 3.	Rutland Road (West of Great Northern Highway)
	Zone 4.	RAAF Base Pearce
	Zone 5.	Bullsbrook Road (West of Great Northern Highway)
	Zone 6.	Warren Road (West of Great Northern Highway)
	Zone 7.	Stock Road (West of Great Northern Highway)
	Zone 8.	Chittering Road (North of Ashton Road)
	Zone 9.	Morrissey Road (East of Great Northern Highway)
	Zone 10.	Sounness Drive (East of Great Northern Highway)
	Zone 11.	Residential Zone (Between Kimberley Street and North Avenue)
	Zone 12.	Residential Zone (Between North Avenue and Caporn Street)
	Zone 13.	Bullsbrook College
	Zone 14.	Residential Zone (Between Parkland Parade and Brookbank Drive)

Zone 15.	Residential Zone (Between Hurd Road and Parkland Parade)
Zone 16.	Bullsbrook Medical Centre / Gas Stations / Drive Thru

Base Model Calibration
Base Matrices have been developed in following steps:

- Intersection turning movement counts were extracted for the daily traffic and peak assessment periods (31st May 2022; 08:00 – 09:00 and 16:00 – 17:00) from MRWA Traffic Map video counts for the following intersections:
  - Great Northern Highway / Rutland Road
  - Great Northern Highway / Chittering Road
  - Great Northern Highway / Warren Road

- The first entries in matrices were OD pairs which directly reflect a turn on one of the intersections. For example, left turn from Rutland Drive onto Great Northern Highway is a matrix entry with Origin in Zone 3 and Destination in Zone 1 and vice-versa. Traffic flow between Zones 2 and 7 was derived through a similar process.
- Traffic for zones without traffic counts (residential zones, Bullsbrook College etc.) has been calculated based on the land uses as seen from the latest aerial imagery.
- For other turning movement counts with the known origin, assumptions have been made on the unknown destinations and vice-versa to match the existing traffic counts as close as possible.
- Interim simulations were run to assist the matrices furness process until the modelled turning movement counts reflected the observed counts on the highest possible level (measured with the GEH Statistic). The model achieved required GEH <5 for all 23 detectors created in the network model. Refer to Appendix 3.

6.2.2 Future Model Traffic Distribution

Nominate internal zones (Future Model)	**13 Internal Zones:** Refer to Appendix 3 and 4 for the Base and Future Model Zones		
	-	**Zones 17-24 and 26**	Residential Zones
	-	**Zone 25**	Industrial Zone
	-	**Zones 27 and 28**	Primary Schools
	-	**Zone 29**	Neighbourhood Centre

Internal Traffic Flow Distribution onto External Road Networks

ZONE	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Internal Traffic
All Internal Residential Zones	9%	38%	10%	1%	1%	5%	15%	1%	20%

Primary Schools Traffic Flow Distribution to Internal Zones

ZONE	Zone 17	Zone 18	Zone 19	Zone 20	Zone 21	Zone 22	Zone 23	Zone 24	Zone 25	Zone 26	External Traffic
All Internal Residential Zones	15%	9%	11%	9%	9%	6%	4%	9%	6%	2%	20%

Neighbourhood Centre Traffic Flow Distribution to Internal Zones

ZONE	Zone 17	Zone 18	Zone 19	Zone 20	Zone 21	Zone 22	Zone 23	Zone 24	Zone 25	Zone 26	External Traffic
All Internal Residential Zones	17%	10%	12%	10%	10%	7%	5%	10%	7%	2%	10%

Traffic was distributed per trends observed from the Great Northern Highway traffic counts. KCTT have developed the above percentages based on the turning movements on Great Northern Highway intersections with Chittering Road and Rutland Road.

Future Model Assumptions and Calibration
Geometry changes have been introduced to match all the relevant planning documents for the subject and surrounding areas.

Future Matrices have been developed in accordance with the below process:

- Passing traffic on the major surrounding road was extracted from 2041 ROM24 data for the surrounding network.
- Matrix furnessing process was repeated until the modelled traffic volumes reflected the ROM24 data as closely as possible.

Appendix 4 shows the extracted 2041 daily, AM and PM traffic volumes on selected links. Furthermore, there are Nodes Levels of Service for peak hours.

6.2.3 Comments and Recommendations

Lower Levels of Service are present on the internal road network surrounding the Neighbourhood Centre in the PM peak only.
KCTT suggest that the position and connection of Neighbourhood Centre to the road network is reassessed in the following stages of planning process given that:

- The proposed DSP plans suggest one nearby connection from the Centre to the North-South Road near the most important internal intersection – the roundabout of North-South and East-West roads.
- Additional connection is proposed to the north; however, it is not likely that patrons would frequently use it because of the residential nature of this area and the distance from the Centre.
- A possibility of an additional roundabout should be investigated to connect the Centre and North-West connection to successfully absorb the high PM traffic in this area.

The above comments should be noted as a guideline only, given the early stage of the planning process and the low level of detail of the lower hierarchy network. Once the local / fine grain network is further developed and exact access points to Neighbourhood Centre and Primary Schools are known, it is expected that the traffic volumes on the core network will be reduced.

6.3 Proposed Road Cross-Sections

Guideline Document used as reference	Draft Liveable Neighbourhoods 2015
How many proposed roads are there within the Study Area?	The full internal local network will be refined during the LSP phase. This DSP amendment focuses on key corridors and connections to the existing network. While this document speaks mostly to two key corridors distributing traffic through the Amendment Area, the cross-sections below are an indicative guide for local network development. The network will be designed in accordance with the Liveable Neighbourhoods.

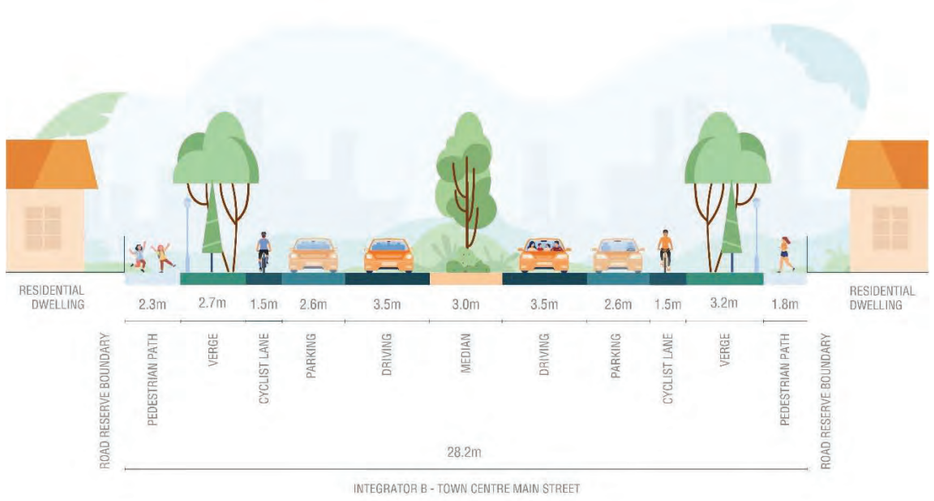
Transport Impact Assessment
KC01293.000 North Bullsbrook – Amendment to Bullsbrook Townsite District Structure Plan

The classification below is reflective of preliminary traffic assessment and minimal traffic requirements. The road reservation widths can be expanded and re-organised to satisfy different types of requirements (e.g. civil engineering, environmental, conservational, urban design etc.), therefore roads that have lower order hierarchy according to traffic engineering requirements might have expanded road reservation widths.
Once more detailed road network is known the classification is to be reassessed. (Local Structure plan/Subdivision stage)

Name of Roads within the Subject Area / Road Classification and Description:

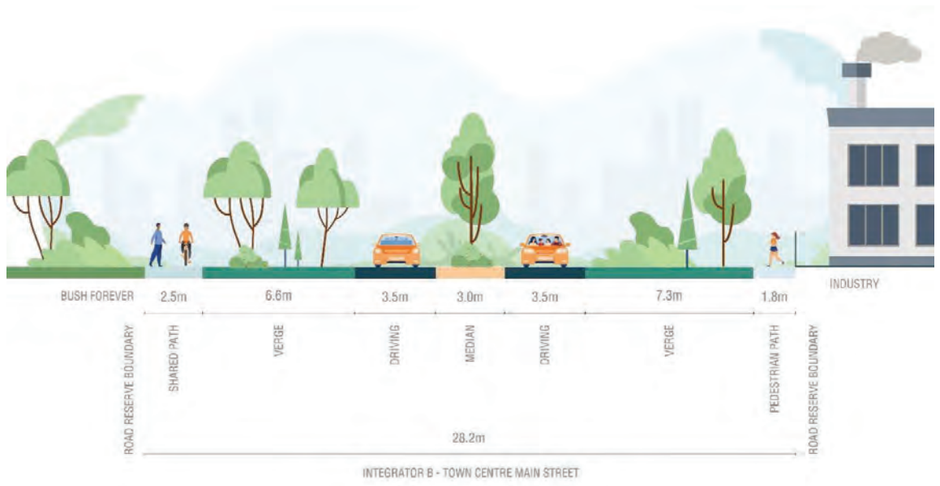
Integrator B (arterial – activity center main street)	
Road	North-south Connection (North from East-west Connection up to 30m Buffer) East-west Connection (West from North-south Connection)
Projected Traffic Volumes	7,000 - 15,000 (up to 20,000 allowable)
Proposed Number of Lanes	one lane per direction
Proposed Road Reservation Width	28.2m
Proposed Road Pavement Width	7.6m per direction (inclusive of traffic and cycling lane)
Proposed Median Width	3.0m
Proposed Pedestrian / Cyclist / Shared Path Width	1.5m cycling lane on both sides of the road reservation 1.8 & 2.3m pedestrian path
Proposed Classification	Integrator B
Proposed Speed Limit	≤50km/h
Proposed Bus Route Extension / Introduction	to be confirmed
Proposed On-street parking	YES – 2.6m parallel parking on both sides of the road reservation

Provide graphics of the proposed internal road cross-section within the Amendment Area



Integrator B (modification)	
Road	East-west Connection (at industrial zone)
Projected Traffic Volumes	7,000 - 15,000 (up to 20,000 allowable)
Proposed Number of Lanes	one lane per direction
Proposed Road Reservation Width	28.2m
Proposed Road Pavement Width	3.5m per direction
Proposed Median Width	3.0m
Proposed Pedestrian / Cyclist / Shared Path Width	1.8 pedestrian path & 2.5m shared path
Proposed Classification	Integrator B
Proposed Speed Limit	≤50km/h
Proposed Bus Route Extension / Introduction	to be confirmed
Proposed On-street parking	YES

Provide graphics of the proposed internal road cross-section within the Amendment Area



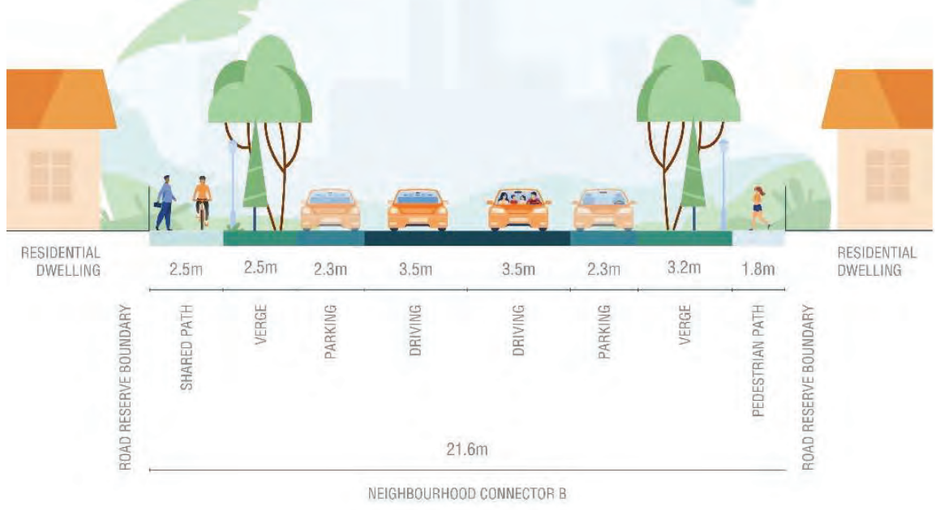
Neighbourhood Connector A	
Road	North-south Connection (South of East-west Connection) East-west Connection (East from North-south Connection)
Projected Traffic Volumes	Approximately 7,000
Proposed Number of Lanes	one lane per direction
Proposed Road Reservation Width	27.6m
Proposed Road Pavement Width	7.3m per direction (inclusive of traffic and cycling lane)
Proposed Median Width	3.0m
Proposed Pedestrian / Cyclist / Shared Path Width	1.5m cycling lane on both sides of the road reservation 1.8 & 2.3m pedestrian path
Proposed Classification	Neighbourhood Connector A
Proposed Speed Limit	50km/h
Proposed Bus Route Extension / Introduction	to be confirmed
Proposed On-street parking	YES – 2.3m parallel parking on both sides of the road reservation

Provide graphics of the proposed internal road cross-section within the Amendment Area



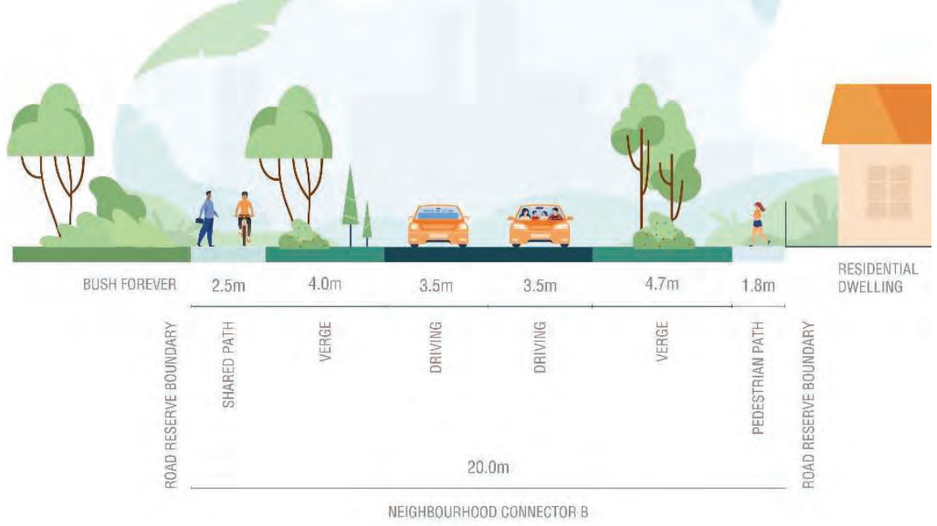
Neighbourhood Connector B	
Road	North-south Connection (North of the 30m buffer)
Projected Traffic Volumes	Approximately 3,000
Proposed Number of Lanes	one lane per direction
Proposed Road Reservation Width	21.6m
Proposed Road Pavement Width	3.5m per direction
Proposed Median Width	-
Proposed Pedestrian / Cyclist / Shared Path Width	1.8 pedestrian path & 2.5m shared path
Proposed Classification	Neighbourhood Connector B
Proposed Speed Limit	50km/h
Proposed Bus Route Extension / Introduction	to be confirmed
Proposed On-street parking	YES – 2.3m parallel parking on both sides of the road reservation

Provide graphics of the proposed internal road cross-section within the Amendment Area



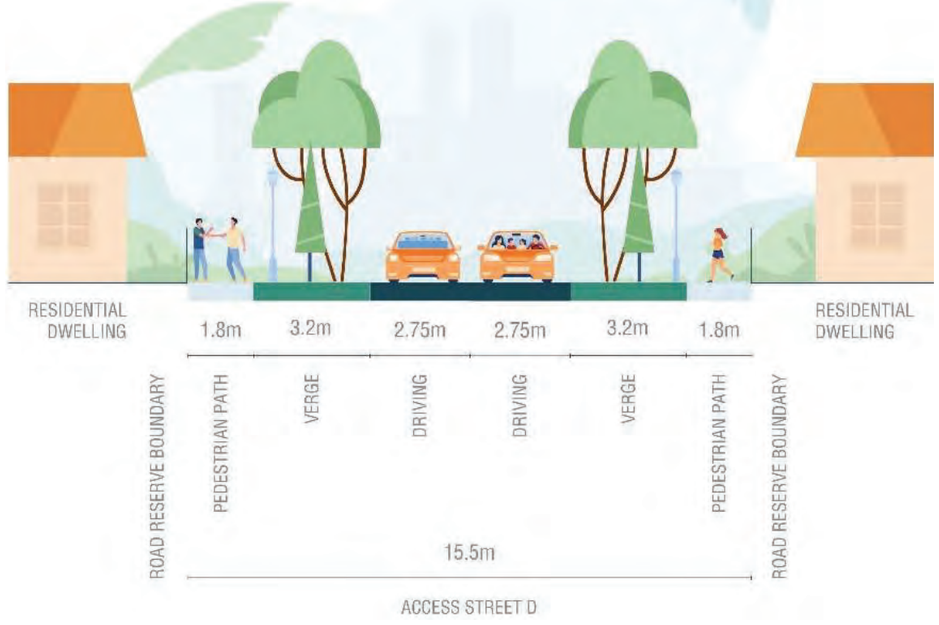
Neighbourhood Connector B (modification)	
Road	Morissey Road
Projected Traffic Volumes	Approximately 3,000
Proposed Number of Lanes	one lane per direction
Proposed Road Reservation Width	20.0m
Proposed Road Pavement Width	3.5m per direction
Proposed Median Width	-
Proposed Pedestrian / Cyclist / Shared Path Width	1.8 pedestrian path & 2.5m shared path
Proposed Classification	Neighbourhood Connector B
Proposed Speed Limit	50km/h
Proposed Bus Route Extension / Introduction	to be confirmed
Proposed On-street parking	NO

Provide graphics of the proposed internal road cross-section within the Amendment Area



Access Street D	
Road	Local Access Roads will be designed as Access Streets A-D in the LSP stage. The most common street type is Access Street D as per information below.
Projected Traffic Volumes	Approximately 1,000
Proposed Number of Lanes	one lane per direction
Proposed Road Reservation Width	15.5m
Proposed Road Pavement Width	2.75m per direction
Proposed Median Width	-
Proposed Pedestrian / Cyclist / Shared Path Width	1.8 pedestrian path on both sides of the road reservation
Proposed Classification	Access Street D
Proposed Speed Limit	30km/h
Proposed Bus Route Extension / Introduction	to be confirmed
Proposed On-street parking	NO

Provide graphics of the proposed internal road cross-section within the Amendment Area



6.4 Proposed Intersection Controls

How many intersections have been proposed?	Below are listed key proposed intersections, including those foreshadowed by previous planning documents.

Name of main Intersections within the Subject Area / Road Classification and Description:

Intersection Type 1	
Name	• Morrissey Road & North-South Road Connection • Kimberley Street & North-South Road Connection • Ashton Road & Chittering Road • East-West Road Connection & Chittering Road
Intersection Control	Uncontrolled T-intersection
Intersection Type 2	
Name	• Rutland Road & Great Northern Highway (BFILUS) • East-West Road Connection & Great Northern Highway • East-West Road Connection & North-South Road Connection
Intersection Control	Roundabout

Additional observations and recommendations

All intersections mentioned above, and any future intersections are to be designed to meet the change in traffic conditions as a result of the urbanisation of the subject site area.

The Rutland Road / Great Northern Highway intersection will be upgraded to a three-way roundabout, connecting the Intermodal Facility to the Great Northern Highway. Although the first iteration of this DSP amendment included proposal to create a four-way roundabout by extending Rutland Road east of Great Northern Highway, stakeholder consultation proved this proposal to be unfeasible in the foreseeable future.

Therefore, the revised DSP amendment proposes creation of a separate intersection between Great Northern Highway and East West Connector, south of Rutland Road, that is to be configured as a three-way roundabout. The proposed East-West Connector provides heavy vehicles from Chittering with a direct connection to Great Northern Highway, bypassing Bullsbrook Town Site.

The intersection of Ashton Road and Chittering Road will have to be considered carefully in terms of geometric alignment. For purposes of this model, the intersection was reconfigured so that Chittering Road south of Ashton Road is downgraded – therefore, all the passing traffic is directly diverted to the East-West Road Connection, bypassing the existing Town Centre. However, as mentioned above, this intersection will be engineered in greater detail in the next phases of the planning process.

The intersection of the East-West Connector and North-South Connector will be configured as a roundabout, while the configuration of other intersections internally to the Amendment Area will be determined during the LSP phase. It is anticipated that most of the internal local intersections will be configured as yield intersections.

6.5 Road Safety

Is intersection spacing adequate?	YES

Justification

All distances between intersections within the Amendment Area should be spaced in accordance with the guidelines set in Liveable Neighbourhoods.

Below figure is an extract from Liveable Neighbourhoods, Table 5 – Junction spacing (measured from the road reserve centreline to the centreline of the terminating street pavement, page 57). This table outlines the specific spacing requirements that need to be addressed and incorporated into the next design phases. Adhering to these standards is crucial for achieving a well-organized and functional roadway network within the Amendment Area, promoting safety, efficiency, and overall community liveability.

Table 5: Indicative terminating street spacing — Close

Integrator Arterial through-route	Terminating route	Minimum spacing on same side of route -Unsignalised (based on left turn lane length on through route)	Minimum Left/ right staggers (based on non-overlapping right turn lanes on through-route)	Right/left stagger (based on left turn lane length on through route)
Primary Distributor	Integrator A arterial	>75m (60 km/h) >100m (70 km/h) >125m (80 km/h)	>175m (60 km/h) >225m (70 km/h) >270m (80 km/h)	20m – 50m (60 km/h) 20m – 70m (70 km/h) 20m – 95m (80 km/h)
Primary Distributor	Integrator B arterial	>75m (60 km/h) >100m (70 km/h) >125m (80 km/h)	>175m (60 km/h) >225m (70 km/h) >270m (80 km/h)	20m – 50m (60 km/h) 20m – 70m (70 km/h) 20m – 95m (80 km/h)
Integrator A arterial	Integrator A arterial	>55m (50 km/h) >75m (60 km/h)	>140m (50 km/h) >175m (60 km/h)	20m – 35m (50 km/h) 20m – 50m (60 km/h)
Integrator A arterial	Integrator B arterial	>55m (50 km/h) >75m (60 km/h	>140m (50 km/h) >175m (60 km/h)	20m – 35m (50 km/h) 20m – 50m (60 km/h)
Integrator A arterial	Neighbourhood connector	>55m (50 km/h) >75m (60 km/h	>140m (50 km/h) >175m (60 km/h)	20m – 35m (50 km/h) 20m – 50m (60 km/h)
Integrator B arterial	Integrator B arterial	>55m (50 km/h) >75m (60 km/h	>140m (50 km/h) >175m (60 km/h)	20m – 35m (50 km/h) 20m – 50m (60 km/h)
Integrator B arterial	Neighbourhood connector	>55m (50 km/h) >75m (60 km/h	>140m (50 km/h) >175m (60 km/h)	20m – 35m (50 km/h) 20m – 50m (60 km/h)

Local through-route	Terminating route	Minimum spacing on same side of route	Minimum left/right staggers (based on minimising corner cutting)	Right/left stagger (based on deflecting through movement on terminating route)
Neighbourhood connector	Neighbourhood connector	>40m	>40m	15m – 20m
Neighbourhood connector	Access street	>40m	>40m	15m – 20m
Access street	Access street	>20m	>20m	15m – 20m
Access street	Laneway	>20m	>20m	15m – 20m

Figure 11 - Table 5 – Junction spacing (measured from road reserve centreline to centreline of terminating street pavement), taken from Liveable Neighbourhoods, pg.57.

Are sight distances adequate at proposed intersections?	TBC

Justification

Guide to Road Design Part 4A: Unsignalised and Signalised Intersections provides guide values for safe intersection sight distance. SISD is the minimum sight distance that should be provided on the major road at an intersection.

Guide to Road Design Part 3: Geometric Design provides guide values for safe stopping distance for cars on sealed roads. SSD distance is considered to be the minimum sight distance that should be available to a driver at all times.

For roads that has a speed limit of 50km/h, the design speed is 60km/h.
The SISD for a 60 km/h design speed is 123m (based on a reaction time of 2.0s).
The absolute minimum SSD for a 60 km/h design speed is 64m based on a reaction time of 2.0s).
For roads that has a speed limit of 60km/h, the design speed is 70km/h.

The SISD for a 70 km/h design speed is 151m (based on a reaction time of 2.0s).
The absolute minimum SSD for a 70 km/h design speed is 81m based on a reaction time of 2.0s).

Sight distances will be evaluated in detail in subsequent design phases. This detailed assessment will help identify any potential visibility issues and determine if any modifications are required to optimize intersection safety and functionality.

Are there any proposed interventions to streets surrounding schools, neighbourhood centres, child and aged person daycare facilities, etc?	YES

Justification

Some calming traffic devices are desirable, especially near the proposed primary schools. Chicanes, speed humps, wombat crossings and/or other methods should be considered when designing streets around schools to lower operating speeds and improve safety. Posted signs with reduced speed limits should be considered for roads near educational facilities.

Additionally, it is advisable to implement posted signs with reduced speed limits on roads adjacent to educational facilities to further ensure the safety of children and pedestrians. Designing streets with narrower lanes, not exceeding a maximum width of 3.3 meters, can also increase side friction, encouraging drivers to reduce their speed.

To prevent long stretches of on-street parking, which can contribute to higher speeds and reduced visibility, it is recommended to incorporate vegetation strips after each block, with a maximum of three on-street parking bays per block. These measures will not only enhance the aesthetic appeal of the area but also improve overall safety.
All these considerations and recommendations will be thoroughly evaluated and integrated during the Local Structure Planning and Subdivision stages to ensure a comprehensive and effective approach to traffic management and safety in these critical areas.

7. Analysis of External Transport Networks

Determine the year(s) for assessment and the period(s) for the traffic flow analysis.	2041 - Estimated Year of Completion of the Bullsbrook North Precinct.
Determine Amendment area generated traffic.	The total additional traffic impact of the Amendment area (with reciprocity between the proposed land uses applied) is expected to be approximately 34,458 vehicular trips per day, 3,608 vehicular trips per hour in the AM peak hour and 3,658 vehicular trips per hour in the PM peak hour.

Determine the base, i.e. without Amendment area, flows on the surrounding road network. These are to be factored up to the Amendment area assessment year(s).

Road Name *(Current MRWA classification)*	Location of Traffic Count	Existing Traffic Volumes (VPD)-(31st May 2022)	Estimated Traffic Volumes Year 2041 (VPD) (future passing traffic was modelled to reflect the 2041 ROM data provided in Strategic Transport Strategy for Intermodal Facility)
Great Northern Highway *(Primary distributor)*	South of Chittering Road	10,614	18,612
	South of Rutland Road	7,541	13,223
	North of Rutland Road	3,815	6,690
Chittering Road *(Regional distributor)*	East of Great Northern Highway	5,836	(Chittering Road will no longer be connected to Great Northern Highway in 2041)
Rutland Road *(Regional distributor)*	West of Great Northern Highway	5,010	8,785

Determine the total traffic flows on the external road network by adding the Amendment area generated traffic to the above base flows.

Road Name *(Current MRWA classification)*	Location of Traffic Count	Existing Traffic Volumes (VPD)-(31st May 2022)	Estimated Traffic Volumes + Subject Subdivision Plan Generated Traffic - Year 2041 (VPD)
Great Northern Highway *(Primary distributor)*	South of Chittering Road	10,614	34,100
	South of Rutland Road	7,541	28,700
	North of Rutland Road	3,815	20,500
			540
Chittering Road *(Regional distributor)*	East of Great Northern Highway	5,836	(Chittering Road will no longer be connected to Great Northern Highway in 2041)
Rutland Road *(Regional distributor)*	West of Great Northern Highway	5,010	12,200

Identify all schools within the Amendment area and those within 800 metres of the Amendment area.	Two primary schools are proposed within the Amendment area. Potential for another school was identified approximately 400m from the southeast boundary of the subject area. Bullsbrook College is south of the Amendment area.
Identify the most likely walk and cycle routes to each school from the catchment areas.	All proposed roads within the Amendment area are expected to have a pedestrian or shared path on one or both sides of the road reservation. In the LSP development phase, the local road network should be refined and designed to ensure continuous access to the proposed Primary Schools. All roads in approach to the Primary Schools should feature a shared path that is a minimum 2.5m wide. There is a continuous pedestrian network enabling the connectivity of Bullsbrook College with the surrounding area.

7.1 RAV Network Analysis

Which RAV network is available in the vicinity of the site?

RAV 7 Network	
Road	H006
Road Name	Great Northern Highway
Start SLK	3.17
End SLK	36.86
Network Type	State Road
Local Government Network	Tandem Drive Network 7
From Intersection	Roe Highway & Great Northern Highway & Reid Highway
To Intersection	Granary Drive & Muchea East Road

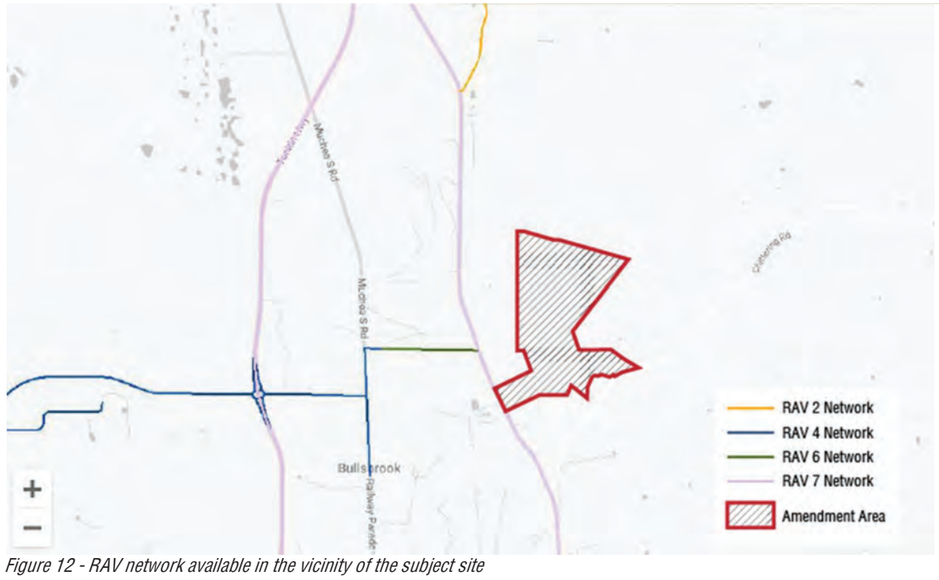


Figure 12 - RAV network available in the vicinity of the subject site

What is the largest vehicle allowed on this network?

Up to 36.5m

What are the expected routes for large vehicles entering and exiting the site?

The largest vehicles (36.5m) will travel on Great Northern Highway. BFILUS stipulates this route will remain key OSOM route for the Intermodal Facility. However, the proposed development will be predominantly residential, therefore, new unrestricted RAV routes going through the subject site are not required.
The central East-West corridor will enable heavy as-of right vehicles coming from Chittering to access Great Northern Highway easily without going through the Bullsbrook Town Centre. Chittering Road is not a formal RAV route, therefore, any vehicle that is not as-of right would require a special trip permit.

7.2 Pedestrian Infrastructure

Describe existing local pedestrian infrastructure within a 400m radius of the site:

Classification	Road Name
"Pedestrian Path"	All the subdivisional roads, interfacing southern edge of the subject site, feature a pedestrian path at least on one side of the road reserve. Section of Chittering Road traversing the Town Centre features pedestrian paths, although not all sections are very well connected. There are no pedestrian paths on Great Northern Highway.

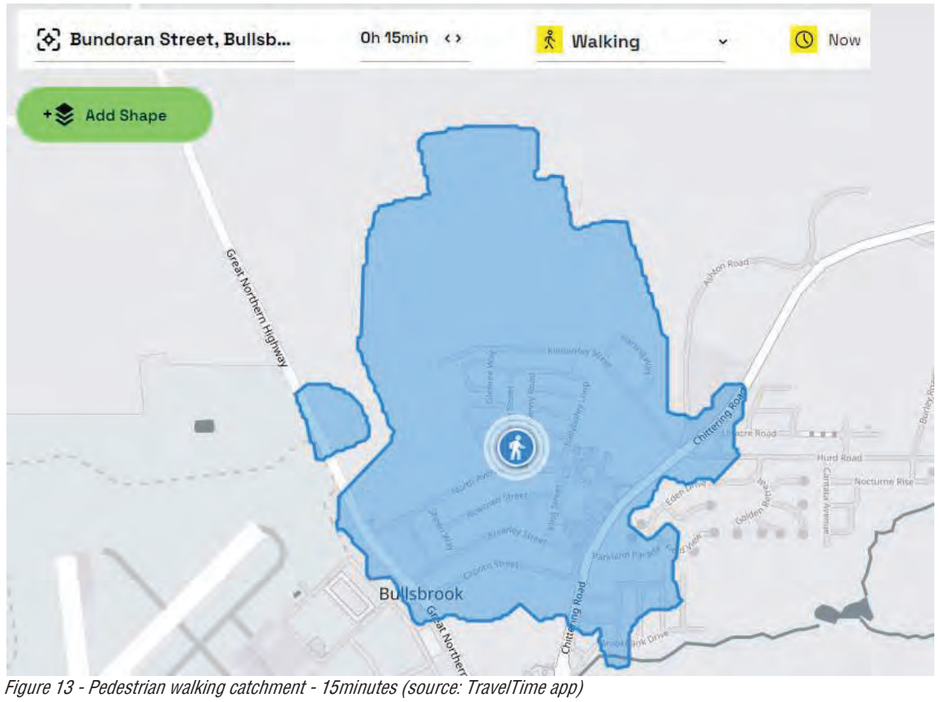


Figure 13 - Pedestrian walking catchment - 15minutes (source: TravelTime app)

Does the site have existing pedestrian facilities — NO

Does the site propose to improve pedestrian facilities? — YES

If YES, describe the measures proposed.

The anticipated residential development will feature permeable and connected pedestrian path network, as Liveable Neighbourhoods mandate the provision of footpaths on one side of road reservation (as a minimum for all roads carrying above 100 VPD).

What is the Walk Score Rating?

1 Car-Dependent. Almost all errands require a car.

7.3 Cyclist Infrastructure

Are there any PBN Routes within an 800m radius of the subject site? NO

Are there any PBN Routes within a 400m radius of the subject site? NO

KCTT comment – As there are no paths currently classified as a PBN route within a 2km radius from the subject area, KCTT sourced other available information and showed them on Plan S02 in Appendix 2 for clarity.



Figure 14 - Cycling walking catchment - 15minutes (source: TravelTime app)

Does the site have existing cyclist facilities? NO

Does the site propose to improve cyclist facilities? YES

If YES, describe the measures proposed.

Although there are no designated cycling facilities in the area, Long Term Cycling Network (LTCN) plans show some long-term infrastructure in the area.

Primary Cycling Route is planned along the Tonkin Highway extension, while Rutland Road and Great Northern Highway (south of Rutland Road) are future secondary routes. Kimberley Street And Chittering Road (south of Kimberley Street) are designated as a future local route. For a comprehensive visual reference, please consult Plan S02 in Appendix 2.

Two key distributors (north-south and east-west), as shown on the plans, will be classified as Integrator B / Neighbourhood Connector A roads. These types of roads, per Liveable Neighbourhoods, will feature on-road

cycling facilities (separated or protected cycle lanes). During the Local Structure Plan phase, contact with the Department of Transport should be established to see whether the LTCN can be further expanded to include the Amendment areas.

Cycling Route Hierarchy, per Department of Transport:

1. Primary Cycling Route - Primary routes are high-demand corridors connecting major regional destinations. They form the spine of the cycle network and are often located adjacent to major roads, rail corridors, rivers and ocean foreshores. Primary routes are vital to all sorts of bike riding, including medium or long-distance commuting/utility, recreational, training and tourism trips.

2. Secondary Cycling Route - Secondary routes have a moderate level of demand, providing connectivity between primary routes and major activity centres such as shopping precincts, industrial areas or major health, education, sporting and civic facilities. Secondary routes support many commuting and utility type trips, but are used by all bike riders, including children and novice riders.

3. Local Cycling Route - Local routes experience a lower level of demand than primary and secondary routes but provide critical access to higher-order routes, local amenities and recreational spaces. Predominantly located in local residential areas, local routes often support the start or end of each trip and must cater to the needs of users of all ages and abilities.

7.4 Provisions for Micromobility Vehicles

Micromobility (or Micromobility Vehicles) refers to a range of small, lightweight vehicles operating at speeds typically below 25 km/h and driven by users personally, which may or may not be battery-assisted. Therefore, this broad term encompasses bicycles, e-scooters, e-bicycles, cargo bicycles, skateboards, roller skates, mobility assisting vehicles etc.

Given the intent of the proposed development, further design development should consider the requirements of micromobility vehicles on key shared paths and accessways and provide a design outcome that is suitable for all ages and all abilities.

Some key points to be considered in further design development are as follows:

a) Appropriate width of circulation spaces (paths and other spaces not dedicated to play, rest and high-skill-level recreational activities)

The figure below shows components of bikeable width, as recommended by NACTO. Although this figure pertains to one-directional bikeway, we believe that the consideration is appropriate. NACTO recommends the approach below for bikeways, which must accommodate commuter and recreational traffic.

Recommended NACTO ***bikeable width*** for two-way paths, located away from busy thoroughfares, is 2.8m-3.4m for paths where a cargo bike can be expected. While bicyclists are not expected to cruise and must travel at lower speeds, wider paths would accommodate variety of pedestrians visiting the centre.

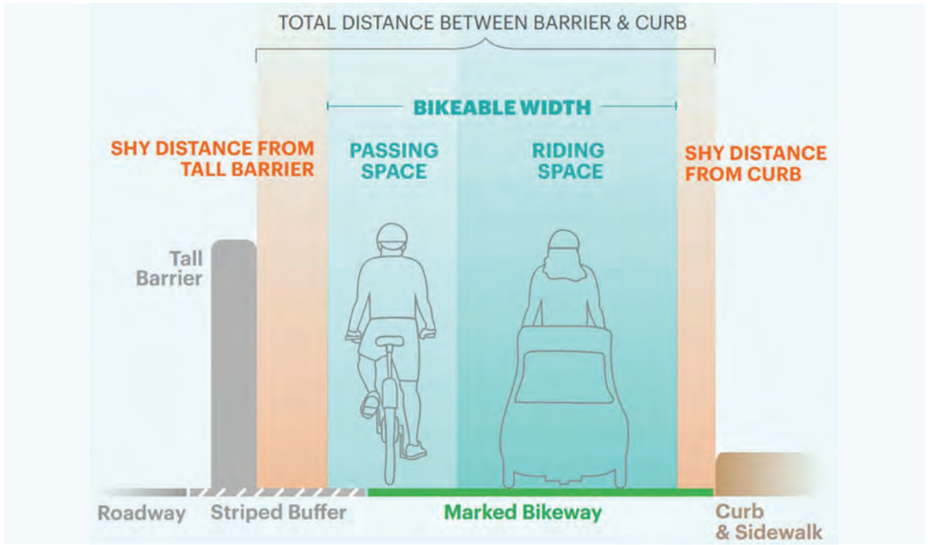


Figure 15 - Considerations for bikeway (source: NACTO)

In addition to the bikeable width, ***shy distance*** (distance from a vertical obstacle deemed unrideable) must be considered as well. Shy distance depends on the side barrier and can range from 0.2m to 0.6m.

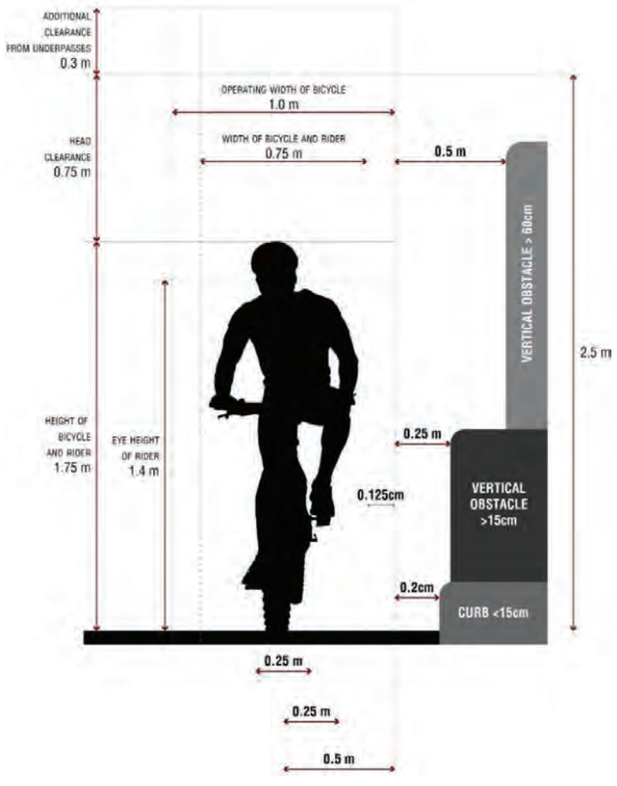


Figure 16 - Vertical clearances and bike-rider operating envelope (NACTO and DoT WA)

Department of Transport WA echoes these guidelines and provides clear guidance on vertical clearances, which should be observed when designing paths travelling under structures and vegetation.
Based on the information above, minimum shared path width should be from 3.2m to 4.0m, depending on the type of vertical obstacles adjacent to the path.
NACTO guidelines align fairly well to the recommendations of Austroads Guide to Road Design, Part 6A: Paths for Walking and Cycling, as shown in the figure below.

Table 5.3: Shared path widths

	Suggested path width (m)		
	Local access path	Regional path[3]	Recreational path
Desirable minimum width	2.5	3.0	3.5
Minimum width – typical maximum	2.0[1] – 3.0[2]	2.5[1] – 4.0[2]	3.0[1] – 4.0[2]

Figure 17 - Austroads recommendations on the width of shared paths (source: GtRD6A)

b) Path gradients and connections to the external network

Although there is a general recommendation that paths should not be steeper than 5%, AS1428 recommends that 2.5% should not be exceeded to ensure that the paths are accessible to all users (if the terrain permits).
Connections to the external network, appropriate ramps and crossings should be designed and constructed not to feature abrupt grade changes. Vehicles such as scooters and skateboards have small, dense wheels and low ground clearances; therefore, abrupt grade changes and uneven surfaces can jolt the rider of a device.

c) Parking/charging spaces

Parking areas should be placed in the vicinity of rest and play areas, and in vicinity of pedestrian entrance points. While bicycle parking is the first form of parking for micromobility vehicles that comes in mind, parking areas for scooters and skateboards should be considered. These can be simple wide, paved areas where riders can store their devices while resting. Alternatively, devices are likely to be left on the path, creating obstructions for other visitors. With the rise of battery-powered and electric devices, it would be prudent to consider locations for device charging, should space allow it.

d) Shared micro-mobility schemes

Potential micro-mobility share schemes can be considered given a significant residential component in this development. The residents can be offered access to shared pool of electric bicycles, scooters or other devices. Charging / docking stations should be strategically placed and easily accessible to the residents.

7.5 Public Transport Accessibility

How many bus routes are within 400 metres of the subject site?	None
How many rail routes are within 800 metres of the subject site?	None

Bus Route	Description	Peak Frequency	Off-Peak Frequency
311*	Midland Station – Bullsbrook	20minutes	2 times a day

Note* -Nearest Bus Route 311 is approximately 600m-800m south of the subject area.(Please refer Appendix 2).

Walk Score Rating for Accessibility to Public Transport
1 | Car–Dependent. Almost all errands require a car.

Is the development in a Greenfields area?	YES

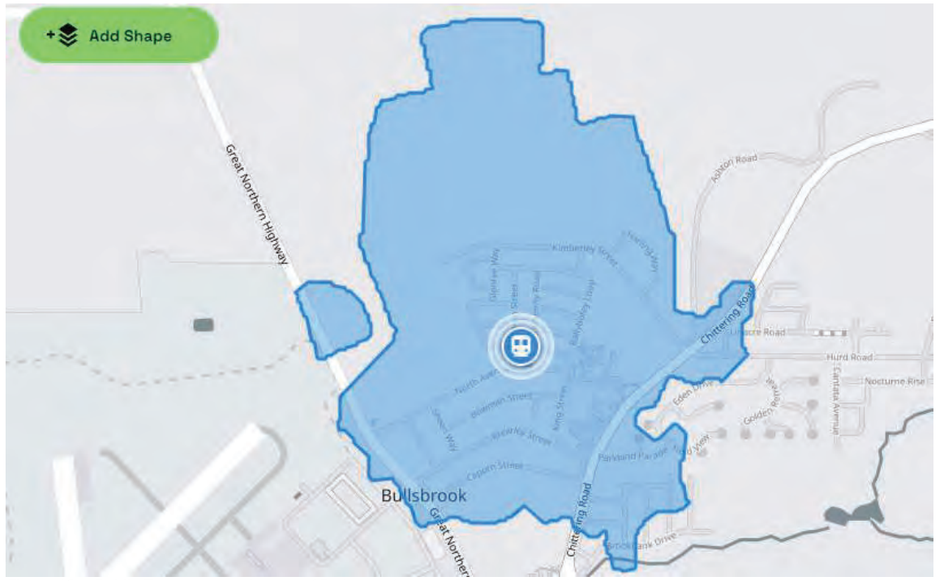


Figure 18 – Public Transport catchment - 15minutes (source: TravelTime app)

In December 2021, KCTT received confirmation by the representative of the PTA '*' that Transperth does not currently have plans to operate future public transport routes on or near Morrisey Road in Bullsbrook.*'' In March 2024, KCTT sent another request for updated information and received the following response:

> *''Currently, Transperth operates the Route 311 bus service between Midland Station and Bullsbrook via Great Northern Hwy, Chittering Rd, Brearley St, Truscott St to a terminus on North Ave. For the completion of the Morley Ellenbrook Line this service will be realigned to travel slightly more north via King St and North Ave in Bullsbrook (still terminating on North Ave). It is worth noting that Kimberley St is currently too narrow to operate a bus service in some sections. Kimberley Street had previously been considered for an extension of the Route 311.*

> *Due the low density and relative isolation from the urban front any service improvements in Bullsbrook are considered a low priority as it is difficult to justify the provision of further services and greater frequency due to the small passenger catchment and current low patronage of the existing bus services. Further, any new services will be dependent on a suitable route network (with road widths suitable for a bus) and the availability of resources. For these reasons, it is unlikely that the subject site will be served by public transport for some time."*

It is anticipated that the PTA may change their position once the land is rezoned for urban use, considering the expected yields. This rezoning would likely increase the population density and passenger catchment area, making it more feasible to justify the provision of additional services and increased frequency.

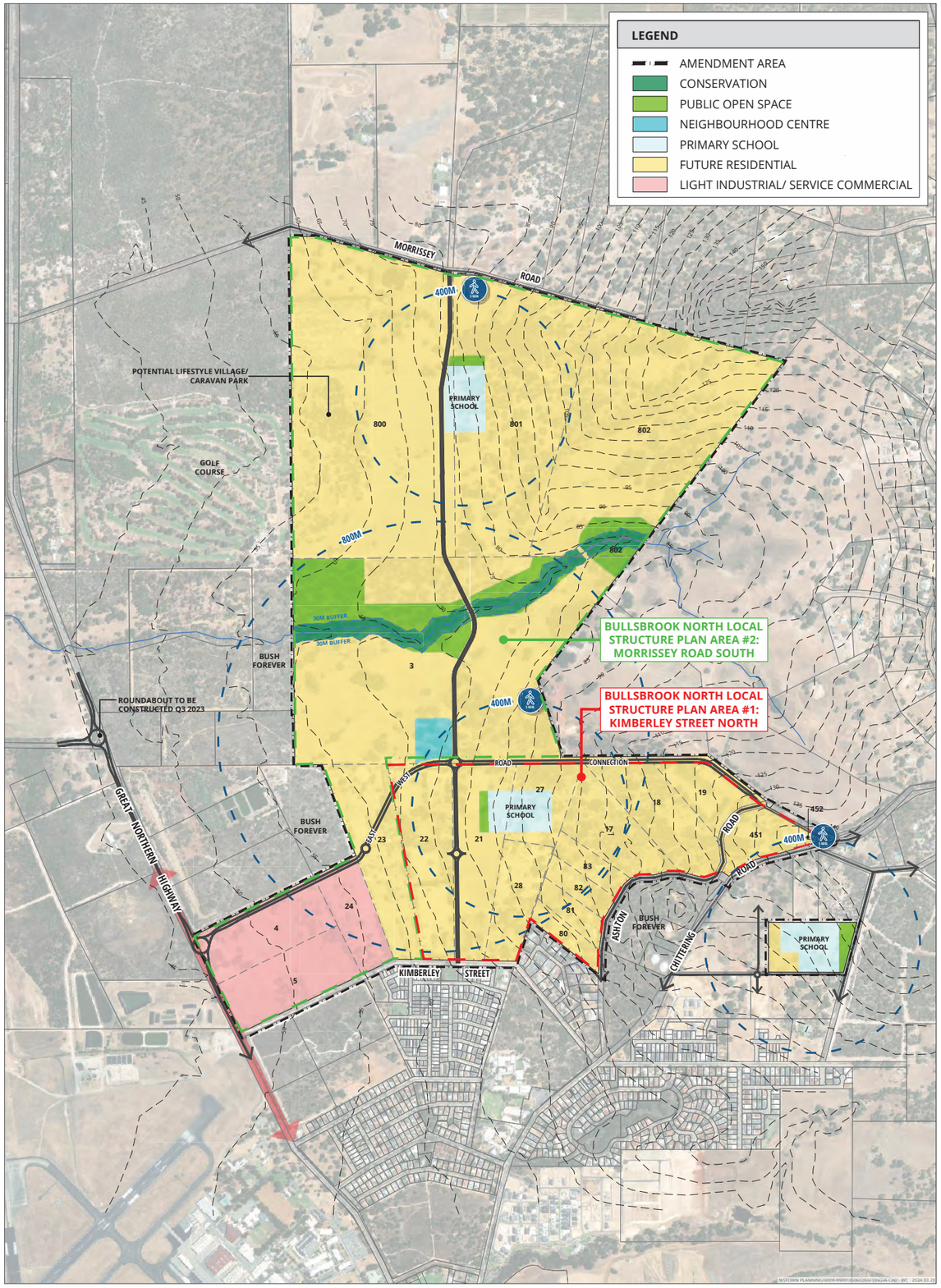
The anticipated urban development could create a stronger case for extending bus routes and improving public transport infrastructure. Therefore, it is crucial that future planning processes include ongoing liaison with the PTA to ensure that transport services are aligned with the evolving needs of the community and the projected growth of the area. This collaborative approach will help to ensure that public transport provisions are effectively integrated into the overall urban development plan, facilitating better connectivity and accessibility for future residents.

8. Site-Specific Issues and Proposed Remedial Measures

How many site-specific issues need to be discussed?	One
Site-Specific Issue No 1	**Traffic impact of the subject Amendment Area on the surrounding road network**
Remedial Measure / Response	The total additional traffic impact of the proposed DSP Amendments (with reciprocity between the proposed land uses applied) is expected to be approximately 34,458 vehicular trips per day, 3,608 vehicular trips per hour in the AM peak hour and 3,658 vehicular trips per hour in the PM peak hour. This is deemed a very high impact, per WAPC guidelines; however, the network will be designed and constructed to cater to the demand. Connection to Great Northern Highway / Rutland Road roundabout is of utmost importance, notwithstanding there may be some constraints in connecting Rutland Road to the Amendment area. In the following planning stages, PTA and DoT should be included in the communication to investigate the potential for expanding the public transport network and LTCN.

Appendix 1

The Layout of the Proposed Development



PLAN 2: BULLSBROOK TOWNSITE DISTRICT STRUCTURE PLAN (AS AMENDED) - INSET
BULLSBROOK

N
0 300 m
SCALE @ A3: 1:12,500
9506-DSP-01-G

DRAWN: JS
DATE CREATED: 2024.03.20
PROJECTION: MGA50 GDA94
CADASTRE: LANDGATE
AERIAL: BING 2020

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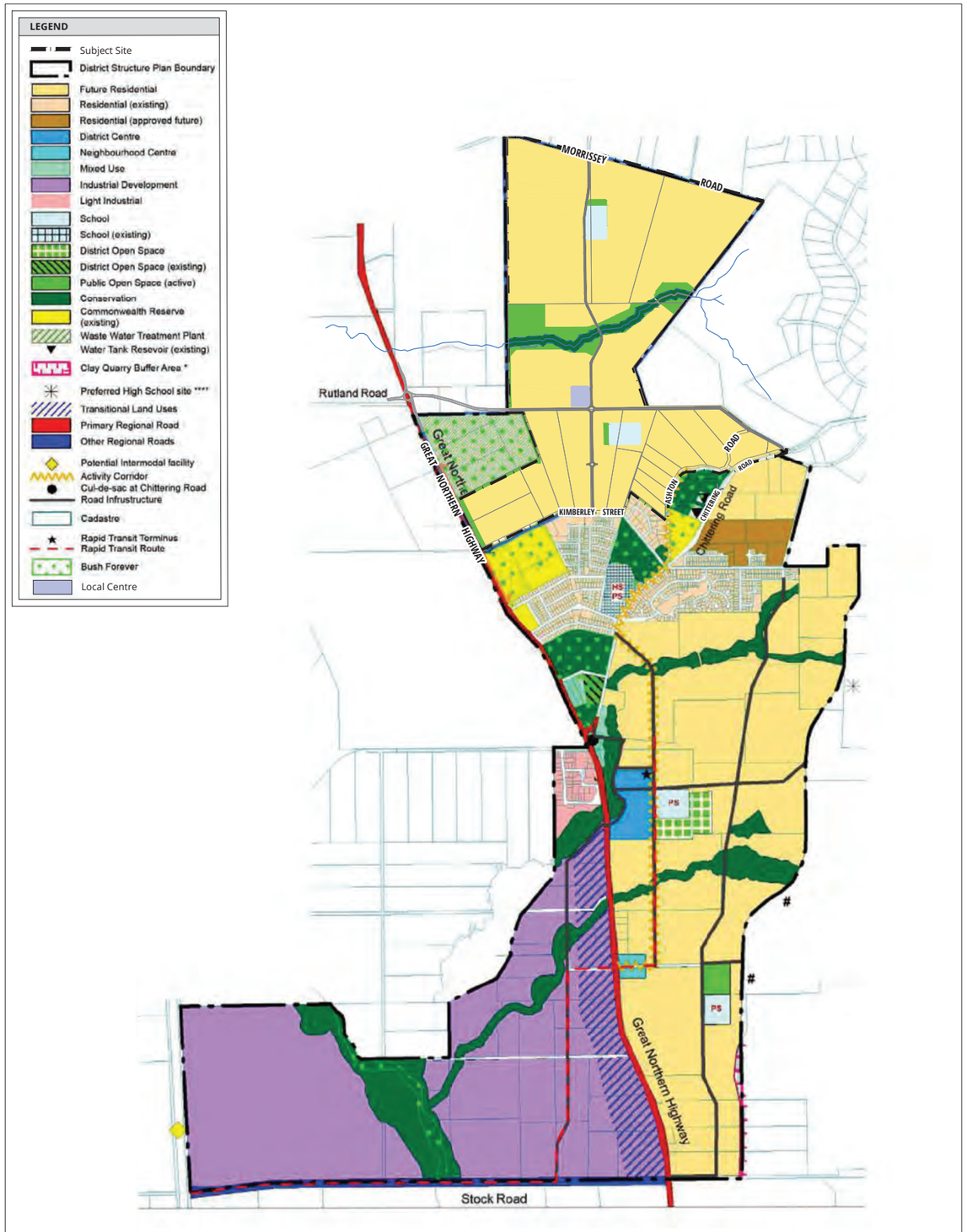

AMENDMENT No.	SUMMARY OF THE AMENDMENT	AMENDMENT TYPE	DATE APPROVED BY WAPC
1	NORTHERN PRECINCT - MODIFIED LAND USE DESIGNATION; INTRODUCTION OF PART 1 OF THE LSP	STANDARD	

N:\TOWN PLANNING\9000-9999\9506\DRAFTING\A-CAD - JK - 2023.02.16

PLAN 1: BULLSBROOK TOWNSITE DISTRICT STRUCTURE PLAN (AS AMENDED)

BULLSKBROOK

N

0 625 m

SCALE @ A3: 1:25,000

9506-FIG-04-C

DRAWN: JS
DATE CREATED: 2023.02.16
PROJECTION: MGA50 GDA94
CADASTRE: LANDGATE

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MORRISSEY ROAD

GREAT NORTHERN HIGHWAY

RUTLAND ROAD

KIMBERLEY STREET

ASHTON ROAD

CHITTERING ROAD

LEGEND

- SUBJECT SITE
- BULLSBROOK NORTH LANDOWNER GROUP
- NON SUPPORTIVE
- COULD NOT CONTACT

BULLSBROOK NORTH	AREA (ha)
LANDOWNER GROUP	335.63ha
NON LANDOWNER GROUP (OTHER/ UNKNOWN/ NOT SUPPORTIVE)	16.72ha
COULD NOT CONTACT	2.29ha
TOTAL	354.64ha

800 Jennifer Margaret Cockram, Terence William Cockram — 68.5297ha

801 Finwave Ltd — 41.0015ha

802 WPG Landholdings No 5 Pty Ltd — 48.2462ha

3 WPG Landholdings No 5 Pty Ltd — 80.5577ha

4 Noel Pomery, Su-Mei Pomery — 10.0160ha

5 Noel Pomery, Su-Mei Pomery — 10.0261ha

22 Sherri Annette Neeling, Carlo Italiano — 12.9828ha

23 Murray Craig Atkinson, Louise Ann Atkinson — 12.6869ha

24 Lynette Esther Fondacaro — 6.2524ha

21 D J M Bullsbrook Pty Ltd — 12.8336ha

27 Kimberley Street Investment Pty Ltd — 6.7808ha

28 James Francis Bennett, Carol Jean Hohnke — 6.7808ha

17 Bullsbrook Investment Co Pty Ltd — 8.2025ha

18 Ashton Road Investment Co Pty Ltd — 9.7580ha

19 Gary Joseph Tomasovich — 4.9093ha

451 Christine Lindsay, David Lindsay — 4.6044ha

452 Lindsay Pty Ltd — 4858m²

83 Andrew Douglas Peterson — 2.6652ha

82 Kevin James Love, Barbara Anne Love — 2.5071ha

81 David Charles Robinson, Cindy Anne Robinson — 2.5224ha

80 Xiuqin Wang — 2.2899ha

LANDOWNERSHIP PLAN

VARIOUS LOTS - GREAT NORTHERN HIGHWAY - MORRISSEY ROAD - KIMBERLEY STREET
BULLSBROOK

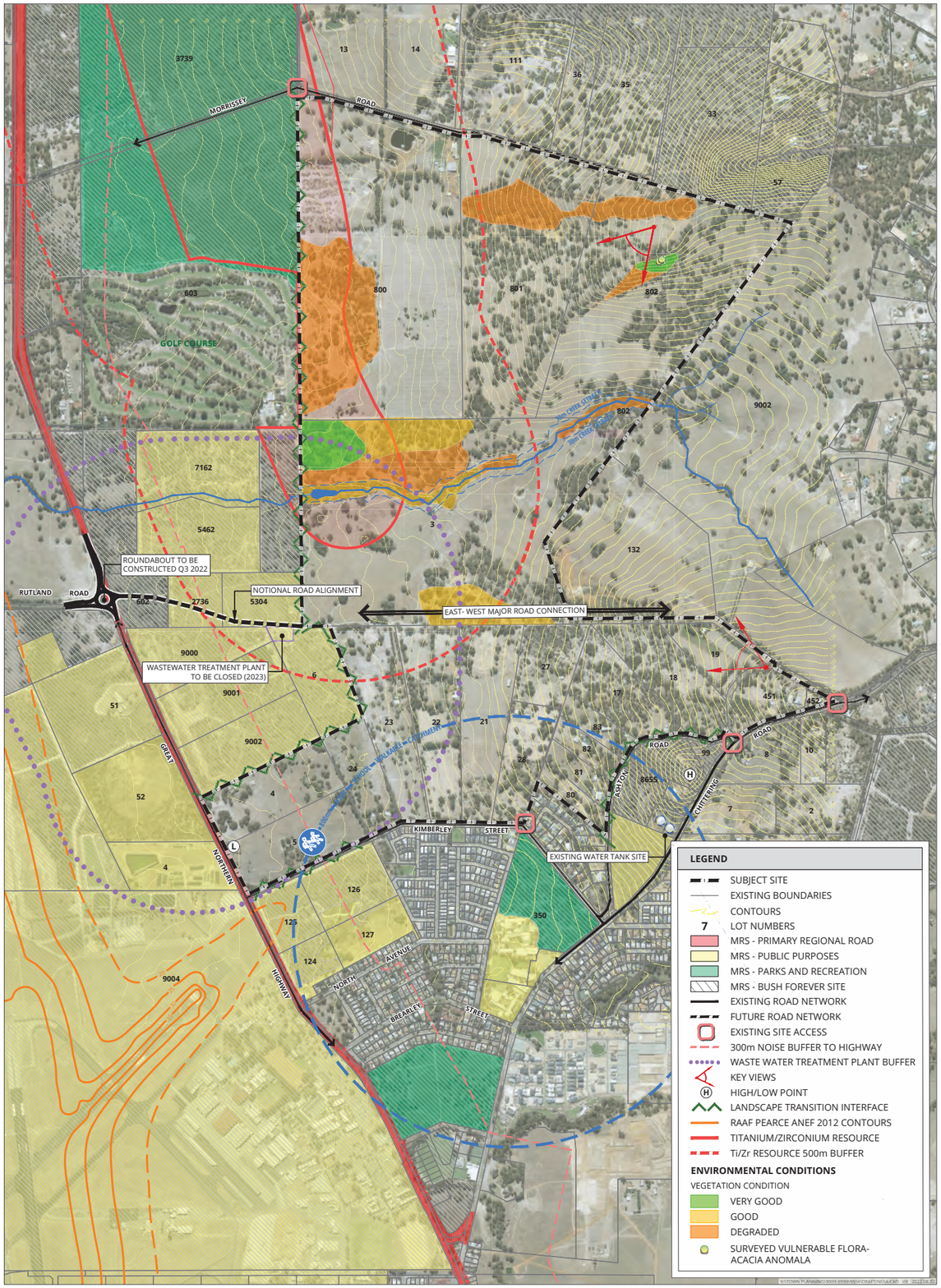
NORTH

0 400 m

9506-FIG-07-E SCALE @ A2: 1:8000

ROWE GROUP DESIGN

9506_FIG07_20220719_Bullsbrook (Landowners) | DRAWN: W. CLEMENTS | DATE CREATED: 2022.07.19 | PROJECTION: MGA50 GDA94
G:\9506 PROJECTS\9506 BULLSBROOK\GIS\MAPS\9506_FIG07_LANDOWNERS_20220719.MXD | W. CLEMENTS - GIS / VISUALISATION - 19/07/2022 11:47:59 AM



OPPORTUNITIES AND CONSTRAINTS PLAN

OPPORTUNITIES AND CONSTRAINTS PLAN
BULLSBROOK

N

0 300 m
SCALE @ A3: 1:12,5000

9506-FIG-09-B

DRAWN: VR
DATE CREATED: 2022.08.02
PROJECTION: MGA50 GDA94
CADASTRE: LANDGATE
AERIAL: 18/04/2022

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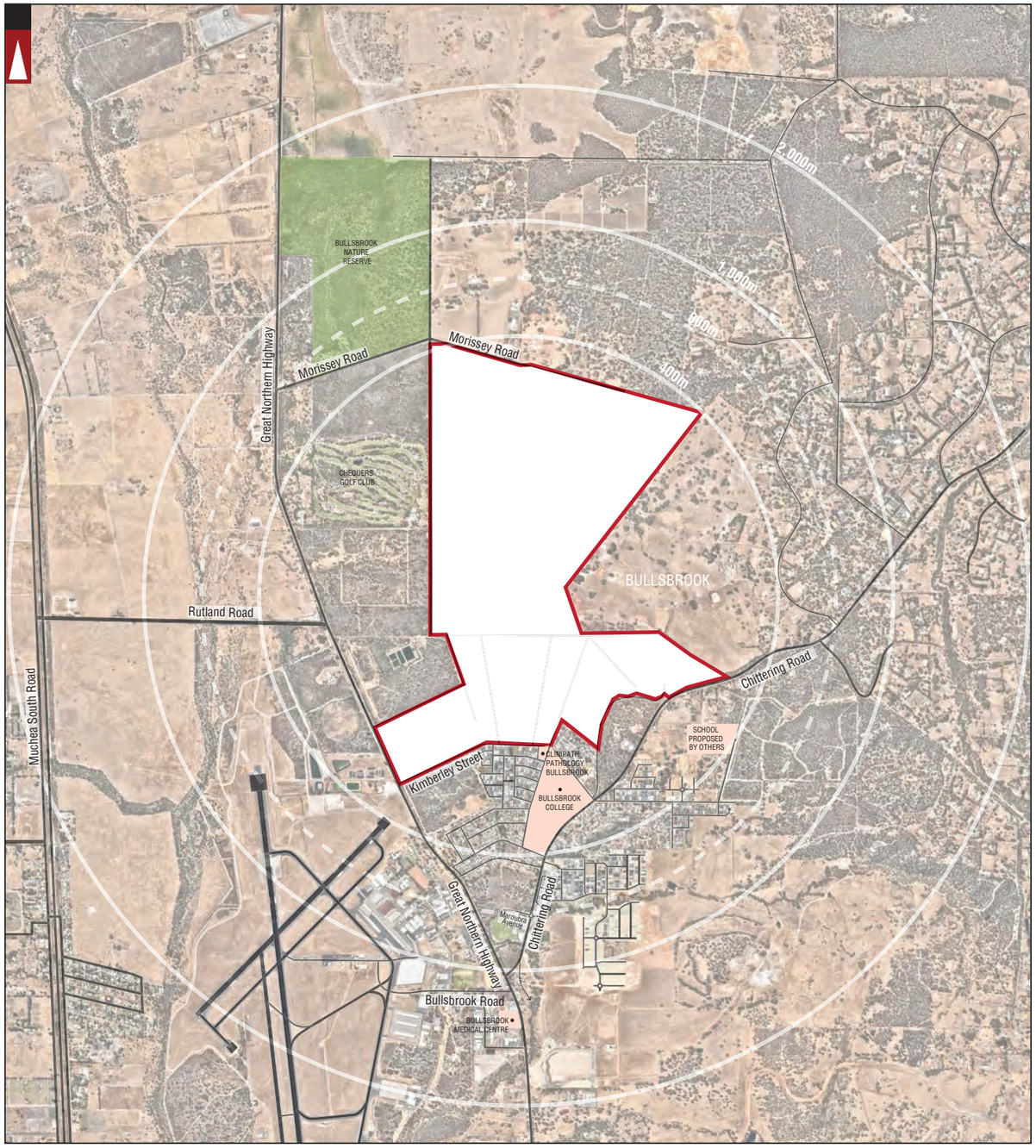
ROWE GROUP DESIGN

Appendix 2

Transport Planning and Traffic Plans



PARKS AND RECREATION
WATERWAYS
PUBLIC PURPOSE
LOCATION BOUNDARY
ROAD
Hay Street STREET NAME
RAILWAY
DISTANCE FROM LOCATION
CITY OF SWAN LOCAL GOVERNMENT NAME
BULLSBROOK SUBURB NAME
LOCAL AUTHORITY BOUNDARY

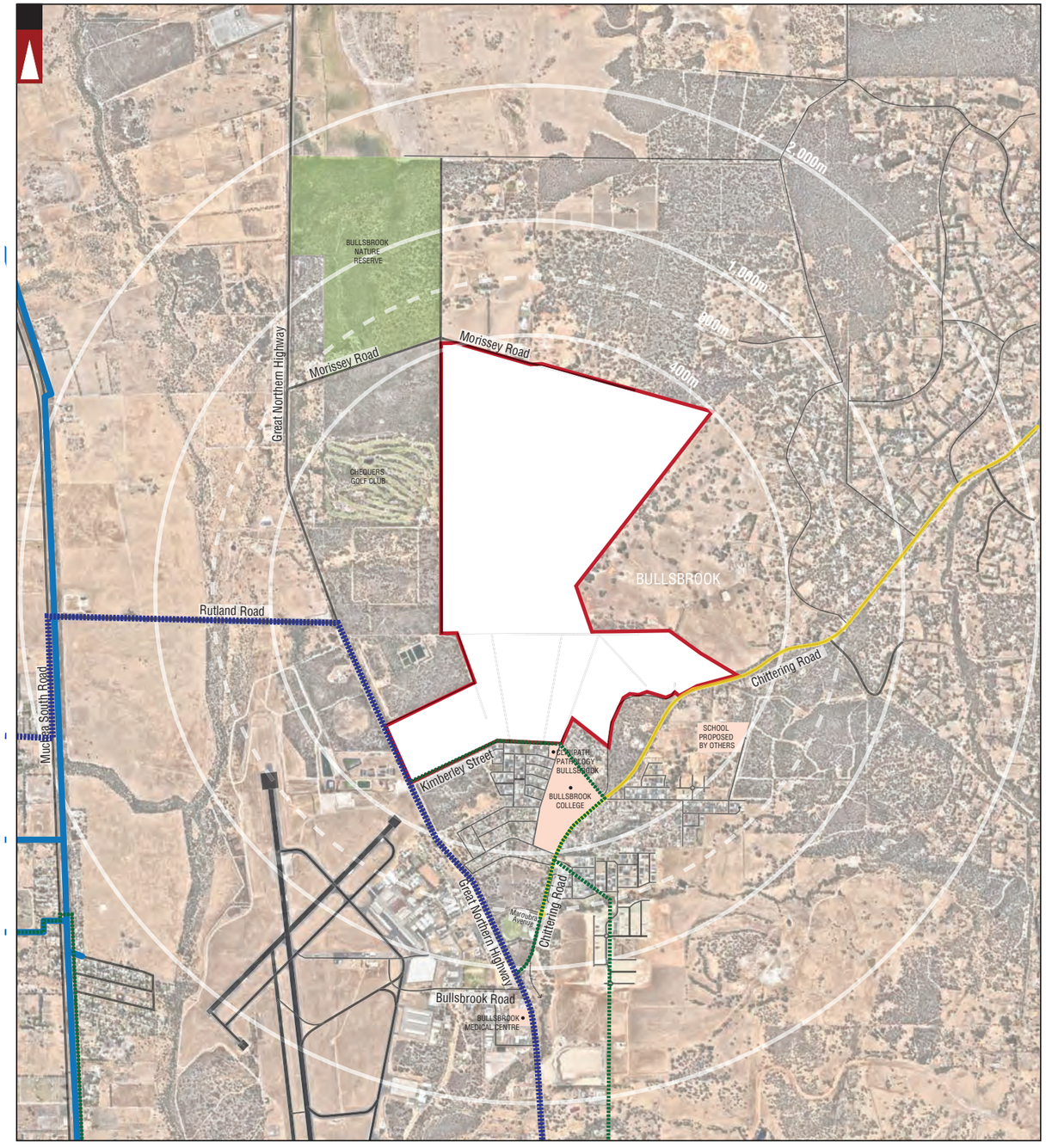
LEGEND

No	DATE	AMENDMENT
C	11-06-2024	INFORMATION UPDATED
B	23-03-2023	INFORMATION UPDATED
A	03-03-2023	INFORMATION UPDATED
A_{draft}	20-12-2021	ISSUED FOR REVIEW

PROJECT: AMENDMENT TO BULLSBROOK TOWNSITE NORTH BULLSBROOK – DISTRICT STRUCTURE PLAN
TITLE: LOCALITY PLAN - 2,000M RADIUS
DRAWING NUMBER: KC01293.000_ S01
DRAWN BY: J.S.

Civil & Traffic Engineering Consultants
KCTT (Trading as KC Traffic and Transport Pty Ltd)
PO Box 1456 Scarborough WA 6922
PH: 08 9441 2700
WEB. www.kctt.com.au

kctt PART OF



PARKS AND RECREATION
WATERWAYS
PUBLIC PURPOSE
LOCATION BOUNDARY
ROAD
Hay Street STREET NAME
RAILWAY
DISTANCE FROM LOCATION
CITY OF SWAN LOCAL GOVERNMENT NAME
BULLSBROOK SUBURB NAME
LOCAL AUTHORITY BOUNDARY
POPULAR CYCLING ROUTES WITHIN BULLSBROOK AREA (INFORMATION SOURCED VIA WWW. BIKEMAP.NET)
THE NEWEST CLASSIC BIKE ROUTE - 140KM BETWEN BULLSBROOK AND TOODYAY (INFORMATION SOURCED VIA WWW. RIDEWITHGPS)
EXISTING LONG-TERM CYCLE NETWORK (LTCN) ROUTES
SECONDARY ROUTE
LOCAL ROUTE

LEGEND

No	DATE	AMENDMENT
C	11-06-2024	INFORMATION UPDATED
B	23-03-2023	INFORMATION UPDATED
A	03-03-2023	INFORMATION UPDATED
Adraft	20-12-2021	ISSUED FOR REVIEW

PROJECT: AMENDMENT TO BULLSBROOK TOWNSITE
NORTH BULLSBROOK – DISTRICT STRUCTURE PLAN

TITLE: BICYCLE NETWORK PLAN - 2,000M RADIUS

DRAWING NUMBER: KC01293.000_ S02

DRAWN BY: J.S.

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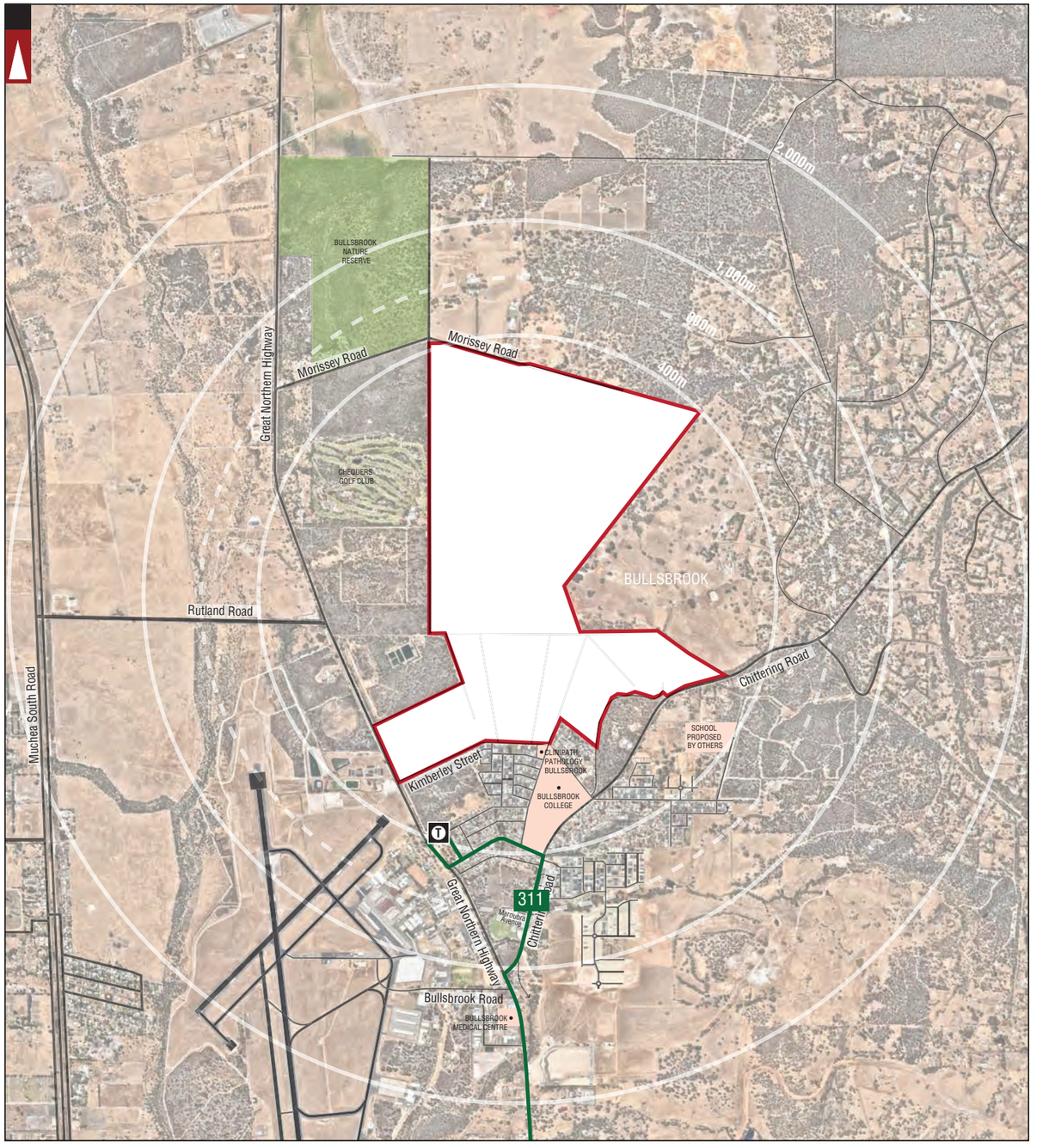

PARKS AND RECREATION
WATERWAYS
PUBLIC PURPOSE
LOCATION BOUNDARY
ROAD
Hay Street STREET NAME
RAILWAY
DISTANCE FROM LOCATION
CITY OF SWAN LOCAL GOVERNMENT NAME
BULLSBROOK SUBURB NAME
LOCAL AUTHORITY BOUNDARY
BUS ROUTES
311 BUS ROUTE NUMBER
BUS TERMINUS

NOTE : FOR MORE INFORMATION REGARDING THE DESCRIPTION OF BUS ROUTES AND THEIR INDICATIVE PEAK AND OFF-PEAK FREQUENCIES REFER TO THE REPORT.

LEGEND

No	DATE	AMENDMENT
C	11-06-2024	INFORMATION UPDATED
B	23-03-2023	INFORMATION UPDATED
A	03-03-2023	INFORMATION UPDATED
Adraft	20-12-2021	ISSUED FOR REVIEW

PROJECT: AMENDMENT TO BULLSBROOK TOWNSITE
NORTH BULLSBROOK – DISTRICT STRUCTURE PLAN

TITLE: PUBLIC TRANSPORT PLAN - 2,000M RADIUS

DRAWING NUMBER: KC01293.000_ S03

DRAWN BY: J.S.

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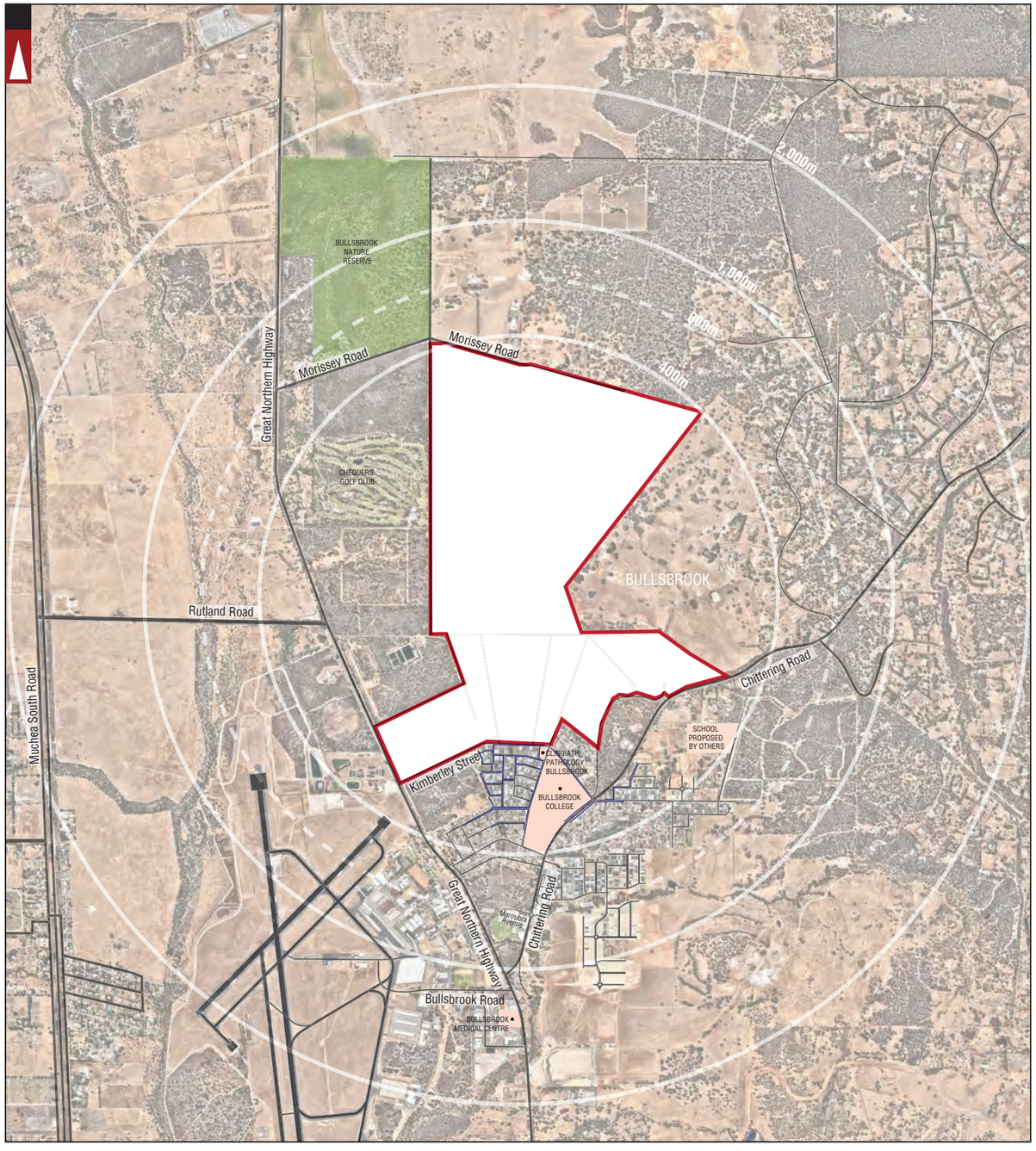

PARKS AND RECREATION
WATERWAYS
PUBLIC PURPOSE
LOCATION BOUNDARY
ROAD
Hay Street STREET NAME
RAILWAY
DISTANCE FROM LOCATION
CITY OF SWAN LOCAL GOVERNMENT NAME
BULLSBROOK SUBURB NAME
LOCAL AUTHORITY BOUNDARY
PEDESTRIAN PATH WITHIN 400M RADIUS FROM THE SUBJECT AREA

LEGEND

No	DATE	AMENDMENT
C	11-06-2024	INFORMATION UPDATED
B	23-03-2023	INFORMATION UPDATED
A	03-03-2023	INFORMATION UPDATED
Adraft	20-12-2021	ISSUED FOR REVIEW

PROJECT: AMENDMENT TO BULLSBROOK TOWNSITE NORTH BULLSBROOK – DISTRICT STRUCTURE PLAN

TITLE: PEDESTRIAN PATHS PLAN - 2,000M RADIUS

DRAWING NUMBER: KC01293.000_ S04

DRAWN BY: J.S.

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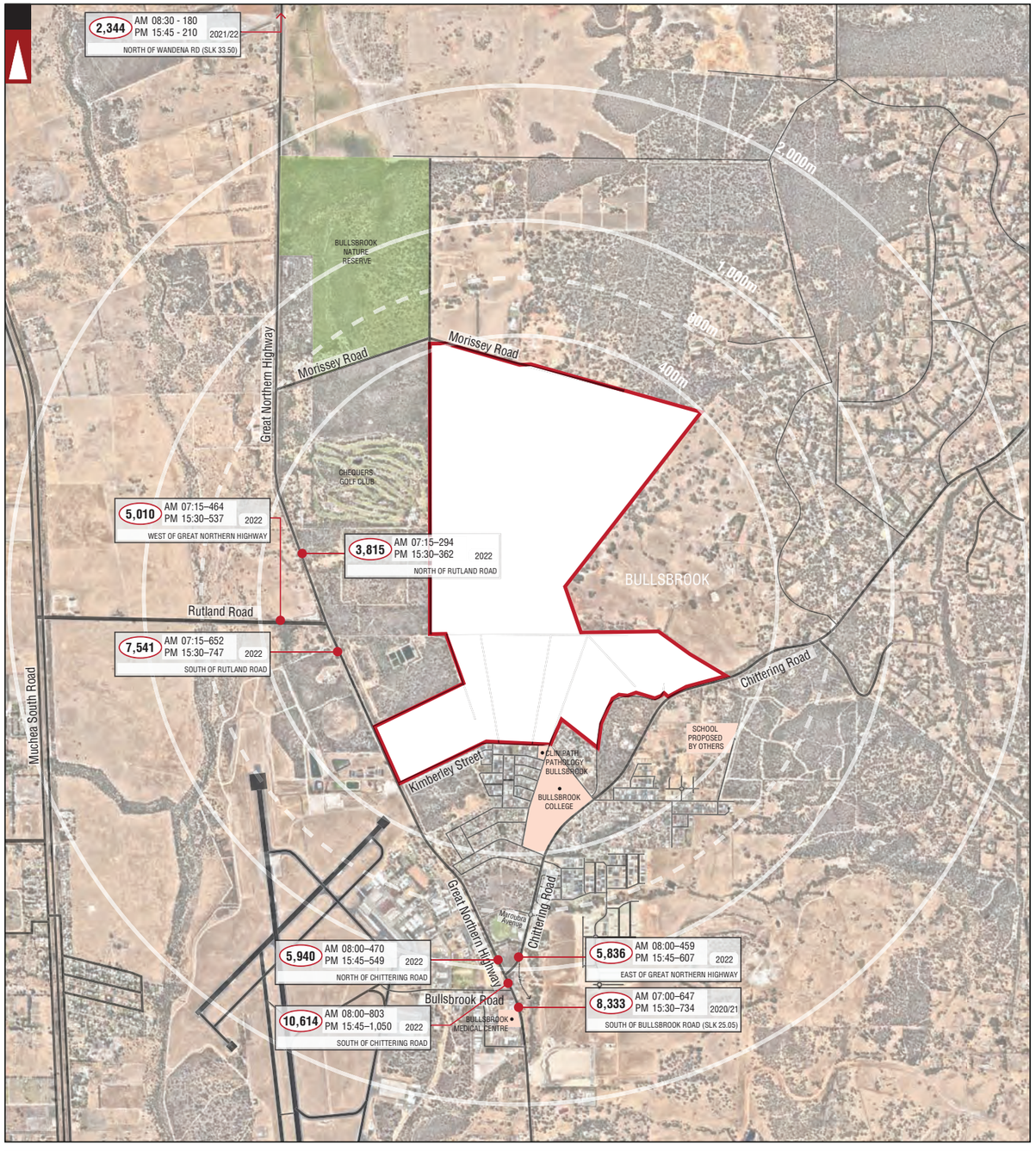

PARKS AND RECREATION
WATERWAYS
PUBLIC PURPOSE
LOCATION BOUNDARY
ROAD
Hay Street STREET NAME
RAILWAY
DISTANCE FROM LOCATION
CITY OF SWAN LOCAL GOVERNMENT NAME
BULLSBROOK SUBURB NAME
LOCAL AUTHORITY BOUNDARY
5,512 NUMBER OF VEHICLES PER DAY
AM 1145 – 381 PM 1630 – 480 NUMBER OF VEHICLES PER AM PEAK HOUR NUMBER OF VEHICLES PER PM PEAK HOUR
2014 YEAR
EAST OF HARLOW ROAD LOCATION

LEGEND

No	DATE	AMENDMENT
C	11-06-2024	INFORMATION UPDATED
B	23-03-2023	INFORMATION UPDATED
A	03-03-2023	INFORMATION UPDATED
Adraft	20-12-2021	ISSUED FOR REVIEW

PROJECT: AMENDMENT TO BULLSBROOK TOWNSITE NORTH BULLSBROOK – DISTRICT STRUCTURE PLAN

TITLE: EXISTING TRAFFIC COUNTS - 2,000M RADIUS

DRAWING NUMBER: KC01293.000_ S05

DRAWN BY: J.S.

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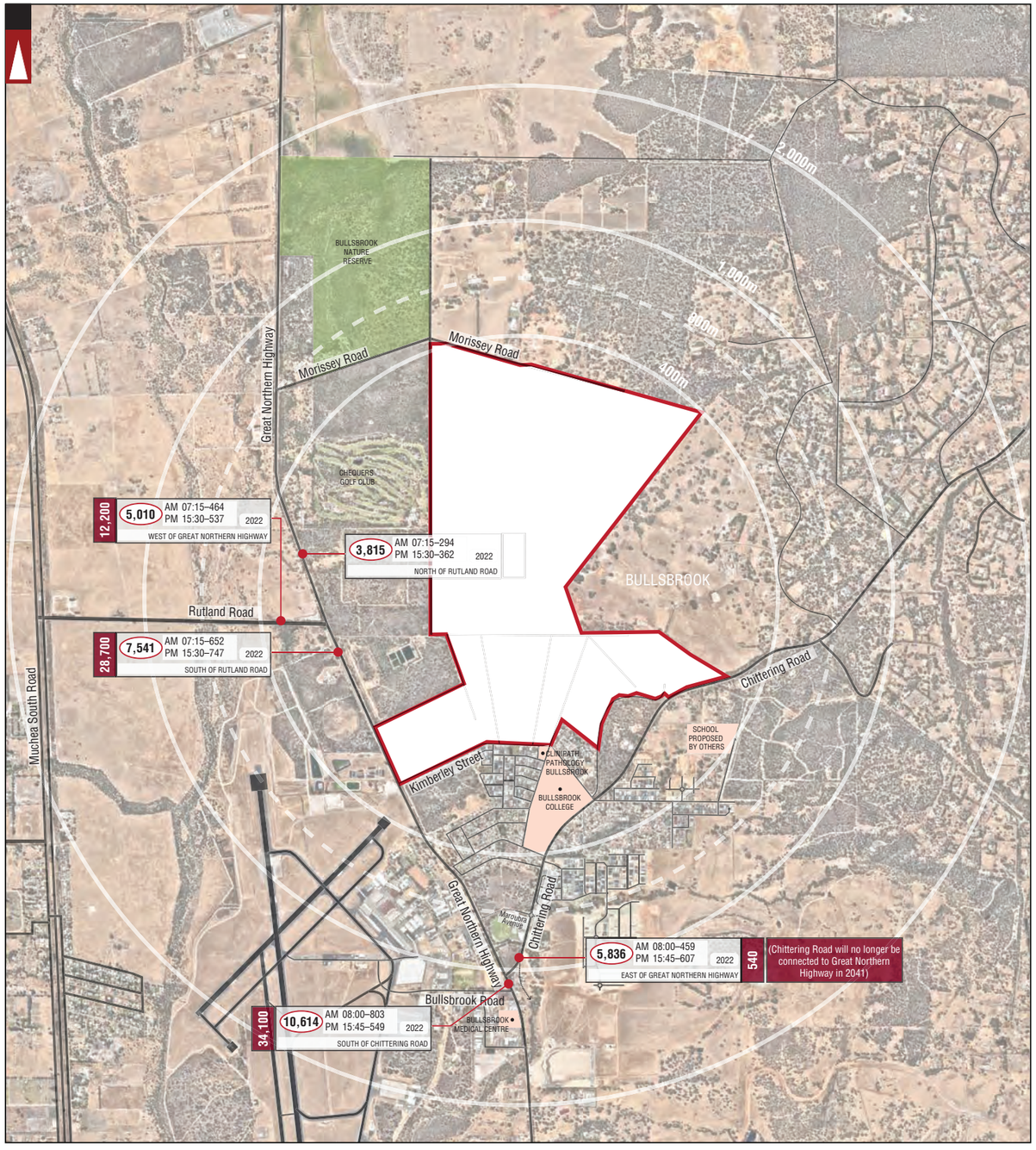

PARKS AND RECREATION
WATERWAYS
PUBLIC PURPOSE
LOCATION BOUNDARY
ROAD
Hay Street STREET NAME
RAILWAY
DISTANCE FROM LOCATION
CITY OF SWAN LOCAL GOVERNMENT NAME
BULLSBROOK SUBURB NAME
LOCAL AUTHORITY BOUNDARY
5,512 NUMBER OF VEHICLES PER DAY
AM 1145 – 381 PM 1630 – 480 NUMBER OF VEHICLES PER AM PEAK HOUR NUMBER OF VEHICLES PER PM PEAK HOUR
2014 YEAR
EAST OF HARLOW ROAD LOCATION
10,581 ESTIMATED TRAFFIC VOLUMES + SUBJECT SUBDIVISION PLAN GENERATED TRAFFIC - YEAR 2041(VPD)

LEGEND

No	DATE	AMENDMENT
C	11-06-2024	INFORMATION UPDATED
B	23-03-2023	INFORMATION UPDATED
A	03-03-2023	INFORMATION UPDATED
Adraft	20-12-2021	ISSUED FOR REVIEW

PROJECT: AMENDMENT TO BULLSBROOK TOWNSITE
NORTH BULLSBROOK – DISTRICT STRUCTURE PLAN

TITLE: EXISTING & ESTIMATED TRAFFIC COUNTS - 2,000M RADIUS

DRAWING NUMBER: KC01293.000_ S05a

DRAWN BY: J.S.

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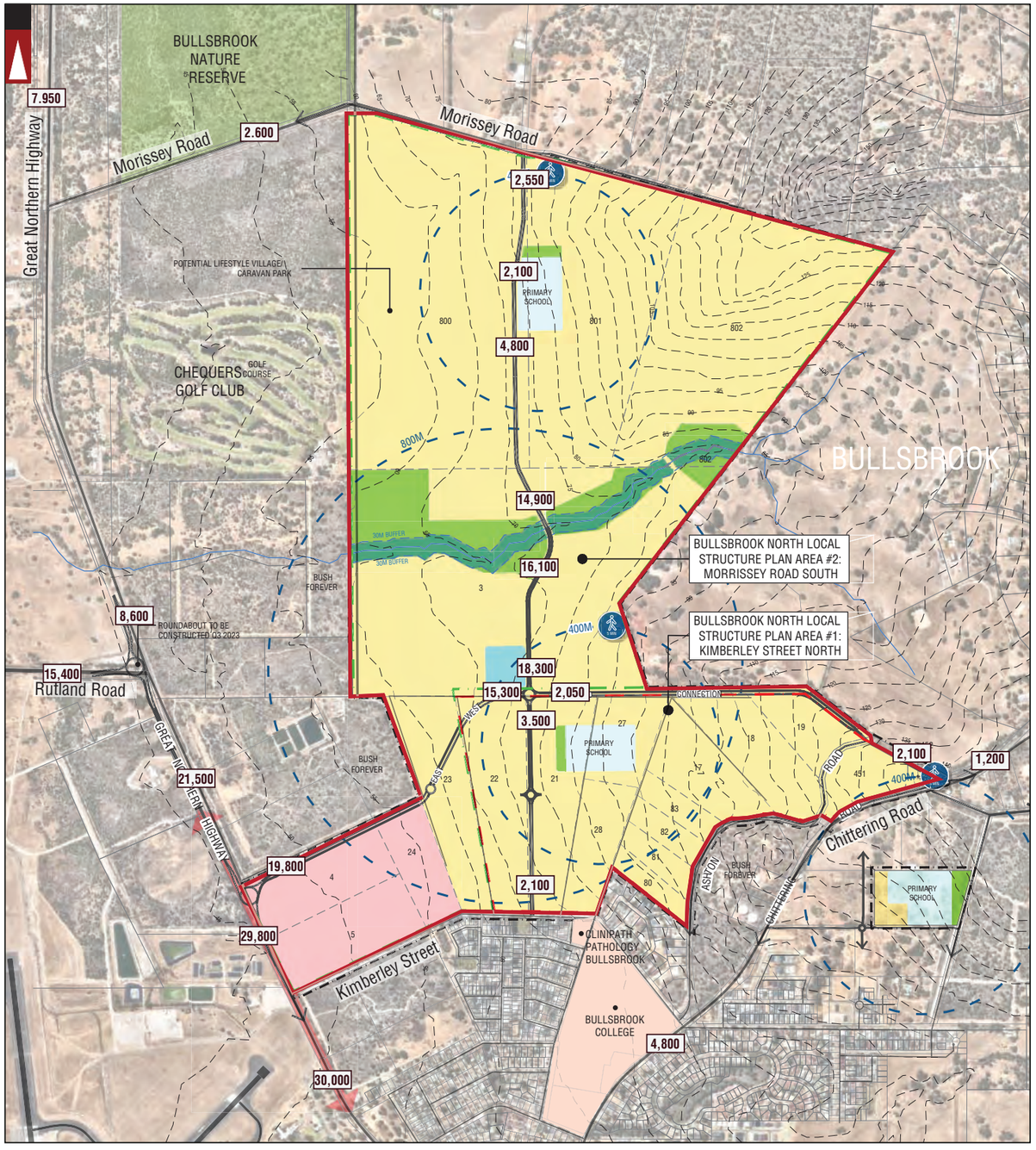
PART OF kctt



PARKS AND RECREATION
WATERWAYS
PUBLIC PURPOSE
LOCATION BOUNDARY
ROAD
Hay Street STREET NAME
RAILWAY
DISTANCE FROM LOCATION
CITY OF SWAN LOCAL GOVERNMENT NAME
BULLSBROOK SUBURB NAME
LOCAL AUTHORITY BOUNDARY
30,500 TOTAL DAILY SIMULATED FLOW (YEAR 2041)

NOTE: THE PLAN IS COURTEOUSY OF ROWE GROUP DESIGN.
LAYOUT IS SUBJECT TO MODIFICATION AT LOCAL STRUCTURE PLAN STAGE

LEGEND

No	DATE	AMENDMENT
C	25-06-2024	PROPOSED LAYOUT UPDATED
B	22-03-2023	PROPOSED LAYOUT UPDATED
A	03-03-2023	ISSUED FOR REVIEW

PROJECT: AMENDMENT TO BULLSBROOK TOWNSITE
NORTH BULLSBROOK – DISTRICT STRUCTURE PLAN

TITLE: TOTAL DAILY SIMULATED FLOW (YEAR 2041)

DRAWING NUMBER: KC01293.000_S06

DRAWN BY: J.S.

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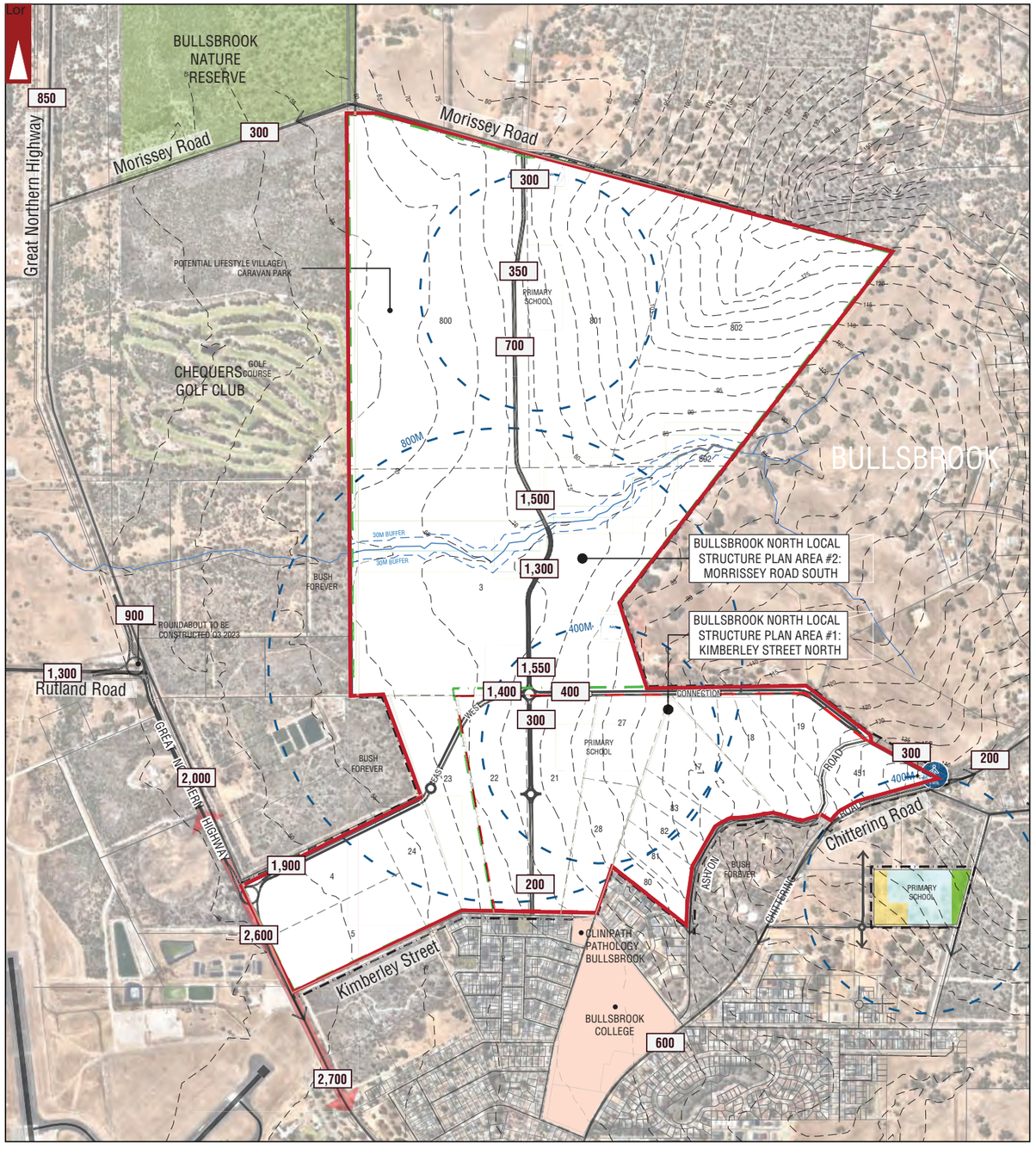

PARKS AND RECREATION
WATERWAYS
PUBLIC PURPOSE
LOCATION BOUNDARY
ROAD
Hay Street STREET NAME
RAILWAY
DISTANCE FROM LOCATION
CITY OF SWAN LOCAL GOVERNMENT NAME
BULLSBROOK SUBURB NAME
LOCAL AUTHORITY BOUNDARY
30,500 TOTAL AM PEAK HOUR SIMULATED FLOW (YEAR 2041)

NOTE: THE PLAN IS COURTEOUSY OF ROWE GROUP DESIGN.
LAYOUT IS SUBJECT TO MODIFICATION AT LOCAL STRUCTURE PLAN STAGE

LEGEND

No	DATE	AMENDMENT
C	25-06-2024	PROPOSED LAYOUT UPDATED
B	22-03-2023	PROPOSED LAYOUT UPDATED
A	03-03-2023	ISSUED FOR REVIEW

PROJECT: AMENDMENT TO BULLSBROOK TOWNSITE
NORTH BULLSBROOK – DISTRICT STRUCTURE PLAN

TITLE: TOTAL AM PEAK HOUR SIMULATED FLOW (YEAR 2041)

DRAWING NUMBER: KC01293.000_S07

DRAWN BY: J.S.

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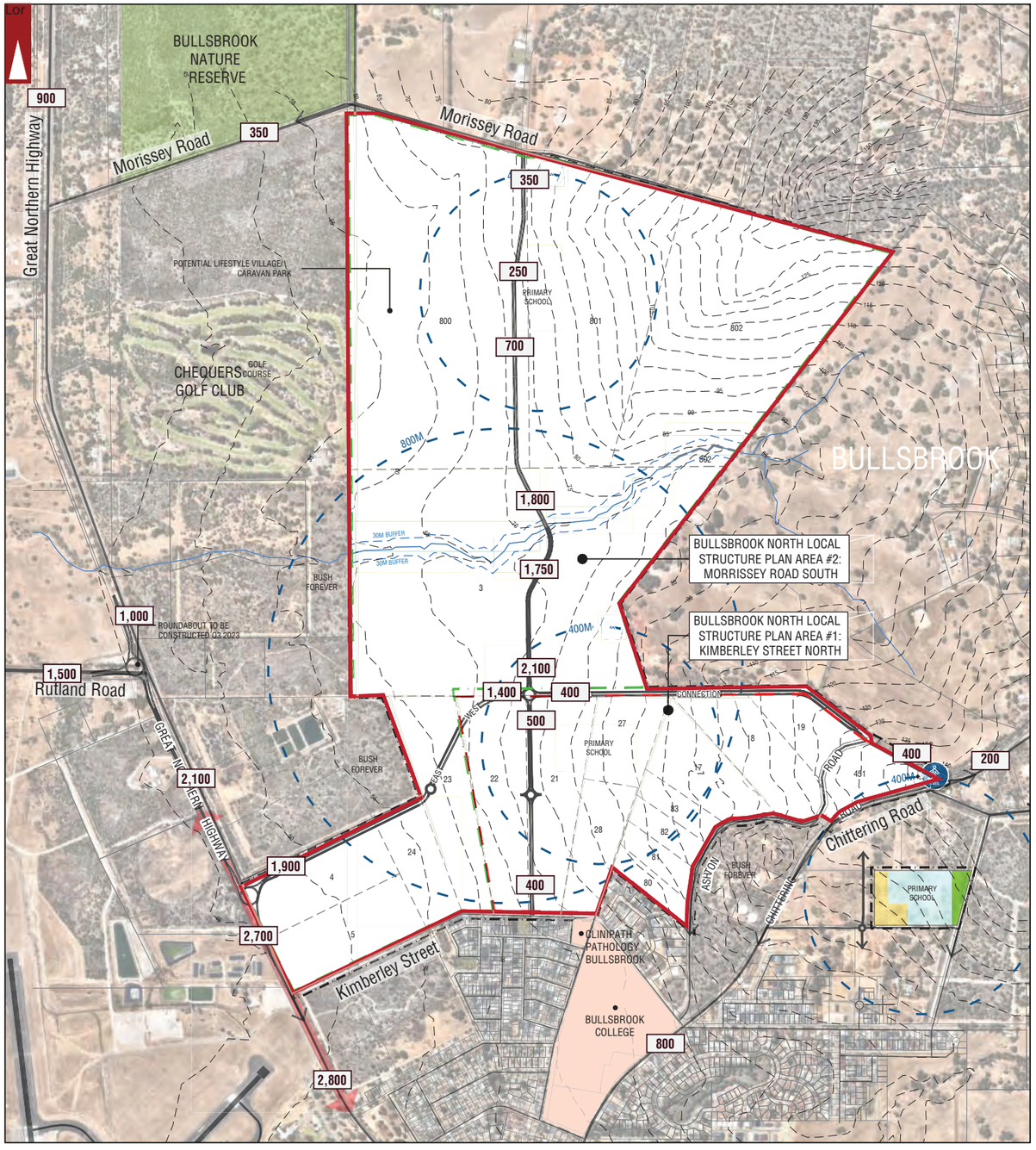

PARKS AND RECREATION
WATERWAYS
PUBLIC PURPOSE
LOCATION BOUNDARY
ROAD
Hay Street STREET NAME
RAILWAY
DISTANCE FROM LOCATION
CITY OF SWAN LOCAL GOVERNMENT NAME
BULLSBROOK SUBURB NAME
LOCAL AUTHORITY BOUNDARY
30,500 TOTAL PM PEAK HOUR SIMULATED FLOW (YEAR 2041)

NOTE: THE PLAN IS COURTEOUSY OF ROWE GROUP DESIGN.
LAYOUT IS SUBJECT TO MODIFICATION AT LOCAL STRUCTURE PLAN STAGE

LEGEND

No	DATE	AMENDMENT
C	25-06-2024	PROPOSED LAYOUT UPDATED
B	22-03-2023	PROPOSED LAYOUT UPDATED
A	03-03-2023	ISSUED FOR REVIEW

PROJECT: AMENDMENT TO BULLSBROOK TOWNSITE
NORTH BULLSBROOK – DISTRICT STRUCTURE PLAN

TITLE: TOTAL PM PEAK HOUR SIMULATED FLOW (YEAR 2041)

DRAWING NUMBER: KC01293.000_S08

DRAWN BY: J.S.

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PH: 08 9441 2700
WEB: www.kctt.com.au
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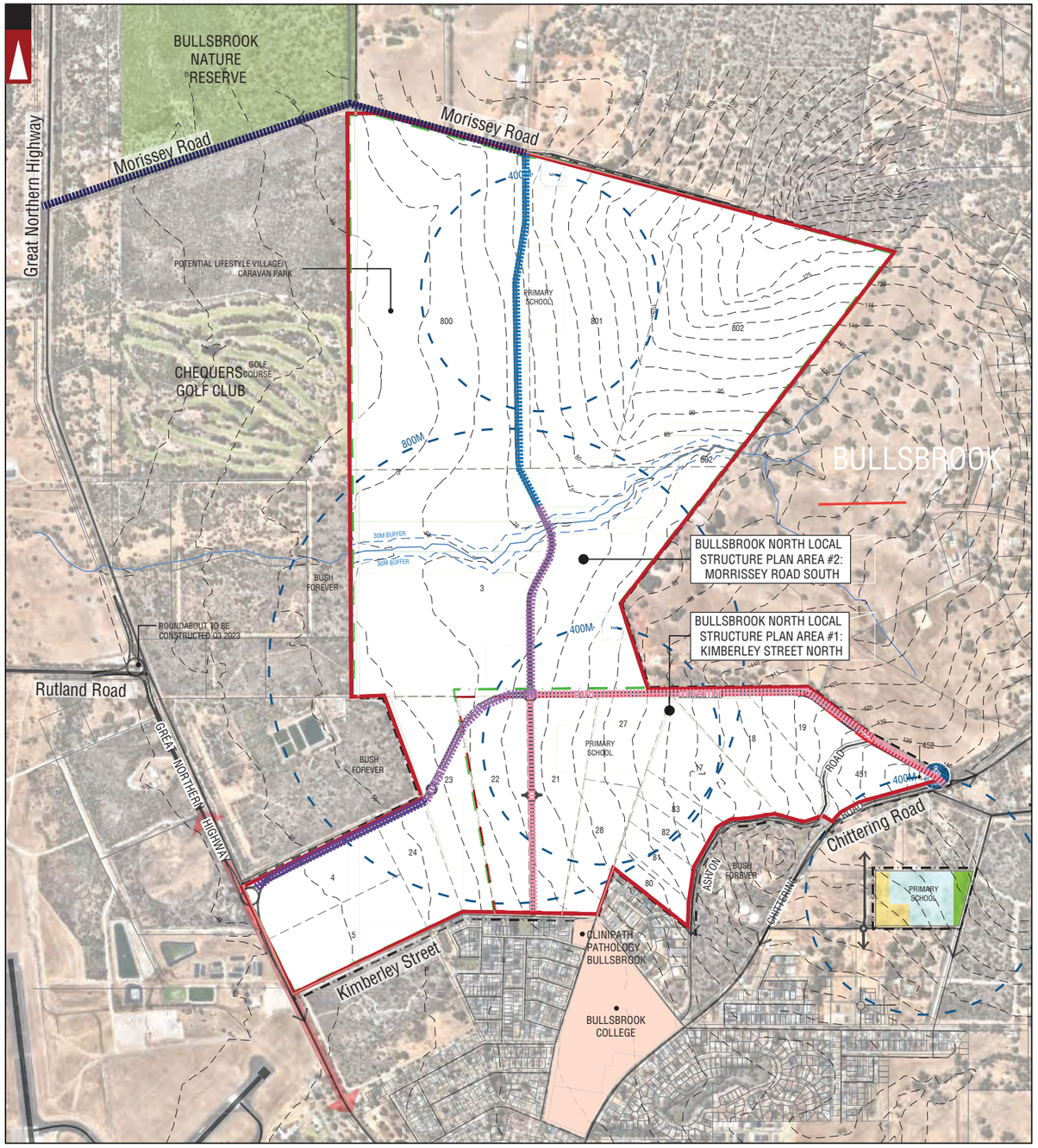

PARKS AND RECREATION
WATERWAYS
PUBLIC PURPOSE
LOCATION BOUNDARY
ROAD
Hay Street STREET NAME
RAILWAY
DISTANCE FROM LOCATION
CITY OF SWAN LOCAL GOVERNMENT NAME
BULLSBROOK SUBURB NAME
LOCAL AUTHORITY BOUNDARY
NEIGHBOURHOOD CONNECTOR A
NEIGHBOURHOOD CONNECTOR B
NEIGHBOURHOOD CONNECTOR B (MODIFICATION)
INTEGRATOR B
INTEGRATOR B (MODIFICATION)

NOTE: THE PLAN IS COURTEOUSY OF ROWE GROUP DESIGN. LAYOUT IS SUBJECT TO MODIFICATION AT LOCAL STRUCTURE PLAN STAGE

LEGEND

No	DATE	AMENDMENT
C	25-06-2024	PROPOSED LAYOUT UPDATED
B	22-03-2023	PROPOSED LAYOUT UPDATED
A	03-03-2023	ISSUED FOR REVIEW

PROJECT: AMENDMENT TO BULLSBROOK TOWNSITE NORTH BULLSBROOK – DISTRICT STRUCTURE PLAN

TITLE: Road Hierarchies Sketch

DRAWING NUMBER: KC01293.000_ S09

DRAWN BY: J.S.

Civil & Traffic Engineering Consultants
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PO Box 1456 Scarborough WA 6922
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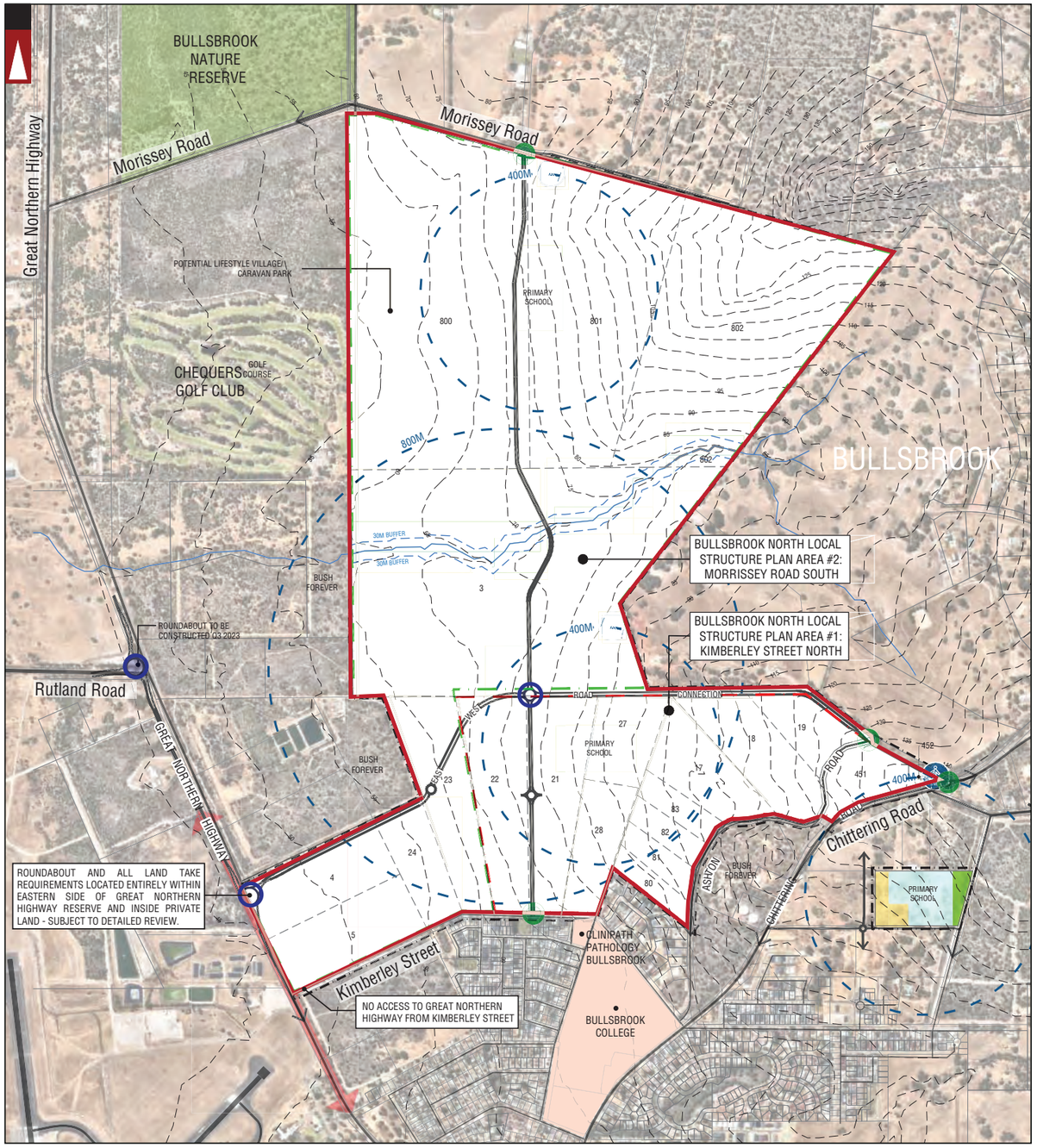

PARKS AND RECREATION
WATERWAYS
PUBLIC PURPOSE
LOCATION BOUNDARY
ROAD
Hay Street STREET NAME
RAILWAY
DISTANCE FROM LOCATION
CITY OF SWAN LOCAL GOVERNMENT NAME
BULLSBROOK SUBURB NAME
LOCAL AUTHORITY BOUNDARY
ROUNDABOUT
UNCONTROLLED T-INTERSECTION

NOTE: THE PLAN IS COURTEOUSY OF ROWE GROUP DESIGN. LAYOUT IS SUBJECT TO MODIFICATION AT LOCAL STRUCTURE PLAN STAGE

LEGEND

No	DATE	AMENDMENT
C	10-06-2024	PROPOSED LAYOUT UPDATED
B	22-03-2023	PROPOSED LAYOUT UPDATED
A	03-03-2023	ISSUED FOR REVIEW

PROJECT: AMENDMENT TO BULLSBROOK TOWNSITE NORTH BULLSBROOK – DISTRICT STRUCTURE PLAN

TITLE: Proposed Configuration of main Intersections within the DSP

DRAWING NUMBER: KC01293.000_ S10

DRAWN BY: J.S.

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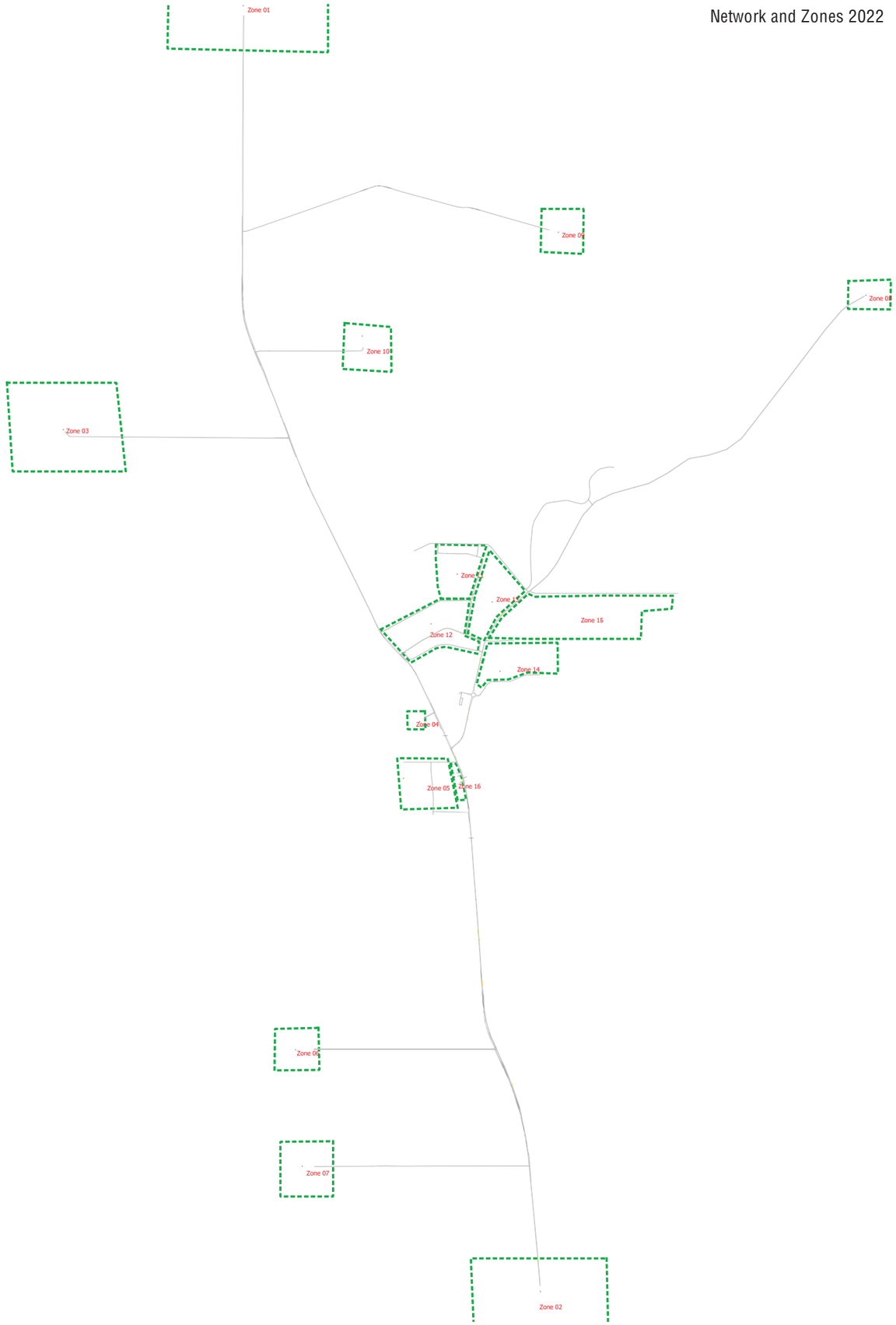
kctt PART OF

Appendix 3

Base Model Aimsun Output



Daily 2022
Simulated Flow

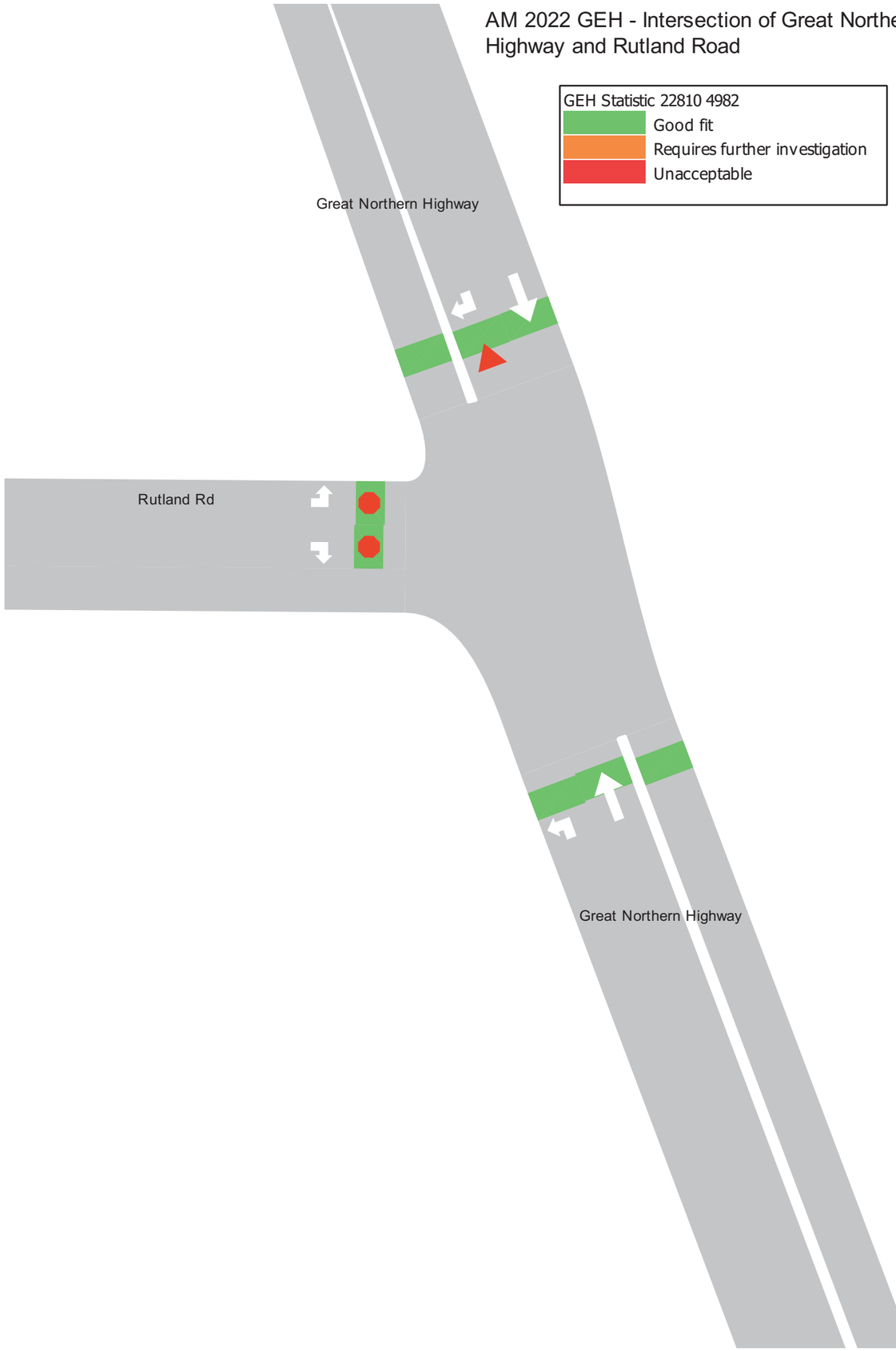
Zone 01
Zone 02
Zone 03
Zone 04
Zone 05
Zone 06
Zone 07
Zone 08
Zone 09
Zone 10
Zone 11
Zone 12
Zone 13
Zone 14
Zone 15
Zone 16

AM 2022 GEH - Intersection of Great Northern Highway and Chittering Road

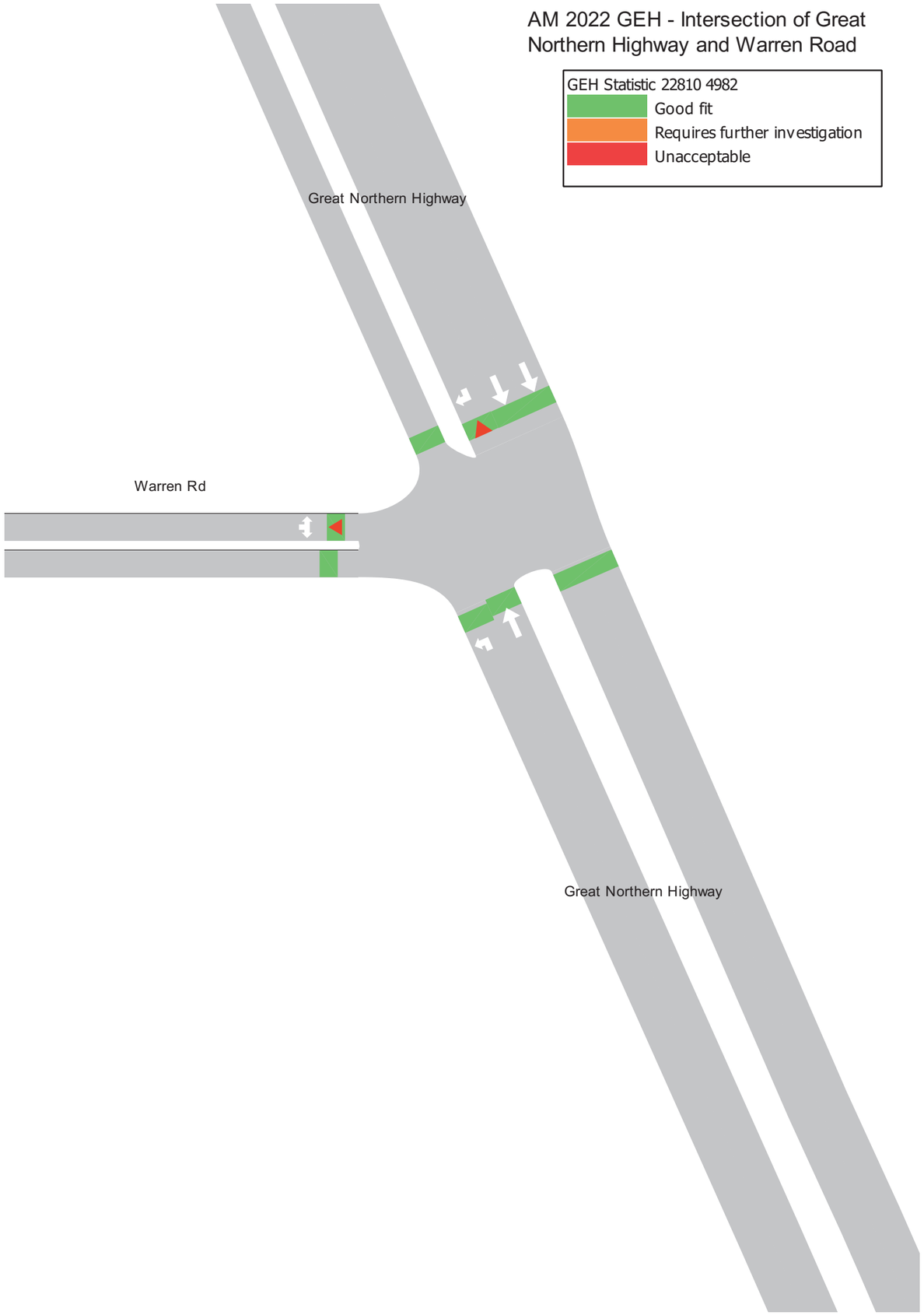
GEH Statistic 22810 4982
Good fit
Requires further investigation
Unacceptable

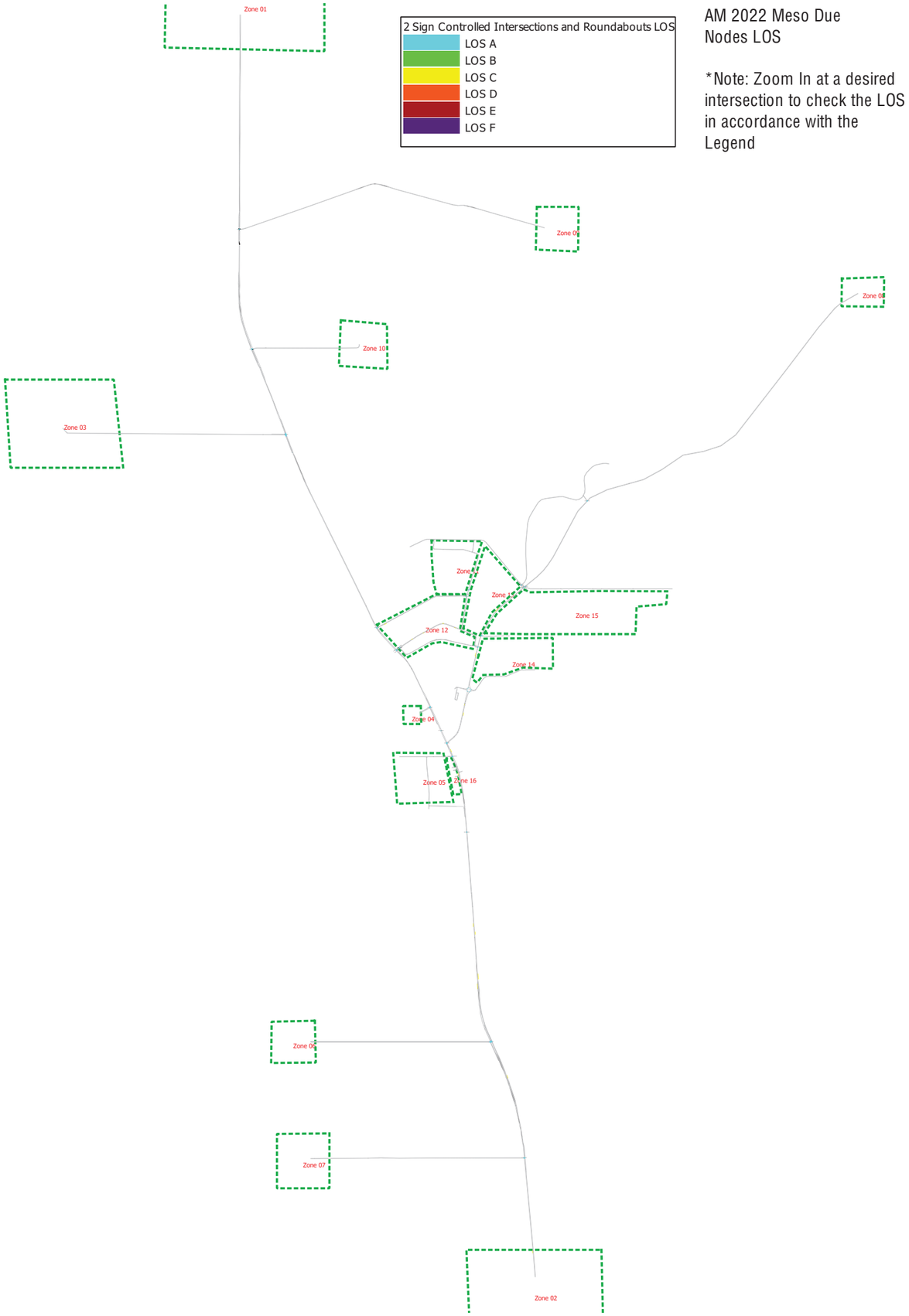
Great Northern Highway
Chittering Rd
Great Northern Highway

AM 2022 GEH - Intersection of Great Northern Highway and Rutland Road



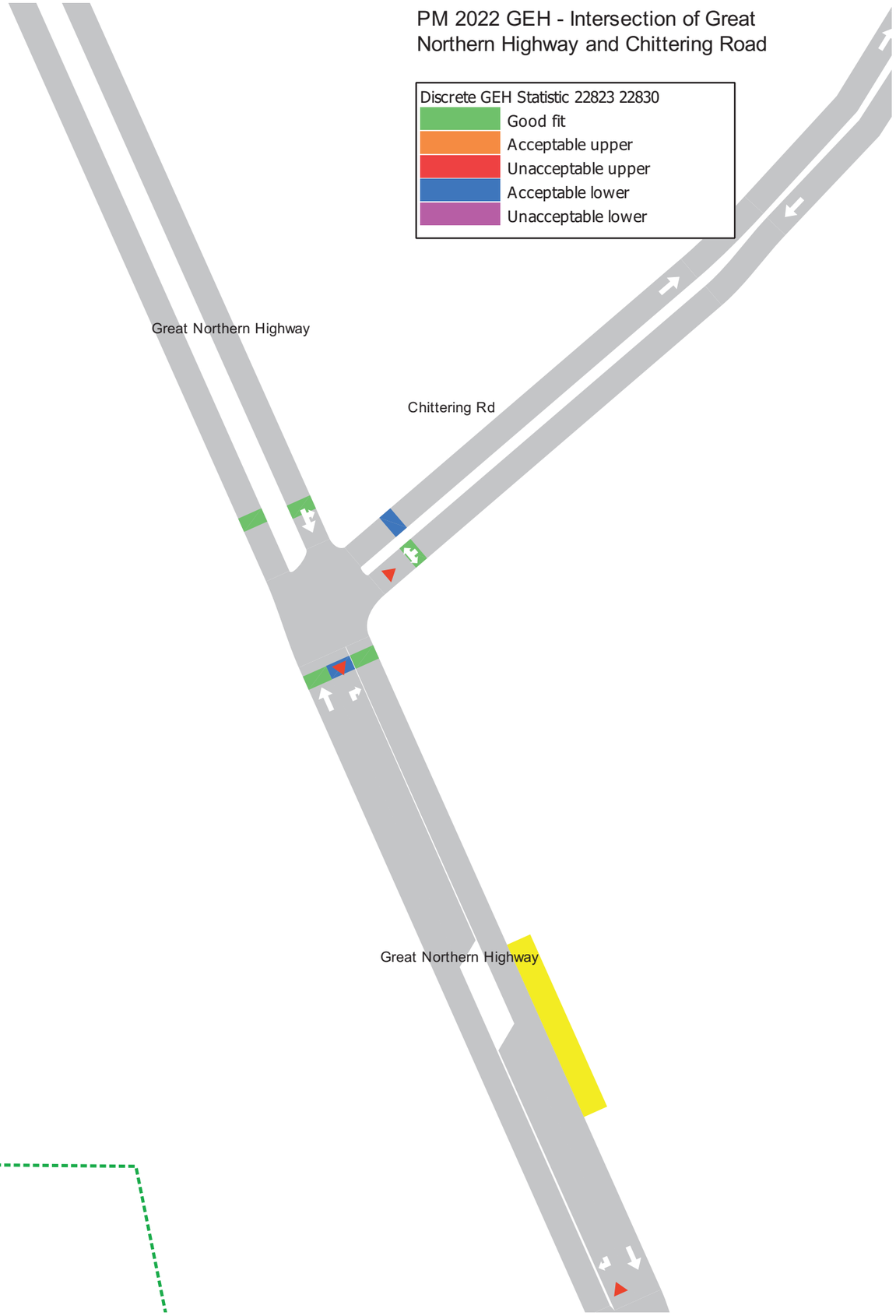
AM 2022 GEH - Intersection of Great Northern Highway and Warren Road





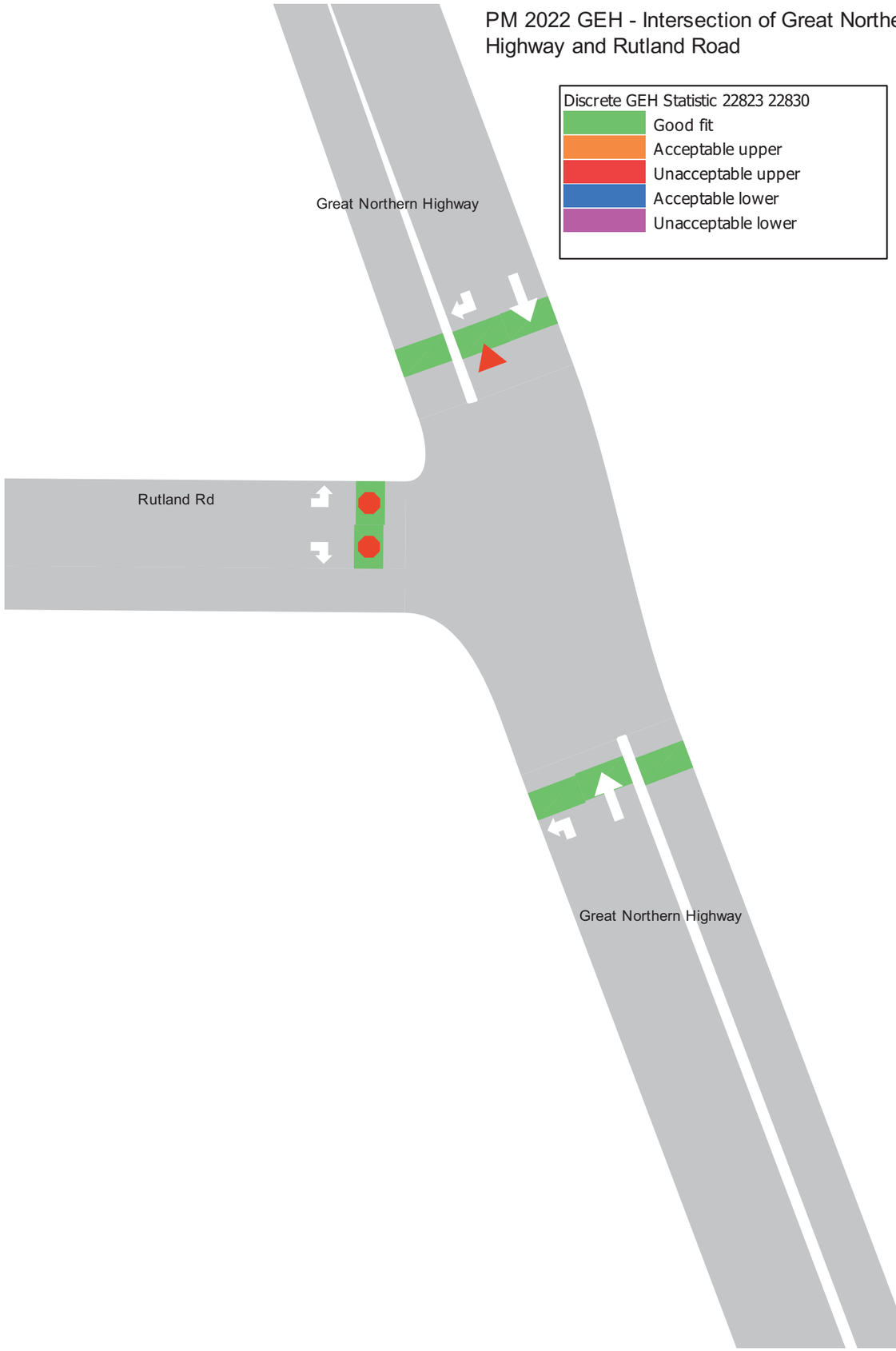
AM 2022 Meso Due Nodes LOS

*Note: Zoom In at a desired intersection to check the LOS in accordance with the Legend

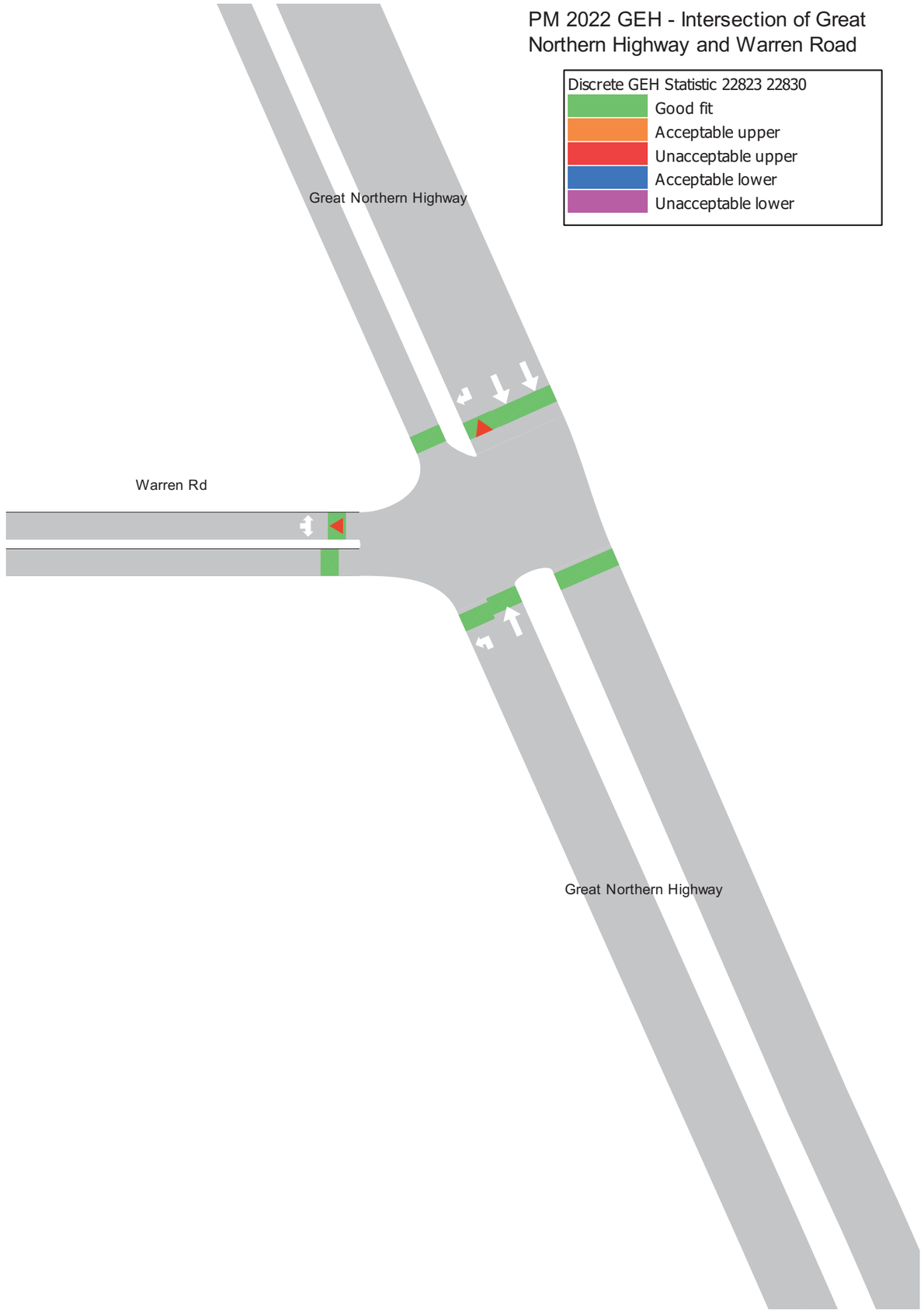


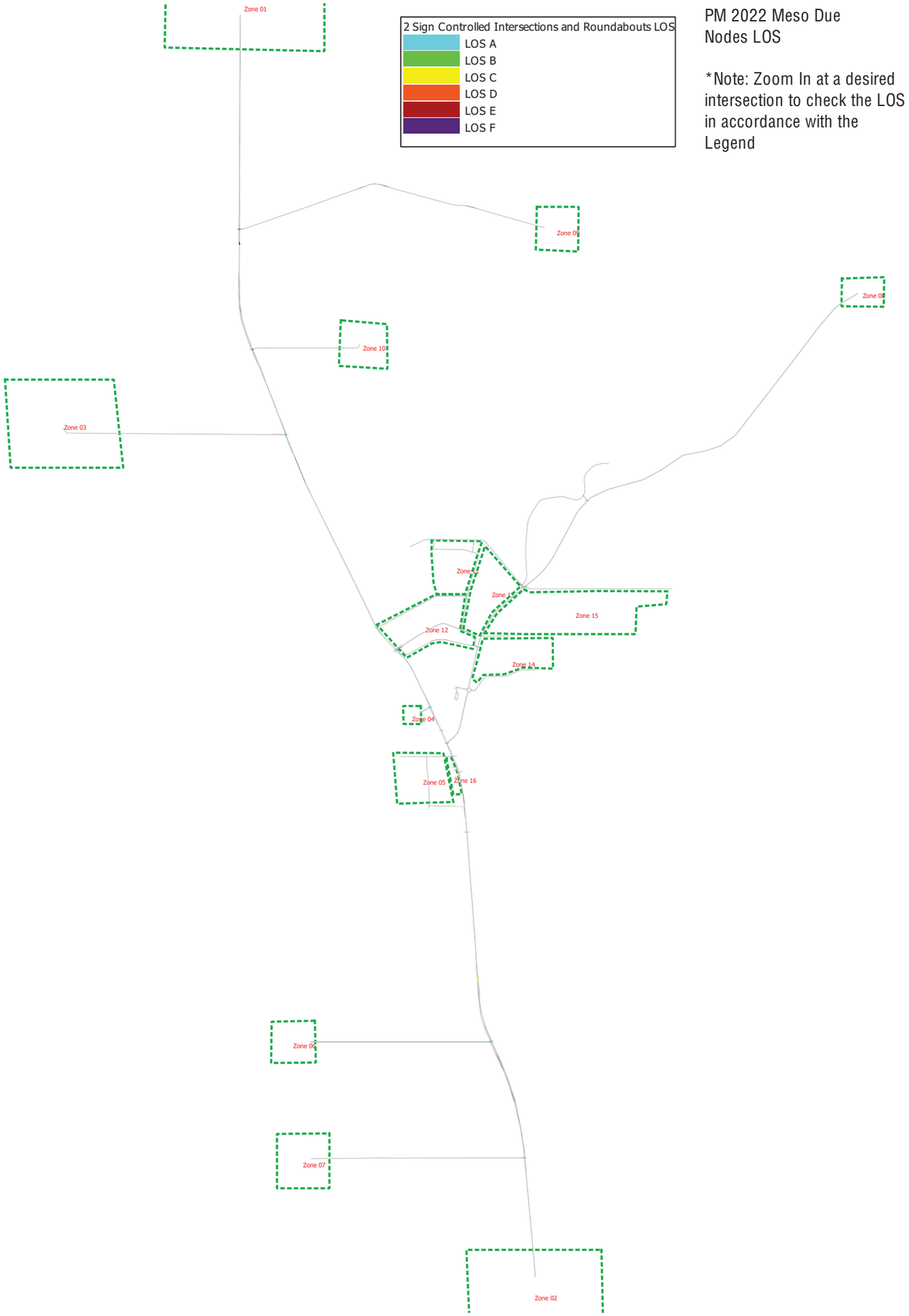
PM 2022 GEH - Intersection of Great Northern Highway and Chittering Road

PM 2022 GEH - Intersection of Great Northern Highway and Rutland Road



PM 2022 GEH - Intersection of Great Northern Highway and Warren Road





PM 2022 Meso Due Nodes LOS

*Note: Zoom In at a desired intersection to check the LOS in accordance with the Legend

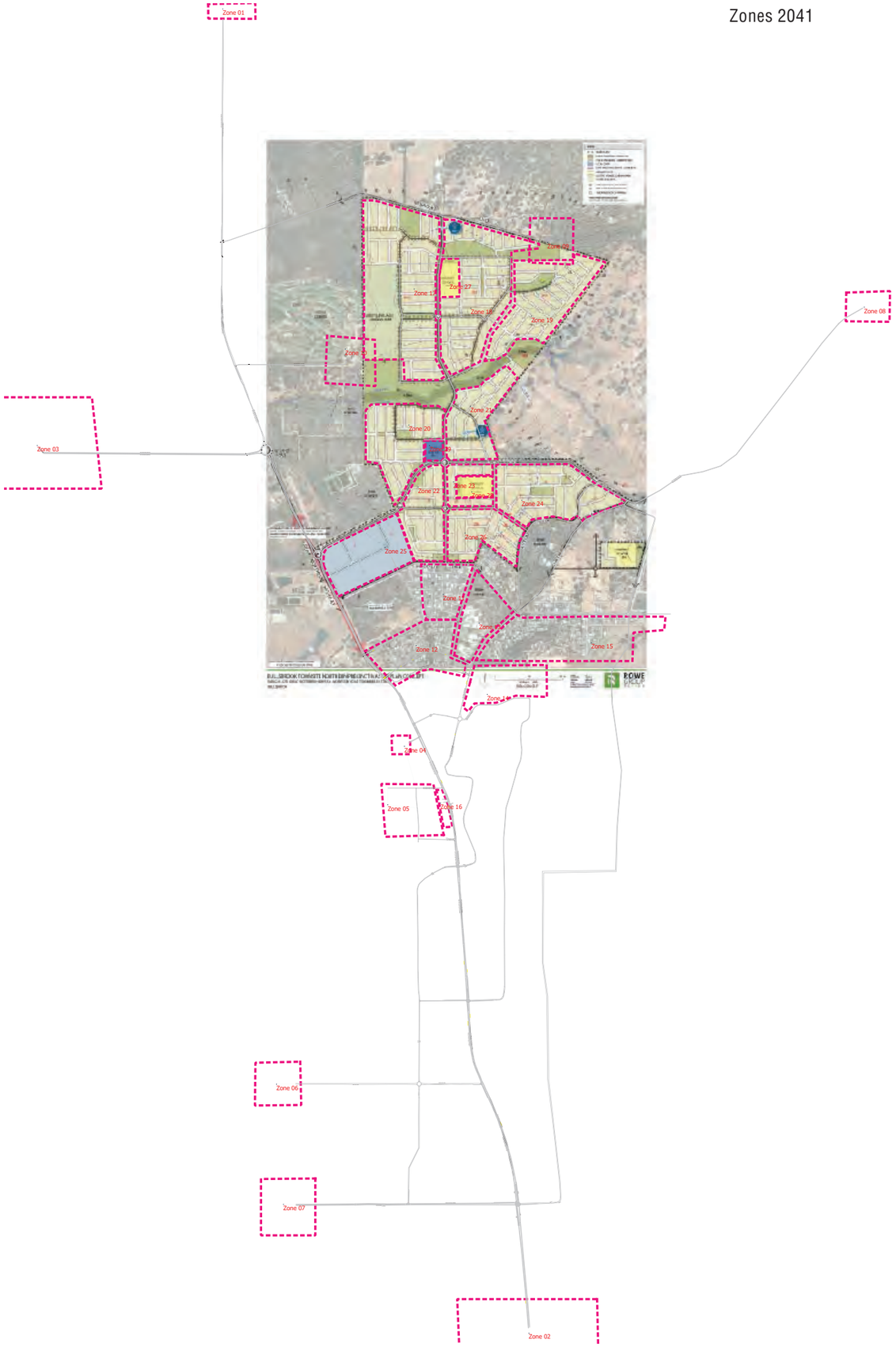
Appendix 4

Future 2041 Model Aimsun Output

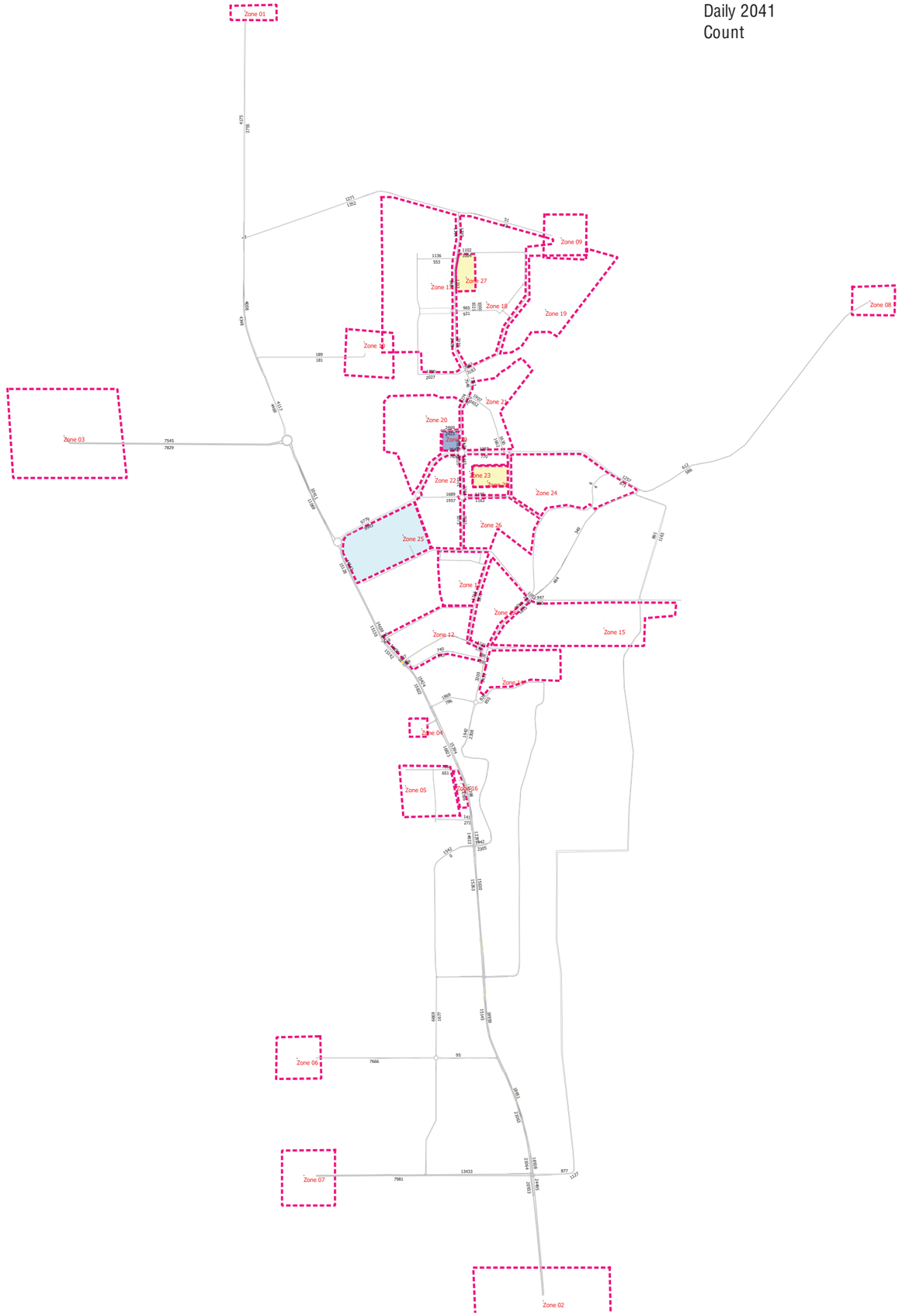
Network Layout - 2041



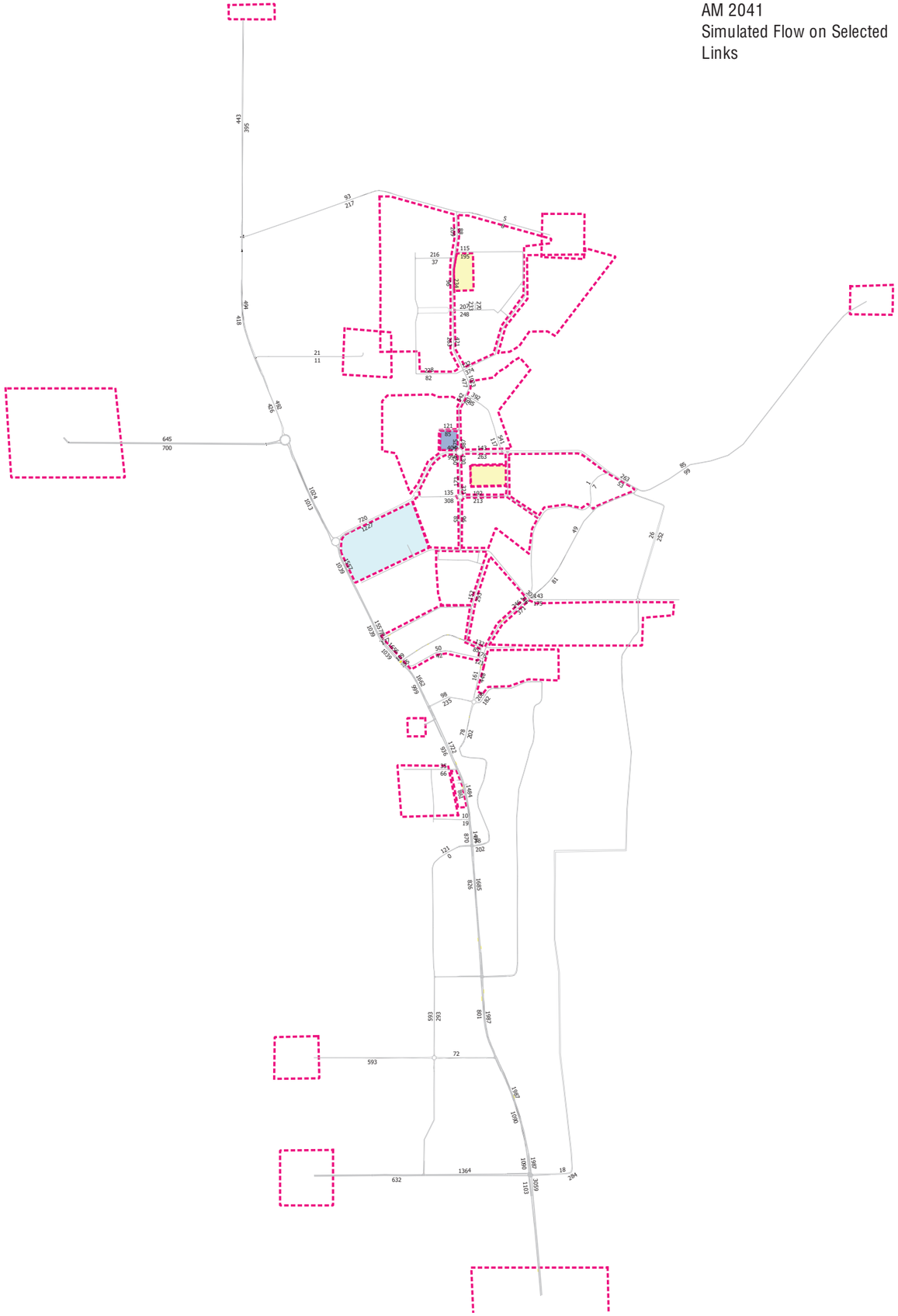
Zones 2041



Daily 2041
Count

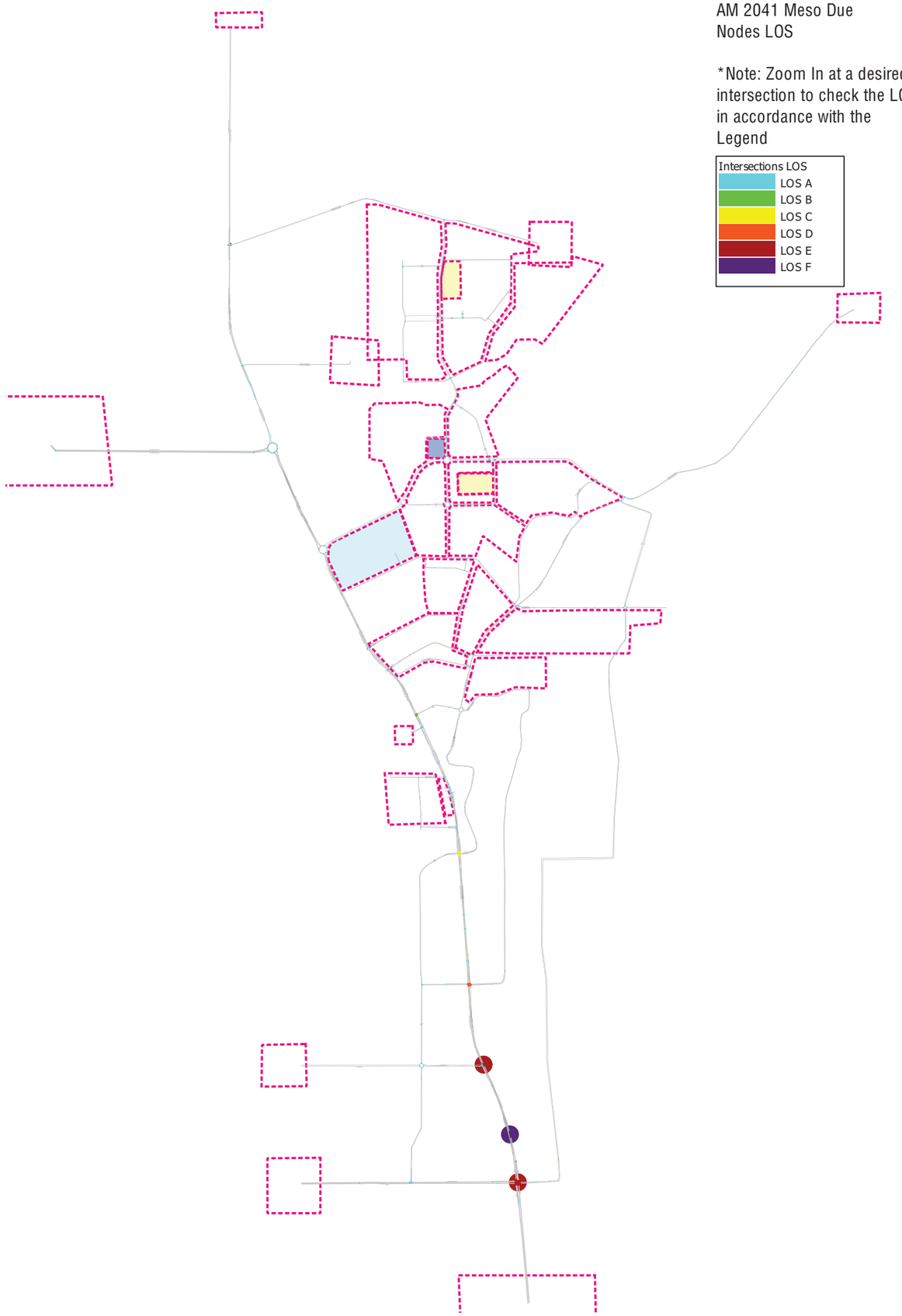


AM 2041
Simulated Flow on Selected Links

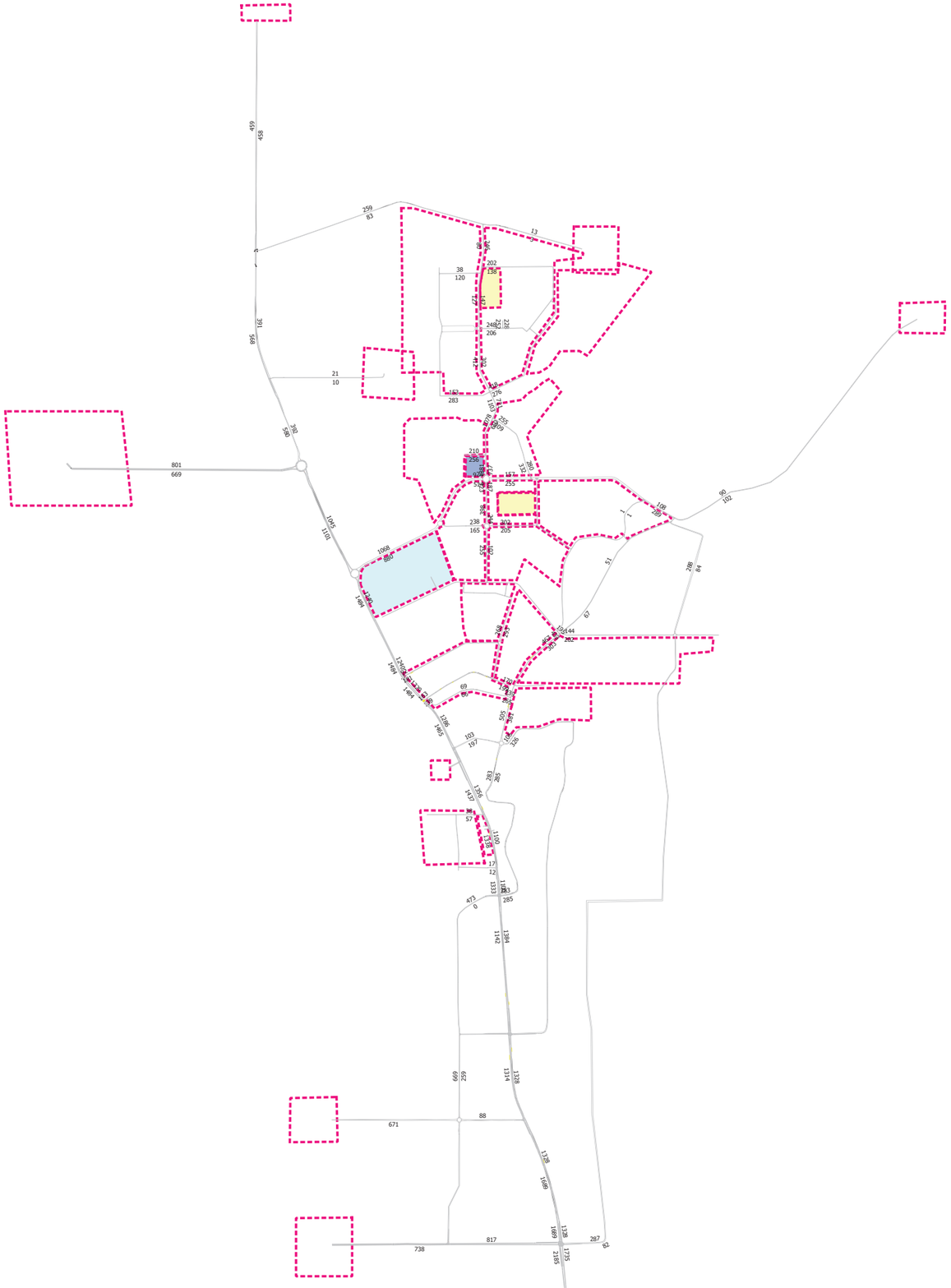


AM 2041 Meso Due Nodes LOS

*Note: Zoom In at a desired intersection to check the LOS in accordance with the Legend

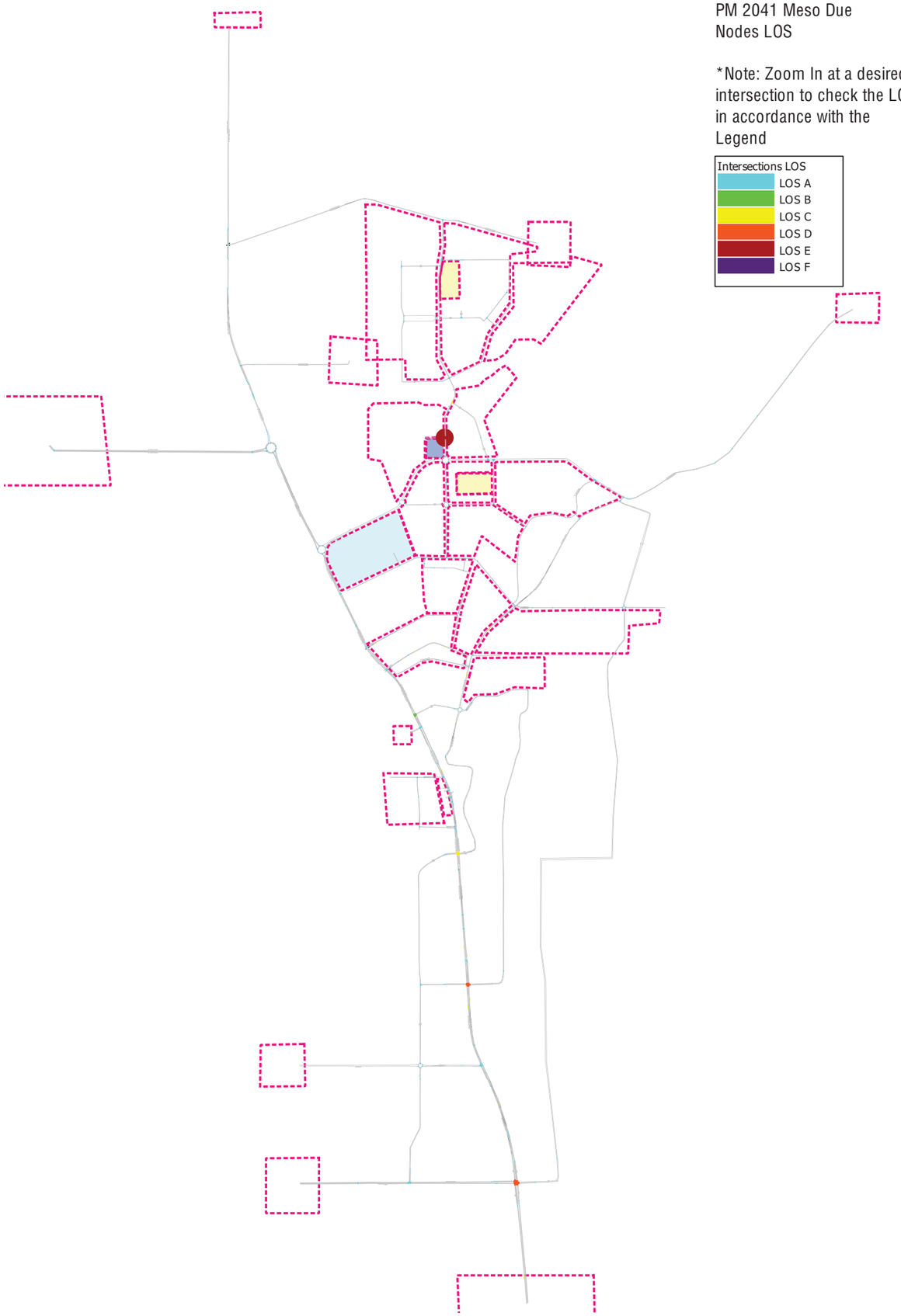


PM 2041
Simulated Flow on Selected Links



PM 2041 Meso Due
Nodes LOS

*Note: Zoom In at a desired intersection to check the LOS in accordance with the Legend



Appendix 5

SIDRA Intersection Analysis

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1. Introduction

1.1 Analysed Intersections

This section of the report provides details on the SIDRA Analysis conducted to support the findings of the report KC01293.000_R01_Rev A. The following intersections have been modelled in AM and PM peak hours for the assessment years of 2022 (base year) and 2041 (ultimate scenario):

- M01 Great Northern Highway / Rutland Drive in 2022 and Great Northern Highway / Rutland Road / East-West Connection in 2041
- M02 Great Northern Highway / Morrisey Road in 2022 and 2041
- M03 Chittering Road / Kimberley Street in 2022 and 2041*
- M04 Kimberley Street / Ashton Road in 2022 and 2041*
- M05 Great Northern Highway / East-West Connection in 2041
- M06 Chittering Road / East-West Connection in 2041

*Note M03 and M04 were modelled and processed in a network to assess the effect of their proximity.

The dimensions of the existing intersection elements have been scaled from aerial imagery which was obtained through our commercial arrangement with Nearmap and through publicly available Intramaps. These images are suitable for use in concept drafting applications with a level of accuracy to within +/- 10 centimetres.

1.2 Turning Movement Counts

Base Models – Intersection turning counts have been extracted for the assessment peak hour periods (08:00 – 09:00 and 16:00 – 17:00;) from the Aimsun Base model simulation results. The base model was developed based on the obtained MRWA Traffic Map video counts (traffic count date - 31st May 2022) and calibrated as explained in detail in the main TIS Report.

Future Models – turning counts were extracted from the Aimsun Future 2041 model results.

Both Base and Future model turn counts are included in the below SIDRA Output section.

1.3 Model Settings and Calibration

KCTT have setup the user classes as described in the MRWA Operational Modelling Guidelines:

- LV – Light Vehicles – Austroads Class 1 – Vehicle length 4.85m; Queue Space 7.35m
- U1 – Development Light vehicles – representing the development's separated traffic, generated/attracted by the Bullsbrook North DSP - Austroads Class 1 – Vehicle length 4.85m; Queue Space 7.35m
- U2 – Austroads Classes 2-5 – Vehicle length 12.5m; Queue Space 15m
- U3 – Austroads Classes 6-9 – Vehicle length 20m; Queue Space 22.5m
- U4 – Austroads Classes 10-11 – Vehicle length 30m; Queue Space 32.5m*

*Note – although MRWA Operational Modelling Guidelines suggest separating Austroads Classes 10 and 11, the MRWA Traffic Map video counts show these classes combined.

All other Vehicle Movement Data parameters are set as per MRWA Operational Modelling Guidelines, such as Gap Acceptance Factor and Opposing Vehicle Factor; and settings concerning PCU values and Fuel and Emissions in Parameter Settings.

Transport Impact Assessment
KC01293.000 Bullsbrook North Landowners Group (WPMG) DSP

1.4 Level of Service definitions

Level of Service for **v/c ≤ 1.0**	Average delay per vehicle in seconds (d)			Level of Service for **v/c > 1.0**
	Signals	"SIDRA Roundabout LOS" method (1)	Sign Control (*Default for roundabouts*) (1)	All Intersection Types
A	d ≤ 10	d ≤ 10	d ≤ 10	**F**
B	10 < d ≤ 20	10 < d ≤ 20	10 < d ≤ 15	**F**
C	20 < d ≤ 35	20 < d ≤ 35	15 < d ≤ 25	**F**
D	35 < d ≤ **55**	35 < d ≤ **50**	25 < d ≤ **35**	**F**
E	**55** < d ≤ 80	**50** < d ≤ 70	**35** < d ≤ 50	**F**
F	80 < d	70 < d	50 < d	**F**

The above table shows the thresholds for determining the LoS for different type of intersections based on delays and based on flow/capacity ratio.

2. Summary of Results

Nominate modelled intersections and intersections controls in the base year - 2022	M01 Great Northern Highway / Rutland Drive	Stop-sign T-intersection
	M02 Great Northern Highway / Morrisey Road	Give-way T-intersection
	M03 Chittering Road / Kimberley Street	Give-way T-intersection
	M04 Kimberley Street / Ashton Road	Give-way T-intersection
Nominate modelled intersections and intersections controls in the ultimate year - 2041	M01 Great Northern Highway / Rutland Road / East-West Connection	Roundabout
	M02 Great Northern Highway / Morrisey Road	Give-way T-intersection
	M03 Chittering Road / Kimberley Street	Give-way T-intersection
	M04 Kimberley Street / Ashton Road	Give-way T-intersection
	M05 Great Northern Highway / East-West Connection	Roundabout
	M06 Chittering Road / East-West Connection	Give-way T-intersection
Nominate the assessment year(s)	• Base year – 2022 • Ultimate year – 2041	
User Classes	• LV – Light Vehicles (Austroads Class 1) • U1 – Proposed development light vehicles (Austroads Class 1) • U2 – Austroads Classes 2-5 • U3 – Austroads Classes 6-9 • U4 – Austroads Classes 10-11 Refer to SIDRA Output Appendix for more details.	
Describe the Level of Service and Delay results	**Base Models:** **M01 Great Northern Highway / Rutland Drive** The Stop-sign T-intersection operates at a satisfactory LOS A and LOS B with an average delay at 7.1s in AM Peak and 6.9s in PM Peak. **M02 Great Northern Highway / Morrisey Road** The Give-way T-intersection operates at a satisfactory LOS A with the average delay at 0.6s in AM Peak and 0.4s in PM peak. **M03 Chittering Road / Kimberley Street** The Give-way intersection operates at LOS A with highest delay of 2.8s on Kimberley Street approach. **M04 Kimberley Street / Ashton Road** The Give-way intersection operates at LOS A with highest delay of 4.6s on Ashton Road approach. **Network M03 and M04** Intersections M03 and M04 were modelled in a network to closely assess the effect of their proximity. All approaches on both intersections operate at LOS A.	

Future Models – 2041:

M01 Great Northern Highway / Rutland Road
The 2-lane Roundabout is expected to operate at a satisfactory LOS B with average delay of 11.6s in AM peak and 13.2s in PM peak.

Approaches on Rutland Road and Great Northern Highway (south) will have 2 lanes per approach and exit based on the ROM24 plot seen in Bullsbrook Freight and Industrial Land Use Strategy.
The Great Northern Highway section north from Rutland Road will have one lane per direction. The only required upgrade would be an addition of a short lane for approach to ensure that this approach operates at a satisfactory LOS as well.

M02 Great Northern Highway / Morrisey Road
The Give-way T-intersection is expected to operate at satisfactory LOS A-C with the maximum delay of 19.5s on the Morrisey Road approach in the PM peak.

M03 Chittering Road / Kimberley Street
The give-way intersection is expected to continue operating at LOS A in 2041 AM and PM peak.

M04 Kimberley Street / Ashton Road
The give-way intersection is expected to continue operating at LOS A in 2041 AM and PM peak.

Network M03 and M04
Intersections M03 and M04 were modelled in a network to closely assess the effect of their proximity. No issues have been found, all approaches on both intersections will operate at LOS A.

M05 Great Northern Highway / East-West Connection
The 2-lane Roundabout is expected to operate at a satisfactory LOS B and LOS C with average delay of 20.0s in AM peak and 32.8s in PM peak respectively.
It should be noted that the northern approach's lanes on Great Northern Highway are showing LOS E and LOS F with delays up to 72s. This is due to the high left turn from GNH onto East-West Connection.
However, given the early stage of the planning process, this should be reevaluated in the following stages. It should be noted that this connection to GNH is not definitive and that addition of at least one more connection would alleviate the pressure off of this roundabout.

M06 Chittering Road / East-West Connection
The give-way intersection is expected to operate at LOS A in 2041 AM and PM peak with average delays up to 4.0s.

A summary of the results of the SIDRA analysis are shown on the following pages. For purposes of clarity we will provide intersection summaries below. The full SIDRA output report can be provided on request.

Note - SIDRA graphic is not an accurate representation of the intersection geometry. It is a simplified tool and its main purpose is to roughly illustrate main intersection elements. The graphic might show median breaks where there are none in reality, oversized splitter islands and central islands for roundabouts etc. The graphic representation does not influence the calculations nor any other output.*

3. SIDRA Intersection Analysis – Output

USER REPORT FOR SITE

All Movement Classes

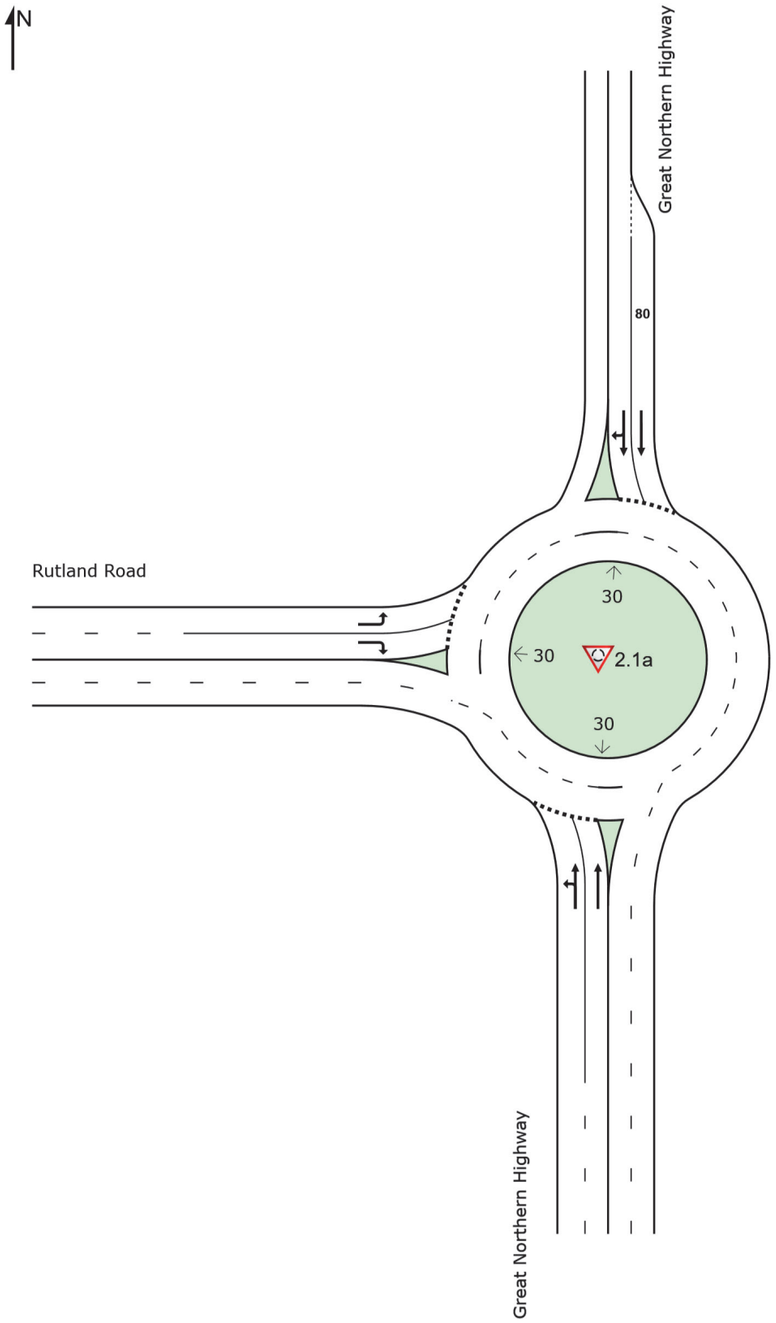
Project: KC01293.000 Future Models **Template: Single Site User Report**

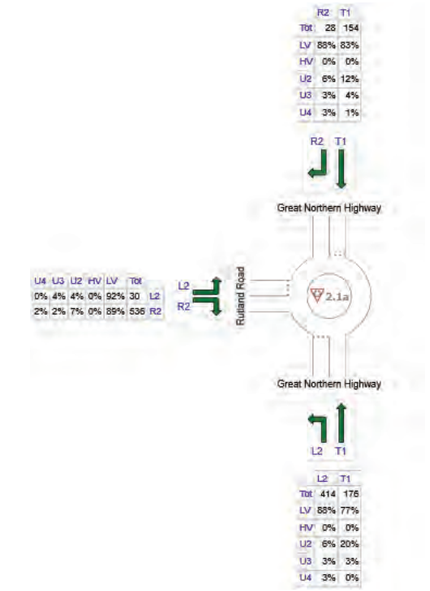
Site: 2.1a [2.1a Great Northern Highway - Rutland Road - 2041 AM - No Development (Site Folder: Future 2041 AM - No Development Traffic)]

2.1a Great Northern Highway - Rutland Road - 2041 AM - No Development
Site Category: Existing Design
Roundabout

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.





	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	AustroadsClass 2-5 (U2)	AustroadsClass 6-9 (U3)	AustroadsClass 10-11 (U4)
S: Great Northern Highway	590	499	0	61	18	12
N: Great Northern Highway	182	152	0	21	7	2
W: Rutland Road	566	505	0	36	13	12
Total	1338	1156	0	119	38	26

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Northern Highway														
7	L2	414	12.4	436	12.4	0.295	6.8	LOS A	1.9	16.9	0.16	0.53	0.16	68.3
8	T1	176	22.8	185	22.8	0.167	7.6	LOS A	0.9	8.2	0.16	0.48	0.16	65.7
Approach		590	15.5	621	15.5	0.295	7.0	LOS A	1.9	16.9	0.16	0.52	0.16	67.4
North: Great Northern Highway														
2	T1	154	17.1	162	17.1	0.124	12.3	LOS B	0.7	6.4	0.65	0.74	0.65	66.1
3	R2	28	12.0	29	12.0	0.124	18.0	LOS B	0.7	6.1	0.65	0.77	0.65	66.4
Approach		182	16.3	192	16.3	0.124	13.2	LOS B	0.7	6.4	0.65	0.74	0.65	66.2
West: Rutland Road														
4	L2	30	7.7	32	7.7	0.039	8.4	LOS A	0.2	1.3	0.34	0.60	0.34	68.0
6	R2	536	11.0	564	11.0	0.448	14.7	LOS B	2.7	23.6	0.43	0.70	0.43	63.2
Approach		566	10.8	596	10.8	0.448	14.4	LOS B	2.7	23.6	0.42	0.69	0.42	63.4
All Vehicles		1338	13.6	1408	13.6	0.448	11.0	LOS B	2.7	23.6	0.34	0.62	0.34	65.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Input Volumes

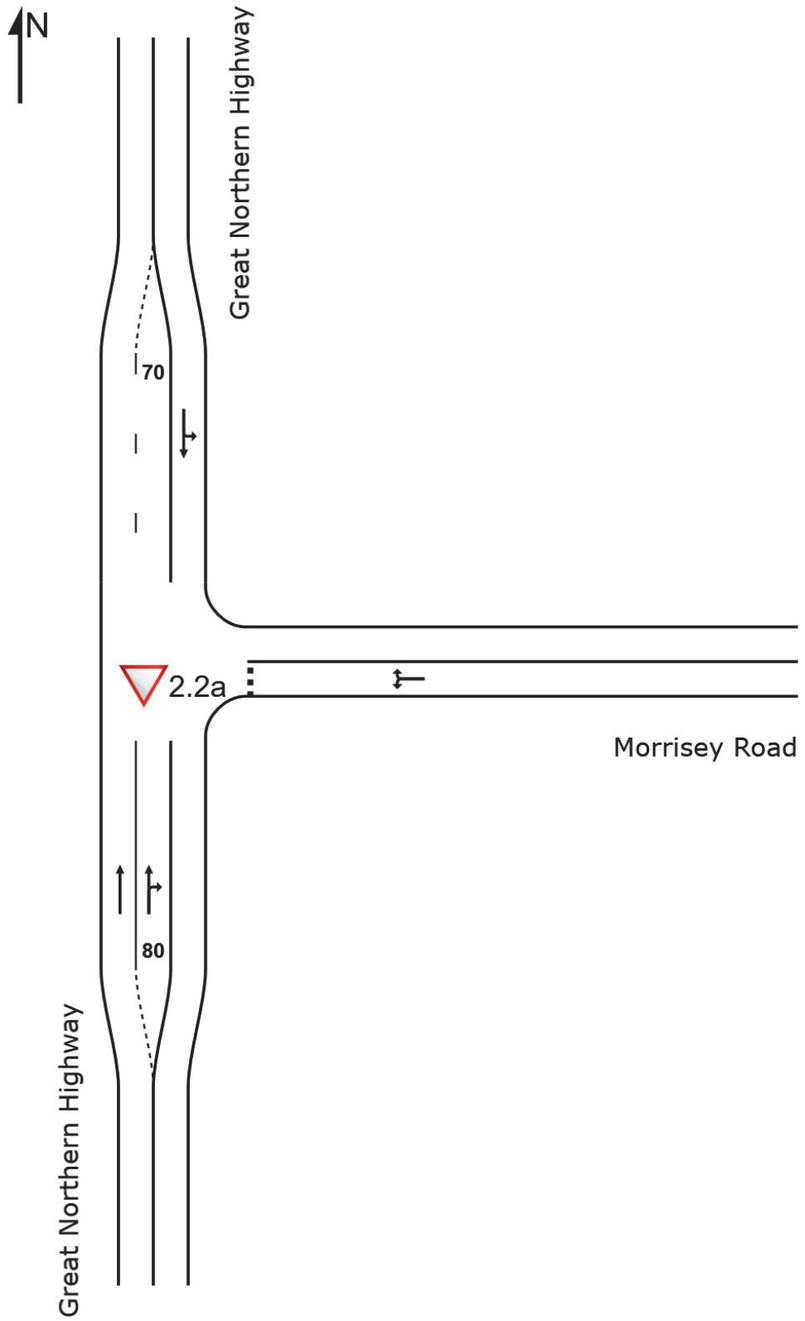
Volume Display Method: Total and %

Site: 2.2a [2.2a Great Northern Highway - Morrisey Road - 2041 AM - No Development (Site Folder: Future 2041 AM - No Development Traffic)]

2.2a Great Northern Highway - Morrisey Road - 2041 AM - No Development
Site Category: Existing Design
Give-Way (Two-Way)

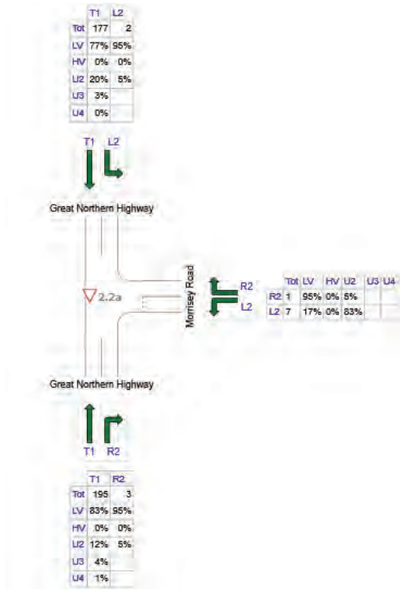
Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Input Volumes

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	AustroadsClass 2-5 (U2)	AustroadsClass 6-9 (U3)	AustroadsClass 10-11 (U4)
S: Great Northern Highway	198	164	0	24	8	1
E: Morrisey Road	8	2	0	6	-	-
N: Great Northern Highway	179	138	0	35	6	0
Total	385	305	0	65	14	1

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Northern Highway														
2	T1	195	17.1	205	17.1	0.094	0.5	LOS A	0.0	0.2	0.01	0.07	0.01	107.4
3	R2	3	5.0	3	5.0	0.036	8.6	LOS A	0.0	0.2	0.04	0.10	0.04	63.4
Approach		198	16.9	208	16.9	0.094	0.6	NA	0.0	0.2	0.01	0.07	0.01	106.2
East: Morrisey Road														
4	L2	7	83.1	7	83.1	0.010	11.1	LOS B	0.0	0.5	0.36	0.63	0.36	42.3
6	R2	1	5.0	1	5.0	0.010	7.9	LOS A	0.0	0.5	0.36	0.63	0.36	58.3
Approach		8	73.3	8	73.3	0.010	10.7	LOS B	0.0	0.5	0.36	0.63	0.36	43.8
North: Great Northern Highway														
7	L2	2	5.0	2	5.0	0.120	8.2	LOS A	0.0	0.0	0.00	0.07	0.00	85.7
8	T1	177	22.8	186	22.8	0.120	0.4	LOS A	0.0	0.0	0.00	0.07	0.00	92.5
Approach		179	22.6	188	22.6	0.120	0.5	NA	0.0	0.0	0.00	0.07	0.00	92.4
All Vehicles		385	20.8	405	20.8	0.120	0.8	NA	0.0	0.5	0.01	0.08	0.01	96.6

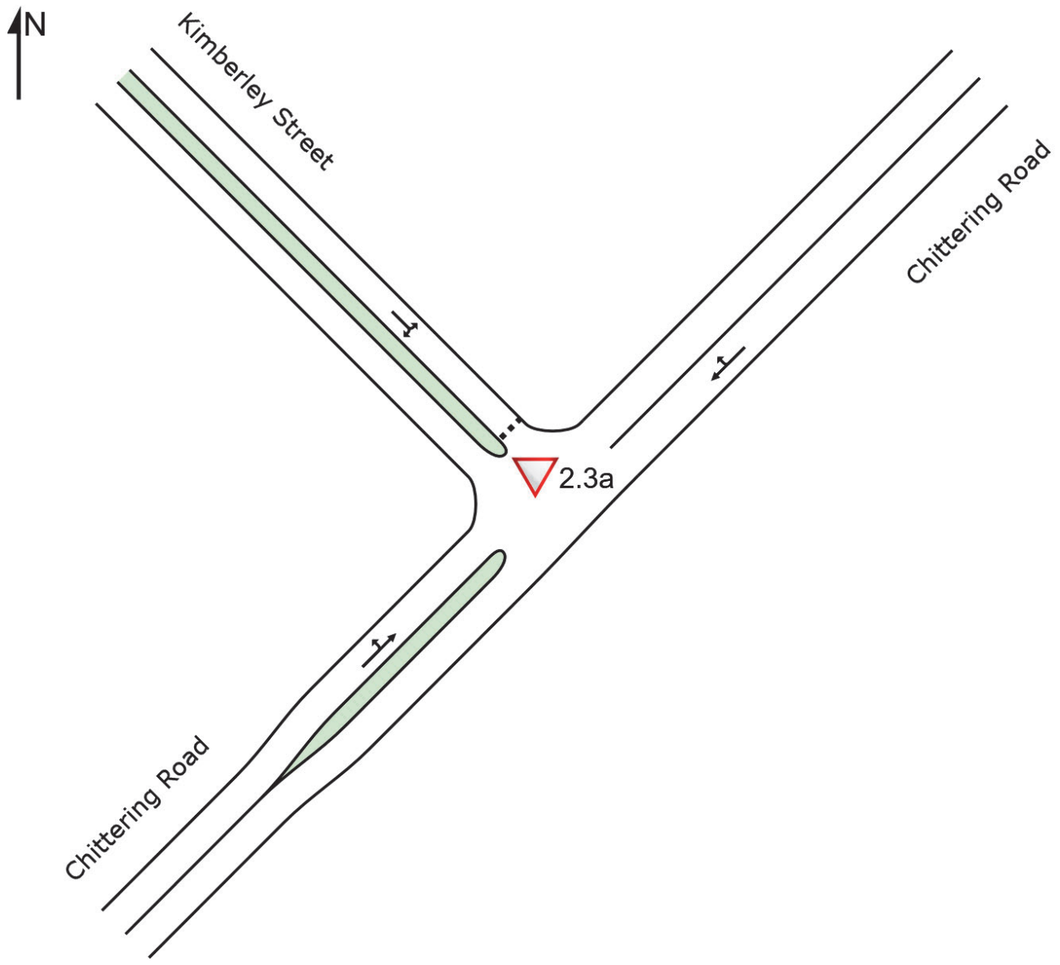
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 2.3a [2.3a Chittering Road - Kimberley Street - 2041 AM - No Development (Site Folder: Future 2041 AM - No Development Traffic)]

2.3a Chittering Road - Kimberley Street - 2041 AM - No Development
Site Category: Existing Design
Give-Way (Two-Way)

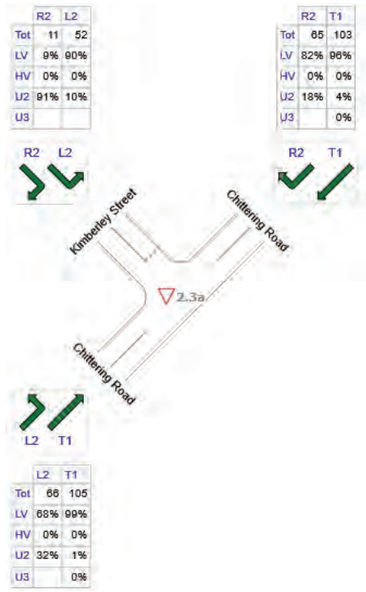
Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Input Volumes

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	AustroadsClass 2-5 (U2)	AustroadsClass 6-9 (U3)
NE: Chittering Road	168	152	0	16	0
NW: Kimberley Street	63	48	0	15	-
SW: Chittering Road	171	149	0	22	0
Total	402	349	0	53	0

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: Chittering Road														
2	T1	103	3.9	108	3.9	0.097	0.3	LOS A	0.4	3.3	0.25	0.20	0.25	57.6
3	R2	65	18.5	68	18.5	0.097	3.0	LOS A	0.4	3.3	0.25	0.20	0.25	28.9
Approach		168	9.5	177	9.5	0.097	1.4	NA	0.4	3.3	0.25	0.20	0.25	54.7
NorthWest: Kimberley Street														
4	L2	52	9.6	55	9.6	0.043	2.8	LOS A	0.2	1.6	0.19	0.46	0.19	23.7
6	R2	11	90.9	12	90.9	0.043	3.5	LOS A	0.2	1.6	0.19	0.46	0.19	25.4
Approach		63	23.8	66	23.8	0.043	2.9	LOS A	0.2	1.6	0.19	0.46	0.19	24.8
SouthWest: Chittering Road														
7	L2	66	31.8	69	31.8	0.106	6.1	LOS A	0.0	0.0	0.00	0.22	0.00	52.6
8	T1	105	1.0	111	1.0	0.106	0.0	LOS A	0.0	0.0	0.00	0.22	0.00	57.0
Approach		171	12.9	180	12.9	0.106	2.4	NA	0.0	0.0	0.00	0.22	0.00	55.2
All Vehicles		402	13.2	423	13.2	0.106	2.0	NA	0.4	3.3	0.13	0.25	0.13	51.5

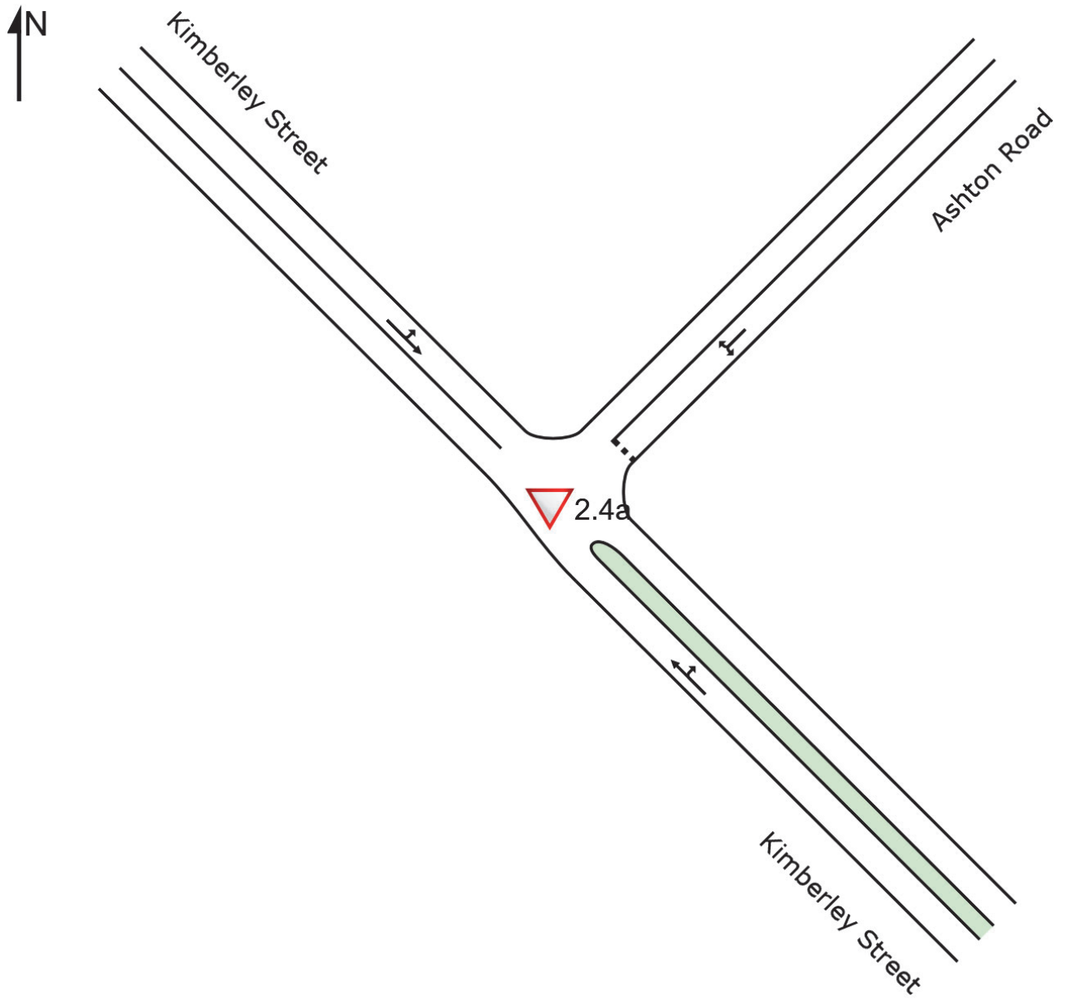
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 2.4a [2.4a Kimberley Street - Ashton Road - 2041 AM - No Development (Site Folder: Future 2041 AM - No Development Traffic)]

2.4a Kimberley Street - Ashton Road - 2041 AM - No Development
Site Category: Existing Design
Give-Way (Two-Way)

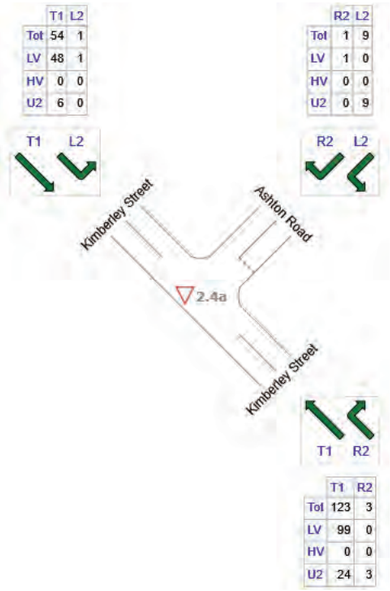
Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Input Volumes

Volume Display Method: Separate



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	AustroadsClass 2-5 (U2)
SE: Kimberley Street	126	99	0	27
NE: Ashton Road	10	1	0	9
NW: Kimberley Street	55	49	0	6
Total	191	149	0	42

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Kimberley Street														
2	T1	123	24	129	19.5	0.083	0.0	LOS A	0.0	0.3	0.01	0.01	0.01	49.8
3	R2	3	3	3	100.0	0.083	2.7	LOS A	0.0	0.3	0.01	0.01	0.01	38.9
Approach		126	27	133	21.4	0.083	0.1	NA	0.0	0.3	0.01	0.01	0.01	49.2
NorthEast: Ashton Road														
4	L2	9	9	9	100.0	0.008	6.0	LOS A	0.0	0.5	0.16	0.49	0.16	41.1
6	R2	1	0	1	0.0	0.008	4.9	LOS A	0.0	0.5	0.16	0.49	0.16	43.6
Approach		10	9	11	90.0	0.008	5.9	LOS A	0.0	0.5	0.16	0.49	0.16	41.4
NorthWest: Kimberley Street														
7	L2	1	0	1	0.0	0.033	4.6	LOS A	0.0	0.0	0.00	0.01	0.00	49.3
8	T1	54	6	57	11.1	0.033	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	49.8
Approach		55	6	58	10.9	0.033	0.1	NA	0.0	0.0	0.00	0.01	0.00	49.7
All Vehicles		191	42	201	22.0	0.083	0.4	NA	0.0	0.5	0.02	0.04	0.02	48.4

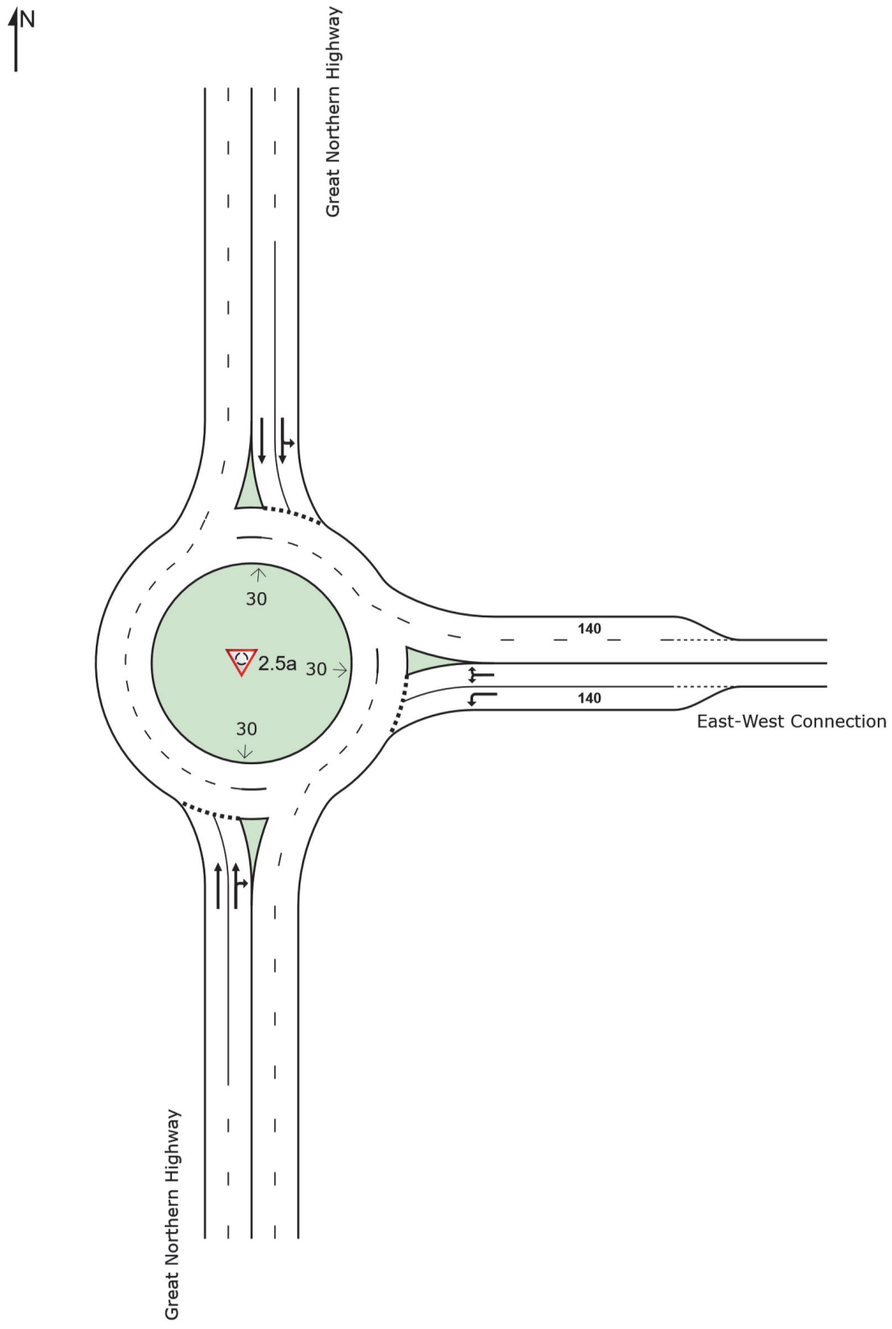
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 2.5a [2.5a Great Northern Highway - East-West Connection - 2041 AM - No Development (Site Folder: Future 2041 AM - No Development Traffic)]

2.5a Great Northern Highway - East-West Connection - 2041 AM - No Development
Site Category: Existing Design
Roundabout

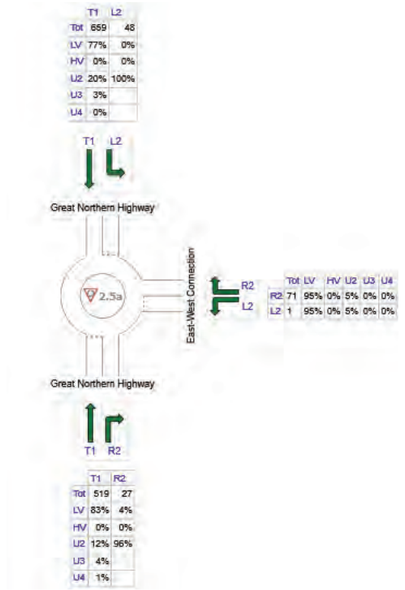
Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Input Volumes

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	AustroadsClass 2-5 (U2)	AustroadsClass 6-9 (U3)	AustroadsClass 10-11 (U4)
S: Great Northern Highway	546	431	0	90	21	4
E: East-West Connection	72	68	0	4	0	0
N: Great Northern Highway	707	509	0	178	21	0
Total	1325	1008	0	271	42	4

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Northern Highway														
2	T1	519	17.1	546	17.1	0.229	9.3	LOS A	1.4	12.4	0.26	0.54	0.26	67.0
3	R2	27	96.3	28	96.3	0.229	17.9	LOS B	1.3	13.0	0.27	0.54	0.27	55.0
Approach		546	21.0	575	21.0	0.229	9.8	LOS A	1.4	13.0	0.26	0.54	0.26	66.5
East: East-West Connection														
4	L2	1	5.0	1	5.0	0.002	6.1	LOS A	0.0	0.1	0.57	0.51	0.57	54.2
6	R2	71	5.0	75	5.0	0.075	9.6	LOS A	0.3	2.4	0.54	0.72	0.54	48.8
Approach		72	5.0	76	5.0	0.075	9.5	LOS A	0.3	2.4	0.54	0.72	0.54	48.8
North: Great Northern Highway														
7	L2	48	100.0	51	100.0	0.283	10.7	LOS B	1.7	16.8	0.18	0.53	0.18	59.7
8	T1	659	22.8	694	22.8	0.283	9.3	LOS A	1.7	16.8	0.18	0.53	0.18	68.1
Approach		707	28.1	744	28.1	0.283	9.4	LOS A	1.7	16.8	0.18	0.53	0.18	67.7
All Vehicles		1325	23.9	1395	23.9	0.283	9.6	LOS A	1.7	16.8	0.23	0.54	0.23	66.2

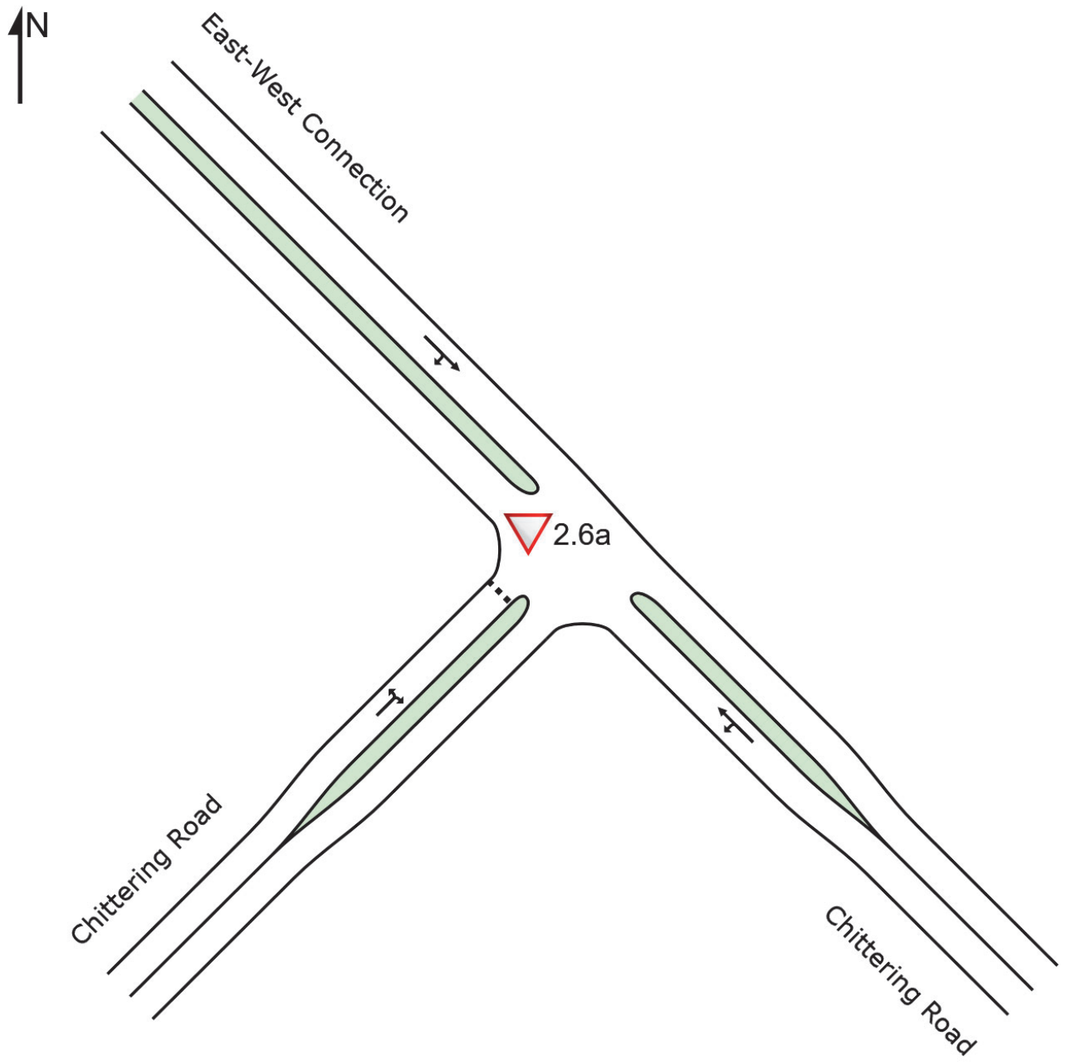
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 2.6a [2.6a Chittering Road - East-West Connection - 2041 AM - No Development (Site Folder: Future 2041 AM - No Development Traffic)]

2.6a Chittering Road - East-West Connection - 2041 AM - No Development
Site Category: Existing Design
Give-Way (Two-Way)

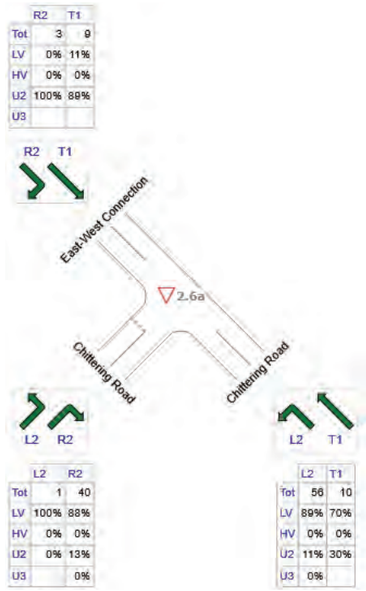
Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Input Volumes

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	AustroadsClass 2-5 (U2)	AustroadsClass 6-9 (U3)
SE: Chittering Road	66	57	0	9	0
NW: East-West Connection	12	1	0	11	-
SW: Chittering Road	41	36	0	5	0
Total	119	94	0	25	0

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Chittering Road														
7	L2	56	10.7	59	10.7	0.042	5.7	LOS A	0.0	0.0	0.00	0.52	0.00	37.8
8	T1	10	30.0	11	30.0	0.042	1.2	LOS A	0.0	0.0	0.00	0.52	0.00	50.3
Approach		66	13.6	69	13.6	0.042	5.0	NA	0.0	0.0	0.00	0.52	0.00	39.8
NorthWest: East-West Connection														
2	T1	9	88.9	9	88.9	0.011	0.1	LOS A	0.0	0.3	0.11	0.15	0.11	50.2
3	R2	3	100.0	3	100.0	0.011	6.2	LOS A	0.0	0.3	0.11	0.15	0.11	26.0
Approach		12	91.7	13	91.7	0.011	1.6	NA	0.0	0.3	0.11	0.15	0.11	45.3
SouthWest: Chittering Road														
4	L2	1	0.0	1	0.0	0.030	3.4	LOS A	0.1	0.6	0.08	0.51	0.08	41.7
6	R2	40	12.5	42	12.5	0.030	3.4	LOS A	0.1	0.6	0.08	0.51	0.08	44.2
Approach		41	12.2	43	12.2	0.030	3.4	LOS A	0.1	0.6	0.08	0.51	0.08	44.2
All Vehicles		119	21.0	125	21.0	0.042	4.1	NA	0.1	0.6	0.04	0.48	0.04	41.7

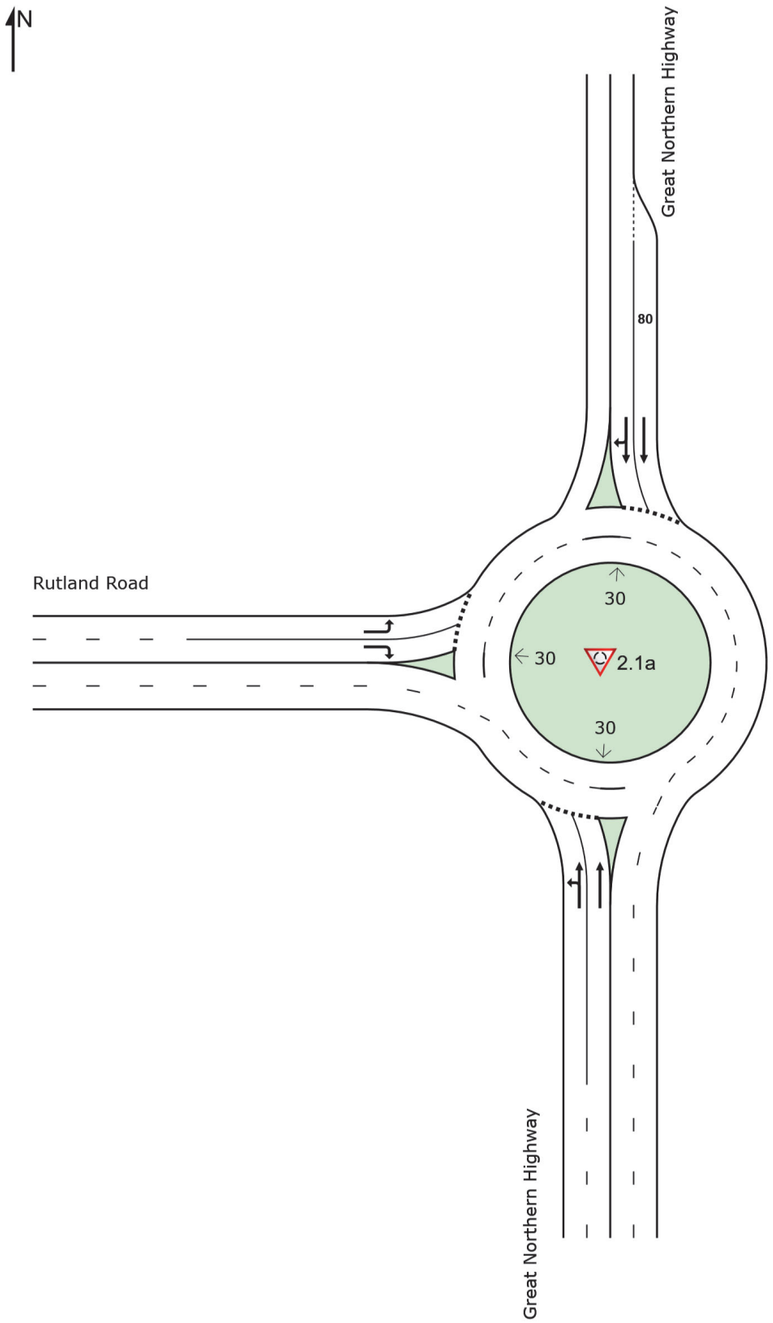
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 2.1a [2.1p Great Northern Highway - Rutland Road - 2041 PM - No Development (Site Folder: Future 2041 PM - No Development Traffic)]

2.1p Great Northern Highway - Rutland Road - 2041 PM - No Development
Site Category: Existing Design
Roundabout

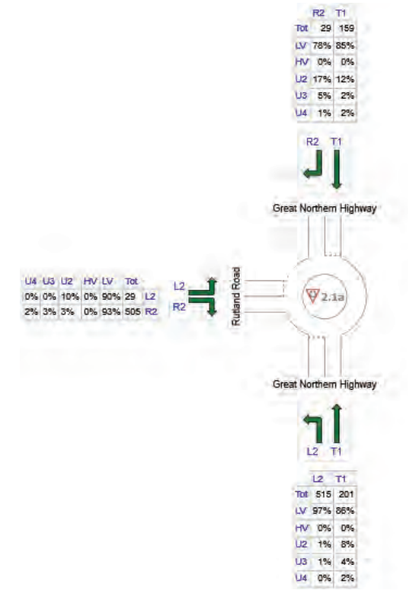
Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Input Volumes

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	AustroadsClass 2-5 (U2)	AustroadsClass 6-9 (U3)	AustroadsClass 10-11 (U4)
S: Great Northern Highway	716	673	0	20	15	7
N: Great Northern Highway	188	158	0	24	4	3
W: Rutland Road	534	495	0	18	13	8
Total	1438	1326	0	62	32	18

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Northern Highway														
7	L2	515	2.8	542	2.8	0.340	6.5	LOS A	2.5	19.1	0.18	0.53	0.18	71.7
8	T1	201	14.0	212	14.0	0.192	7.5	LOS A	1.1	10.1	0.18	0.48	0.18	67.1
Approach		716	5.9	754	5.9	0.340	6.8	LOS A	2.5	19.1	0.18	0.52	0.18	70.3
North: Great Northern Highway														
2	T1	159	15.0	167	15.0	0.123	11.9	LOS B	0.7	6.3	0.63	0.72	0.63	67.1
3	R2	29	22.2	31	22.2	0.123	18.1	LOS B	0.7	6.1	0.64	0.75	0.64	62.9
Approach		188	16.1	198	16.1	0.123	12.8	LOS B	0.7	6.3	0.63	0.73	0.63	66.4
West: Rutland Road														
4	L2	29	9.5	31	9.5	0.040	8.8	LOS A	0.2	1.4	0.40	0.61	0.40	67.3
6	R2	505	7.3	532	7.3	0.432	14.9	LOS B	2.8	23.7	0.49	0.70	0.49	64.3
Approach		534	7.4	562	7.4	0.432	14.6	LOS B	2.8	23.7	0.48	0.70	0.48	64.5
All Vehicles		1438	7.8	1514	7.8	0.432	10.5	LOS B	2.8	23.7	0.35	0.61	0.35	67.5

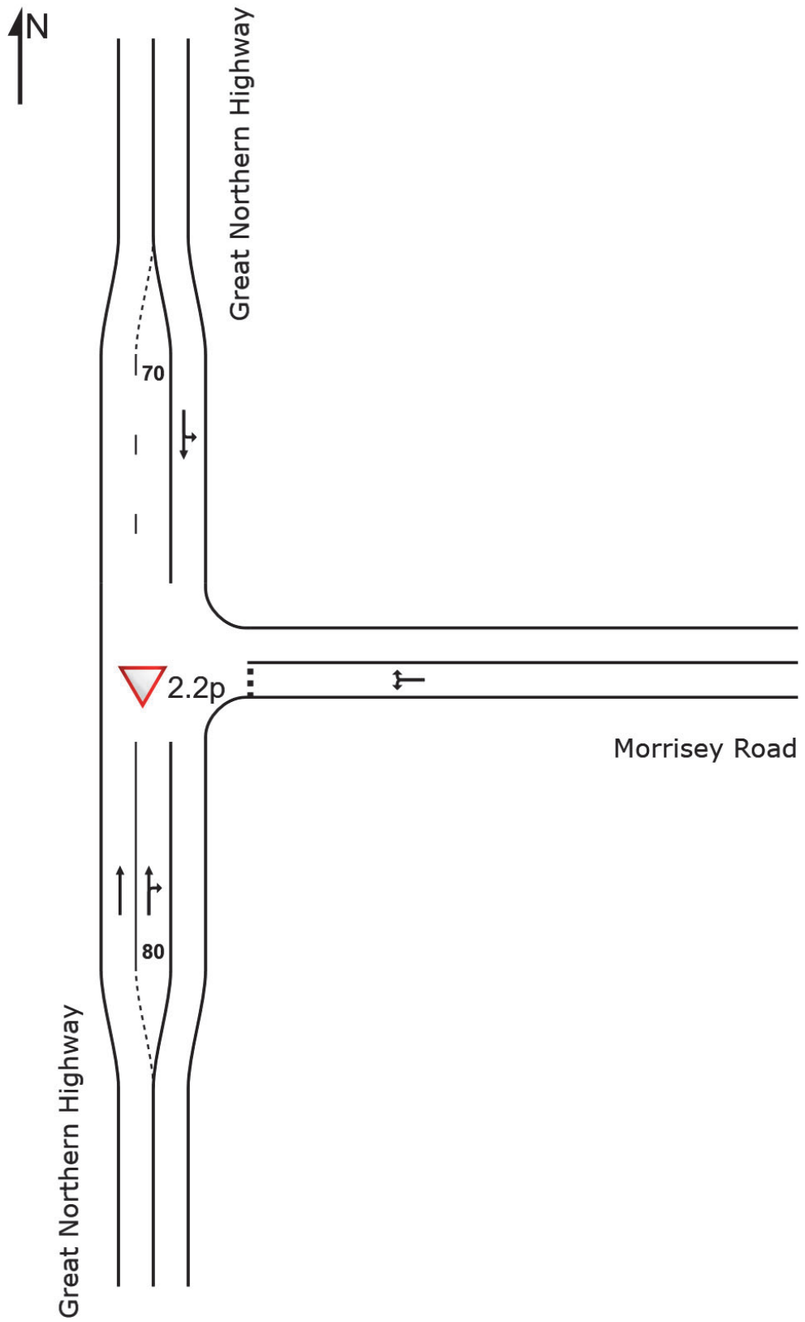
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 2.2p [2.2p Great Northern Highway - Morrisey Road - 2041 PM - No Development (Site Folder: Future 2041 PM - No Development Traffic)]

2.2p Great Northern Highway - Morrisey Road - 2041 PM - No Development
Site Category: Existing Design
Give-Way (Two-Way)

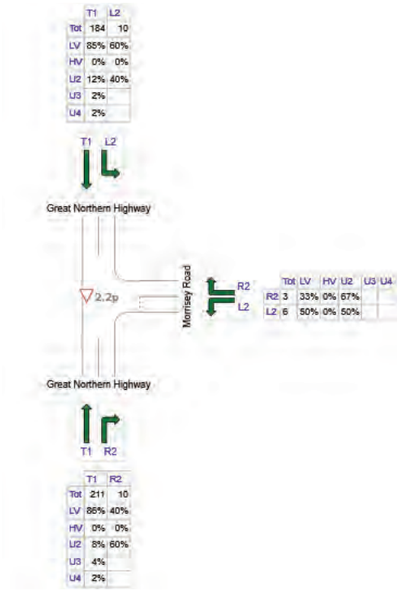
Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Input Volumes

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	AustroadsClass 2-5 (U2)	AustroadsClass 6-9 (U3)	AustroadsClass 10-11 (U4)
S: Great Northern Highway	221	185	0	22	9	5
E: Morrisey Road	9	4	0	5	-	-
N: Great Northern Highway	194	162	0	25	3	3
Total	424	352	0	53	12	8

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Northern Highway														
2	T1	211	14.0	222	14.0	0.109	0.1	LOS A	0.1	1.0	0.03	0.03	0.03	108.9
3	R2	10	60.0	11	60.0	0.042	11.4	LOS B	0.1	1.0	0.16	0.12	0.16	59.8
Approach		221	16.1	233	16.1	0.109	0.7	NA	0.1	1.0	0.04	0.03	0.04	105.0
East: Morrisey Road														
4	L2	6	50.0	6	50.0	0.014	6.1	LOS A	0.1	0.6	0.40	0.55	0.40	42.6
6	R2	3	66.7	3	66.7	0.014	11.5	LOS B	0.1	0.6	0.40	0.55	0.40	39.2
Approach		9	55.6	9	55.6	0.014	7.9	LOS A	0.1	0.6	0.40	0.55	0.40	41.4
North: Great Northern Highway														
7	L2	10	40.0	11	40.0	0.126	9.7	LOS A	0.0	0.0	0.00	0.04	0.00	50.6
8	T1	184	15.0	194	15.0	0.126	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	109.0
Approach		194	16.3	204	16.3	0.126	0.5	NA	0.0	0.0	0.00	0.04	0.00	102.8
All Vehicles		424	17.0	446	17.0	0.126	0.7	NA	0.1	1.0	0.03	0.04	0.03	100.7

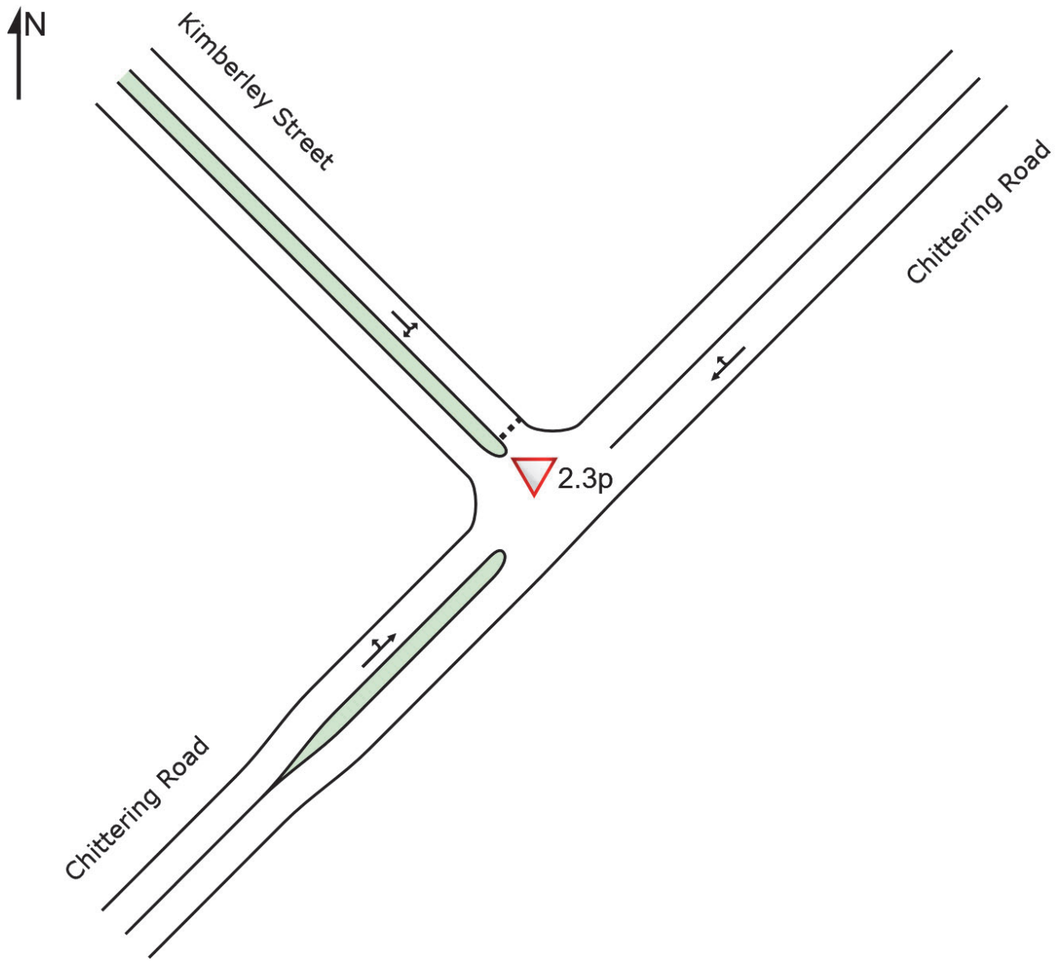
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

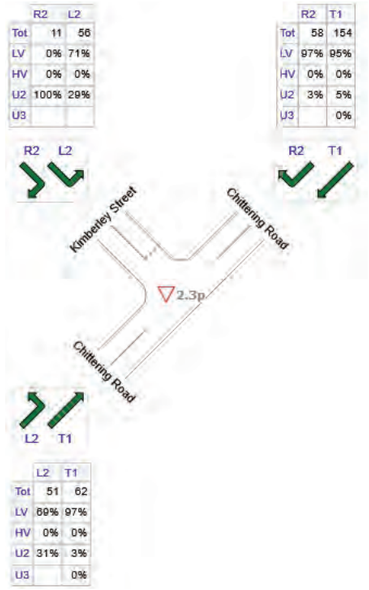
Site: 2.3p [2.3p Chittering Road - Kimberley Street - 2041 PM - No Development (Site Folder: Future 2041 PM - No Development Traffic)]

2.3p Chittering Road - Kimberley Street - 2041 PM - No Development
Site Category: Existing Design
Give-Way (Two-Way)

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.





	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	AustroadsClass 2-5 (U2)	AustroadsClass 6-9 (U3)
NE: Chittering Road	212	203	0	9	0
NW: Kimberley Street	67	40	0	27	-
SW: Chittering Road	113	95	0	18	0
Total	392	338	0	54	0

Input Volumes

Volume Display Method: Total and %

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: Chittering Road														
2	T1	154	4.5	162	4.5	0.113	0.1	LOS A	0.3	2.6	0.14	0.14	0.14	58.4
3	R2	58	3.4	61	3.4	0.113	2.7	LOS A	0.3	2.6	0.14	0.14	0.14	31.7
Approach		212	4.2	223	4.2	0.113	0.8	NA	0.3	2.6	0.14	0.14	0.14	56.8
NorthWest: Kimberley Street														
4	L2	56	28.6	59	28.6	0.048	2.7	LOS A	0.2	2.0	0.14	0.46	0.14	23.7
6	R2	11	100.0	12	100.0	0.048	3.6	LOS A	0.2	2.0	0.14	0.46	0.14	34.6
Approach		67	40.3	71	40.3	0.048	2.9	LOS A	0.2	2.0	0.14	0.46	0.14	30.0
SouthWest: Chittering Road														
7	L2	51	31.4	54	31.4	0.072	6.0	LOS A	0.0	0.0	0.00	0.26	0.00	52.1
8	T1	62	3.2	65	3.2	0.072	0.0	LOS A	0.0	0.0	0.00	0.26	0.00	56.3
Approach		113	15.9	119	15.9	0.072	2.7	NA	0.0	0.0	0.00	0.26	0.00	54.3
All Vehicles		392	13.8	413	13.8	0.113	1.7	NA	0.3	2.6	0.10	0.23	0.10	53.1

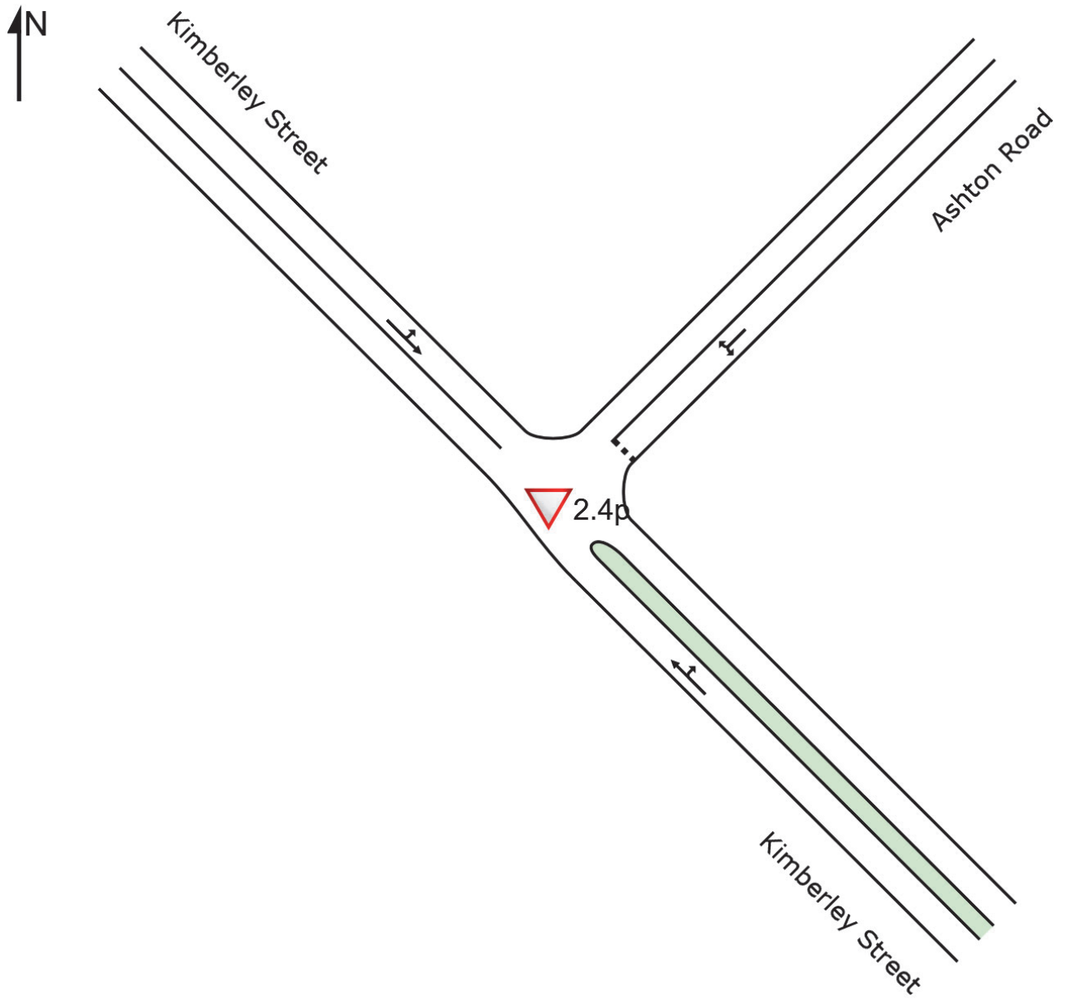
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

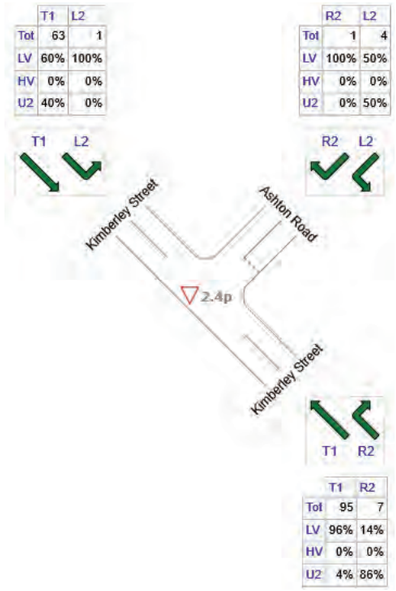
Site: 2.4p [2.4p Kimberley Street - Ashton Road - 2041 PM - No Development (Site Folder: Future 2041 PM - No Development Traffic)]

2.4p Kimberley Street - Ashton Road - 2041 PM - No Development
Site Category: Existing Design
Give-Way (Two-Way)

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.





Input Volumes

Volume Display Method: Total and %

	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	AustroadsClass 2-5 (U2)
SE: Kimberley Street	102	92	0	10
NE: Ashton Road	5	3	0	2
NW: Kimberley Street	64	39	0	25
Total	171	134	0	37

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Kimberley Street														
2	T1	95	4.2	100	4.2	0.062	0.0	LOS A	0.1	0.6	0.04	0.03	0.04	49.8
3	R2	7	85.7	7	85.7	0.062	2.8	LOS A	0.1	0.6	0.04	0.03	0.04	40.0
Approach		102	9.8	107	9.8	0.062	0.2	NA	0.1	0.6	0.04	0.03	0.04	48.3
NorthEast: Ashton Road														
4	L2	4	50.0	4	50.0	0.003	5.4	LOS A	0.0	0.1	0.17	0.49	0.17	42.5
6	R2	1	0.0	1	0.0	0.003	4.9	LOS A	0.0	0.1	0.17	0.49	0.17	44.5
Approach		5	40.0	5	40.0	0.003	5.3	LOS A	0.0	0.1	0.17	0.49	0.17	43.0
NorthWest: Kimberley Street														
7	L2	1	0.0	1	0.0	0.049	4.6	LOS A	0.0	0.0	0.00	0.01	0.00	49.2
8	T1	63	39.7	66	39.7	0.049	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	49.7
Approach		64	39.1	67	39.1	0.049	0.1	NA	0.0	0.0	0.00	0.01	0.00	49.7
All Vehicles		171	21.6	180	21.6	0.062	0.3	NA	0.1	0.6	0.03	0.04	0.03	48.5

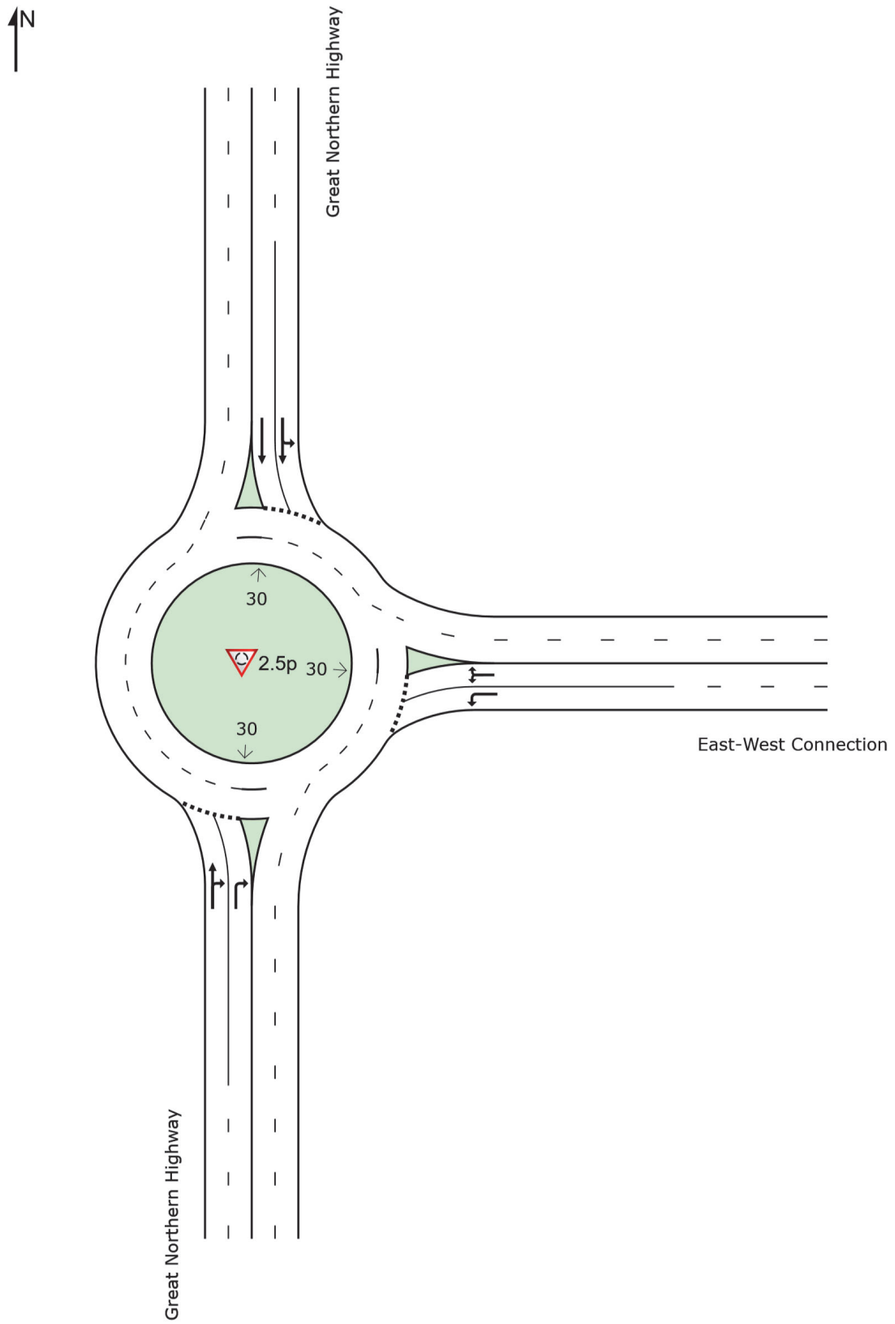
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 2.5p [2.5p Great Northern Highway - East-West Connection - 2041 PM - No Development (Site Folder: Future 2041 PM - No Development Traffic)]

2.5p Great Northern Highway - East-West Connection - 2041 PM - No Development
Site Category: Existing Design
Roundabout

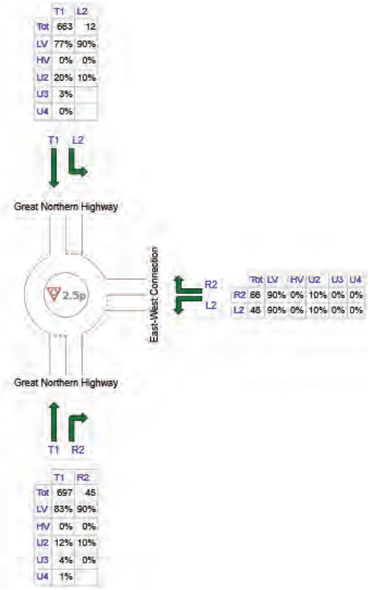
Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Input Volumes

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	AustroadsClass 2-5 (U2)	AustroadsClass 6-9 (U3)	AustroadsClass 10-11 (U4)
S: Great Northern Highway	742	618	0	90	29	5
E: East-West Connection	114	103	0	11	0	0
N: Great Northern Highway	675	522	0	132	21	0
Total	1531	1243	0	234	50	5

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Northern Highway														
2	T1	697	17.1	734	17.1	0.525	9.5	LOS A	4.6	41.6	0.35	0.53	0.35	68.1
3	R2	45	10.0	47	10.0	0.053	14.8	LOS B	0.3	2.1	0.25	0.65	0.25	62.5
Approach		742	16.7	781	16.7	0.525	9.8	LOS A	4.6	41.6	0.34	0.54	0.34	67.8
East: East-West Connection														
4	L2	48	10.0	51	10.0	0.066	5.4	LOS A	0.3	2.1	0.56	0.64	0.56	54.0
6	R2	66	10.0	69	10.0	0.072	9.7	LOS A	0.3	2.4	0.54	0.72	0.54	47.6
Approach		114	10.0	120	10.0	0.072	7.9	LOS A	0.3	2.4	0.55	0.69	0.55	50.0
North: Great Northern Highway														
7	L2	12	10.0	13	10.0	0.269	7.8	LOS A	1.5	14.3	0.19	0.53	0.19	64.9
8	T1	663	22.8	698	22.8	0.269	9.3	LOS A	1.5	14.3	0.20	0.53	0.20	68.3
Approach		675	22.6	711	22.6	0.269	9.3	LOS A	1.5	14.3	0.20	0.53	0.20	68.3
All Vehicles		1531	18.8	1612	18.8	0.525	9.4	LOS A	4.6	41.6	0.29	0.54	0.29	66.8

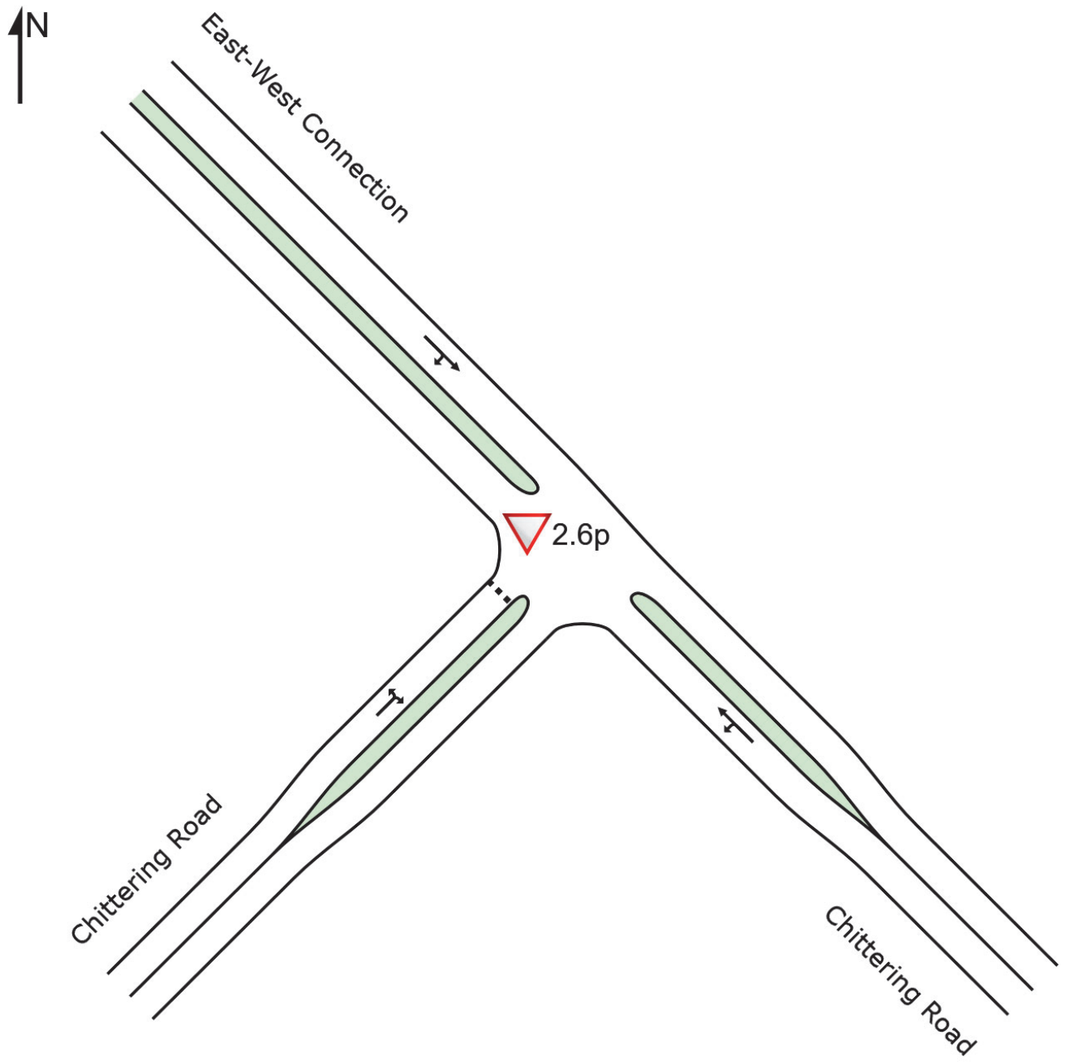
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 2.6p [2.6p Chittering Road - East-West Connection - 2041 PM - No Development (Site Folder: Future 2041 PM - No Development Traffic)]

2.6p Chittering Road - East-West Connection - 2041 PM - No Development
Site Category: Existing Design
Give-Way (Two-Way)

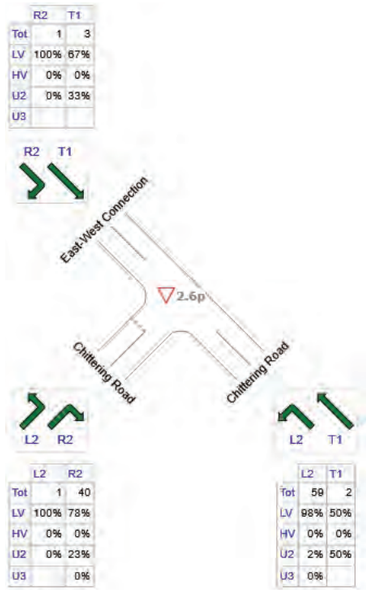
Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Input Volumes

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	AustroadsClass 2-5 (U2)	AustroadsClass 6-9 (U3)
SE: Chittering Road	61	59	0	2	0
NW: East-West Connection	4	3	0	1	-
SW: Chittering Road	41	32	0	9	0
Total	106	94	0	12	0

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Chittering Road														
7	L2	59	1.7	62	1.7	0.035	5.6	LOS A	0.0	0.0	0.00	0.56	0.00	37.6
8	T1	2	50.0	2	50.0	0.035	1.3	LOS A	0.0	0.0	0.00	0.56	0.00	47.5
Approach		61	3.3	64	3.3	0.035	5.4	NA	0.0	0.0	0.00	0.56	0.00	38.0
NorthWest: East-West Connection														
2	T1	3	33.3	3	33.3	0.002	0.0	LOS A	0.0	0.0	0.08	0.14	0.08	54.0
3	R2	1	0.0	1	0.0	0.002	4.7	LOS A	0.0	0.0	0.08	0.14	0.08	29.5
Approach		4	25.0	4	25.0	0.002	1.2	NA	0.0	0.0	0.08	0.14	0.08	49.3
SouthWest: Chittering Road														
4	L2	1	0.0	1	0.0	0.031	3.4	LOS A	0.1	0.6	0.05	0.52	0.05	41.8
6	R2	40	22.5	42	22.5	0.031	3.4	LOS A	0.1	0.6	0.05	0.52	0.05	40.5
Approach		41	22.0	43	22.0	0.031	3.4	LOS A	0.1	0.6	0.05	0.52	0.05	40.5
All Vehicles		106	11.3	112	11.3	0.035	4.5	NA	0.1	0.6	0.02	0.53	0.02	39.3

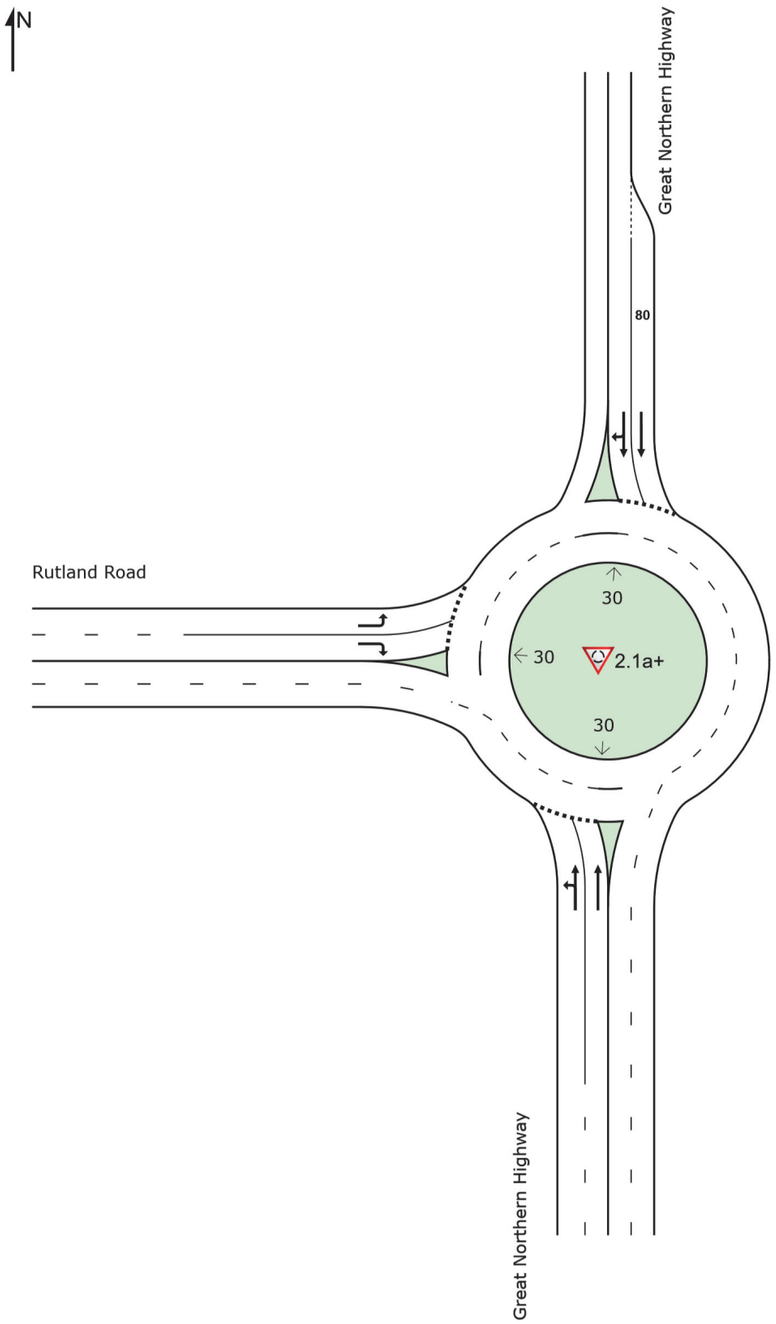
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 2.1a+ [2.1a+ Great Northern Highway - Rutland Road - 2041 AM - With Development (Site Folder: Future 2041 AM - With Development Traffic)]

2.1a+ Great Northern Highway - Rutland Road - 2041 AM - With Development
Site Category: Existing Design
Roundabout

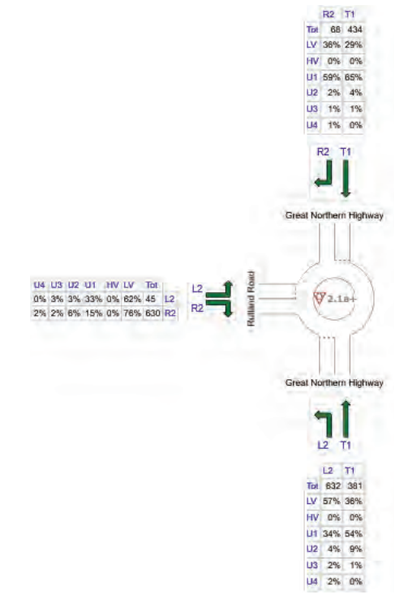
Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Input Volumes

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	Development LV (U1)	AustroadsClass 2-5 (U2)	AustroadsClass 6-9 (U3)	AustroadsClass 10-11 (U
S: Great Northern Highway	1013	499	0	423	61	18	12
N: Great Northern Highway	502	152	0	320	21	7	2
W: Rutland Road	675	505	0	109	36	13	12
Total	2190	1156	0	852	119	38	26

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Northern Highway														
7	L2	632	8.1	665	8.1	0.461	6.9	LOS A	3.7	31.1	0.32	0.54	0.32	68.8
8	T1	381	10.5	401	10.5	0.332	7.6	LOS A	2.2	17.7	0.29	0.50	0.29	66.8
Approach		1013	9.0	1066	9.0	0.461	7.1	LOS A	3.7	31.1	0.31	0.52	0.31	68.0
North: Great Northern Highway														
2	T1	434	6.1	457	6.1	0.370	13.1	LOS B	2.7	21.1	0.84	0.86	0.84	68.4
3	R2	68	4.9	72	4.9	0.370	19.0	LOS B	2.5	19.6	0.83	0.89	0.83	68.1
Approach		502	5.9	528	5.9	0.370	13.9	LOS B	2.7	21.1	0.83	0.86	0.83	68.4
West: Rutland Road														
4	L2	45	5.1	47	5.1	0.068	9.6	LOS A	0.3	2.2	0.50	0.68	0.50	67.3
6	R2	630	9.3	663	9.3	0.614	17.2	LOS B	5.3	45.2	0.71	0.85	0.81	62.3
Approach		675	9.1	711	9.1	0.614	16.7	LOS B	5.3	45.2	0.69	0.83	0.78	62.6
All Vehicles		2190	8.3	2305	8.3	0.614	11.6	LOS B	5.3	45.2	0.55	0.70	0.58	66.3

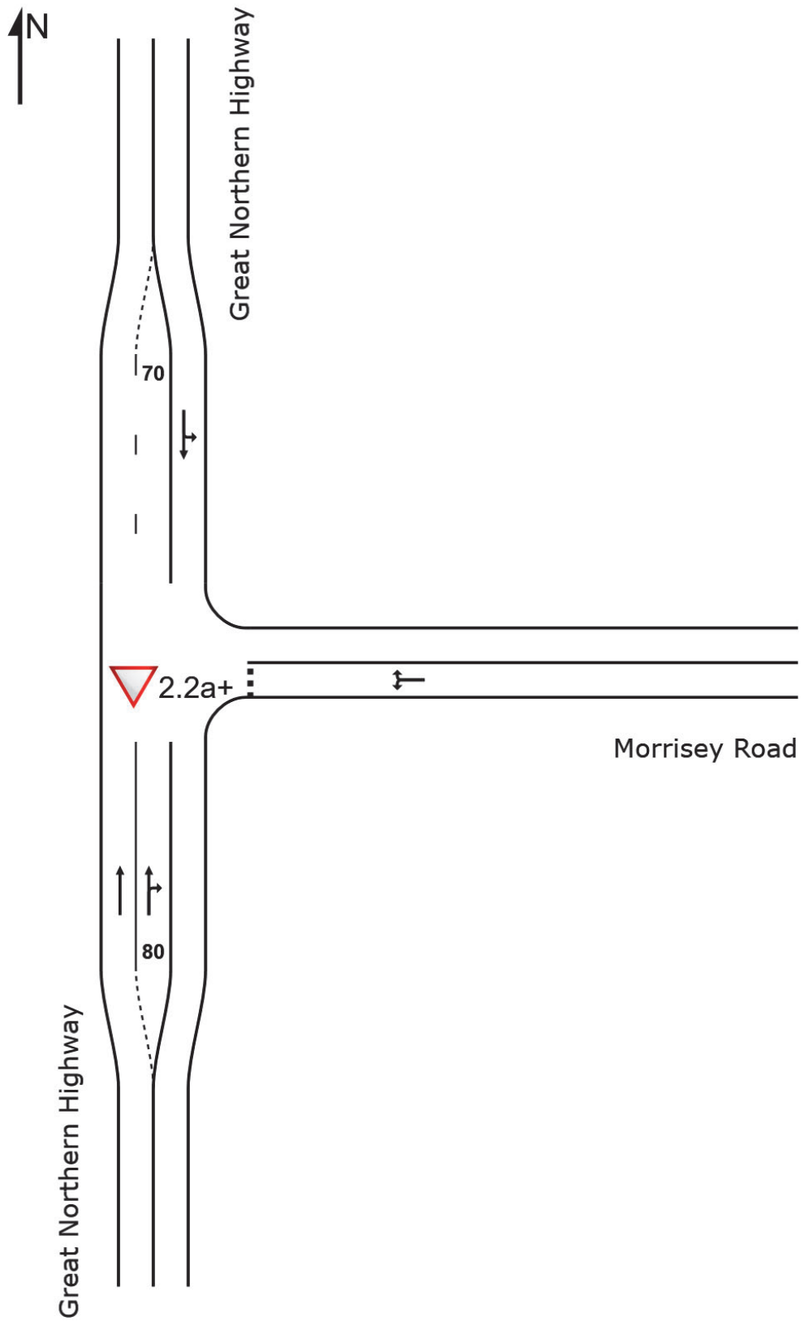
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 2.2a+ [2.2a+ Great Northern Highway - Morrisey Road - 2041 AM - With Development (Site Folder: Future 2041 AM - With Development Traffic)]

2.2a+ Great Northern Highway - Morrisey Road - 2041 AM - With Development
Site Category: Existing Design
Give-Way (Two-Way)

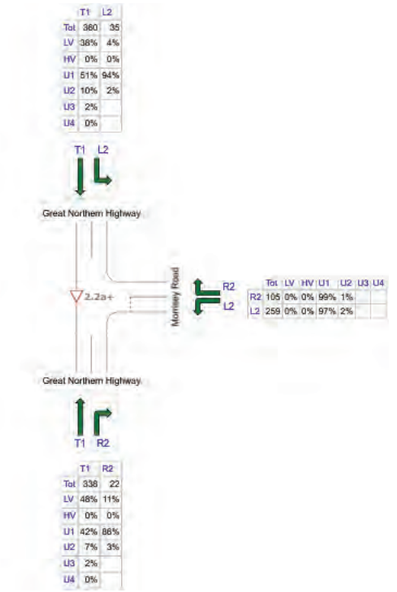
Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Input Volumes

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	Development LV (U1)	AustroadsClass 2-5 (U2)	AustroadsClass 6-9 (U3)	AustroadsClass 10-11 (U
S: Great Northern Highway	360	164	0	162	25	8	1
E: Morrisey Road	364	1	0	356	7	-	-
N: Great Northern Highway	395	138	0	216	36	6	0
Total	1119	303	0	734	67	14	1

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Northern Highway														
2	T1	338	9.9	356	9.9	0.162	0.4	LOS A	0.2	1.6	0.05	0.05	0.05	82.9
3	R2	22	3.0	23	3.0	0.062	7.7	LOS A	0.2	1.6	0.26	0.22	0.26	61.1
Approach		360	9.5	379	9.5	0.162	0.9	NA	0.2	1.6	0.07	0.06	0.07	81.1
East: Morrisey Road														
4	L2	259	2.2	273	2.2	0.517	9.5	LOS A	3.5	25.2	0.64	0.93	1.00	48.7
6	R2	105	0.7	111	0.7	0.517	18.3	LOS C	3.5	25.2	0.64	0.93	1.00	48.7
Approach		364	1.8	383	1.8	0.517	12.0	LOS B	3.5	25.2	0.64	0.93	1.00	48.7
North: Great Northern Highway														
7	L2	35	2.1	37	2.1	0.237	6.7	LOS A	0.0	0.0	0.00	0.06	0.00	68.1
8	T1	360	11.2	379	11.2	0.237	0.1	LOS A	0.0	0.0	0.00	0.06	0.00	73.3
Approach		395	10.4	416	10.4	0.237	0.6	NA	0.0	0.0	0.00	0.06	0.00	72.8
All Vehicles		1119	7.3	1178	7.3	0.517	4.4	NA	3.5	25.2	0.23	0.34	0.35	64.5

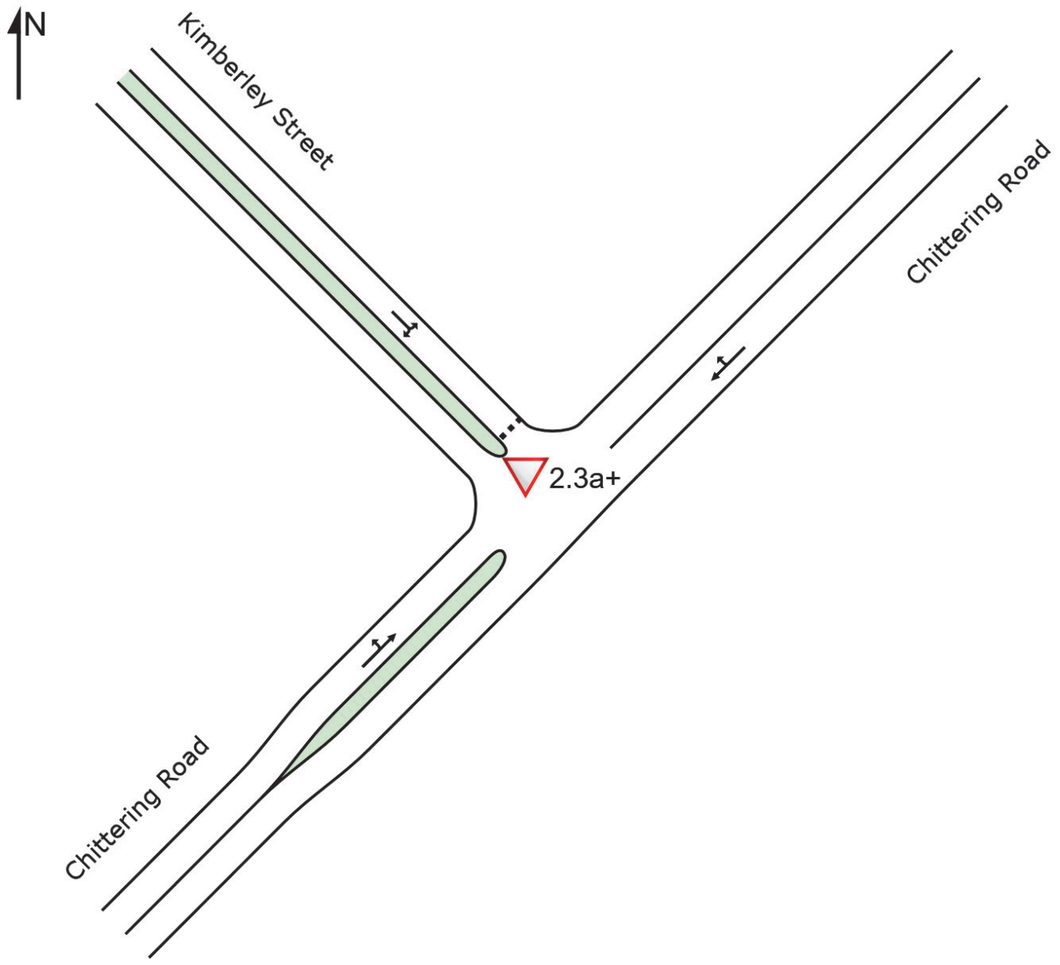
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

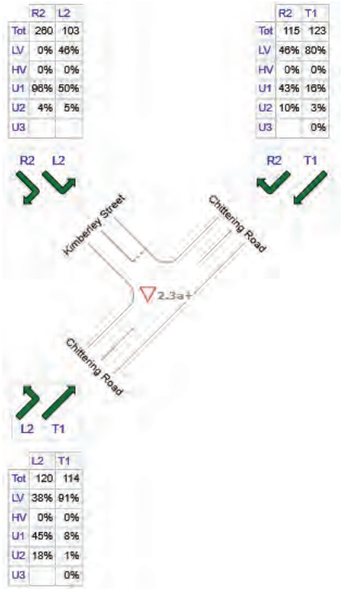
Site: 2.3a+ [2.3a+ Chittering Road - Kimberley Street - 2041 AM - With Development (Site Folder: Future 2041 AM - With Development Traffic)]

2.3a+ Chittering Road - Kimberley Street - 2041 AM - With Development
Site Category: Existing Design
Give-Way (Two-Way)

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.





	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	Development LV (U1)	AustroadsClass 2-5 (U2)	AustroadsClass 6-9 (U3)
NE: Chittering Road	238	152	0	70	16	0
NW: Kimberley Street	363	48	0	300	15	-
SW: Chittering Road	234	149	0	63	22	0
Total	835	349	0	433	53	0

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: Chittering Road														
2	T1	123	3.3	129	3.3	0.137	0.6	LOS A	0.7	5.2	0.34	0.26	0.34	56.8
3	R2	115	10.4	121	10.4	0.137	3.2	LOS A	0.7	5.2	0.34	0.26	0.34	27.0
Approach		238	6.7	251	6.7	0.137	1.8	NA	0.7	5.2	0.34	0.26	0.34	52.2
NorthWest: Kimberley Street														
4	L2	103	4.9	108	4.9	0.284	2.9	LOS A	1.0	7.2	0.25	0.56	0.25	22.4
6	R2	260	3.8	274	3.8	0.284	3.4	LOS A	1.0	7.2	0.25	0.56	0.25	48.5
Approach		363	4.1	382	4.1	0.284	3.3	LOS A	1.0	7.2	0.25	0.56	0.25	46.5
SouthWest: Chittering Road														
7	L2	120	17.5	126	17.5	0.141	5.8	LOS A	0.0	0.0	0.00	0.30	0.00	51.5
8	T1	114	0.9	120	0.9	0.141	0.0	LOS A	0.0	0.0	0.00	0.30	0.00	55.4
Approach		234	9.4	246	9.4	0.141	3.0	NA	0.0	0.0	0.00	0.30	0.00	53.3
All Vehicles		835	6.3	879	6.3	0.284	2.8	NA	1.0	7.2	0.21	0.40	0.21	50.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Input Volumes

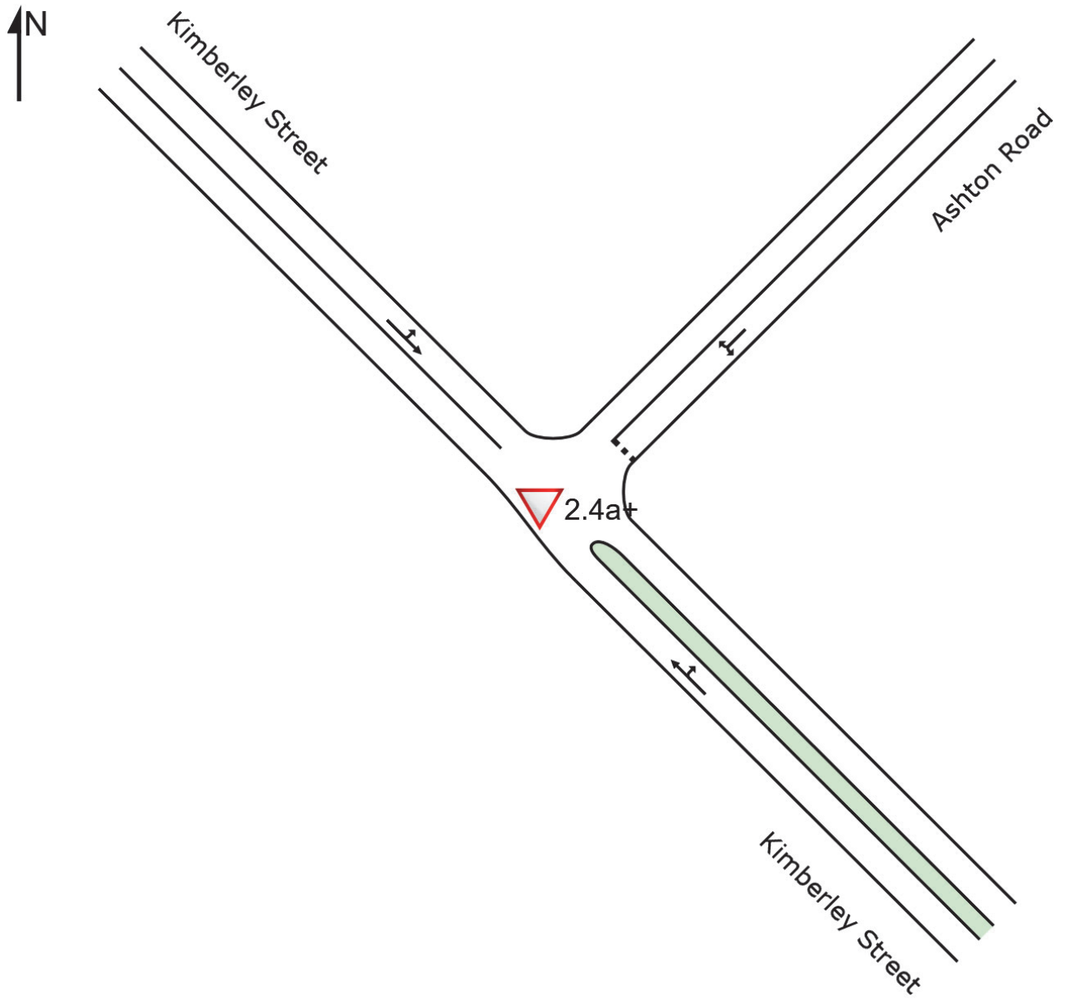
Volume Display Method: Total and %

Site: 2.4a+ [2.4a+ Kimberley Street - Ashton Road - 2041 AM - With Development (Site Folder: Future 2041 AM - With Development Traffic)]

2.4a+ Kimberley Street - Ashton Road - 2041 AM - With Development
Site Category: Existing Design
Give-Way (Two-Way)

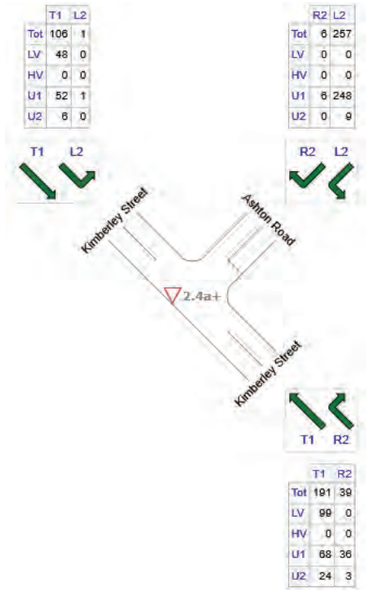
Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Input Volumes

Volume Display Method: Separate



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	Development LV (U1)	AustroadsClass 2-5 (U2)
SE: Kimberley Street	230	99	0	104	27
NE: Ashton Road	263	0	0	254	9
NW: Kimberley Street	107	48	0	53	6
Total	600	147	0	411	42

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Kimberley Street														
2	T1	191	24	201	12.6	0.136	0.1	LOS A	0.2	2.0	0.09	0.09	0.09	48.6
3	R2	39	3	41	7.7	0.136	2.7	LOS A	0.2	2.0	0.09	0.09	0.09	46.6
Approach		230	27	242	11.7	0.136	0.5	NA	0.2	2.0	0.09	0.09	0.09	48.0
NorthEast: Ashton Road														
4	L2	257	9	271	3.5	0.147	4.9	LOS A	0.7	5.4	0.22	0.51	0.22	42.5
6	R2	6	0	6	0.0	0.147	5.3	LOS A	0.7	5.4	0.22	0.51	0.22	44.4
Approach		263	9	277	3.4	0.147	4.9	LOS A	0.7	5.4	0.22	0.51	0.22	42.6
NorthWest: Kimberley Street														
7	L2	1	0	1	0.0	0.062	4.6	LOS A	0.0	0.0	0.00	0.01	0.00	49.3
8	T1	106	6	112	5.7	0.062	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	49.9
Approach		107	6	113	5.6	0.062	0.1	NA	0.0	0.0	0.00	0.01	0.00	49.9
All Vehicles		600	42	632	7.0	0.147	2.4	NA	0.7	5.4	0.13	0.26	0.13	44.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

USER REPORT FOR NETWORK

All Movement Classes

Project: KC01293.000 Future Models — **Template: Network Site Report**

Network: n2.1a [n2.1a M03 and M04 - 2041 AM (Network Folder: General)]

New Network
Network Category: (None)

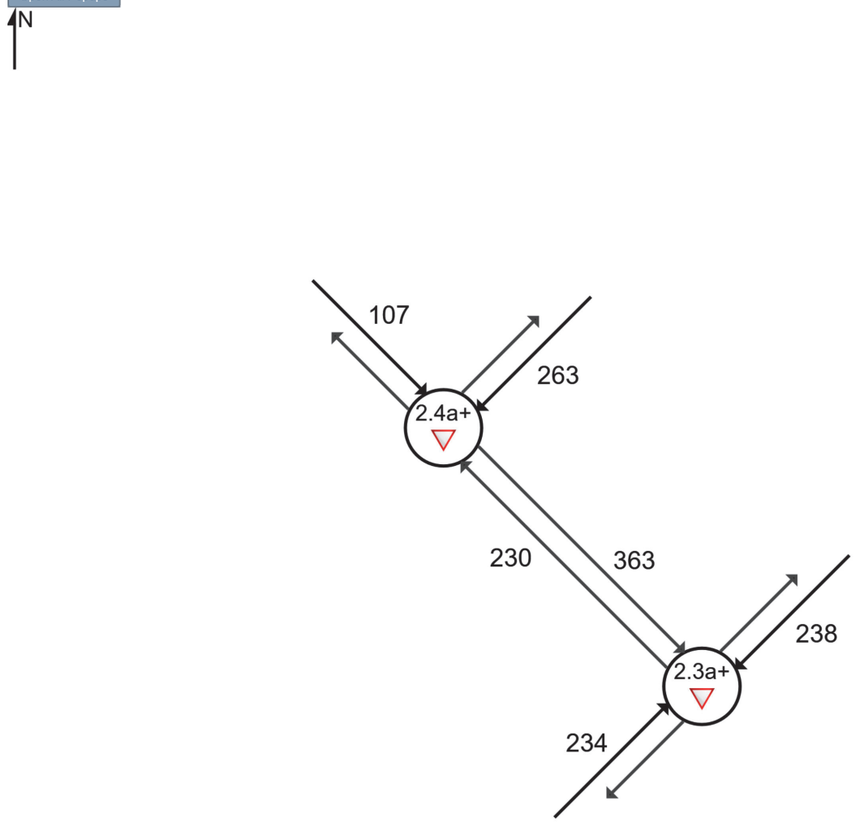
Sites in Network

SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
2.3a+	NA	2.3a+ Chittering Road - Kimberley Street - 2041 AM - With Development
2.4a+	NA	2.4a+ Kimberley Street - Ashton Road - 2041 AM - With Development

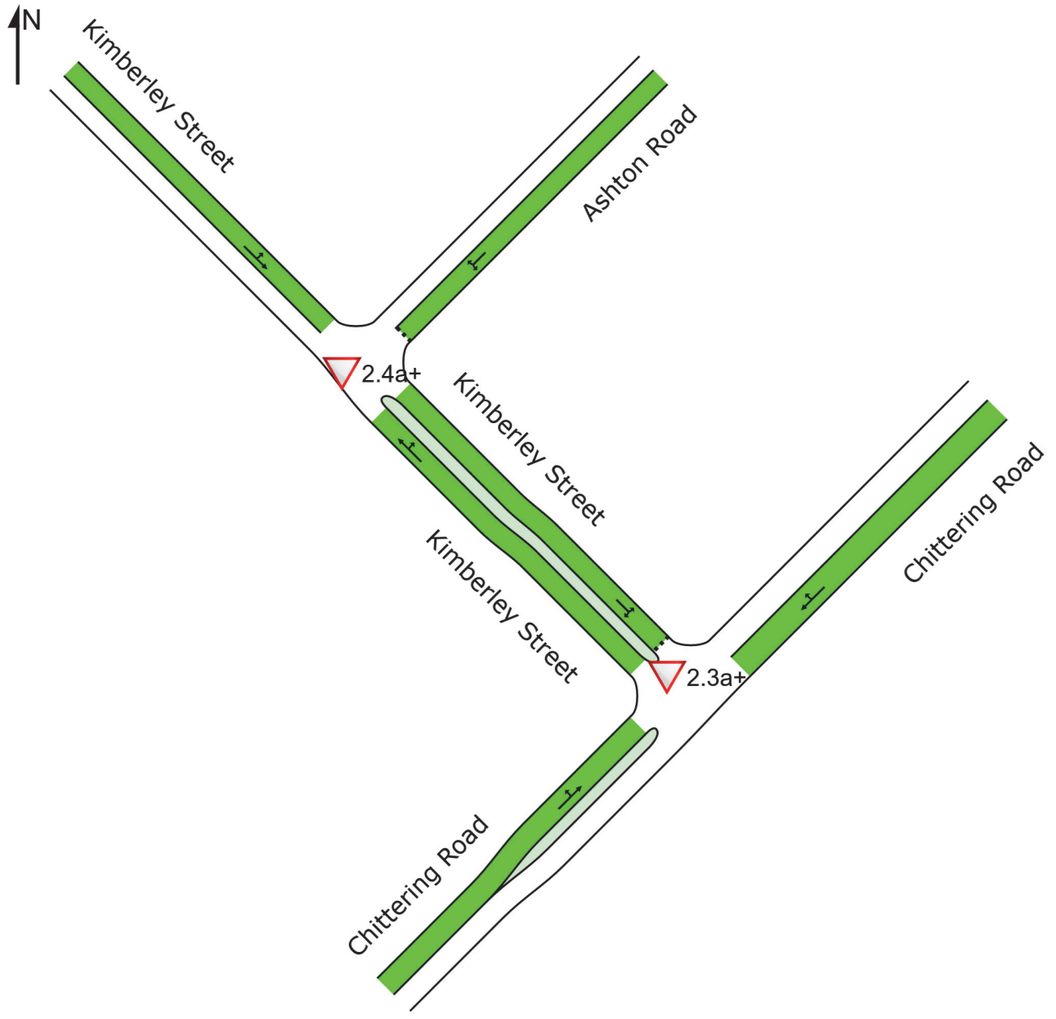
Network Flows - Input

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Open All Popups



Level of Service



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

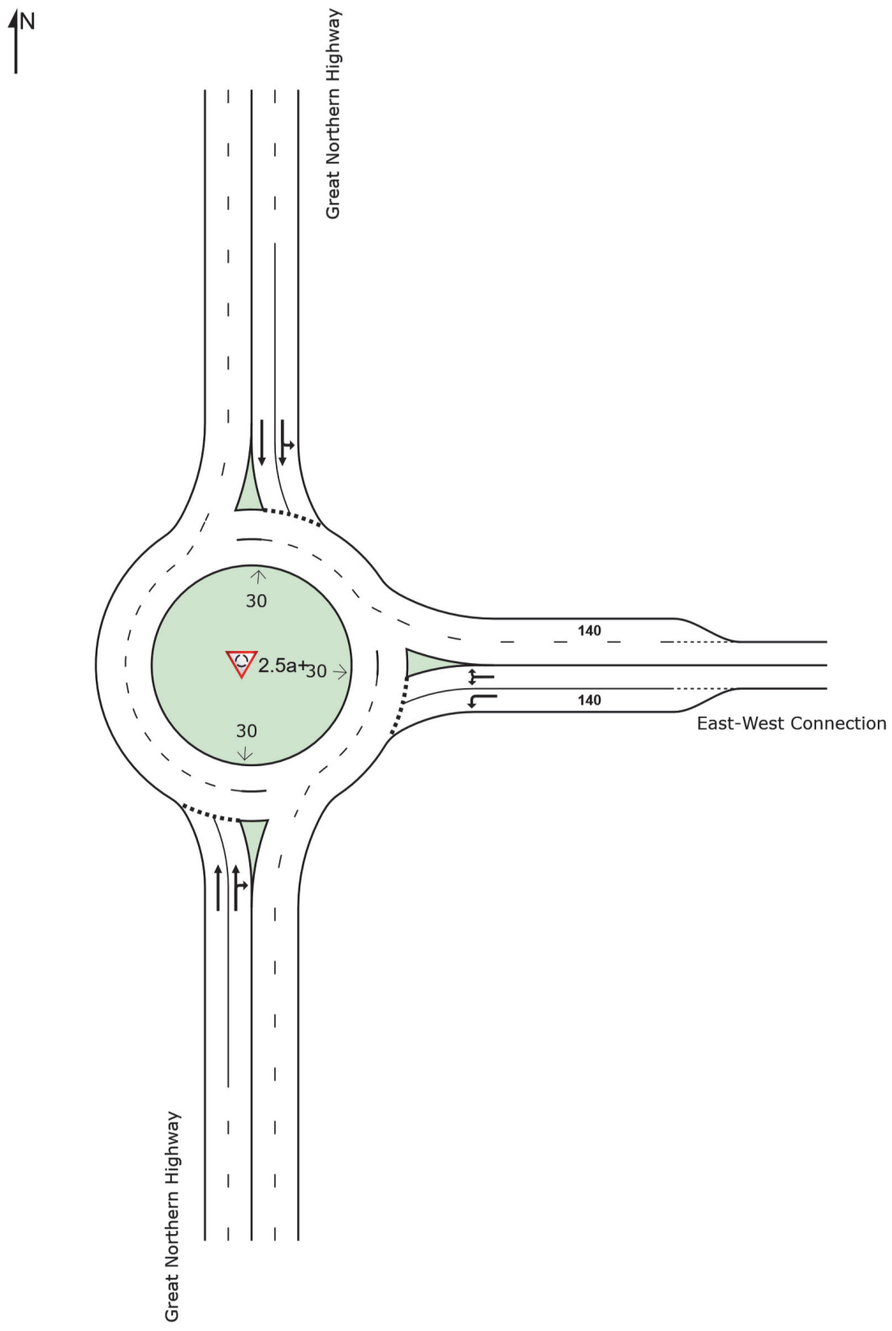
Delay Model: SIDRA Standard (Geometric Delay is included).

Site: 2.5a+ [2.5a+ Great Northern Highway - East-West Connection - 2041 AM - With Development (Site Folder: Future 2041 AM - With Development Traffic)]

2.5a+ Great Northern Highway - East-West Connection - 2041 AM - With Development
Site Category: Existing Design
Roundabout

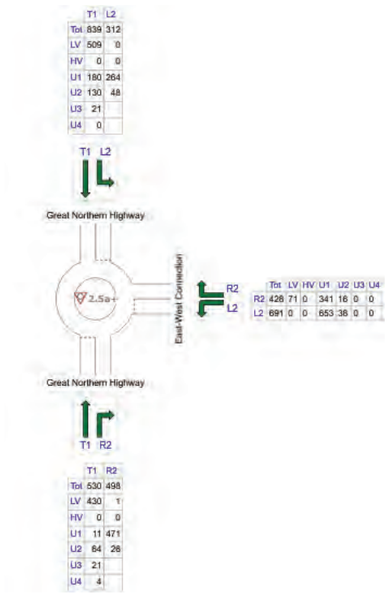
Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Input Volumes

Volume Display Method: Separate



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	Development LV (U1)	AustroadsClass 2-5 (U2)	AustroadsClass 6-9 (U3)	AustroadsClass 10-11 (U
S: Great Northern Highway	1028	431	0	482	90	21	4
E: East-West Connection	1119	71	0	994	54	0	0
N: Great Northern Highway	1151	509	0	444	178	21	0
Total	3298	1011	0	1920	322	42	4

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Northern Highway														
2	T1	530	89	558	16.8	0.621	13.8	LOS B	6.3	56.8	0.87	0.88	1.00	62.5
3	R2	498	26	524	5.2	0.621	19.0	LOS B	6.2	46.5	0.87	0.90	1.01	58.1
Approach		1028	115	1082	11.2	0.621	16.3	LOS B	6.3	56.8	0.87	0.89	1.00	60.7
East: East-West Connection														
4	L2	691	38	727	5.5	0.910	20.9	LOS C	14.0	104.0	1.00	1.48	2.12	40.3
6	R2	428	16	451	3.7	0.910	29.2	LOS C	12.6	93.0	1.00	1.49	2.19	36.3
Approach		1119	54	1178	4.8	0.910	24.1	LOS C	14.0	104.0	1.00	1.48	2.15	38.6
North: Great Northern Highway														
7	L2	312	48	328	15.4	0.774	18.6	LOS B	10.8	92.3	1.00	1.03	1.41	52.9
8	T1	839	150	883	17.9	0.774	19.6	LOS B	10.8	92.3	1.00	1.06	1.43	59.2
Approach		1151	198	1212	17.2	0.774	19.3	LOS B	10.8	92.3	1.00	1.06	1.42	57.8
All Vehicles		3298	367	3472	11.1	0.910	20.0	LOS B	14.0	104.0	0.96	1.15	1.54	51.5

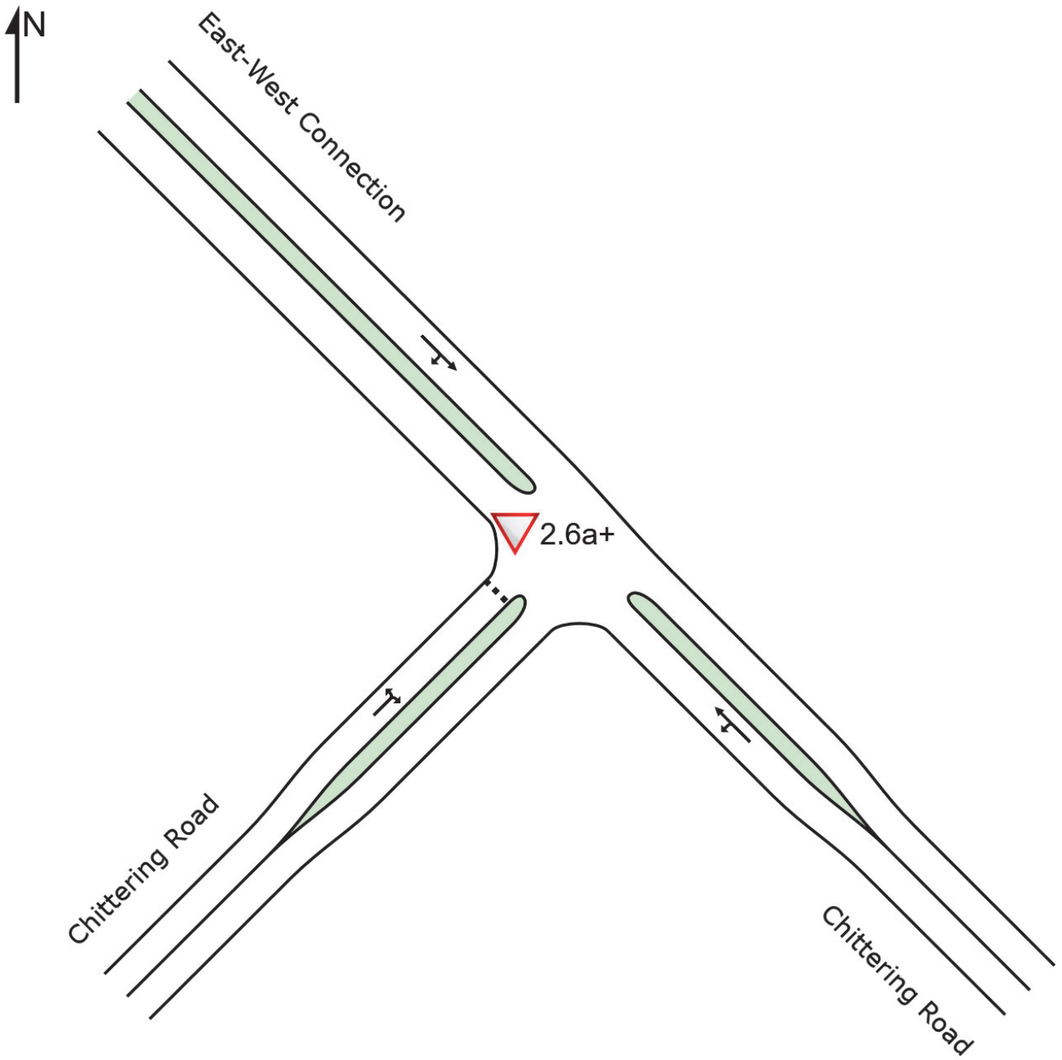
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 2.6a+ [2.6a+ Chittering Road - East-West Connection - 2041 AM - With Development (Site Folder: Future 2041 AM - With Development Traffic)]

2.6a+ Chittering Road - East-West Connection - 2041 AM - With Development
Site Category: Existing Design
Give-Way (Two-Way)

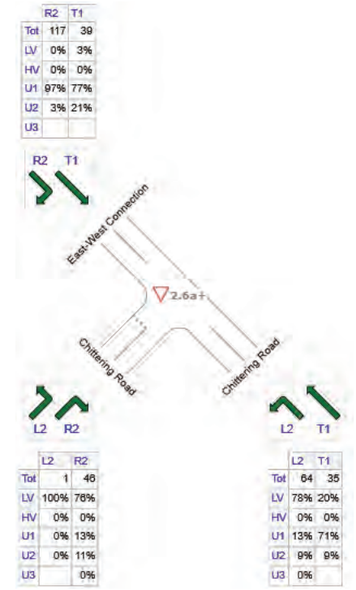
Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Input Volumes

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	Development LV (U1)	AustroadsClass 2-5 (U2)	AustroadsClass 6-9 (U3)
SE: Chittering Road	99	57	0	33	9	0
NW: East-West Connection	156	1	0	144	11	-
SW: Chittering Road	47	36	0	6	5	0
Total	302	94	0	183	25	0

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Chittering Road														
7	L2	64	9.4	67	9.4	0.060	5.7	LOS A	0.0	0.0	0.00	0.45	0.00	38.6
8	T1	35	8.6	37	8.6	0.060	1.1	LOS A	0.0	0.0	0.00	0.45	0.00	54.3
Approach		99	9.1	104	9.1	0.060	4.1	NA	0.0	0.0	0.00	0.45	0.00	44.1
NorthWest: East-West Connection														
2	T1	39	20.5	41	20.5	0.079	0.2	LOS A	0.4	3.2	0.22	0.39	0.22	51.6
3	R2	117	2.6	123	2.6	0.079	4.9	LOS A	0.4	3.2	0.22	0.39	0.22	27.5
Approach		156	7.1	164	7.1	0.079	3.7	NA	0.4	3.2	0.22	0.39	0.22	35.0
SouthWest: Chittering Road														
4	L2	1	0.0	1	0.0	0.038	3.5	LOS A	0.1	0.7	0.18	0.54	0.18	41.2
6	R2	46	10.9	48	10.9	0.038	3.8	LOS A	0.1	0.7	0.18	0.54	0.18	44.6
Approach		47	10.6	49	10.6	0.038	3.7	LOS A	0.1	0.7	0.18	0.54	0.18	44.6
All Vehicles		302	8.3	318	8.3	0.079	3.8	NA	0.4	3.2	0.14	0.43	0.14	39.8

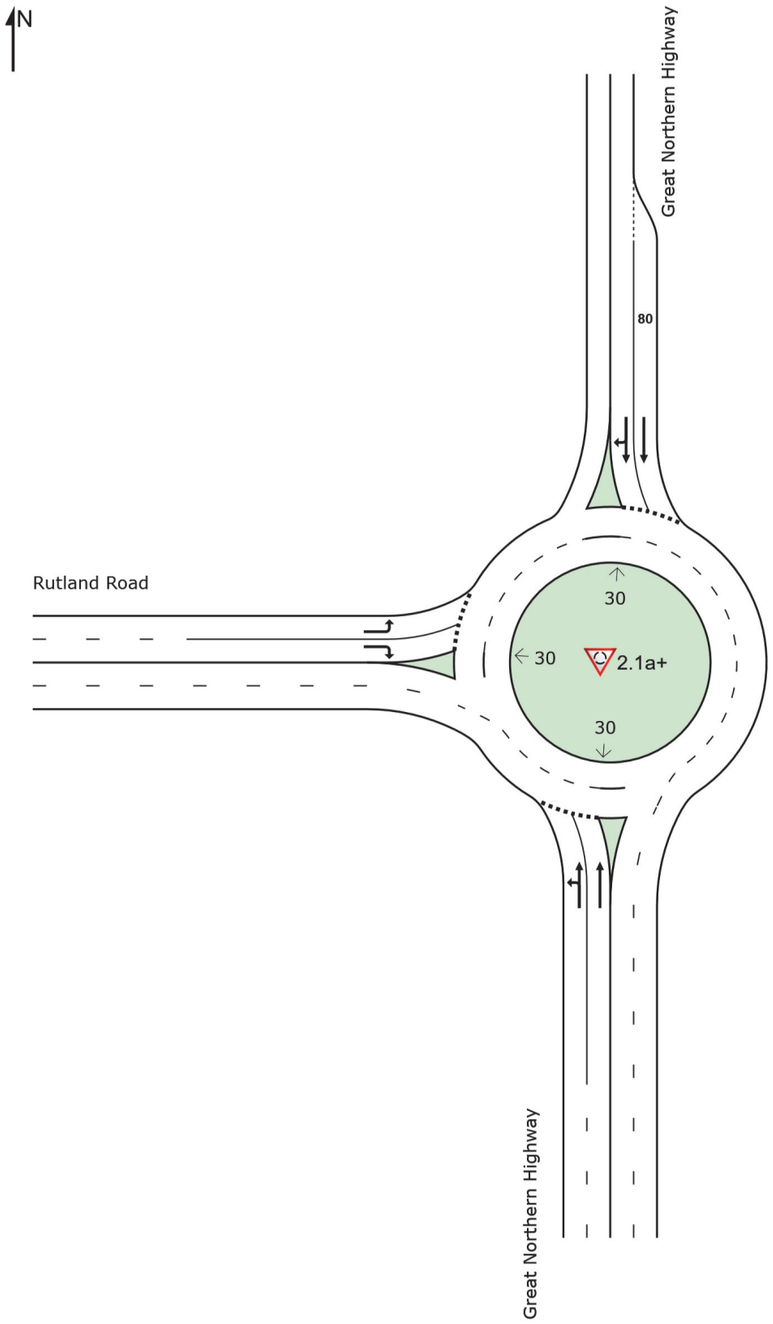
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 2.1a+ [2.1p+ Great Northern Highway - Rutland Road - 2041 PM - With Development (Site Folder: Future 2041 PM - With Development Traffic)]

2.1a+ Great Northern Highway - Rutland Road - 2041 AM - With Development
Site Category: Existing Design
Roundabout

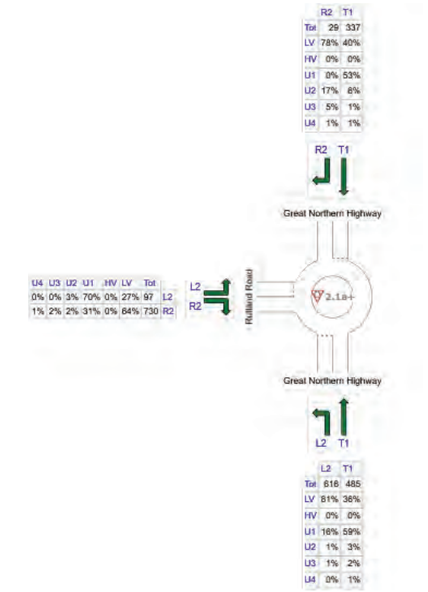
Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Input Volumes

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	Development LV (U1)	AustroadsClass 2-5 (U2)	AustroadsClass 6-9 (U3)	AustroadsClass 10-11 (U
S: Great Northern Highway	1101	673	0	385	20	15	7
N: Great Northern Highway	366	158	0	178	24	4	3
W: Rutland Road	827	495	0	293	18	13	8
Total	2294	1326	0	856	62	32	18

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Northern Highway														
7	L2	616	2.3	648	2.3	0.403	6.5	LOS A	3.4	26.2	0.21	0.52	0.21	71.7
8	T1	485	5.8	511	5.8	0.376	7.3	LOS A	3.0	23.6	0.22	0.48	0.22	68.3
Approach		1101	3.9	1159	3.9	0.403	6.8	LOS A	3.4	26.2	0.21	0.50	0.21	70.1
North: Great Northern Highway														
2	T1	337	7.1	355	7.1	0.332	13.9	LOS B	2.5	20.1	0.90	0.90	0.90	67.8
3	R2	29	22.2	31	22.2	0.332	21.1	LOS C	2.3	18.8	0.89	0.92	0.89	61.7
Approach		366	8.3	385	8.3	0.332	14.5	LOS B	2.5	20.1	0.90	0.90	0.90	67.3
West: Rutland Road														
4	L2	97	2.8	102	2.8	0.161	11.1	LOS B	0.8	5.8	0.61	0.77	0.61	66.1
6	R2	730	5.0	768	5.0	0.767	22.3	LOS C	10.6	84.3	0.91	1.02	1.32	58.8
Approach		827	4.8	871	4.8	0.767	21.0	LOS C	10.6	84.3	0.88	0.99	1.23	59.6
All Vehicles		2294	4.9	2415	4.9	0.767	13.2	LOS B	10.6	84.3	0.56	0.74	0.69	65.4

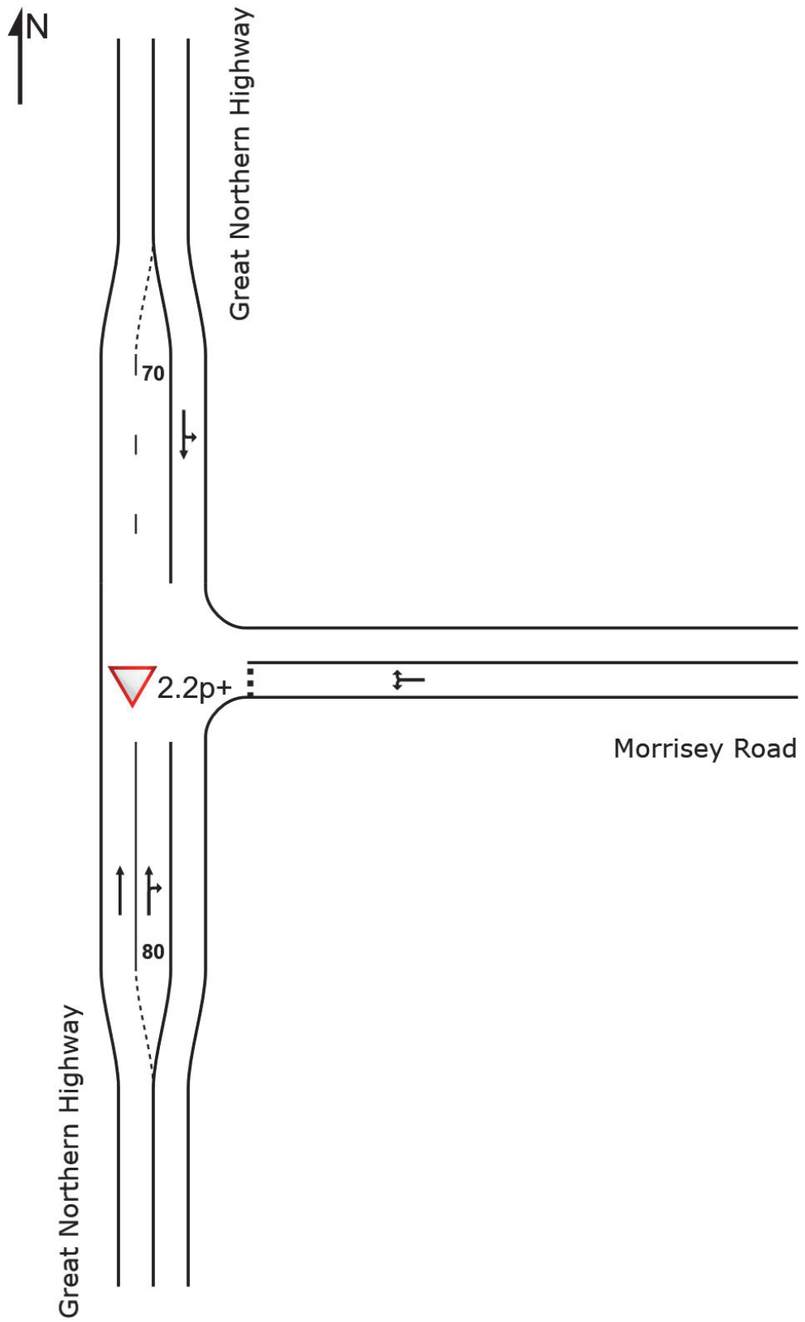
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 2.2p+ [2.2p+ Great Northern Highway - Morrisey Road - 2041 PM - With Development (Site Folder: Future 2041 PM - With Development Traffic)]

2.2p+ Great Northern Highway - Morrisey Road - 2041 PM - With Development
Site Category: Existing Design
Give-Way (Two-Way)

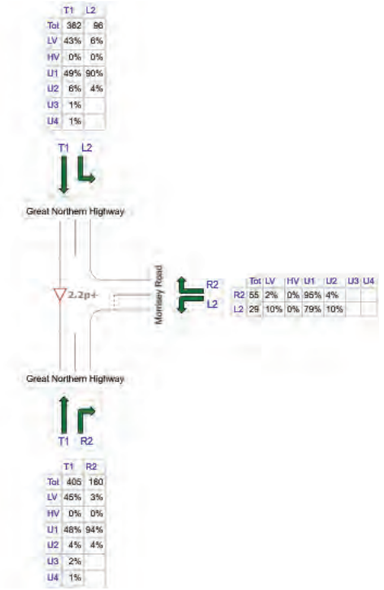
Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Input Volumes

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	Development LV (U1)	AustroadsClass 2-5 (U2)	AustroadsClass 6-9 (U3)	AustroadsClass 10-11 (U
S: Great Northern Highway	565	185	0	344	22	9	5
E: Morrisey Road	84	4	0	75	5	-	-
N: Great Northern Highway	458	162	0	264	25	3	3
Total	1107	352	0	683	53	12	8

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Northern Highway														
2	T1	405	7.3	426	7.3	0.243	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.9
3	R2	160	3.8	168	3.8	0.161	10.1	LOS B	0.7	5.2	0.54	0.77	0.54	56.5
Approach		565	6.3	595	6.3	0.243	2.9	NA	0.7	5.2	0.15	0.22	0.15	86.7
East: Morrisey Road														
4	L2	29	10.3	31	10.3	0.242	6.9	LOS A	0.9	6.8	0.70	0.85	0.76	45.1
6	R2	55	3.6	58	3.6	0.242	19.5	LOS C	0.9	6.8	0.70	0.85	0.76	46.1
Approach		84	6.0	88	6.0	0.242	15.1	LOS C	0.9	6.8	0.70	0.85	0.76	45.7
North: Great Northern Highway														
7	L2	96	4.2	101	4.2	0.269	8.3	LOS A	0.0	0.0	0.00	0.15	0.00	58.3
8	T1	362	7.6	381	7.6	0.269	0.0	LOS A	0.0	0.0	0.00	0.15	0.00	104.4
Approach		458	6.9	482	6.9	0.269	1.8	NA	0.0	0.0	0.00	0.15	0.00	89.5
All Vehicles		1107	6.5	1165	6.5	0.269	3.3	NA	0.9	6.8	0.13	0.24	0.14	82.2

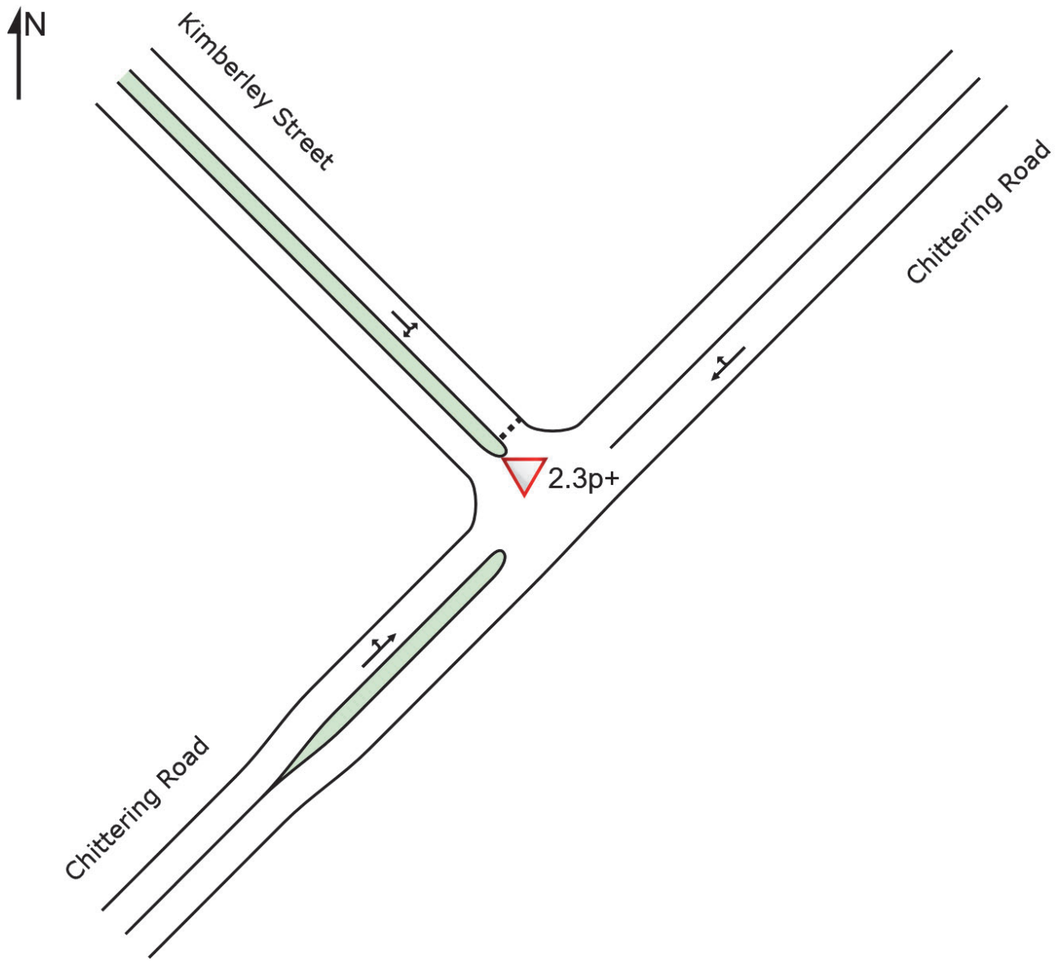
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

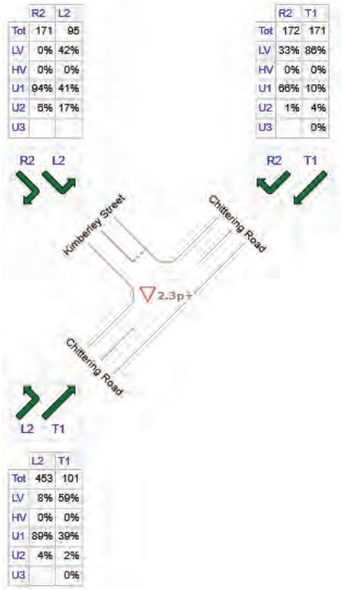
Site: 2.3p+ [2.3p+ Chittering Road - Kimberley Street - 2041 PM - With Development (Site Folder: Future 2041 PM - With Development Traffic)]

2.3p+ Chittering Road - Kimberley Street - 2041 PM - With Development
Site Category: Existing Design
Give-Way (Two-Way)

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.





Input Volumes

Volume Display Method: Total and %

	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	Development LV (U1)	AustroadsClass 2-5 (U2)	AustroadsClass 6-9 (U3)
NE: Chittering Road	343	203	0	131	9	0
NW: Kimberley Street	266	40	0	199	27	-
SW: Chittering Road	554	95	0	441	18	0
Total	1163	338	0	771	54	0

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: Chittering Road														
2	T1	171	4.1	180	4.1	0.228	1.8	LOS A	1.3	9.6	0.56	0.36	0.56	54.4
3	R2	172	1.2	181	1.2	0.228	4.7	LOS A	1.3	9.6	0.56	0.36	0.56	22.3
Approach		343	2.6	361	2.6	0.228	3.2	NA	1.3	9.6	0.56	0.36	0.56	48.5
NorthWest: Kimberley Street														
4	L2	95	16.8	100	16.8	0.236	2.9	LOS A	0.8	6.3	0.23	0.57	0.23	21.1
6	R2	171	6.4	180	6.4	0.236	4.1	LOS A	0.8	6.3	0.23	0.57	0.23	46.7
Approach		266	10.2	280	10.2	0.236	3.7	LOS A	0.8	6.3	0.23	0.57	0.23	44.0
SouthWest: Chittering Road														
7	L2	453	3.5	477	3.5	0.319	5.7	LOS A	0.0	0.0	0.00	0.48	0.00	49.0
8	T1	101	2.0	106	2.0	0.319	0.1	LOS A	0.0	0.0	0.00	0.48	0.00	52.4
Approach		554	3.2	583	3.2	0.319	4.7	NA	0.0	0.0	0.00	0.48	0.00	49.6
All Vehicles		1163	4.6	1224	4.6	0.319	4.0	NA	1.3	9.6	0.22	0.46	0.22	48.2

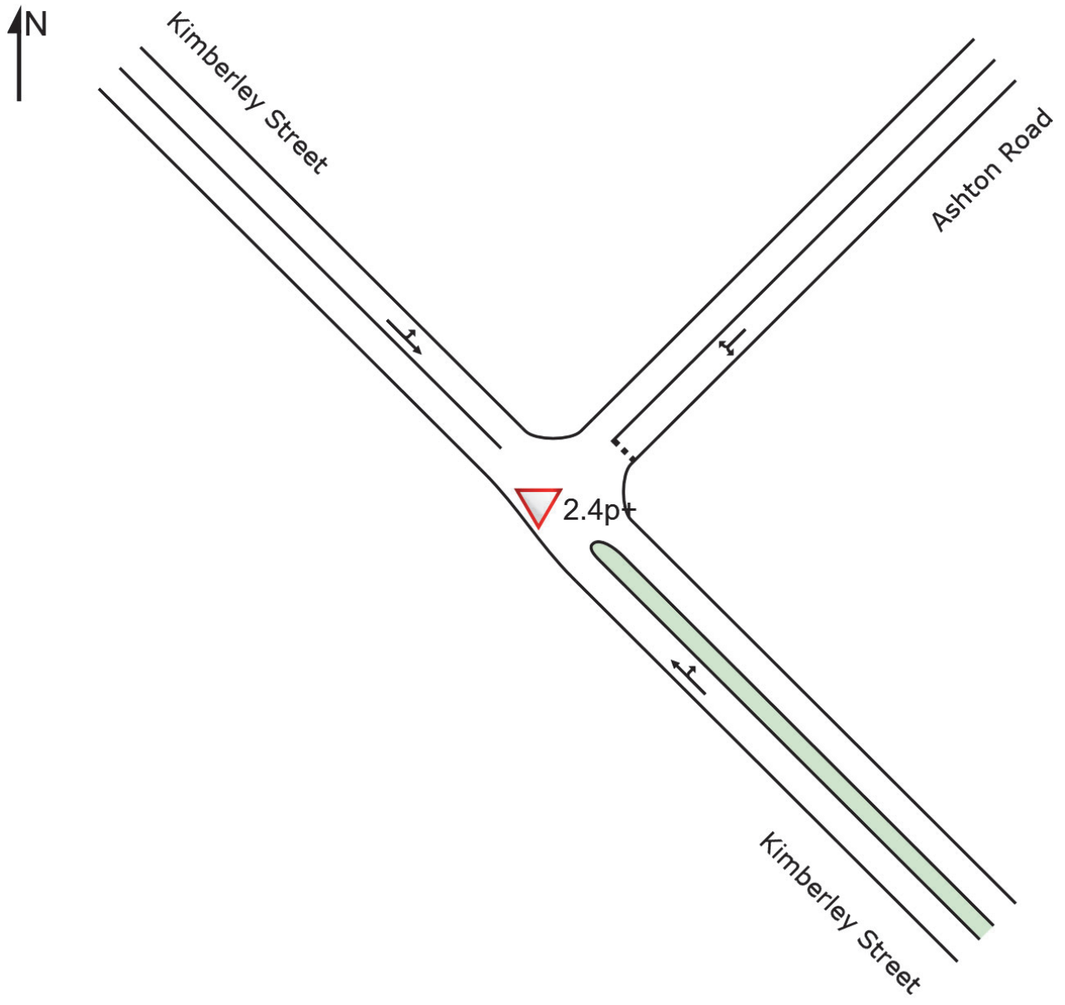
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 2.4p+ [2.4p+ Kimberley Street - Ashton Road - 2041 PM - With Development (Site Folder: Future 2041 PM - With Development Traffic)]

2.4p+ Kimberley Street - Ashton Road - 2041 PM - With Development
Site Category: Existing Design
Give-Way (Two-Way)

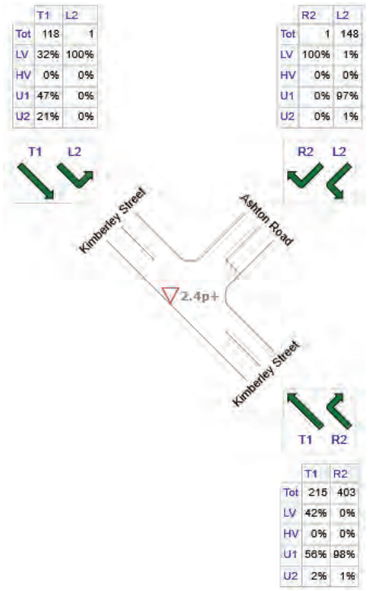
Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Input Volumes

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	Development LV (U1)	AustroadsClass 2-5 (U2)
SE: Kimberley Street	618	92	0	516	10
NE: Ashton Road	149	3	0	144	2
NW: Kimberley Street	119	39	0	55	25
Total	886	134	0	715	37

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Kimberley Street														
2	T1	215	1.9	226	1.9	0.322	0.4	LOS A	2.1	14.8	0.31	0.33	0.31	45.1
3	R2	403	1.5	424	1.5	0.322	2.9	LOS A	2.1	14.8	0.31	0.33	0.31	45.4
Approach		618	1.6	651	1.6	0.322	2.0	NA	2.1	14.8	0.31	0.33	0.31	45.3
NorthEast: Ashton Road														
4	L2	148	1.4	156	1.4	0.084	4.9	LOS A	0.4	2.8	0.24	0.51	0.24	42.5
6	R2	1	0.0	1	0.0	0.084	6.4	LOS A	0.4	2.8	0.24	0.51	0.24	44.3
Approach		149	1.3	157	1.3	0.084	4.9	LOS A	0.4	2.8	0.24	0.51	0.24	42.5
NorthWest: Kimberley Street														
7	L2	1	0.0	1	0.0	0.079	4.6	LOS A	0.0	0.0	0.00	0.00	0.00	49.3
8	T1	118	21.2	124	21.2	0.079	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.8
Approach		119	21.0	125	21.0	0.079	0.1	NA	0.0	0.0	0.00	0.00	0.00	49.8
All Vehicles		886	4.2	933	4.2	0.322	2.2	NA	2.1	14.8	0.25	0.32	0.25	45.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Network: n2.1p [n2.1p M03 and M04 - 2041 PM (Network Folder: General)]

New Network
Network Category: (None)

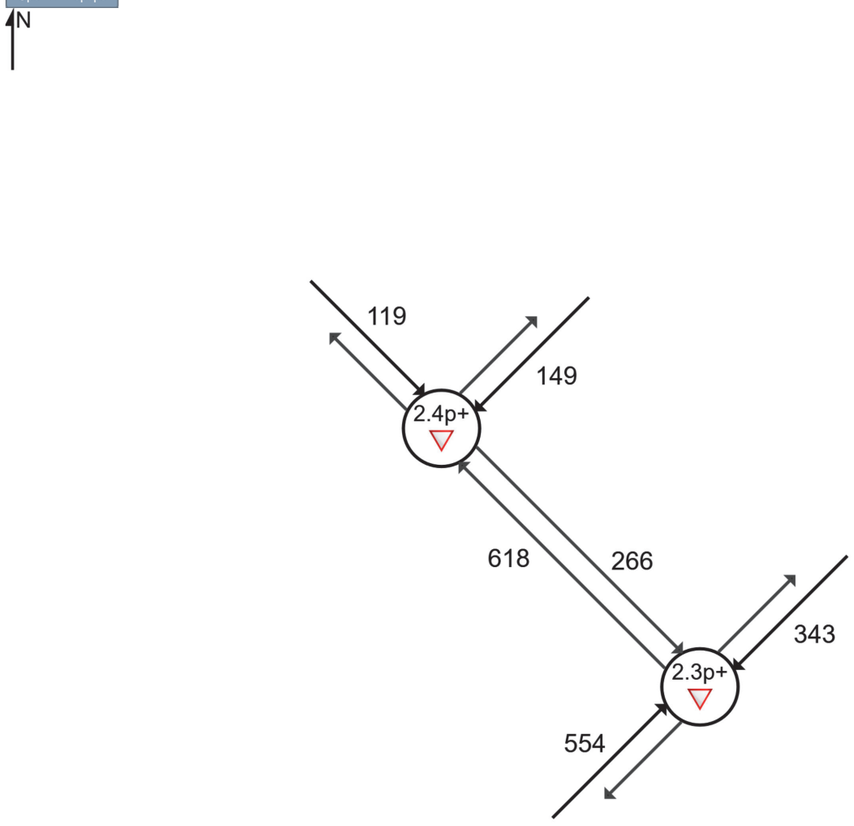
Sites in Network

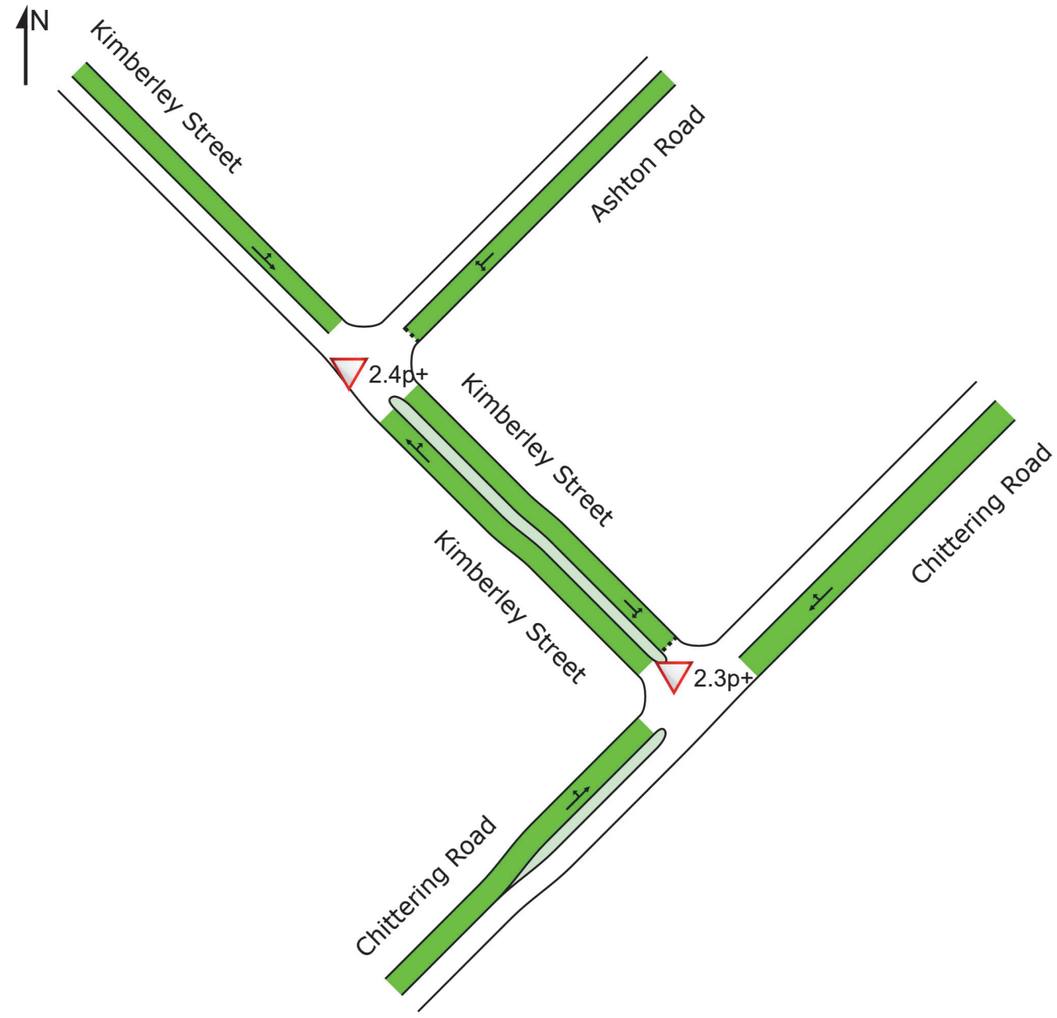
SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽2.3p+	NA	2.3p+ Chittering Road - Kimberley Street - 2041 PM - With Development
▽2.4p+	NA	2.4p+ Kimberley Street - Ashton Road - 2041 PM - With Development

Network Flows - Input

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Open All Popups





Colour code based on Level of Service
LOS A | LOS B | LOS C | LOS D | LOS E | LOS F
Delay Model: SIDRA Standard (Geometric Delay is included).

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Organisation: KC TRAFFIC AND TRANSPORT | Licence: NETWORK / 1PC | Created: Tuesday, June 25, 2024 12:20:00
Project: C:\Users\Nemanja\Box\KCTT Projects\KC00000 Current Projects\KC01293.000 Bullsbrook North Landowners Group (WPMG) LSP\Outgoing\SIDRA\KC01293.000 Future Models.sip9

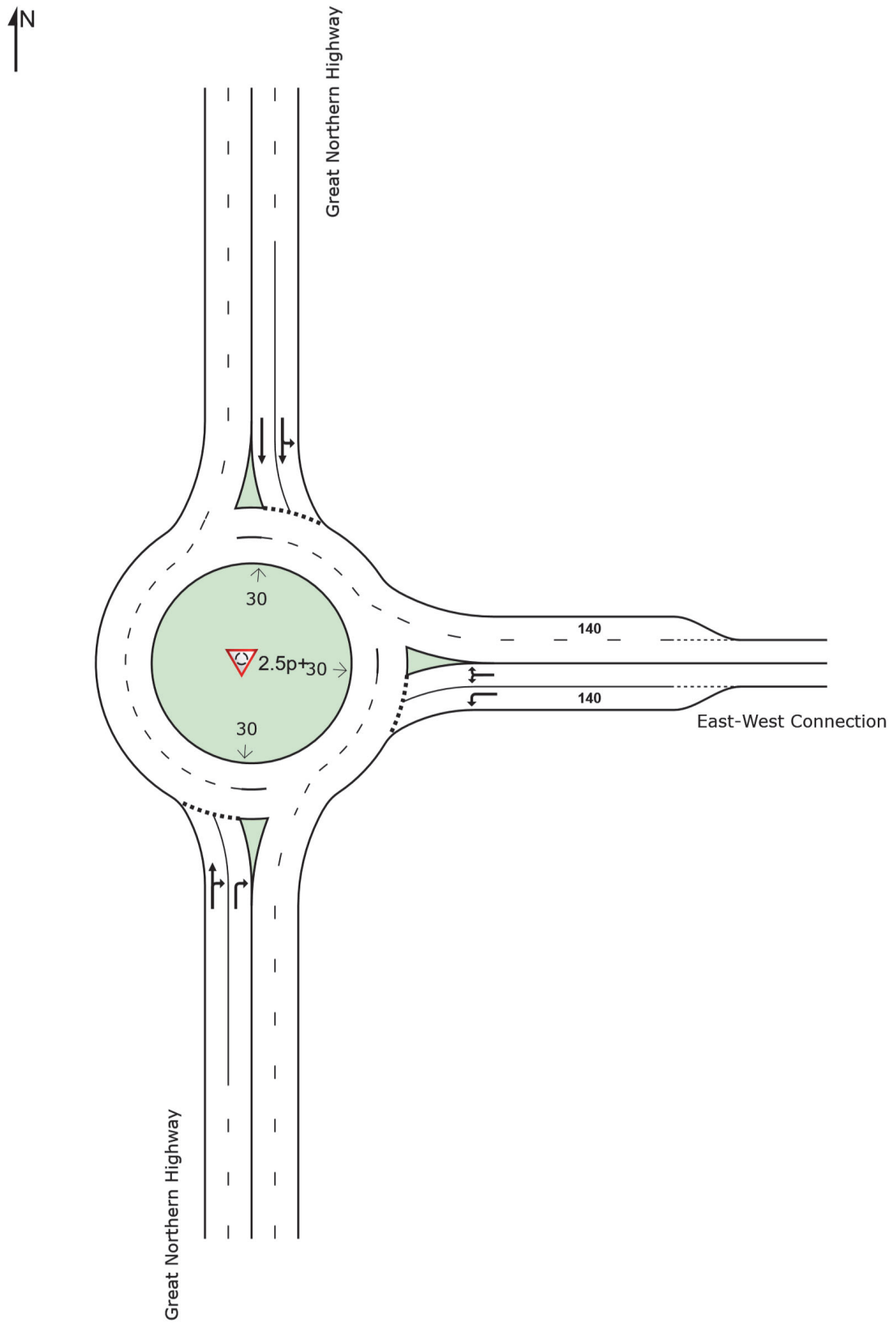
Level of Service

Site: 2.5p+ [2.5p+ Great Northern Highway - East-West Connection - 2041 PM - With Development (Site Folder: Future 2041 PM - With Development Traffic)]

2.5p+ Great Northern Highway - East-West Connection - 2041 PM - With Development
Site Category: Existing Design
Roundabout

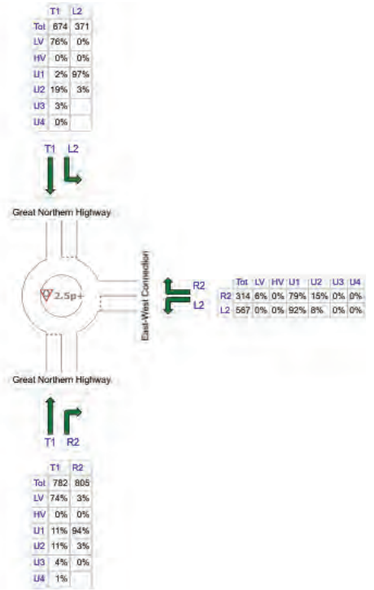
Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Input Volumes

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	Development LV (U1)	AustroadsClass 2-5 (U2)	AustroadsClass 6-9 (U3)	AustroadsClass 10-11 (U
S: Great Northern Highway	1587	601	0	845	108	29	5
E: East-West Connection	881	20	0	767	94	0	0
N: Great Northern Highway	1045	513	0	370	142	21	0
Total	3513	1133	0	1982	343	50	5

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Northern Highway														
2	T1	782	15.3	823	15.3	0.824	16.6	LOS B	13.7	120.8	0.99	0.93	1.31	60.7
3	R2	805	2.7	847	2.7	0.824	21.9	LOS C	13.7	120.8	1.00	0.93	1.32	54.9
Approach		1587	8.9	1671	8.9	0.824	19.3	LOS B	13.7	120.8	0.99	0.93	1.31	58.2
East: East-West Connection														
4	L2	567	8.3	597	8.3	0.654	8.4	LOS A	5.7	43.7	0.89	1.04	1.14	50.3
6	R2	314	15.0	331	15.0	0.654	15.2	LOS B	5.2	42.6	0.89	1.07	1.17	43.5
Approach		881	10.7	927	10.7	0.654	10.8	LOS B	5.7	43.7	0.89	1.05	1.15	47.5
North: Great Northern Highway														
7	L2	371	3.0	391	3.0	1.007	69.7	LOS E	33.1	265.9	1.00	1.64	3.83	25.8
8	T1	674	22.5	709	22.5	1.007	73.1	LOS F	33.1	265.9	1.00	1.61	3.76	31.9
Approach		1045	15.5	1100	15.5	1.007	71.9	LOS F	33.1	265.9	1.00	1.62	3.78	30.1
All Vehicles		3513	11.3	3698	11.3	1.007	32.8	LOS C	33.1	265.9	0.97	1.17	2.01	43.2

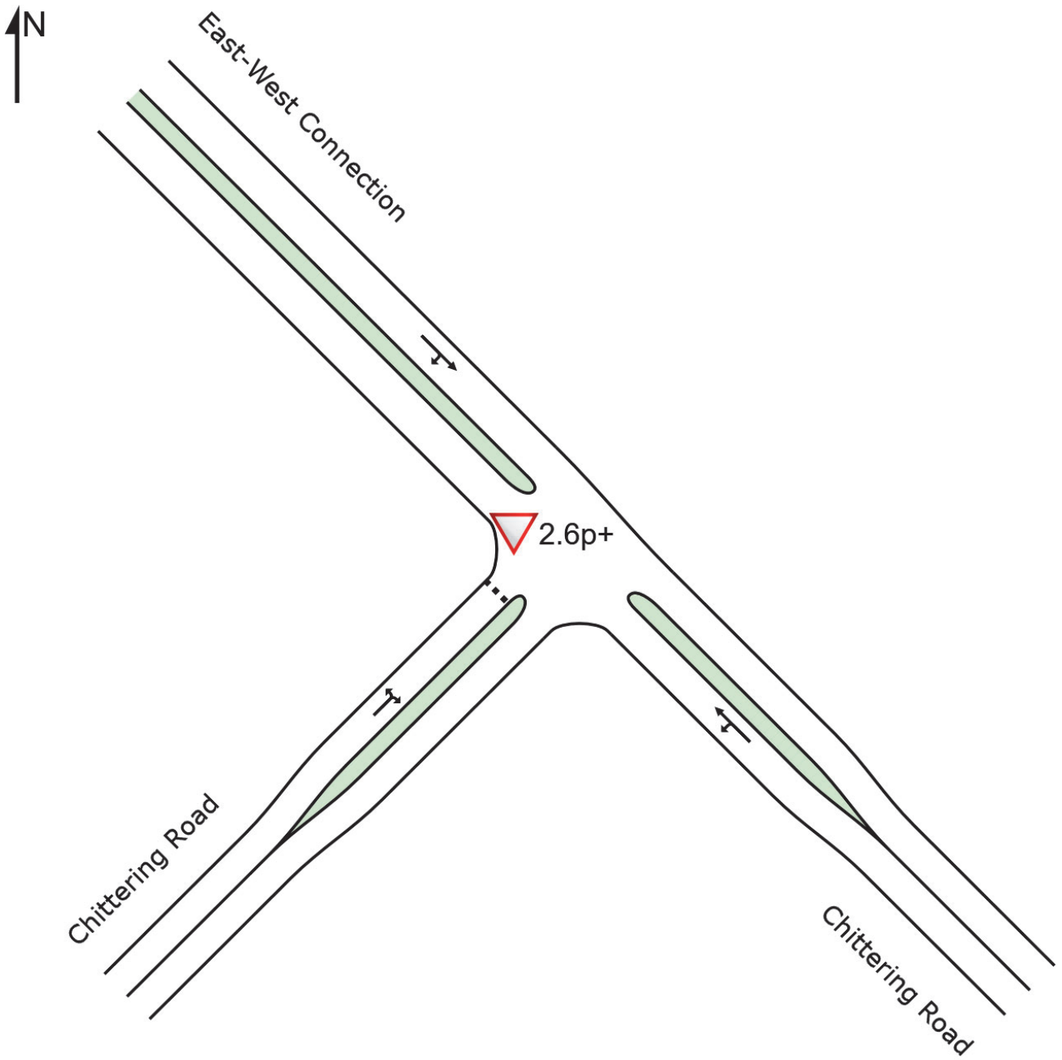
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 2.6p+ [2.6p+ Chittering Road - East-West Connection - 2041 PM - With Development (Site Folder: Future 2041 PM - With Development Traffic)]

2.6p+ Chittering Road - East-West Connection - 2041 PM - With Development
Site Category: Existing Design
Give-Way (Two-Way)

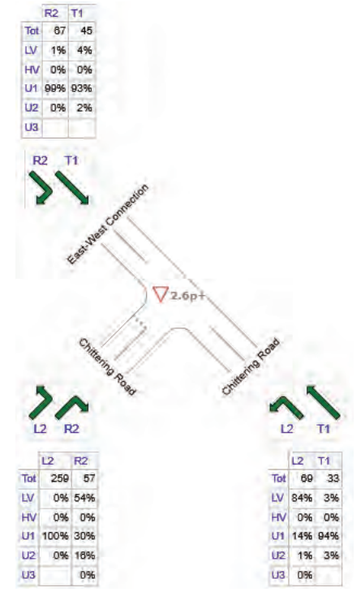
Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Input Volumes

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	Development LV (U1)	AustroadsClass 2-5 (U2)	AustroadsClass 6-9 (U3)
SE: Chittering Road	102	59	0	41	2	0
NW: East-West Connection	112	3	0	108	1	-
SW: Chittering Road	316	31	0	276	9	0
Total	530	93	0	425	12	0

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Chittering Road														
7	L2	69	1.4	73	1.4	0.057	5.6	LOS A	0.0	0.0	0.00	0.46	0.00	38.6
8	T1	33	3.0	35	3.0	0.057	1.1	LOS A	0.0	0.0	0.00	0.46	0.00	55.0
Approach		102	2.0	107	2.0	0.057	4.1	NA	0.0	0.0	0.00	0.46	0.00	43.8
NorthWest: East-West Connection														
2	T1	45	2.2	47	2.2	0.056	0.2	LOS A	0.3	2.0	0.21	0.31	0.21	52.7
3	R2	67	0.0	71	0.0	0.056	4.8	LOS A	0.3	2.0	0.21	0.31	0.21	28.2
Approach		112	0.9	118	0.9	0.056	3.0	NA	0.3	2.0	0.21	0.31	0.21	39.9
SouthWest: Chittering Road														
4	L2	259	0.0	273	0.0	0.178	3.5	LOS A	0.8	6.0	0.09	0.50	0.09	41.6
6	R2	57	15.8	60	15.8	0.178	3.7	LOS A	0.8	6.0	0.09	0.50	0.09	42.8
Approach		316	2.8	333	2.8	0.178	3.6	LOS A	0.8	6.0	0.09	0.50	0.09	41.9
All Vehicles		530	2.3	558	2.3	0.178	3.5	NA	0.8	6.0	0.10	0.45	0.10	41.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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APPENDIX 9

Engineering Servicing Report



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ENGINEERING SERVICING REPORT

BULLSBROOK NORTH DISTRICT STRUCTURE PLAN AMENDMENT

WPG LANDHOLDINGINGS No.05 PTY LTD &
BULLSBROOK INVESTMENT COMPANY PTY LTD

APRIL 2023



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APPENDIX B – WC – Wastewater Planning

EXECUTIVE SUMMARY

This Engineering Servicing Report (ESR) has been prepared by both Cossill & Webley Consulting Engineers and Porter Engineering and summarises the results of an ongoing assessment of the engineering aspects associated with the proposed northern expansion of the Bullsbrook Townsite (the Site).

SITE DESCRIPTION

The site is located approximately 1.5km north of the Bullsbrook town site and is approximately 335.6 Ha in size.

The topography varies from around RL140m in the north to RL45m in the west with a well-defined creek line that runs through the middle of the site (east to west). There are existing homesteads, sheds, driveways and fencing across the site as typically expected in a rural setting.

VEGETATION AND GEOTECHNICAL CHARACTERISTICS

The site is predominantly vacant with trees scattered between cleared areas used for pastural, grazing, general farming and vegetable growing purposes.

The geological mapping indicates the ground conditions are predominantly free draining sand. This has been confirmed by a site investigation completed by Brown Geotechnical.

WASTEWATER AND WATER RETICULATION

The Water Corporation (WC) have a well-defined strategy for both wastewater and water reticulation over the proposed northern expansion area.

Operations at the existing Bullsbrook Wastewater Treatment Plant will cease following the completion of wastewater infrastructure upgrades currently under construction (due to be complete by the end of 2023).

Part of the proposed northern expansion area is lower than the current water reticulation servicing elevation. The WC has a strategy involving the construction of a high level tank site including distribution pipelines to service the proposed development area which is elevated above the current servicing level. Negotiations between the City of Swan and the WC in relation to the high level tank site are currently underway.

ROADWORKS AND STORMWATER DRAINAGE

The existing road network and proposed road upgrades will support the methodical progression of the development.

Stormwater will be managed via pipe and pit network within the road reserves. Due to the free draining sand, the stormwater drainage will be attenuated in swales predominantly located in proposed POS areas.

POWER

Based on Western Power's Network Capacity Mapping Tool, there appears to be sufficient capacity within the network to service to the proposed development.

COMMUNICATION AND GAS RETICULATION

The existing Bullsbrook region has Telstra phone communication and is serviced by NBN Co's broadband fibre optic network. This network can be readily extended to support the proposed expansion area.

Reticulated Gas is not available in the Bullsbrook region and it has been determined to be cost prohibitive to extend the gas pipework to service the expansion area. It is not proposed to service this expansion area with gas.

CONCLUSION

The proposed Bullsbrook Townsite's Northern Precinct is highly suited to future residential development. The existing infrastructure is sufficient to support the proposed residential development and the infrastructure upgrades proposed by the service authorities over the near term will facilitate further development such that the entire site can be developed.

Bullsbrook North - District Structure Plan Amendment
Engineering Servicing Report
Apr 2023

1. INTRODUCTION

The following Engineering Servicing Report (ESR) has been prepared by both Cossill & Webley Consulting Engineers and Porter Consulting Engineers and summarises the results of an ongoing assessment of the engineering aspects associated with the proposed Northern expansion of the Bullsbrook Townsite (the Site).

This report has been prepared in support of an amendment of the City of Swan's (CoS) Bullsbrook Townsite District Structure Plan (BTDSP). The site is located in the northernmost extent of the "Future Residential".

The site is currently classified as "rural" under the current Metropolitan Region Scheme (MRS) and identified as "Future Residential" under the CoS Local Planning Scheme No. 17 (LPS17).

The site is located approximately 1.5km north of the Bullsbrook town site and is approximately 355 hectares in size. The site has frontage to Morrissey Road, Great Northern Highway, Kimberley Street and Ashton Road. Refer to Figure 1 for the location of the Site.

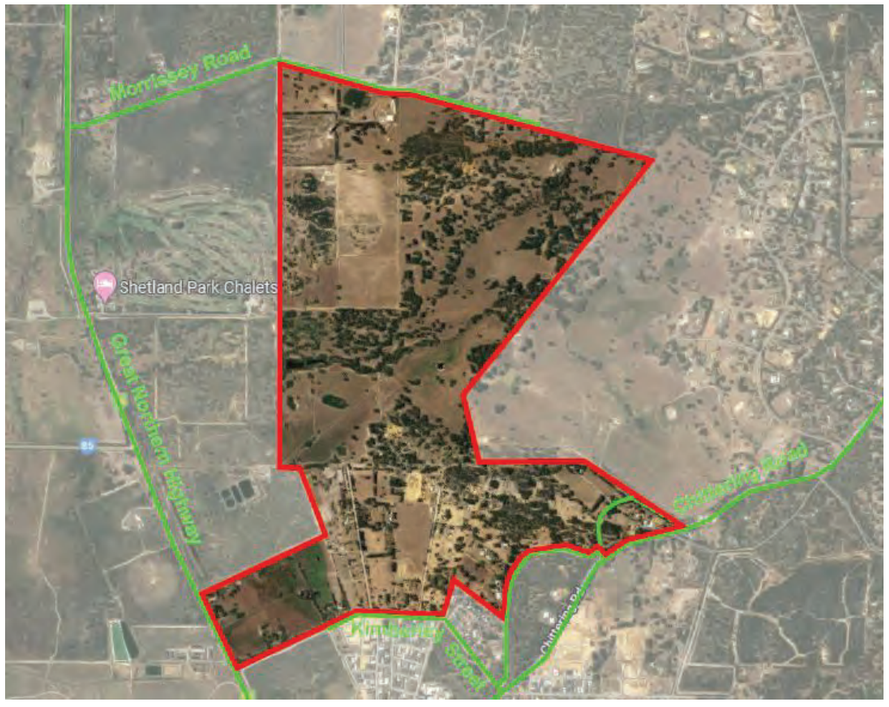


Figure 1 – Northern Expansion of the Bullsbrook Townsite (The Site)

The site is predominantly bounded by rural lots to the north and west and bounded to the south by recent urban development. According to the CoS's BTDSP, the existing Bullsbrook community were heavily involved in preparation of the BTDSP and LPS17 so local residents are considered to be significant stakeholders in any future development outcomes.

2. EXISTING SITE INFORMATION AND ENVIRONMENT

2.1 Site Description

The site is predominantly vacant with trees scattered throughout. There are existing homesteads, sheds, driveways and fencing across the site as typically expected in a rural setting. There are existing overhead power lines that traverse the site as well as overheads that provide points of connection to the buildings.

The site is located part way up the Darling Scarp. The topography varies from around RL140m in the north to RL45m in the west.

There is a well-defined creek line that runs through the middle of the site (east to west) with what appears to be man-made berms on the western edge that retain water on site. The creek extends 2.5km west to the bottom of the scarp before it flows into the upper reaches of Ellen Brook.

2.2 Urban Planning

The sub regional framework confirms the site is within the urban expansion area. The normal planning process needs to be followed to allow the site to evolve to an urban zoning. Rowe Group are coordinating the planning for Bullsbrook North.

It is understood Bullsbrook North will yield in the order of 4,465 dwellings plus other facilities as typically provided in a master-planned estate including schools, a local centre and public open spaces.

The planning has progressed with input provided by the whole project team. The proposed amendment to the Bullsbrook Townsite District Structure Plan is presented in Appendix A.

2.3 Vegetation Site Inspection

Site visits in late spring and summer revealed typical vegetation for the Guildford and Reagan complexes. The site is predominantly populated by Eucalyptus trees, Acacia of varying sizes and clusters of Grasstrees and other low level undergrowth. The deforested areas of site are consistently covered in dry grass, typical of rotation farming and livestock grazing across the land.



Figure 2 – Typical vegetation across the future development area

Bullsbrook North - District Structure Plan Amendment
Engineering Servicing Report
Apr 2023

2.4 Geotechnical Desktop Study

The Perth Metropolitan Region 1:50,000 Environmental Geology Series Survey has classified the site as "S_6" SAND - light grey, fine to course, angular to sub-rounded, quartz with some feldspar of colluvial origin. It is considered suitable for roads and urbanisation with some waste storage limitations due a relatively high permeability.

According to the geological mapping both S_5 and S_6 sands are highly suited to urbanisation and may potentially be used as "Class A" structural material, pending testing and endorsement by a geotechnical consultant.

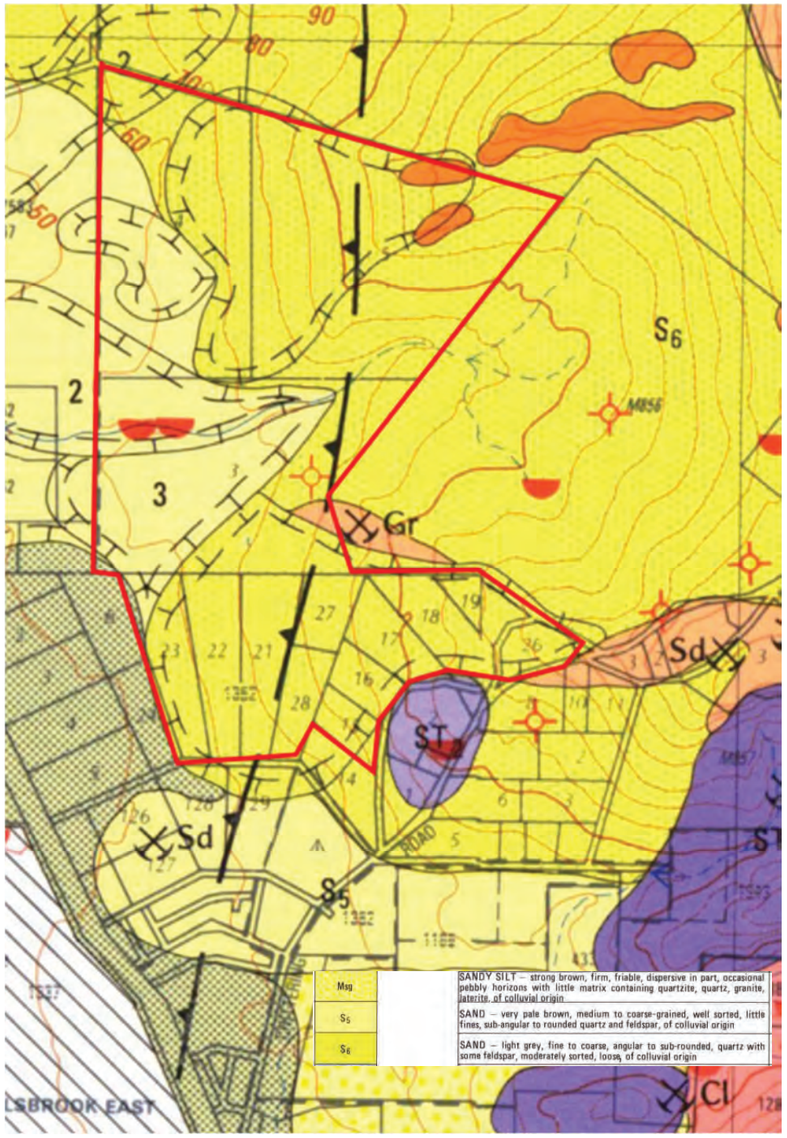


Figure 3 - Perth Metropolitan Region 1:50,000 Environmental Geology Series Survey (Muchea)

2.5 Site Geotechnical Investigation

A Brown Geotechnical site investigation was completed in Jun 2022 and covers the whole site. Key observations of the preliminary and outcomes include the following;

- Topsoil is present covering granular, non-cohesive and relatively free draining soil across the majority of the site.
- Predominantly SAND with low fines.
- Gravel and laterite is present in parts with thin sand deposits over (north east).
- Stiff clay was found in two locations.
- The vast majority of the site is Class A with small pockets of Class S and Class M. Minor filling is required to upgrade the Class M areas to Class S.
- Groundwater is likely to be at least 1.5m below the current ground levels.

Acid sulphate soil mapping does not register any zones of high, moderate or low risk areas across, or within 500m of, the site.

None of the land holdings within Bullsbrook North are registered on the contaminated sites database.

Although the site is within close proximity to the RAAF Pearce Airbase, the area is not recorded as potentially affected by Unexploded Explosive Ordnance's (UXO).

2.6 Consultant Team

An experienced consultant team has been assembled to consider and respond to all critical development matters. The team includes:

- Rowe Group - Planning
- JDA - Hydrology
- PGV - Environmental
- LD Total – Landscape
- Cossill & Webley Consulting Engineers
- Brown Geotechnical – Geotechnical Engineering
- Lush Fire Planning – Bush Fire
- KCTT – Traffic
- Macroplan – Land Supply and Retail Needs
- Porter Consulting Engineers

3. SITEWORKS AND EARTHWORKS

PGV have completed an environmental assessment of the site. They have identified areas of environmental importance and areas where vegetation is to be protected. Rowe Group's master planning reflect the preservation of these areas. It is expected areas of environmental importance will be fenced off to ensure these areas are protected during construction activities.

The outcomes of the geotechnical investigation confirm the site is suitable for urban development and a Class A or Class S lots can be achieved using typical construction processes. It is anticipated cut to fill operations will be completed in bulk earthworks phases across the development area and the need for imported fill should be minimal.

A general site tidy will be required as part of the forward work. Structures, fences, rubbish and redundant services will need to be removed and disposed of off-site. Any items highlighted in the Environmental Studies will also need to be attended to.

It is likely flat level lots will be presented when the site is developed. Retaining may be required and it is expected this will be managed in the normal process.

Bullsbrook North - District Structure Plan Amendment
Engineering Servicing Report
Apr 2023

4. WASTEWATER

Based on engagement with the Water Corporation (WC), they have existing wastewater infrastructure that services the proposed residential land to the south. There is no reticulated wastewater within Bullsbrook North.

Future wastewater infrastructure planning was requested from the WC and it is presented in Appendix B. The planning covers the entirety of Bullsbrook North. To enable the development of Bullsbrook North, two wastewater pumping stations (Bullsbrook PS D and Bullsbrook PS 6) are required with a normal gravity network flowing into them. Both pumping stations will have a pressure main that discharge effluent that will flow into the existing sewer network to the south.

It is expected the existing infrastructure (Bullsbrook North PS1) will require an upgrade to ensure it can receive the additional wastewater flows.

WC are currently upgrading Bullsbrook North PS No 1. Their scope involves the construction of a new pressure main south to Ellenbrook which will negate the need to continue operations at the existing Bullsbrook Wastewater Treatment Plant. The WC website suggests this project will be completed by late 2023.

The current odour buffer surrounding the existing Bullsbrook Wastewater Treatment Plant is expected to be removed once operations at the treatment plant is no longer in use.

5. WATER RETICULATION

5.1 Existing Services

The WC have a water reticulation network located along Kimberley Street and it services the properties on the southern side of Kimberley St. There is no other water infrastructure within Bullsbrook North. Existing properties utilise local domestic bores and tanks for water and firefighting purposes.

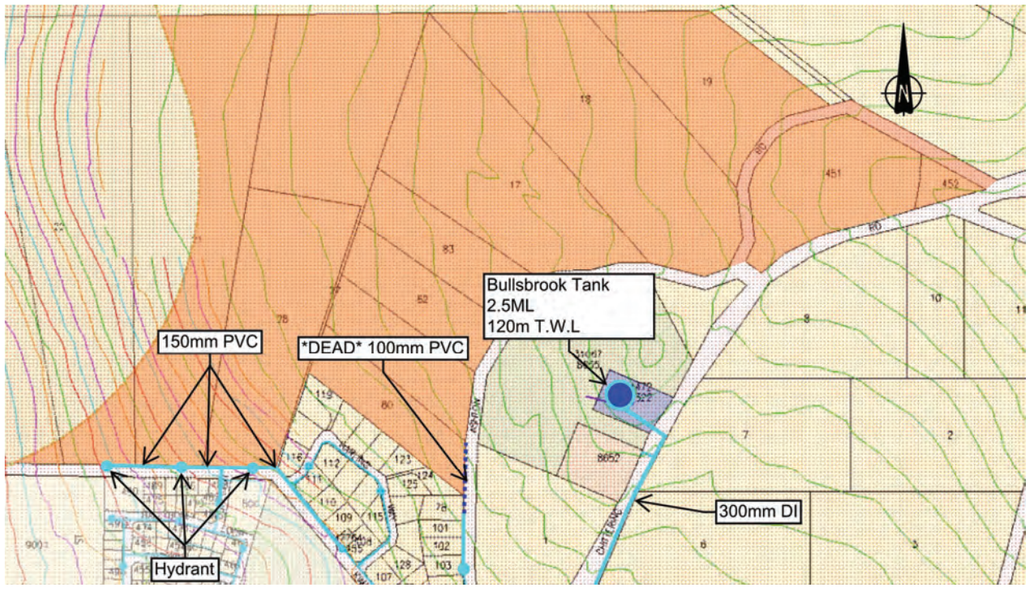


Figure 4 – Existing Water Retic Network

The WC have an existing water supply tank near the south eastern corner of Bullsbrook North, this supplies the existing town site. This tank has pressure supply limitations and can only service lots located below an elevation of RL90m. Parts of Bullsbrook North are located at an elevation higher than RL90m. As such, an alternate and higher water storage and supply is needed to service the future elevated areas of the Bullsbrook North expansion.

5.2 Future Water Servicing

The WC have completed an assessment on the future water supply and reticulation requirements for the Bullsbrook Townsite Expansion. An extract of the WC's Bullsbrook Water Supply Distribution plan is reflected in Figure 5.

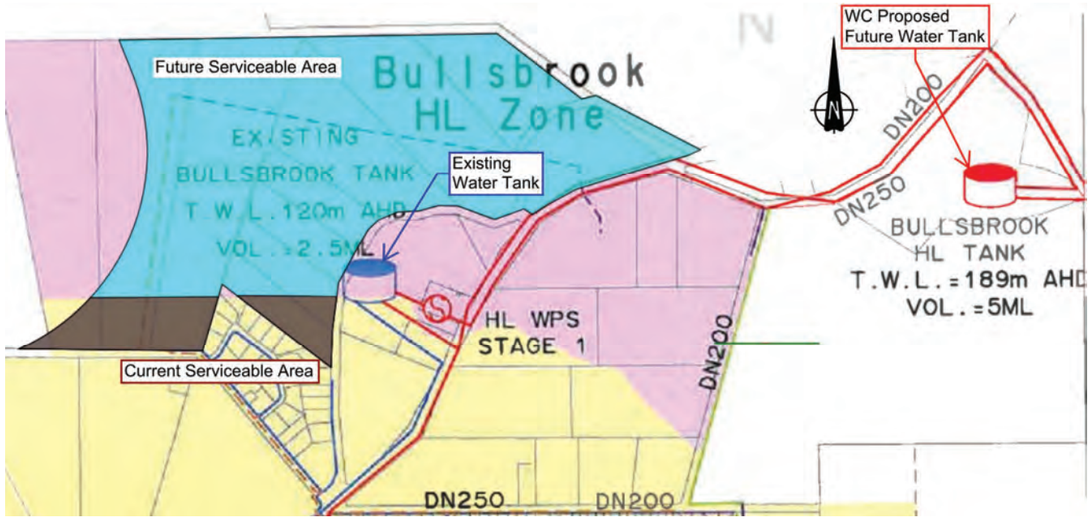


Figure 5 - WC Long Term Water Retic Planning

The above extract was prepared in June 2010 and does not include the northern portion of Bullsbrook North. Since Bullsbrook North planning discussions have commenced, the WC have acknowledged the scheme boundary will be amended to capture the entirety of Bullsbrook North. As reflected in Figure 5 the Water Supply Distribution plan shows a new Bullsbrook High Level (HL) Tank in the north eastern corner. This has a design top water level of RL 189m. At this very high-level conceptual planning phase, the WC have indicated a majority of the expansion area can be serviced.

The highest point of the future development area is around 135 to 140m AHD. This will likely be just beyond the reach of the HL tank at the likely distance from the tank, so local water booster pump station may be required for a small portion of the land in the NE corner. The specifics of this will be resolved as Bullsbrook North evolves. The current intent for the NE portion of the Site reflects a POS covering the majority of the land set above RL135m. As such, water reticulation supply to this area might not be required.

5.3 Future High Level Water Tank Site

In relation to the future high level (HL) water tank site, the WC have prepared a conceptual design including a general arrangement (GA) and identified a parcel of land for the Bullsbrook North HL Tank site. The existing ground level within the close vicinity of the HL Tank Site is RL180.

Figure 6 reflects the WC's general arrangement (GA) for the HL tank site including the proposed vehicle access off Smith Road. This GA was presented to the City of Swan in support of the WC's application to acquire this section of

land located in Burley Park.

At the Ordinary Meeting of Council held on 16 Dec 2015, the City resolved to accept the WC's financial offer for the land area requirement for the HL water tank location at Burley Park. The WC have advised the WC have been unsuccessful with recent land acquisition negotiations with the City.



Figure 6 – WC High Level Tank Design (as presented to City of Swan in 2015)

The WC are currently in discussions with the City of Swan regarding acquiring the land for this HL Tank site.

5.4 Bullsbrook North Network

To enable the development of Bullsbrook North, it is expected a water reticulation main will extend out from the tank site to supply the expansion area. The local reticulation network will be located in the future and existing road reserves and loop as typically expected with any normal subdivision.



Figure 7 – 3D Visualisation of the High-Level Water Tank Site within Burley Park (Cossill & Webley)

6. STORMWATER DRAINAGE

JDA has prepared the District Water Management Strategy for the amendment area. Input was provided by the whole consultant team to ensure the primary design considerations are included.

The intent is to attenuate stormwater flow in each catchment with drainage zones in the POS areas. Normal stormwater design criteria will be addressed including flows from frequent, moderate and infrequent events.

Stormwater will naturally flow down to the low point of the site, being central east-west creek. Water quality improvement measures will be implemented to ensure this development will not affect the receiving waters.

LD Total have prepared landscaping concepts for the proposed POS areas, main avenues and stormwater drainage attenuation zones. The intent is to incorporate drainage infiltration seamlessly into the development.

7. ROADWORKS & FOOTPATHS

7.1 Regional Road Network

Tonkin Highway (also known as Northlink) is located west of the Bullsbrook Townsite and has recently been extended from Reid Hwy to Muchea. The newly constructed road includes a grade separated intersection at Neaves Road and Stock Road, of which both these roads provide suitable vehicular access into south and north Bullsbrook (via Great Northern Hwy). Stock Road, from Tonkin Hwy to Great Northern Hwy, is currently under construction and will be compete by July 2023.

Bullsbrook North - District Structure Plan Amendment
Engineering Servicing Report
Apr 2023

7.2 Existing Road Network

The Site is located within close proximity to a number of major Primary and Regional Distributor roads. Great Northern Hwy is located to the west of the site and is classified a Primary Distributor. Chittering Road bounds the site in the south and eastern area and is classified a Regional Distributor. Kimberly St is considered a Neighbourhood Connector A and Ashton Road a Neighbourhood Connector B.



Figure 8 – Existing Kimberley St extended in a westerly direction in 2020 (view east) and Ashton Rd (view north)

As part of the development, the northern side of the existing Kimberley St road carriageway will need to be upgraded to a residential urban standard with the inclusion of kerbing and stormwater drainage. Ashton Road is a rural standard road with unsealed shoulders. Ashton Road will be upgraded as part of the ongoing development.

7.3 Proposed Road Network

In 2017, the City of Swan commissioned Transcore to complete a Traffic Impact Assessment (TIA) focusing on the "Bullsbrook Townsite Land Use Master Plan" (BTLUMP). Key outcomes of the report included indicative road hierarchy and intersection controls investigations including the strategic transport plan for current and future operating conditions of the surrounding road network.

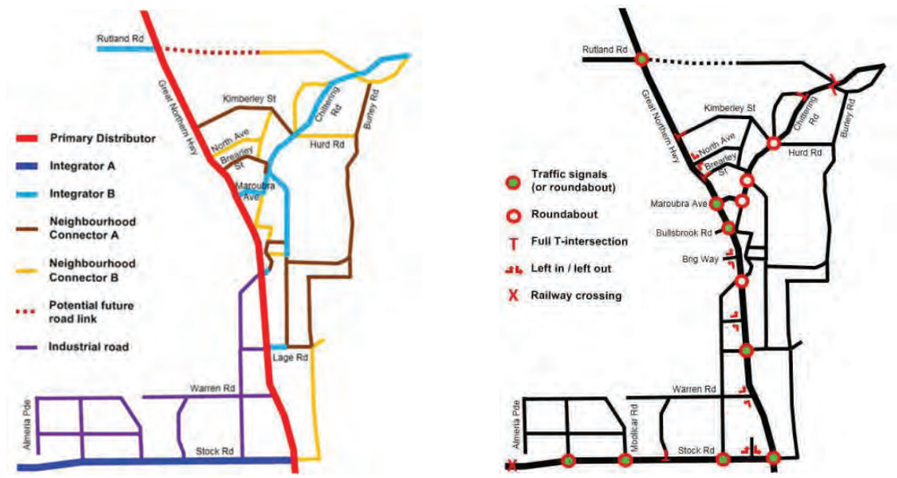


Figure 9 –Road Hierarchy and Intersection Controls from Transcore's TIA prepared for the BTLUMP

As reflected in Figure 10, Main Roads WA (MRWA) has completed a preliminary roundabout design for Great Northern Hwy and Rutland Road. This design includes provision for a future access leg to the east, which represents the future road link connection to an Integrator B through to Chittering Road (potential future road link), as determined by KCTT in the March 2023 Transport Impact Assessment (TIA). This road connection will provide an alternative vehicular movement through Bullsbrook North to and from the existing area to the east, without using Chittering Road south of this point, which requires vehicle movements through the existing Bullsbrook Townsite.

The subject proposal incorporates provision for this road through the subject site.

MRWA have indicated they intend to construct the roundabout at Great Northern Hwy and Rutland Road in 2023.

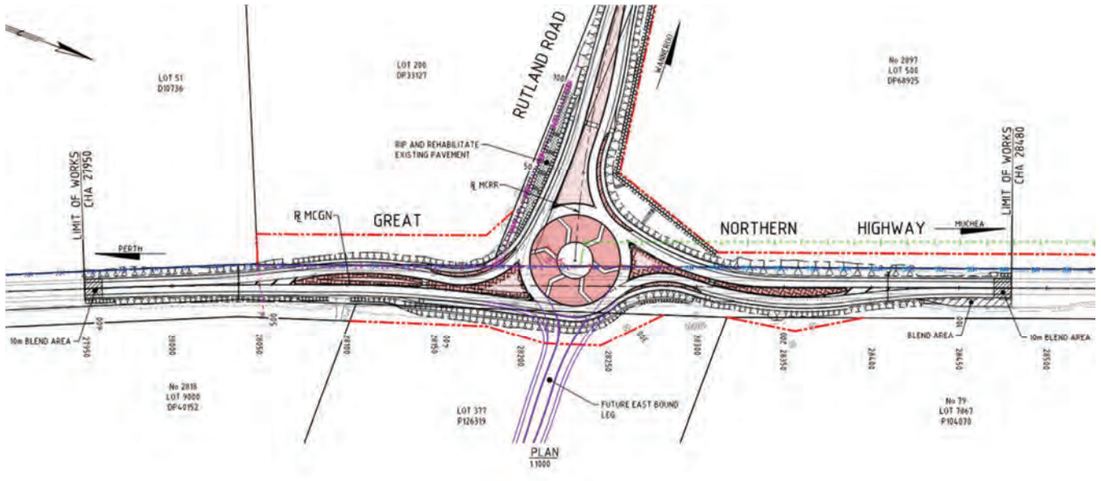


Figure 10 – Great Northern Highway / Rutland Road Roundabout Design (Proposed)

7.4 Road Network Modelling

According to the road network modelling completed by KCTT, the additional traffic volumes generated by the site are within reasonable thresholds and therefore the existing and proposed road upgrades identified in the BTDSP can support the proposed development of the site.

8. POWER

Western Power's (WP) Network Capacity Mapping Tool (NCMT) provides a high-level overview of high voltage (HV) infrastructure throughout the Bullsbrook Townsite. There is a significant amount of HV Distribution infrastructure in and around the site within the existing townsite.

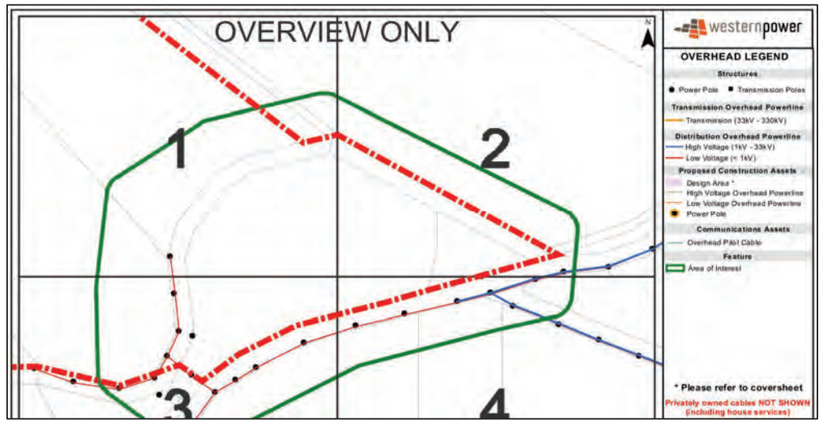


Figure 11 - Western Power DBYD Overview Plan – North East (WP, 2023)

Based on recent investigations, High Voltage (HV) overhead (OH) single phase lines are running through the centre of the site. This includes numerous low voltage (LV) connections which service the existing rural lots. This overhead power line network and LV tails will require decommissioning and removal once alternative service connections have been provided.

Towards the south eastern edge of the site there is High Voltage OH three phase power bordering from the site (originating from the east). This may also provide an alternate power source for the northern cell, should it be required.

In addition to the numerous HV distribution lines, WP's NCMT forecasts the remaining power capacity in the Bullsbrook region in excess of 25MVA as far as 2034 (the limits of the tool's forecast). Refer to Figure 12 which presents an output from Western Power's Network Mapping Tool. It appears there is sufficient capacity within the network to service Bullsbrook North.

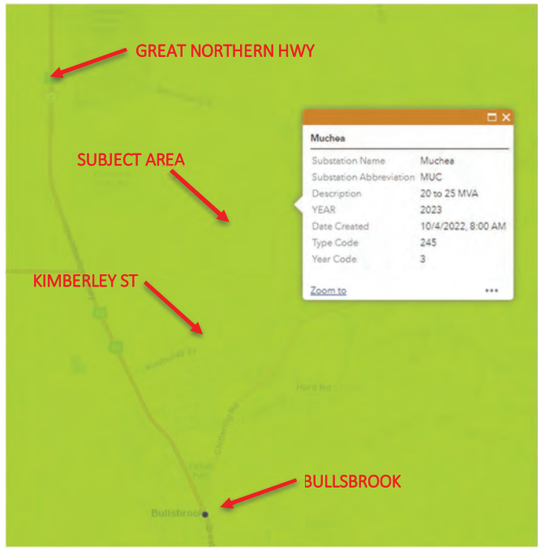


Figure 12 - Western Power Network Capacity Mapping Tool – HV only (WP, 2023)

9. COMMUNICATIONS

9.1 Existing Telstra Infrastructure

Telstra's DBYB information package identifies pit and pipe and fibre optic cables which service the existing lots in the site. The Telstra infrastructure enters the proposed site boundary from the south, via Kimberley St. The Kimberley St cabling appears to service all of the rural lots in the site, which fall between the western boundary and Ashton Road, north of Kimberley St.

There is a significant amount of infrastructure within the site, providing connections to homes set deep in rural lots. The pit and pipe residing in the north of Kimberley St road reserve is relatively small, suitable for the single and dual lot connections currently required. Should a developer choose to connect to this existing network, the Kimberley St pit and pipe infrastructure will almost certainly require upgrading.

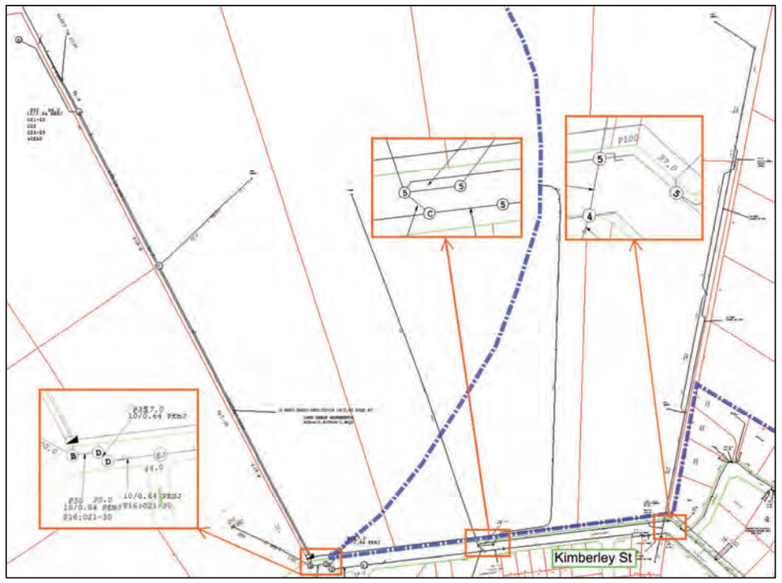


Figure 13 - Telstra DBYD Locality Plan

9.2 Existing NBN Co. Infrastructure

NBN's current fibre optic network extends as far as Kimberley Street to the immediate south of the site. According to the NBN Co's "Check your address" webpage, the service is fixed line, so backhauling NBN Co to Bullsbrook Townsite has already been undertaken. A preliminary search has also identified a telecommunications exchange on Bullsbrook Rd which is assumed to facilitate the Bullsbrook Townsite fibre optics. This exchange is approximately 2.3km from the site.

NBN servicing of the extended portion of the site to the north should be a relatively simple process subject to the development front being leveraged from Kimberley Street or Ashton Road.

Bullsbrook North - District Structure Plan Amendment
Engineering Servicing Report
Apr 2023

10. GAS SUPPLY

There is no existing gas infrastructure in Bullsbrook. To enable a gas supply, primary infrastructure needs to be extended into Bullsbrook. Developers of other parcels of land within Bullsbrook previously held discussions with ATCO regarding the possible extension of their network. ATCO have confirmed the extending of the infrastructure will be 100% developer funded at a cost of approximately $3M. To date, these developers have decided not to proceed with the extension.

Because reticulated gas is not considered an essential service, many developers are looking to promote, and home owners are looking use, more environmentally friendly and carbon neutral energy sources. Natural gas is a fossil fuel and there are alternate heating and cooking options now available which can utilise renewable sources such as solar and battery storage.

It is not expected Bullsbrook North will be reticulated with gas.

11. SUMMARY

The proposed Bullsbrook Townsite's Northern Precinct is highly suited to future residential development and is consistent with the Sub Regional Planning Framework.

The existing infrastructure currently within close proximity of the site is sufficient to support the commencement of residential development. In addition, the infrastructure upgrades proposed by the service authorities over the near term will facilitate further development such that the entire site can be developed.

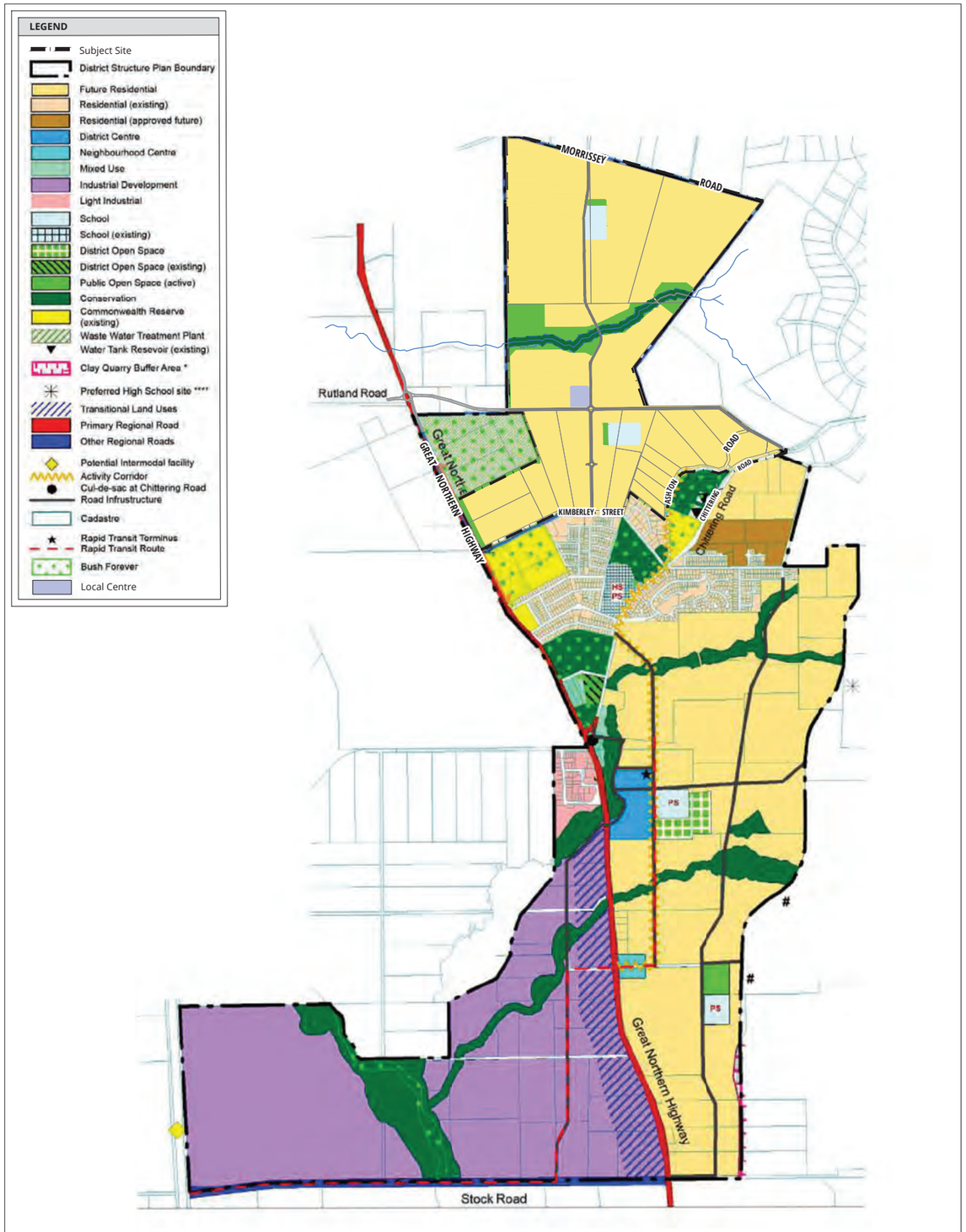
The intent to progressively undertake further expansion of the Bullsbrook Townsite will also assist to prioritise infrastructure programs, including road network upgrades, creation of additional school sites, provision of District Open Spaces and upgrades to essential services.



Figure 14 – Photo of Subject Area (looking west)

APPENDIX A

Rowe Group – Proposed Bullsbrook Townsite District Structure Plan – Northern Precinct



AMENDMENT No.	SUMMARY OF THE AMENDMENT	AMENDMENT TYPE	DATE APPROVED BY WAPC
1	NORTHERN PRECINCT - MODIFIED LAND USE DESIGNATION; INTRODUCTION OF PART 1 OF THE LSP	STANDARD	

N:\TOWN PLANNING\9000-9999\9500\DRAFTING\A-CAD - JK - 2023.02.16

PLAN 1: BULLSBROOK TOWNSITE DISTRICT STRUCTURE PLAN (AS AMENDED)

BULLSKBROOK

N

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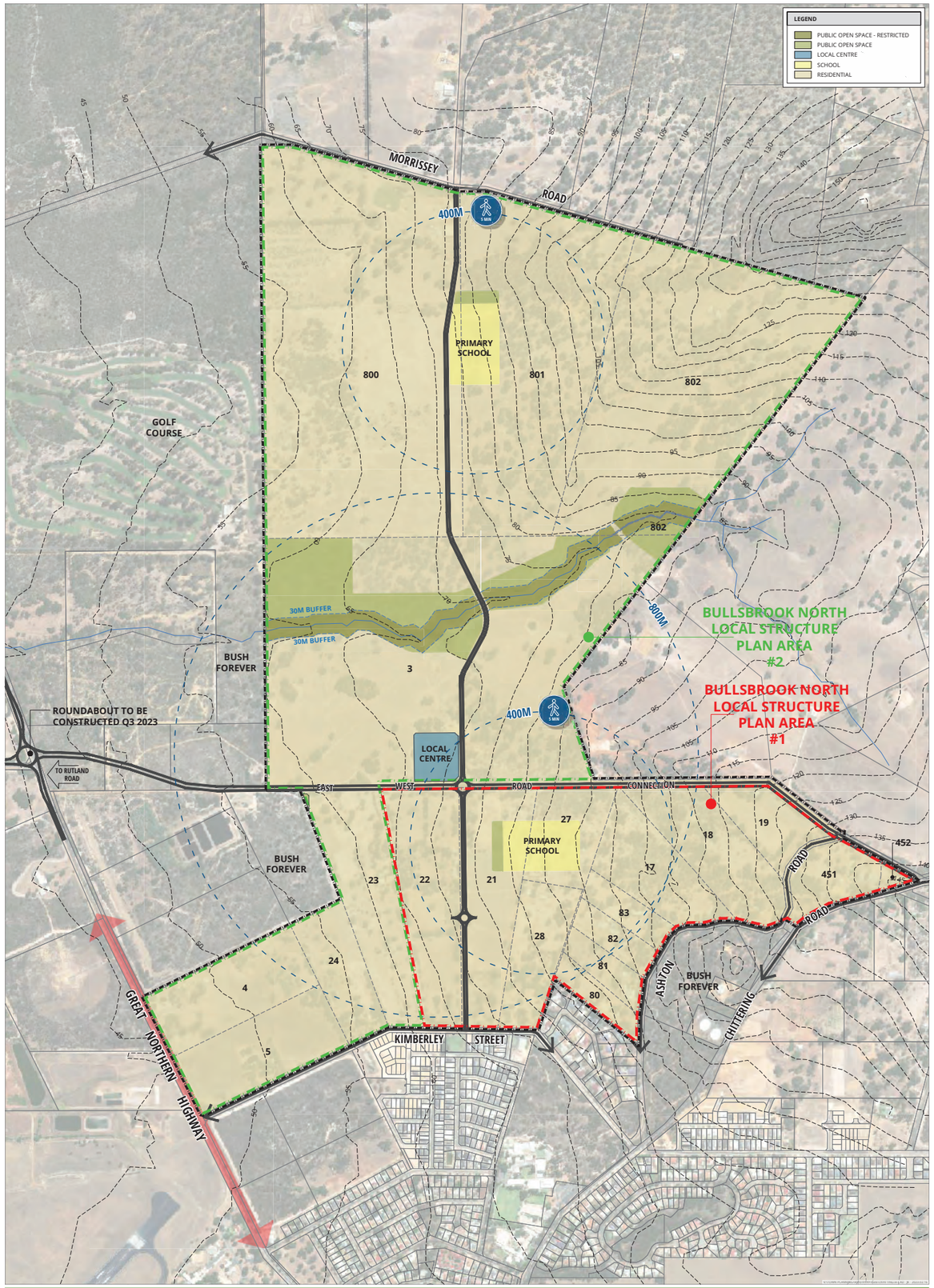

PLAN 2: BULLSBROOK TOWNSITE DISTRICT STRUCTURE PLAN - NORTHERN PRECINCT
VARIOUS LOTS GREAT NORTHERN HIGHWAY - MORRISSEY ROAD TO KIMBERLEY STREET
BULLSBROOK

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9506-DSP-01-C

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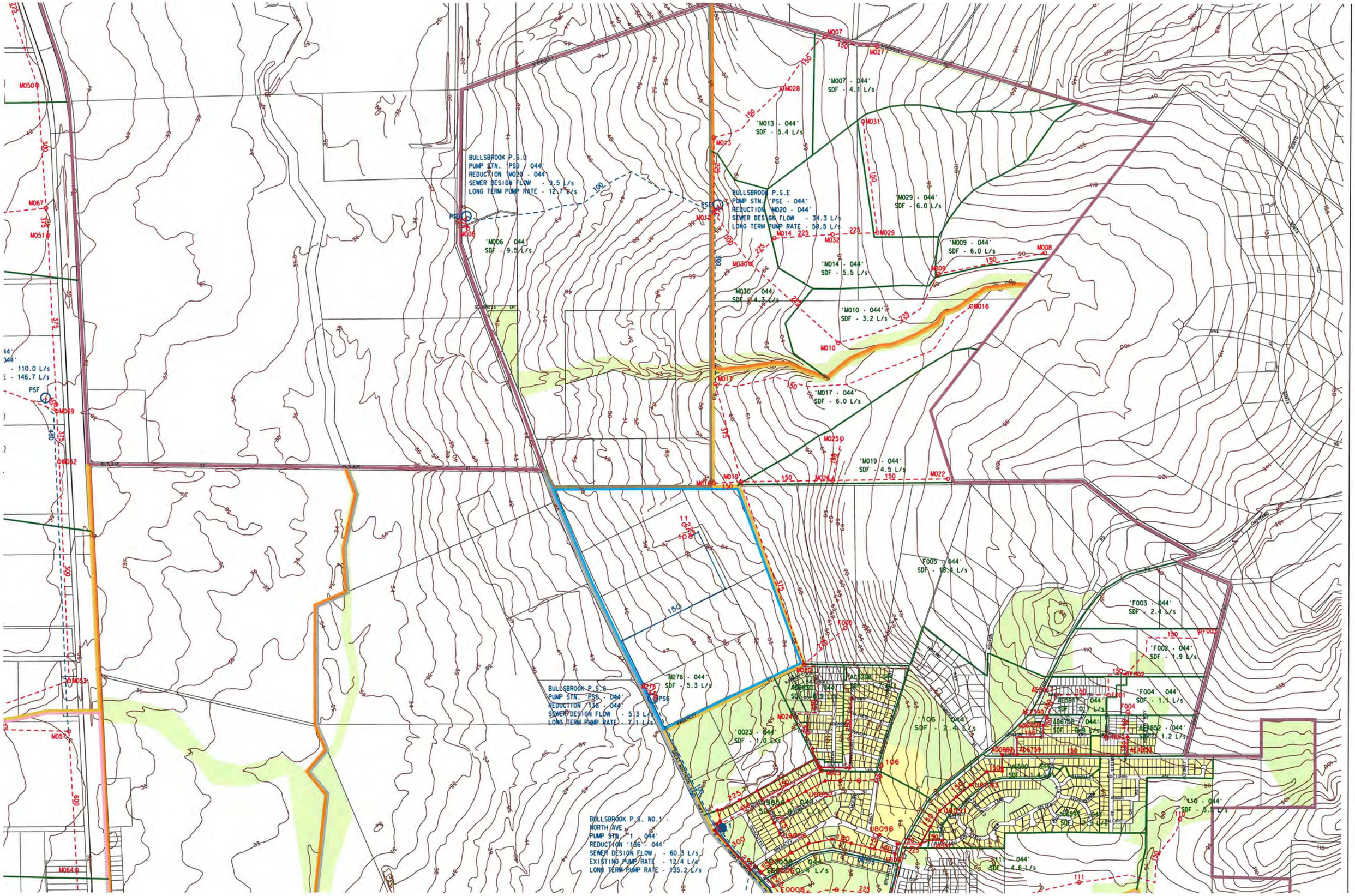
APPENDIX B

WC – Wastewater Planning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REDUCTION 'M020 - 044'
SEWER DESIGN FLOW - 9.5 L/s
LONG TERM PUMP RATE - 12.7 L/s
'M006 - 044'
SDF - 9.5 L/s
BULLSBROOK P.S.E
PUMP STN. 'PSE - 044'
REDUCTION 'M020 - 044'
SEWER DESIGN FLOW - 34.3 L/s
LONG TERM PUMP RATE - 58.5 L/s
'M007 - 044'
SDF - 4.1 L/s
'M013 - 044'
SDF - 5.4 L/s
'M029 - 044'
SDF - 6.0 L/s
'M009 - 044'
SDF - 6.0 L/s
'M014 - 044'
SDF - 5.5 L/s
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SDF - 4.3 L/s
'M010 - 044'
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SDF - 6.0 L/s
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SDF - 4.5 L/s
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'F005 - 044'
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SDF - 1.9 L/s
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SDF - 5.8 L/s
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'0023 - 044'
SDF - 1.0 L/s
'106 - 044'
SDF - 2.4 L/s
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REDUCTION '136 - 044'
SEWER DESIGN FLOW - 5.3 L/s
LONG TERM PUMP RATE - 7.1 L/s
BULLSBROOK P.S. NO.1 -
NORTH AVE
PUMP STN. '1 - 044'
REDUCTION '156 - 044'
SEWER DESIGN FLOW - 60.3 L/s
EXISTING PUMP RATE - 12.4 L/s
LONG TERM PUMP RATE - 135.2 L/s
PSD
PSE
PS6
PSF
M007
M027
M028
M031
M029
M032
M008
M009
M030
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M012
M006
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M023
M021
M026
M275
M067
M051
M069
M052
M053
M054
M064
M050
RUTLAND
NORTH AVE
STIRLING
DR
CRESCENT
COURT
CLOSE
PLACE
WAY
ROAD
PARADE
HQ

APPENDIX 10

Bullsbrook North Urban Expansion Area Development Contribution Plan Scoping Paper



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Bullsbrook North Urban Expansion Area
Development Contribution Plan Scoping Paper

Prepared for the City of Swan by Rowe Group (May 2026)

Preamble

In April 2018, the Western Australian Planning Commission (WAPC) approved the Bullsbrook Townsite District Structure Plan as the strategic planning document to guide future land use and development over the affected landholdings and provide a framework for more detailed, localised structure planning and scheme rezonings.

Refer Figure 1 – Approved Bullsbrook Townsite District Structure Plan.

The townsite is relatively disconnected from other established urban areas within the Perth Metropolitan Region. The purpose of the District Structure Plan is to facilitate the development, over time, of a self-sufficient townsite which provides for diverse land uses and associated infrastructure requirements, while taking into account the natural environment and existing major land uses including RAAF Pearce, several resource extraction operations and adjacent agricultural and horticultural activities.

The boundaries of the District Structure Plan were generally established in the City of Swan's Bullsbrook Townsite and Rural Strategy, endorsed by the Council in September 2008. That document acknowledged (and recommended) that detailed planning would be required to facilitate future townsite expansion. It also anticipated detailed planning would generally focus on three areas – Bullsbrook South, Bullsbrook Central, and Bullsbrook North.

The residential component of the approved District Structure Plan comprises existing residential; approved residential; existing 'Urban Deferred' zones and proposed future residential. It also makes provision for a proposed District Centre, and two Neighbourhood Centres. Critically, the District Structure Plan also recognised the need for a Development Contribution Plan to be prepared to facilitate the cost effective provision of shared infrastructure such as utilities, roads and district Public Open Space.

A Development Contribution Area 7 (DCA 7) was progressed as an amendment (Amendment 170) to the City of Swan's Local Planning Scheme 17 (LPS 17) and given effect by the provisions of Section 5A.2 and Schedule 13 of LPS 17 on 15 December 2020. A Development Contribution Plan Report over DCA 7 – comprising 3 separate precincts - was subsequently prepared in accordance with *State Planning Policy 3.6 (Infrastructure Contributions) (SPP 3.6)* and the associated Implementation Guidelines. The Report was adopted by the City of Swan on 22 September 2022.

Critically, the Bullsbrook North Urban Expansion Area was excluded from DCA 7 on the basis that zoning and detailed planning had not been sufficiently progressed. Accordingly, a Development Contribution Plan report will need to be progressed independently once the planning framework for this precinct has been finalised.

1. Background

The Bullsbrook Townsite District Structure Plan **('The DSP')** was prepared over an area encompassing approximately 1,583 hectares. The DSP estimated the creation of 6,500 new lots, with the population of the Bullsbrook locality forecast to grow from approximately 6,000 in 2018 to 16,000 in 2031 and 20,500 in 2036.

The Bullsbrook North Urban Expansion Area **('The Expansion Area')** comprises the northern most portion of the DSP and is located approximately 50 kilometres north-east of the Perth CBD and 25 kilometres of the Midland Strategic Metropolitan Centre. The Expansion Area comprises 21 landholdings and an area of 354 hectares, with approximately 95 per cent (335 hectares) of this land held by the main Bullsbrook North Landowner Group.

Refer Figure 2 – Local Location Plan.

Rowe Group, on behalf of the Bullsbrook North Landowner Group, has prepared an Amendment request to the DSP. The purpose of the Amendment is to update previously incomplete planning for the Expansion Area through preparation of a Masterplan and associated framework to guide future local structure planning, subdivision and development of the Expansion Area. The Expansion Area will accommodate an estimated 4,465 dwellings, with a forecast population of 12,500 people, 3 Primary Schools, a local centre and District Open Space**.**

Refer Figure 3 – Proposed Amendment to Bullsbrook Townsite District Structure Plan.

Once adopted by the Western Australian Planning Commission (WAPC), the proposed Amendment will become *Amendment No. 1 to the Bullsbrook Townsite District Structure Plan.*

The proposed Amendment is informed by a number of technical studies and investigations including:

- Bushfire Management Plan;
- Environmental Assessment Report;
- Geotechnical Investigation;
- District Water Management Strategy;
- Economic Demand Report;
- Landscape Master Plan;
- Traffic Impact Assessment;
- Engineering Servicing Report; and
- District Development Contribution Plan (this document).

Critically, future Implementation of the Expansion Area will also require the equitable funding of key infrastructure through the preparation of a District level Development Contribution Plan **('The DCP').**

This Scoping Paper articulates a broad summary of the principles to be applied to the DCP for the Expansion Area, including the key infrastructure elements to be funded by the landowner group, relevant assumptions and/or exclusions. It is acknowledged that there are both planning and environmental approvals required to facilitate future development of the Expansion Area that will pre-empt a DCP. However, this Scoping Paper seeks to identify (and inform stakeholders including the City of Swan) the relevant infrastructure elements that will be captured in the DCP.

2. Purpose & Key Principles

In September 2021, the City of Swan adopted the *Bullsbrook Townsite Development Contribution Plan for DCA 7*. Consistent with DCA 7, the purpose of the DCP for the Expansion Area will be to:

- promote the efficient and effective provision of public infrastructure to meet the demands arising from new growth and development;
- ensure that Development Contributions are necessary and relevant to the proposed development and are charged equitably among those to benefit from the infrastructure provided; and
- ensure consistency and transparency in the system for apportioning, collecting and spending Development Contributions.

Landowner Development Contributions will be made through monetary payment or, where appropriately guided by the Development Contributions Plan, offset by undertaking works on behalf of the City of Swan, and/or ceding land to the value of the Development Contribution.

The DCP will be prepared in accordance with *State Planning Policy 3.6 (Infrastructure Contributions)* and the associated Implementation Guidelines, and take into account the following principles:

- Need and nexus
- Transparency
- Equity
- Certainty
- Efficiency
- Consistency
- Right of consultation and comment
- Accountability

3. Development Contribution Costs

The DCP for the Expansion Area will identify relevant infrastructure, land and other relevant works required to unlock the land and facilitate orderly development of the broader Expansion Area. Elements to be funded by the landowner group may include a new north-south and east-west road connections, upgrades to existing roads, and areas of Open Space.

The infrastructure elements are addressed in more detail below.

3.1 Roads

Road construction standards will be consistent with *WAPC DC Policy 1.7 - General Road Planning* i.e., bulk earthworks along the whole of the proposed north-south and east-west road reserves, construction of one carriageway and associated drainage facilities, as well as land acquisition and costs for relevant intersections. In addition, a dual use path along one side of these roads will be constructed, consistent with the public mobility objectives of the proposed Expansion Area Masterplan.

The DCP may also need to make provision for the upgrading of:

- Kimberley Street, which provides the interface between the Expansion Area and existing townsite and will facilitate access to future residential development within Precinct 4; and
- Morrissey Road, which provides the northern edge interface between the Expansion Area and the rural surrounds and will facilitate access from the future residential development's northern extent out to Great Northern Highway and beyond.
- A new north-south and east-west road connection and provide key connections to the surrounding road network.

3.2 Open Space

Land and development cost contributions for the Open Space may potentially be apportioned between landowners and be subject to further discussions with the City of Swan. The location and extent of the Open Space will be subject to further review and refinement at the local structure planning stage.

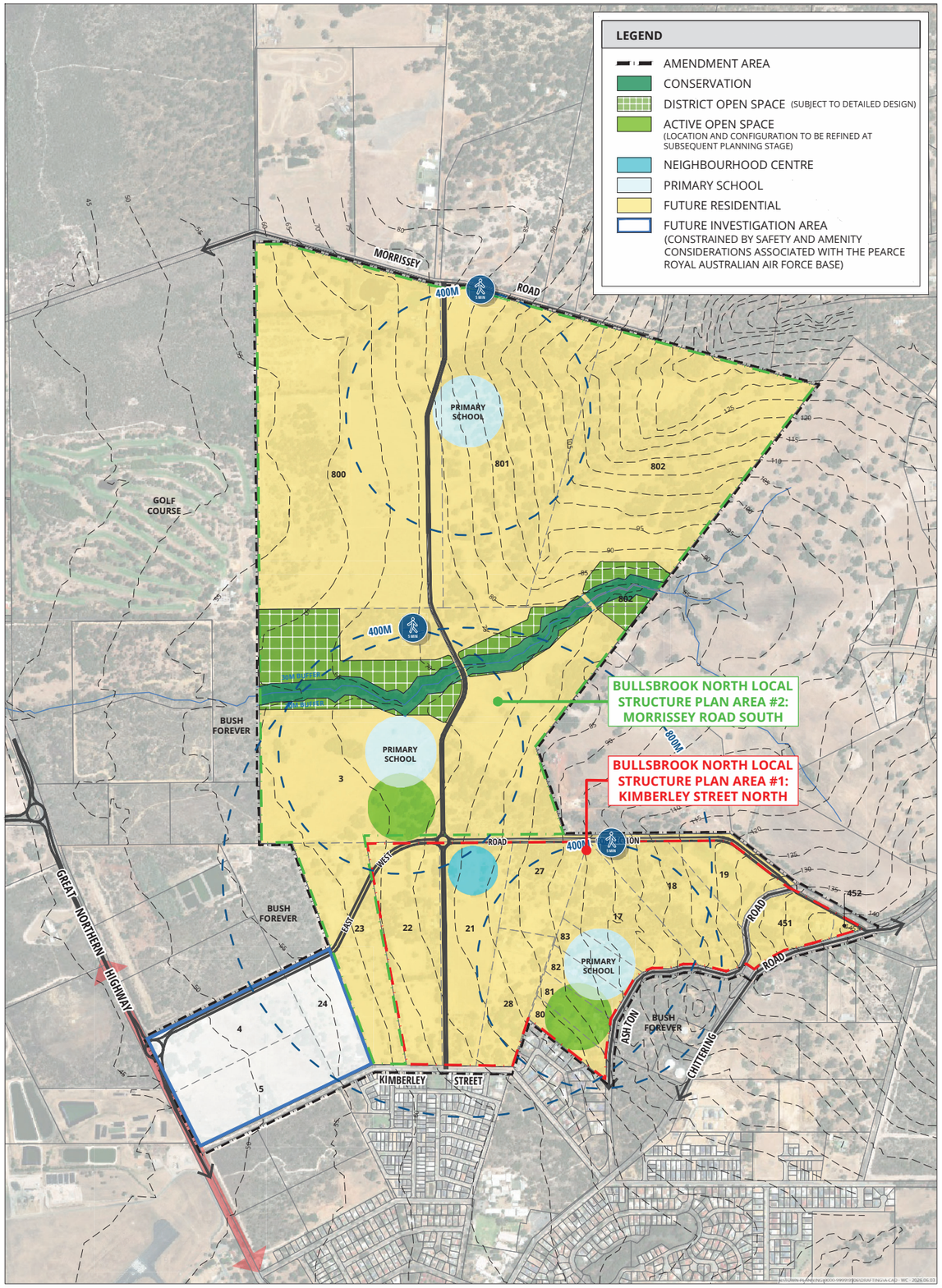
4. Next Steps

Timeframes for delivery of DCP infrastructure is contingent upon finalisation of the proposed DSP Amendment, subsequent Metropolitan Region Scheme ('MRS') Amendments, local structure planning and land subdivisions within the Expansion Area.

With these considerations in mind, the DCP assumes delivery of the required infrastructure over two stages (Stage 1 – Kimberley Street North 2026 - 2036) and Stage 2 – Morrissey Road South 2030+).

Most importantly, this Scoping Paper seeks to recognise the need for a DCP, while acknowledging that more detailed preparatory work will be required in parallel to local structure planning, and once the land has been rezoned to facilitate urban residential use. The City and or WAPC can reasonably then consider the detail and prospect of initiating a required scheme amendment to LPS 17 at that time.

Figures



PLAN 2: BULLSBROOK TOWNSITE DISTRICT STRUCTURE PLAN (AS AMENDED) - INSET

BULLSBROOK

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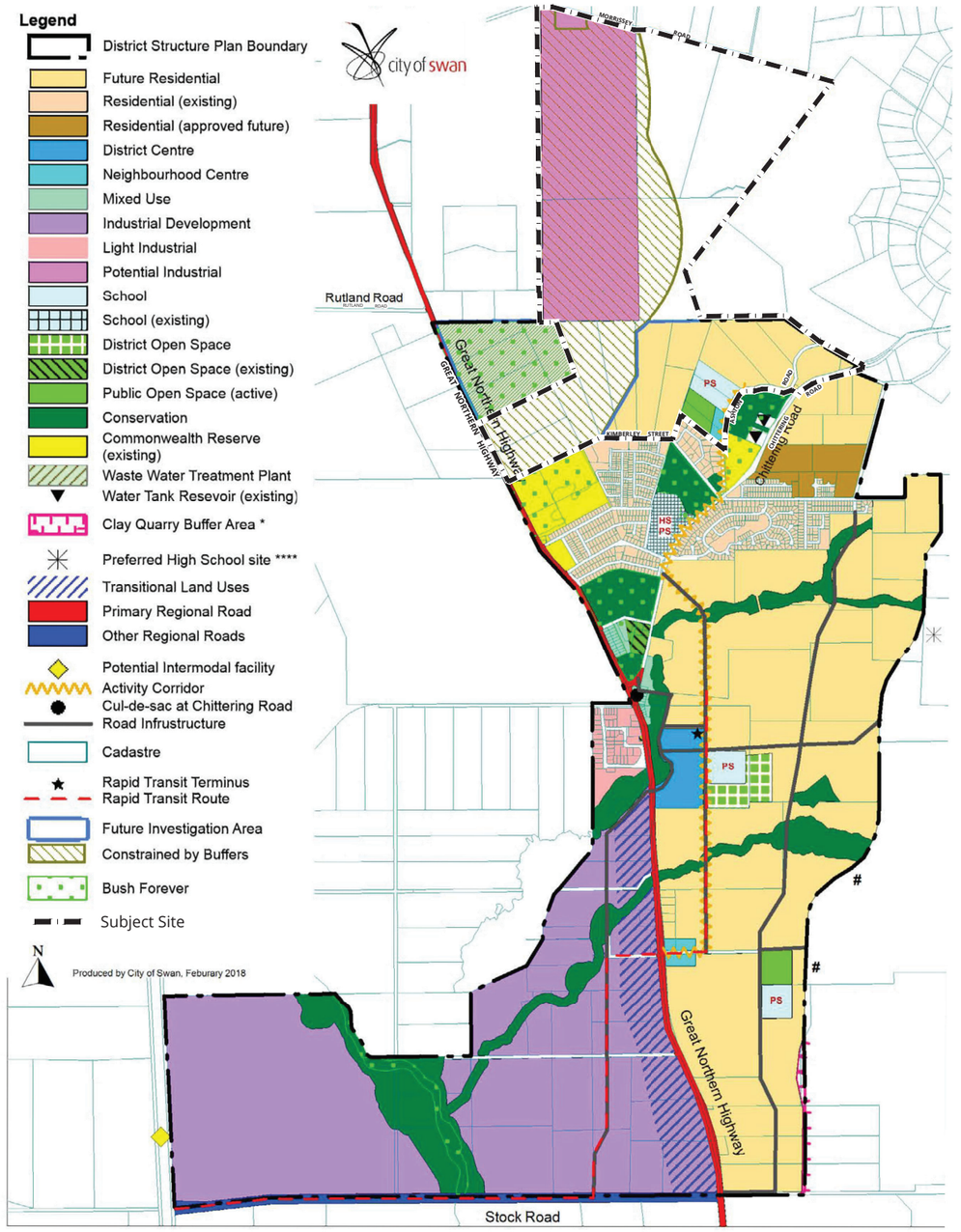

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FIGURE 1

APPROVED BULLSBROOK TOWNSITE DISTRICT STRUCTURE PLAN



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FIGURE 2

LOCAL LOCATION

APPENDIX 11

Basic Fauna Survey and Black Cockatoo Assessment



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BULLSBROOK NORTH STAGE 1

BASIC FAUNA SURVEY AND BLACK COCKATOO HABITAT ASSESSMENT

Prepared for: Bullsbrook Investment Company Pty Ltd

Report Date: 2 August 2023

Version: 1

Report No. 2023-766



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Appendix 4: Conservation Codes

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1 INTRODUCTION

1.1 Background

Bullsbrook North Stage 1 is located on Lots 21, 22, 27 and 28 Kimberley Street, Lots 17 to 19 and 80 to 83 Ashton Road and Lots 451 and 452 Chittering Road, Bullsbrook (Site) in the City of Swan, approximately 40km north-north-east of the Perth Central Business District (Figure 1). The subject land is 77.32ha in size and is bounded by Kimberley Street, Ashton Road and Chittering Road to the south and rural land on the other boundaries (Figure 2).

The subject land is currently zoned 'Rural' under the Metropolitan Region Scheme (National Map, 2022) and 'General Rural' under the City of Swan Local Planning Scheme No. 17 (WAPC, 2022). The land is located inside the Bullsbrook District Structure Plan (DSP) area and is designated Urban Expansion under the North-East Sub Regional Planning Framework. The proposed amendment to the Metropolitan Region Scheme (MRS) and Local Planning Scheme is to designate the area as 'Urban' to facilitate the future development of the subject land.

This Basic Fauna Survey and Black Cockatoo Habitat Assessment was commissioned by Bullsbrook Investment Company Pty Ltd to identify any habitat on the subject land for Conservation Significant fauna. The results may inform potential amendments to the DSP to retain areas of conservation value within the Stage 1 Amendment area.

1.2 Scope of Works

A Basic Fauna Survey was undertaken in accordance with EPA Technical Guidance *Fauna Surveys for Environmental Impact Assessment* (EPA, 2020). The survey included the following:

- A search of the DBCA Databases and Atlas of Living Australia for the general area for Threatened and Priority Species;
- A search of the Commonwealth Government's Protected Matters Search Tool to identify species potentially occurring within the area that are protected under the Environment Protection and Biodiversity Conservation (EPBC) Act 1999 or international migratory bird agreements (JAMBA/CAMBA);
- A review of studies previously undertaken in the vicinity of the subject land;
- A description of the fauna habitats present on the subject land from field surveys; and
- An assessment of the significance of the subject land for conservation significant species in a local and regional context.

The Black Cockatoo Habitat Assessment was undertaken to:

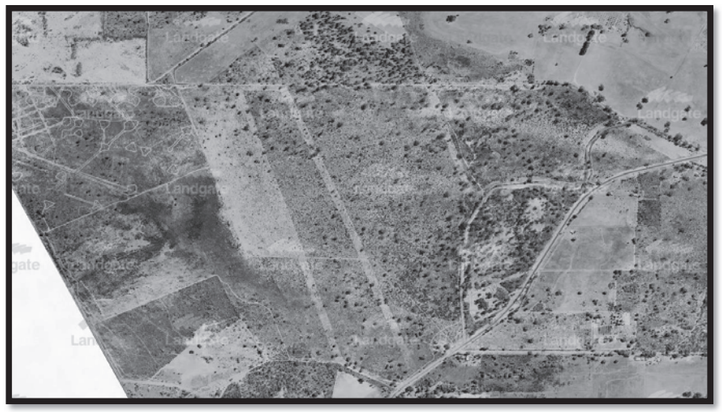
- Map and quantify the extent and quality of foraging habitat for Carnaby's and Forest Red-tailed Black Cockatoos;
- Record any evidence of foraging;
- Assess the foraging quality;
- Identify all suitable breeding habitat trees for Carnaby's and Forest Red-tailed Black Cockatoos within lots able to be accessed; and
- Identify any evidence of roosting on the subject land.

2 EXISTING ENVIRONMENT

2.1 Land Use

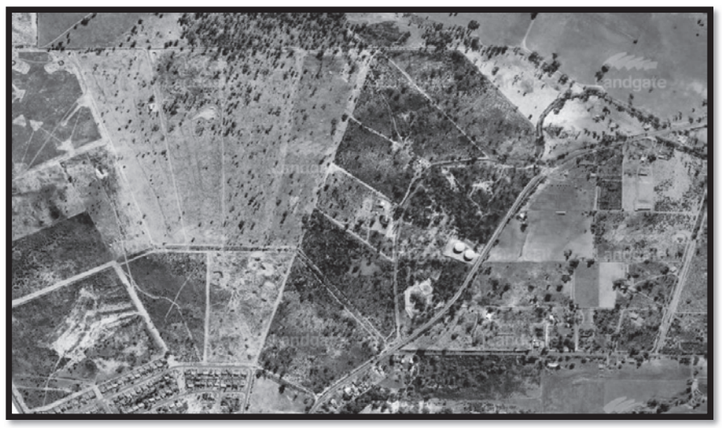
Earliest available aerial photography for the subject land from 1965 shows that a large proportion of has been cleared for agricultural purposes with scattered trees and pockets of remnant native vegetation remaining (Plate 1) (Landgate, 2023).

Plate 1: Aerial Photograph from 1965 (Landgate, 2023)



The 1977 aerial photograph shows a lot more clearing of trees throughout the subject land (Plate 2).

Plate 2: Aerial Photograph from 1977 (Landgate, 2023)



Urban development commenced to the south in 2013 (Plate 3).

Plate 3: Aerial Photograph from 2013 (Landgate, 2023)



The subject land use has not significantly changed from 2013 to 2022 (Plate 4).

Plate 4: Aerial Photograph from 2022 (Landgate, 2022)



2.2 Topography

The subject land is undulating, generally sloping up to the east. Elevations range between 64m Australian Height Datum (AHD) in the south-western corner to 144m AHD at the eastern end (Figure 2).

2.3 Geology and Soils

2.3.1 Geology

The subject land is mapped as part of the Dandaragan Plateau which is a gently undulating plateau with areas of sandplain and some laterite capping on Cretaceous sediments (McArthur and Bettenay, 1960). The plateau has broad u-shaped valleys 80-150 m deep and smaller v-shaped east of the Gingin Scarp in the south (National Map, 2022). Soils are formed in colluvium and weathered rock (DPIRD, 2023).

2.3.2 Soils

The soils subsystems mapped on the subject land are described as follows:

- Reagan 1 Subsystem (222Re_1) which are on gentle slopes (<10%) with deep, rapidly drained loose brownish or pale sands with a sandy fabric; and
- Reagan 3 Subsystem (222Re_3) are on gentle slopes (<10%) and spurs (<20% slope) with shallow gravelly sands and few areas of lateritic outcrop (DPIRD, 2023).

2.4 Hydrology

Groundwater under the subject land is at depth at approximately 37m AHD (DWER, 2023), which is greater than 30m below ground level. There are no wetlands or watercourses on the subject land.

2.5 Flora and Vegetation

2.5.1 Flora

A site reconnaissance flora and vegetation survey on 3 March 2021 and a Detailed flora and vegetation survey on 7 October 2021 were conducted by PGV Environmental. A total of 113 plant species were recorded on the subject land. The total consisted of 87 native and 26 introduced species (16.5%) (PGV Environmental, 2021).

No Threatened or Priority plant species were recorded on the subject land.

2.5.2 Vegetation Complex

Vegetation Complexes are a broad level of vegetation description which is based on the underlying geomorphology and rainfall (Heddle *et al*., 1980). The vegetation is mapped as part of the Reagan Complex which is described as "Vegetation ranges from low open woodland of *Banksia* species *Eucalyptus todtiana* (Pricklybark) to closed heath depending on the depth of soil" (Heddle *et al.,* 1980).

The vegetation on the subject land does not meet the general description of the Reagan vegetation complex. The vegetation on the subject land better fits the description of the Mogumber– South vegetation complex which is mapped as occurring about 1km east of the subject land and is broadly described as "Open Woodland of *Eucalyptus calophylla* (Marri) with some admixture of *E. marginata* (Jarrah) and a second storey of *E. todtiana-Banksia attenuata-B. menziesii-B. ilicifolia*".

A very small area of the subject land in the south-western corner is mapped in the Guildford Complex which is described as "a mixture of open forest to tall open forest of *E. calophylla – E. wandoo – E. marginata* and woodland of *E. wandoo* (with rare occurrences of *E. lane-poolei*). Minor components include *E. rudis – M. rhaphiophylla*" (Heddle *et al.,* 1980).

2.5.3 Vegetation Types

Vegetation types mapped on the subject land are:

Cc *Corymbia calophylla* (Marri) Woodland over *Xanthorrhoea preissii* Open Low Heath
Em *Eucalyptus marginata* (Jarrah) Woodland over weeds
Bs *Banksia sessilis* Shrubland over *Xanthorrhoea preissii* Open Heath
Xp *Xanthorrhoea preissii* Open Heath over weeds (PGV Environmental, 2022).

2.5.4 Vegetation Condition

The condition of the native vegetation is mostly in Degraded and Completely Degraded condition (PGV Environmental, 2022) due to the past clearing and long history of grazing under the trees (Figure 4). Five small areas containing vegetation in Good condition are mapped on the subject land (Figure 4).

3 BASIC FAUNA SURVEY

3.1 Methodology

The Basic Fauna Survey was undertaken in accordance with EPA Technical Guidance *Fauna Surveys for Environmental Impact Assessment* (EPA, 2020). Desktop studies were undertaken to identify habitats and potential threatened species that may occur on the subject land. Searches of the following databases were undertaken prior to the site survey:

- Department of Biodiversity, Conservation and Attractions (DBCA) Threatened and Priority Fauna database (Appendix 1) with a buffer radius of 10km;
- Atlas of Living Australia (ALA, 2023) (Appendix 2) with a buffer radius of 10km; and
- The Commonwealth Government's Protected Matters Search Tool to identify species potentially occurring within the area that are protected under the *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999* (DCCEEW, 2023). A radius of 5km was used for this database (Appendix 3).

A site reconnaissance was conducted by PGV Environmental on 4 October 2022. The inspection included traversing the subject land on foot.

3.2 Database Searches

The database searches indicates that a number of species that are listed as Endangered, Threatened or Priority have been recorded within a 10km radius of the subject land or could potentially having habitat in the area. The results from these database searches are shown in Table 2. None of the species has been recorded from the survey area.

Table 1: List of Fauna Species Identified from Fauna Database Searches

Scientific Name	Common Name	Conservation Status (WA)	Status under EPBC Act
Bettongia penicillata ogilbyi (Bettongia penicillata)	Woylie, Brush-tailed Bettong	Critically Endangered	Endangered
Calidris ferruginea	Curlew Sandpiper	Critically Endangered	Critically Endangered
Hesperocolletes douglasi	Douglas's Broad-headed Bee	Critically Endangered	Critically Endangered
Numenius madagascariensis	Eastern Curlew	Critically Endangered	Critically Endangered
Pseudemydura umbrina	Western Swamp Tortoise	Critically Endangered	Critically Endangered
Botaurus poiciloptilus	Australasian bittern	Endangered	Endangered
Calyptorhynchus (Zanda)baudinii	Baudin's Black Cockatoo	Endangered	Endangered
Calyptorhynchus (Zanda) latirostris	Carnaby's Black Cockatoo	Endangered	Endangered
Galaxiella nigrostriata	Black-stripe Minnow	Endangered	Endangered
Leioproctus douglasiellus	A Short-tongued Bee	Endangered	Critically Endangered

Scientific Name	Common Name	Conservation Status (WA)	Status under EPBC Act
Petrogale lateralis lateralis	Black-flanked Rock-wallaby, Black-footed Rock-wallaby, Moororong	Endangered	Vulnerable
Rostratula australis (Rostratula benghalensis australis)	Australian Painted Snipe	Endangered	Endangered Marine/ Migratory
Calyptorhynchus banksii naso	Forest Red-tailed Black-Cockatoo	Vulnerable	Vulnerable
Dasyurus geoffroii	Chuditch, Western Quoll	Vulnerable	Vulnerable
Leipoa ocellata	Mallee Fowl	Vulnerable	Vulnerable
Macrotis lagotis	Bilby, Dalgyte, Ninu	Vulnerable	Vulnerable
Westralunio carteri	Carter's Freshwater Mussel	Vulnerable	Vulnerable
Actitis hypoleucos	Common Sandpiper	Migratory	Marine/ Migratory
Apus pacificus	Fork-tailed Swift	Migratory	Marine/Migratory
Calidris acuminata	Sharp-tailed Sandpiper	Migratory	Marine/ Migratory
Calidris melanotos	Pectoral Sandpiper	Migratory	Marine/ Migratory
Motacilla cinerea	Grey Wagtail	Migratory	Migratory/ Marine
Tringa nebularia	Common Greenshank	Migratory	Marine/ Migratory
Phascogale tapoatafa wambenger	South-western Brush-tailed Phascogale, Wambenger	Conservation Dependent	
Falco peregrinus	Peregrine Falcon	Other Specially Protected Fauna	Marine/ Migratory
Ardea alba	Great Egret, White Egret		Marine
Ardea ibis	Cattle Egret		Marine
Haliaeetus leucogaster	White-bellied Sea-eagle		Marine
Merops ornatus	Rainbow Bee-eater		Marine
Euoplos inornatus	Inornate Trapdoor Spider (northern Jarrah Forest)	Priority 3	
Leioproctus contrarius	A Short-tongued Bee	Priority 3	
Neelaps calonotos	Black-striped Snake	Priority 3	
Isoodon fusciventer	Southern Brown Bandicoot, Quenda	Priority 4	
Notamacropus irma	Western Brush Wallaby	Priority 4	
Synemon gratiosa	Graceful Sun-moth	Priority 4	

Conservation Codes are in Appendix 4.

3.3 Fauna Habitat

There were four fauna habitats were described during the reconnaissance visits including:

- Open Woodland Habitat with a total area of 3.87 ha (Plate 5). The Open Woodland habitat has an overstorey of trees with some native species in the understorey however there are also a large number of weeds;
- Shrubland Habitat with a total area of 2.05 ha (Plate 6). The shrubland habitat does not have a tree overstorey and is dominated by shrubs. This fauna habitat also contains a large number of weeds;
- Parkland Cleared Habitat which is the dominant habitat type over 36.61 ha (Plate 7). This habitat consists of trees over pasture species; and
- Cleared Habitat with a total area of 21.89 ha (Plate 8). This habitat is made up of cropping areas and other areas that contain no native vegetation and an herbaceous weedy ground cover.

The fauna habitats are shown in Figure 3.

Plate 5: Open Woodland Habitat



Plate 6: Shrubland Habitat



Plate 7: Parkland Cleared Habitat



Plate 8: Cleared Habitat



Fauna habitat can be assessed using a number of factors including, the size of the habitat, the level of habitat connectivity, availability of specific resources (e.g. tree hollows) and overall vegetation quality. The habitat was assessed according to the categories in Table 5.

Table 5: Fauna Habitat Value

Habitat Value	Description
High Quality Fauna Habitat	These areas closely approximate the vegetation mix and quality that would have been in the area prior to any disturbance. The habitat has connectivity with other habitats and is likely to contain the most natural vertebrate fauna assemblage.
Very Good Fauna Habitat	These areas show minimal signs of disturbance (e.g. grazing, clearing, fragmentation, weeds) and generally retain many of the characteristics of the habitat if it had not been disturbed. The habitat has connectivity with other habitats and fauna assemblages in these areas are likely to be minimally affected by disturbance.
Good Fauna Habitat	These areas showed signs of disturbance (e.g. grazing, clearing, fragmentation, weeds) but generally retain many of the characteristics of the habitat if it had not been disturbed. The habitat has connectivity with other habitats and fauna assemblages in these areas are likely to be affected by disturbance.
Disturbed Fauna Habitat	These areas showed signs of significant disturbance. Many of the trees, shrubs and undergrowth are cleared. These areas may be in the early succession and regeneration stages. Areas may show signs of significant grazing, contain weeds or have been damaged by vehicle or machinery. Habitats are fragmented or have limited connectivity with other fauna habitats. Fauna assemblages in these areas are likely to differ significantly from what might be expected in the area had the disturbance not occurred.

Habitat Value	Description
Highly Degraded Fauna Habitat	These areas often have a significant loss of vegetation, an abundance of weeds, and a large number of vehicle tracks or are completely cleared. Limited or no fauna habitat connectivity. Faunal assemblages in these areas are likely to be significantly different to what might have been in the area pre-disturbance.

From: Coffey Environments, 2009

The subject land contains many areas that have been significantly impacted by historical clearing and only five small areas of native vegetation that area in Good condition. Native vegetation in very good condition occurs in a Bush Forever site to the west of the subject land. However, there is little to no ground connectivity between the vegetation to the west, vegetation on the subject land and other areas of vegetation further east. Any connectivity that exists is provided by the tree canopies and would be primarily used by birds. The subject land is therefore considered to be Highly Degraded Fauna Habitat due to disturbance and lack of connectivity.

3.4 Conservation Significant Species

Table 2 identifies the likelihood of species listed in Table 1 to occur on the subject land based on their habitat preferences and the fauna habitat on the subject land.

In summary the following species may occur on the subject land:

- Carnaby's Black Cockatoo (*Calyptorhynchus (Zanda) latirostris*) (Endangered);
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) (Vulnerable);
- Rainbow Bee-eater (*Merops ornatus*) (Marine);
- Southern Brown Bandicoot, Quenda (*Isoodon fusciventer*) (Priority 4).

Table 2: Likelihood of Conservation Significant Species being Present on the Subject Land

Scientific Name	Common Name	Habitat*	Likelihood to occur on the subject land
Schedule 1 – Critically Endangered			
Bettongia penicillata ogilbyi (Bettongia penicillata)	Woylie, Brush-tailed Bettong	The Woylie habitat types ranged from forest to grassland, coastal and inland. During the day the Woylie shelters under patches of dense undergrowth, logs and rock-cavities and occasionally in burrows.	No – no dense habitat the subject land is too disturbed
Calidris ferruginea	Curlew Sandpiper	Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms.	No – not suitable habitat
Hesperocolletes douglasi	Douglas's Broad-headed Bee	Douglas's Broad-headed Bee was recorded on Rottnest and rediscovered in Pinjar in Banksia Woodland with pollen from *Philotheca spicata*, *Patersonia occidentalis*, two species of *Stylidium*, a species of *Scaevola* and species from Fabaceae and Myrtaceae (DBCA, 2018).	Highly Unlikely – not recorded in the area and not suitable habitat
Numenius madagascariensis	Eastern Curlew	The Eastern Curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets.	No – not suitable habitat
Pseudemydura umbrina	Western Swamp Tortoise	The Western Swamp Tortoise is restricted to very few wild populations. During winter and spring, the tortoises live in the water. This species is carnivorous feeding on insects, larvae and tadpoles (Burbidge and Kuchling, 1994). In the drier, hotter months they shelter under leaf litter and in holes and aestivate (sleep).	No – no suitable habitat
Schedule 2 – Endangered			
Botaurus poiciloptilus	Australasian bittern	The Australasian Bittern occurs mainly in densely vegetated freshwater wetlands and, rarely, in estuaries or tidal wetlands.	No – not coastal or wetland habitat
Calyptorhynchus (Zanda) baudinii	Baudin's Black Cockatoo	Baudin's Black-Cockatoo mainly occurs in eucalypt forests, especially Jarrah (*Eucalyptus marginata*), Marri (*Corymbia calophylla*), also Karri (*Eucalyptus diversicolor*) forest, often feeding in the understorey on proteaceous trees and shrubs, especially banksias (SEWPaC, 2012).	The subject land is outside the mapped range for this species is unlikely to occur
Calyptorhynchus (Zanda) latirostris	Carnaby's Black Cockatoo	Carnaby's Cockatoo is found in the south-west of Australia from Kalbarri through to Ravensthorpe. It has a preference for feeding on the seeds of *Banksia, Hakea, Eucalyptus, Grevillea, Pinus a*nd *Allocasuarina* spp. Nesting mostly occurs in smooth-barked trees (e.g. Salmon Gum, Wandoo, Red Morrell) (SEWPaC, 2012).	Likely to occur on the subject land intermittently

Scientific Name	Common Name	Habitat*	Likelihood to occur on the subject land
Leioproctus douglasiellus	A Short-tongued Bee	The short-tongued bee species is only known from three locations within the Perth metropolitan area ranging from Cannington to Forrestdale. Specimens have been collected on two plant species, *Goodenia filiformis* and *Anthotium junciforme* (TSSC, 2013).	No – no suitable habitat
Petrogale lateralis lateralis	Black-flanked Rock-wallaby, Black-footed Rock-wallaby, Moororong	The preferred habitat of the Black-flanked Rock-wallaby varies between colonies but always involves grassland feeding habitat for feeding in close proximity to cliff, rock-pile, talus or escarpment refuge habitat.	No – no suitable habitat and has never been recorded in the area
Rostratula australis (Rostratula benghalensis australis)	Australian Painted Snipe	The Australian Painted Snipe has been recorded at wetlands in all states of Australia but is most common in eastern Australia. It generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. It also uses inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains.	No – not wetland habitat
Schedule 3 – Vulnerable			
Calyptorhynchus banksii naso	Forest Red-tailed Black-Cockatoo	Forest Red-tailed Black Cockatoos frequent the humid to sub-humid south-west of Western Australia from Gingin in the north, to Albany in the south and west to Cape Leeuwin and Bunbury (SEWPaC, 2012). It nests in tree hollows with a depth of 1-5m, that are predominately Marri (Corymbia calophylla), Jarrah (Eucalyptus marginata) and Karri (Eucalyptus diversicolor) and it feeds primarily on the seeds of Marri.	Likely to occur on the subject land intermittently
Dasyurus geoffroii	Chuditch, Western Quoll	The Chuditch have been known to occupy a wide range of habitats including woodlands, dry sclerophyll forests, riparian vegetation, beaches and deserts. They are opportunistic feeders, and forage on the ground at night, feeding on invertebrates, small mammals, birds and reptiles.	No – no suitable habitat
Leipoa ocellata	Mallee Fowl	Mallee fowl have been found in mallee regions of southern Australia from approximately the 26th parallel of latitude southwards in mallee bushland.	No – not mallee habitat
Macrotis lagotis	Bilby, Dalgyte, Ninu	The greater Bilby is a nocturnal omnivorous marsupial that shrub species, such as *Acacia kempeana* and *A. hilliana*, which have root-dwelling larvae that provide a constant food source for the Greater Bilby. They also utilise Spinifex hummocks which are quite uniform and discrete, providing runways between hummocks, enabling easier movement and foraging.	No – No suitable habitat and not recorded locally

Scientific Name	Common Name	Habitat*	Likelihood to occur on the subject land
Westralunio carteri	Carter's Freshwater Mussel	Carter's Freshwater Mussel is South-West Western Australia's only freshwater mussel (Murdoch University & SERCUL, 2012). Carter's Freshwater Mussel occurs in freshwater streams, rivers, reservoirs and lakes (ICUN, 2015b) and is intolerant to dehydration for more than three days and salinity (Murdoch University & SERCUL, 2012).	No – no suitable permanent freshwater habitat – the dams are too degraded
Schedule 5 – International Agreement			
Actitis hypoleucos	Common Sandpiper	The Common Sandpiper is mostly found around muddy margins or rocky shores. Generally the species forages in shallow water and on bare soft mud at the edges of wetlands.	No – not suitable habitat
Apus pacificus	Fork-tailed Swift	The Fork-tailed Swift is almost exclusively aerial and is not known to breed in Australia. They are seen in inland plains but sometimes above foothills or in coastal areas. They often occur over cliffs and beaches and also over islands and sometimes well out to sea. They also occur over settled areas, including towns, urban areas and cities. Apus pacificus subsp. pacificus is the only subspecies to migrate to Australia.	No – may fly over the subject land but unlikely to land
Calidris acuminata	Sharp-tailed Sandpiper	The Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	No – no suitable habitat
Calidris melanotos	Pectoral Sandpiper	The Pectoral Sandpiper prefers shallow fresh to saline wetlands and is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	No – no suitable habitat
Motacilla cinerea	Grey Wagtail	The Grey Wagtail is mostly recorded in coastal areas in Western Australia (ALA, 2015) however is widespread. There is non-breeding habitat only in Australia and the species has a strong association with water, particularly rocky substrates along water courses but also lakes and marshes.	No – not coastal habitat and not recorded in the area
Tringa nebularia	Common Greenshank	The Common Greenshank is a wader and does not breed in Australia. This species can be found in many types of wetlands and has the widest distribution of any shorebird in Australia. This species typically feeds on molluscs, crustaceans, insects, and occasionally fish and frogs.	

Scientific Name	Common Name	Habitat*	Likelihood to occur on the subject land
Phascogale tapoatafa wambenger	South-western Brush-tailed Phascogale, Wambenger	Southern Brush-tailed Phascogales are arboreal marsupials which require tree hollows in suitable woodland or forest and rely on abundant invertebrate prey to sustain populations (Pescott, 2012).	No – no suitable habitat
Other Specially Protected Species			
Falco peregrinus	Peregrine Falcon	The Peregrine Falcon is found in a variety of habitats but nests on high cliff ledges or artificial structures. It feeds primarily on small-medium sized birds, but occasionally taking insects, such as moths, cicadas and locusts (Birdlife Australia, 2012).	No – no suitable habitat
Marine			
Ardea alba	Great Egret, White Egret	The Eastern Great Egret has been reported in a wide range of wetland habitats and usually frequents shallow waters. This species feeds on fish, insects, crustaceans, molluscs, frogs, lizards, snakes and small birds and mammals.	No – no suitable habitat
Ardea (Bubulcus) ibis	Cattle Egret	The Cattle Egret occurs in tropical and temperate grasslands, wooded lands and terrestrial wetlands with breeding in Western Australia recorded in the far north This species forages away from water on low lying grasslands, improved pastures and croplands generally in areas that have livestock eating insects, frog, lizards and small mammals.	Highly Unlikely – has not been recorded locally
Haliaeetus leucogaster	White-bellied Sea-eagle	The White-bellied Sea-Eagle is found in coastal habitats with large areas of open water, especially those close to the sea-shore. This species feeds opportunistically on a variety of fish, birds, reptiles, mammals and crustaceans, and on carrion and offal.	No – not coastal habitat
Merops ornatus	Rainbow Bee-eater	The Rainbow Bee-eater nests in a burrow dug in the ground. It is found across the better-watered parts of WA including islands preferring lightly wooded, sandy country near water.	Possible intermittent visitor but unlikely to rely on the subject land for survival
Priority 3			
Euoplos inornatus	Inornate Trapdoor Spider (northern Jarrah Forest)	The Inornate Trapdoor Spider is recorded from clay creek banks (ALA, 2019).	No – no suitable habitat

Scientific Name	Common Name	Habitat*	Likelihood to occur on the subject land
Leioproctus contrarius	A Short-tongued Bee	*Leioproctus contrarius* is apparently dependent on flowers of Goodeniaceae and possibly *Lechenaultia stenosepala*. It was found at Forrestdale Lake in 1952 and 1954 (PES, 2011).	No – no suitable habitat
Neelaps calonotos	Black-striped Snake	The Black-striped snake has a limited distribution, inhabiting areas with sandy soils that support heathlands and Banksia/Eucalypt Woodlands (Nevill, 2005) on the Swan Coastal Plain generally in the lower west coast from Lancelin to Mandurah (Storr *et al*, 1999).	Unlikely – not suitable habitat in vegetated areas and the remainder of the subject land has no shelter
Priority 4			
Isoodon fusciventer	Southern Brown Bandicoot, Quenda	Southern Brown Bandicoots are small grey marsupials that prefer dense scrub (up to one metre high). Their diet includes invertebrates (including earthworms, adult beetles and their larvae), underground fungi, subterranean plant material, and very occasionally, small vertebrates (DEC, 2012a).	Possible – this species may be present but it is not likely due to the absence of a dense understorey throughout the subject land
Notamacropus eugenii derbianus	Tammar Wallaby	The Tammar Wallaby prefers dense, low vegetation for daytime shelter and open grassy areas for feeding. This species inhabits coastal scrub, heath, dry sclerophyll forest and thickets in mallee and woodland (DEC, 2012b).	No – no suitable habitat
Synemon gratiosa	Graceful Sun-moth	The Graceful Sun-moth is a diurnal moth with dull coloured brown to black forewings and brightly coloured orange hind wings. The larvae burrow into the rhizomes of *Lomandra maritima* and *Lomandra hermaphrodita* exclusively and therefore require the presence of one or both of these species to be present in an area (Bishop *et al.*, 2011).	No – no suitable habitat

* Habitat descriptions from DoEE (2018) SPRAT Database unless otherwise denoted

3.5 Pest Fauna

Rabbits and foxes would be present on the subject land. Feral cats, rats and mice would also be present.

3.6 Biodiversity Value

The EPA's (2002) *Terrestrial Biological Surveys as an Element of Biodiversity Protection Position Statement No. 3* indicated an ecological assessment of a subject land must consider its biodiversity value at the genetic, species and ecosystem levels; and its ecological functional value at the ecosystem level.

From a fauna perspective the habitat is Highly Degraded Fauna Habitat. There is likely to be a significant decrease in native mammals and reptiles present as a result of disturbances on the subject land, introduced feral species such as foxes and rabbits and increased domestic predators such as cats.

4 BLACK COCKATOO HABITAT ASSESSMENT

4.1 Black Cockatoo Species

4.1.1 Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*)

Carnaby's Black Cockatoo is found in the south-west of Australia from Kalbarri through to Ravensthorpe. It has a preference for feeding on the seeds of *Banksia, Hakea, Eucalyptus, Grevillea, Pinus* and *Allocasuarina* spp. It is nomadic, often moving toward the coast after breeding. It breeds in tree hollows that are 2.5 – 12m above the ground and have an entrance of 23-30cm with a depth of 1-2.5m. Nesting mostly occurs in smooth-barked trees (e.g. Salmon Gum, Wandoo, Red Morrell). Eggs are laid from July to October, with incubation lasting 29 days (DoE, 2014).

The subject land is inside the boundary of the modelled distribution for Carnaby's Black Cockatoos (DAWE, 2022). The subject land is not within a confirmed roosting or breeding area (National Map, 2019).

4.1.2 Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*)

Forest Red-tailed Black Cockatoos are endemic to the humid to sub-humid south-west of Western Australia (SEWPaC, 2012). The range of Forest Red-tailed Black Cockatoos is bound by Gingin in the north to Mt Helena, Christmas Tree Well, West Dale, North Bannister, Mt Saddleback, Kojonup, Rocky Gully, upper King River and Green Range (east of Albany) (SEWPaC, 2012; DoE, 2014). It nests in tree hollows with a depth of 1-5m, that are predominately Marri, Jarrah and Karri (*E. diversicolor*) and it feeds primarily on the seeds of Marri and Jarrah (Johnstone, Johnstone and Kirkby, 2011).

The subject land is inside the modelled distribution for Forest Red-tailed Black Cockatoos (DAWE, 2022).

4.2 Habitat definitions

4.2.1 Roosting Habitat

'Roosting habitat' is usually evident due to the presence of Black Cockatoos in the survey area in the evening and early morning and if there are scats or moulted feathers under the roosting area. Black Cockatoos utilise a wide range of native and non-native trees, situated within a variety of land-use types. Roosting habitat is generally in tall (average of > 25 m) tree species that have relatively thick trunks (average DBH of 1 m) and medium foliage density (average of 50 %), and that are not too densely forested amongst other trees (average tree crown connectivity of 20 %) (Le Roux, 2017). Black cockatoos rely upon the availability of suitable night roosting sites in proximity to foraging resources, and particularly on access to water, which are usually within 2 km of the roost (DAWE, 2022).

4.2.2 Breeding Habitat

'Breeding habitat' is defined as trees of species known to support breeding within the range of the species which either have a suitable nest hollow OR have a DBH of 500mm or greater (SEWPaC, 2012). Past studies have found that on average hollow openings are 25 cm x 27 cm (Saunders *et al.,* 1982, Saunders and Dawson, 2017) and 30 cm x 34 cm (Johnstone *et al*., 2013). The height of a hollow entrance off the ground is on average 14.49 m (Johnstone *et al*., 2013). Nearly all hollows that are

used for nesting by Black Cockatoos are located in the main trunk and have a vertical aspect (Johnstone *et al*., 2013, Saunders and Dawson, 2017). Black Cockatoos are large birds with shoulders that are about 100 mm wide, therefore they require hollows with an entrance bigger than this (as shown above they are typically much larger), but the internal dimensions (depth and floor base) need to be much larger in order for it to be suitable to lay eggs in and for adults to be able to move around.

Previous research has found for Carnaby's Black Cockatoo a mean depth of 1.2 m and a floor diameter of 40 cm is required in order for it to be suitable to lay eggs in and for adults to be able to move around (Johnstone *et al*., 2013, Saunders and Dawson 2017).

4.2.3 Foraging Habitat

'Foraging habitat' for Black Cockatoos is determined from the plant species that are present in the survey area and evidence of feeding such as direct observation of birds or by chewed nuts and cones. Foraging plants utilised by each species of Black Cockatoo varies, with Carnaby's Black Cockatoo foraging on Eucalypts, pines and proteaceous species, whereas Forest Red-tailed Cockatoos prefer Eucalypts and *Allocasuarina* and many exotic species (DAWE, 2022).

Foraging habitat was identified by comparing the literature on plant species known to be foraged upon by black cockatoos against the vegetation within the subject land.

4.3 Habitat Survey Methodology

PGV Environmental undertook a Black Cockatoo habitat assessment on 7 July 2023 in accordance with the *Referral guideline for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black- cockatoo* (DAWE, 2022) (Black Cockatoo Referral Guidelines) and the methodology that is outlined in the SPRAT Database for each of the Black Cockatoo species for Black Cockatoo Habitat Assessments.

The survey area was traversed on foot and information on Black Cockatoo foraging and habitat was assessed. The extent, type and quality of the vegetation present, including the presence and extent of plants known to be used by Black Cockatoos was investigated. Evidence of foraging was recorded.

Breeding habitat was surveyed by measuring appropriate habitat trees on site. Not all of the site was able to be accessed so the survey boundary for the breeding habitat survey is shown on Figure 4. The diameter at breast height of potential breeding habitat trees was measured and the trees assessed from the ground for the presence of potential hollows that may be suitable breeding habitat.

4.4 Habitat Survey Results

4.4.1 Roosting

Black Cockatoos are known to roost overnight in tall trees including native and introduced eucalypts and pine trees generally in close proximity to a fresh water source. The subject land contains tall trees and permanent water in a dammed ephemeral creekline is available 600m to the north of the subject land and therefore is potentially roosting habitat. Roosting has not been recorded on the subject land (DoP, 2011; Peck *et al.,* 2018; National Map, 2022). The nearest roosting sites are reported to be around 2.3km to the east-north-east, 5.2km to the east and 6.2km to the north-east (National Map, 2023) (Figure 5).

4.4.2 Breeding

Black Cockatoos are known to breed in hollows of large eucalypts, including Jarrah and Marri trees. The subject land is not known as a breeding site for Black Cockatoos (DoP, 2011; National Map, 2022). The nearest recorded breeding is 10km north-north-west (National Map, 2023).

The Black Cockatoo Referral Guidelines define Marri and Jarrah with a DBH of 500mm or greater, as breeding habitat regardless of the presence or not of hollows. The theory behind this definition is the concept that while the trees may not currently contain hollows, they are mature enough that in the next 50 years or so a hollow might form and be of use to Black Cockatoos for the purposes of breeding.

There were 96 trees within the lots accessed in the Stage 1 subject land that were potential breeding habitat for Black Cockatoos (Figure 4), including 67 Marri, 10 Jarrah and 19 dead trees. Nine of the trees contained hollows that may be suitable for breeding. Details of the trees are in Appendix 5.

4.4.3 Foraging

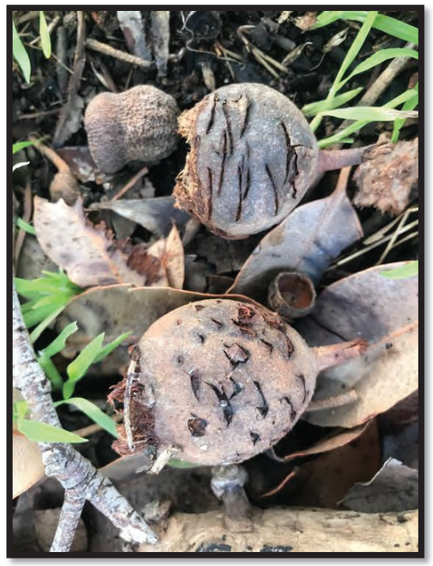
The subject land contains nine native species that are recognised as foraging habitat for Black Cockatoos (Table 3) (Davies 1966; Saunders 1980; Johnstone and Storr, 1998; Johnstone and Kirkby, 1999; Valentine and Stock, 2008; Groom 2011; Johnstone *et al*., 2011; SEWPaC, 2012; Johnstone, *et al.*, 2013; Bamford, 2013; Johnstone *et al*., 2016; DAWE, 2022) as shown in Table 3 (Figure 4).

There was abundant evidence of foraging on the subject land by both species of Black Cockatoos (Plate 9).

Table 3: Foraging Species for Black Cockatoos

Species	Common Name	Carnaby's Black Cockatoo	Forest red-tailed Black Cockatoo
Acacia saligna	Golden Wattle	✓	
Banksia dallanneyi	Couch Honeypot	✓	
Banksia sessilis	Parrot Bush	✓	
Callitris preissii	Rottnest Island Pine	✓	
Corymbia calophylla	Marri	✓	✓
Eucalyptus marginata	Jarrah	✓	✓
Hakea prostrata	Harsh Hakea	✓	
Mesomelaena pseudostygia	Semaphore Sedge	✓	
Xanthorrhoea preissii	Balga	✓	

Plate 9: Foraging Evidence on the Subject Land (Forest red-tails and Carnaby's)



The foraging habitat value for Carnaby's Black Cockatoos was determined using the scoring tool in the revised Black Cockatoo Referral Guidelines (DAWE, 2022) (Table 4). The tool starts with a score of 10 and then subtracts points for contextual attributes (Table 4). The tool gives a result of 10 which is considered High quality foraging habitat.

Table 4: Scoring Tool for Foraging Habitat for Carnaby's Black Cockatoos

Attribute	Context Adjustor	Score with Breeding and Roosting as per mapping
Foraging potential	**Subtract 2** from your score if there is no evidence of feeding debris on your site.	0
Connectivity	**Subtract 2** from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	0
Proximity to breeding	**Subtract 2** if you have evidence to conclude that your site is more than 12 km from breeding habitat.	0
Proximity to roosting	**Subtract 1** if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	0
Impact from significant plant disease	**Subtract 1** if your site has disease present (e.g. *Phytophthora* spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.	0
Score		**10**

The total area of foraging habitat for Carnaby's Black Cockatoos and Forest Red-tailed Black Cockatoos is 32.76 ha (Figure 4).

4.5 Surrounding Habitat

To assist in determining the significance of any impact on Black Cockatoo habitat on the subject land an assessment of Black Cockatoo habitat within the vicinity of the subject land was undertaken (Table 5). There is a total of 19,821.9 ha of Black Cockatoo habitat within 12km of the subject land with a total of 3,435.3 ha in secure reserves (Figure 5) (DPIRD, 2023).

Table 5: Black Cockatoo Habitat within 12km

Category	Area (ha)
Crown Freehold - Dept Managed	420.5
National Park	1,724.8
Nature Reserve	579.6
State Forest	710.4
Outside DBCA Managed Lands	16,386.5
TOTAL	**19,821.9**

4.6 EPBC Act Significant Impact Guidelines 1.1

According to the EPBC Act Significant Impact Guidelines 1.1 (DoE, 2013), the significance of the impact on Black Cockatoos depends on the sensitivity, value and quality of the environment and the intensity, duration, magnitude and geographic extent of the impacts. The category of listing (for example; Endangered, Vulnerable or Migratory) determines the significant impact criteria for listed flora and fauna species and ecological communities.

This assessment assumes all of the foraging and identified potential breeding trees on the subject land would be cleared for future development. Using this assumption, the clearing would result in approximately 32.76 ha of foraging habitat for Carnaby's Black Cockatoos and Forest Red-tailed Black Cockatoos.

The following assessments are for the Carnaby's Black Cockatoo which is listed as Endangered and the Forest Red-tailed Black Cockatoo which is listed as Vulnerable.

Carnaby's Black Cockatoos

The impact on Carnaby's Black Cockatoos from clearing the Black Cockatoo habitat on the subject land has been assessed against the criteria set out in the Significant Impact Guidelines 1.1 for the impact on an Endangered species and is shown below:

• *Lead to a long-term decrease in the size of a population*

The subject land does not support and confirmed breeding or roosting of Carnaby's Black Cockatoos. There are large areas (in excess of 19,000 ha) within 12km consisting of large areas of foraging, roosting and potential breeding habitat. Therefore, clearing of the subject land will not result in this outcome.

• *Reduce the area of occupancy of the species*

Clearing of the subject land will not result in a reduction of any known breeding and roosting habitat although it will result in a reduction of approximately 32.76 ha of foraging habitat. Within 12km of the subject land, however, there is more than 19,000 ha of foraging habitat and therefore clearing of the subject land will not result in this outcome.

• *Fragment an existing population into two or more populations*

Clearing of the subject land is unlikely to fragment the population of Carnaby's Black Cockatoos in the area into sub-populations due to the State Forest, Regional Parks and National Parks in the area providing linkages consisting of large areas of Black Cockatoo habitat. Carnaby's Black Cockatoos can fly large distances between foraging areas. Clearing of the subject land will therefore not result in this outcome.

• *Adversely affect habitat critical to the survival of a species*

The 32.76 ha of foraging habitat is not critical to the survival of the species.

• *Disrupt the breeding cycle of a population*

The subject land does not contain any confirmed breeding therefore clearing of the subject land would not result in this outcome.

• *Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

Clearing of the subject land will not result in this outcome due to the large extent of Black Cockatoo habitat within 12km of the subject land.

• *Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat*

Clearing of the subject land will not result in the establishment of an invasive species harmful to Carnaby's Black Cockatoos.

• *Introduce disease that may cause the species to decline*

Clearing of the subject land will not cause disease to be introduced therefore will not result in this outcome.

• *Interfere with the recovery of the species*

The Carnaby's Black Cockatoos that would utilise the subject land have access to greater than 19,000 ha of habitat within 12km. Therefore, any clearing of habitat on the subject land would not interfere substantially with the recovery of the species.

The conclusion of this assessment in accordance with the criteria set out in the Significant Impact Guidelines 1.1 is that the proposed clearing will not have a significant impact on Carnaby's Black Cockatoos.

Forest Red-tailed Black Cockatoo

The impact on Forest Red-tailed Black Cockatoos from clearing the Black Cockatoo habitat on the subject land has been assessed against the criteria set out in the Significant Impact Guidelines 1.1 for the impact on a Vulnerable species and is shown below:

• *Lead to a long-term decrease in the size of an important population of a species*

In the Significant Impact Guidelines 1.1 an important population is defined as "a population that is necessary for a species' long-term survival and recovery" and may be "key source populations either for breeding or dispersal, populations that are necessary for maintaining genetic diversity, and/or populations that are near the limit of the species' range".

The subject land does not contain any trees suitable for breeding. The surrounding area contains greater than 19,000 ha of large areas of foraging and breeding habitat for Cockatoos that utilise the subject land. Clearing of the subject land would therefore not result in this outcome.

• *Reduce the area of occupancy of an important population*

There is no confirmed breeding or roosting on the subject land. Clearing of the subject land will result in the clearing of potential breeding and roosting habitat and reduce the area of foraging available by 32.76 ha and , however there is greater than 19,000 ha of habitat within 12km of the subject land therefore clearing of the subject land would not result in this outcome.

• *Fragment an existing important population into two or more populations*

The large area containing habitat within 12km of the subject land that provide foraging and potential breeding habitat. Forest Red-tailed Black Cockatoos can fly large distances between foraging areas. Therefore, clearing of the subject land would not result in this outcome.

• *Adversely affect habitat critical to the survival of a species*

Forest Red-tailed Black Cockatoos do not breed on the subject land and there are large areas of foraging habitat within 12km of the subject land as formal reserves, therefore the subject land is not considered critical to the survival of these species.

• *Disrupt the breeding cycle of an important population*

Forest Red-tailed Black Cockatoos do not breed on the subject land, therefore clearing of the subject land would not result in this outcome.

• *Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The large areas of foraging and breeding habitat located in reserves within 12km of the subject land would prevent the population from declining as a result of clearing of the subject land.

• *Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

Clearing the subject land will not result in invasive species being introduced, therefore would not result in this outcome.

• *Introduce disease that may cause the species to decline*

Clearing the subject land will not result in disease being introduced, therefore would not result in this outcome.

• *Interfere substantially with the recovery of the species*

The Forest Red-tailed Black Cockatoos that would utilise the subject land have access to and area greater than 19,000 ha of Black Cockatoo habitat within 12km. Therefore, the clearing of 32.76 ha of foraging habitat and 96 potential breeding habitat trees on the subject land would not interfere substantially with the recovery of this species.

In accordance with the criteria set out in the Significant Impact Guidelines 1.1 the conclusion of this assessment is that clearing the subject land would not have a significant impact on Forest Red-tailed Black Cockatoos.

4.7 Black Cockatoo Referral Guidelines

The *Referral guideline for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black- cockatoo* (DAWE, 2022) (Black Cockatoo Referral Guidelines) contain several steps to determine whether or not a referral is required. These steps are:

1. Will the action directly or indirectly impact on Black Cockatoo Habitat;
2. Does your action involve loss of any habitat as defined in Section 4 and Appendix A of the guidelines;
3. Formulation of a mitigation strategy to reduce the scale of impact; and
4. A flowchart to assist in decision making on whether or not an action should be referred.

Step 1 Black Cockatoo Habitat

The subject land contains approximately 32.76 ha of foraging habitat and 96 potential breeding habitat trees for Black Cockatoos. There is no confirmed breeding or roosting on the subject land.

Step 2 Loss of Habitat

Breeding

According to the Black Cockatoo Referral Guidelines the clearing of any known nesting tree has a high risk of being a significant impact. A known nesting tree is defined in the Black Cockatoo Referral Guidelines as any existing tree in which breeding has been recorded or suspected. There are no known nesting trees that occur on the subject land and therefore there is no risk of a significant impact on known breeding habitat of Black Cockatoos.

The Black Cockatoo Referral Guidelines also consider that the clearing or degradation of any part of a vegetation community known to contain breeding habitat is likely to have a high risk of a significant impact. Breeding habitat is defined as woodlands, forests or isolated trees that contain or consist of live or dead trees of certain species with either a DBH of or greater than 500mm or the presence of suitable nest hollows.

There are 96 trees on the subject land that meet the definition of breeding habitat due to their trunk diameter. While the development will retain many of the Marri and Jarrah trees the clearing of any of the 96 trees is highly likely to have a significant impact and referral is recommended.

Roosting

The Black Cockatoo Referral Guidelines consider the clearing of a known roosting site as a high risk of being a significant impact. The subject land does not contain a known roosting site, and there is no roosting habitat. Clearing of the subject land would not have an impact on roosting habitat on the subject land.

Foraging

According to the Black Cockatoo Referral Guidelines the clearing of more than 1ha of quality foraging habitat or more than 10ha of low quality foraging habitat has a high risk of causing a significant impact. Degradation of more than 1ha of quality habitat by things such as altered hydrology or fire regimes has an uncertain risk. The significance of degradation depends on the type of degradation and the quality of the habitat.

The subject land contains approximately 32.76 ha of foraging habitat which is greater than 1ha. The foraging habitat quality scoring tool indicates it is high quality foraging habitat. While the development will retain many of the Marri and Jarrah trees, the proposed development is likely to result in the clearing of more than 1ha of foraging habitat. Therefore, the clearing is likely to have a significant impact.

Step 3 Mitigation

The consideration of a mitigation strategy during the determination of the level of impact and requirement to refer is allowed by the Black Cockatoo Referral Guidelines and setting in place the best practice mitigation strategy may reduce the level of impact and in turn the risk of a significant impact. Mitigation strategies include avoiding impact, managing impact so that there is no net decline in habitat and monitoring the effectiveness of mitigation.

The proposed development will retain many of the Marri and Jarrah trees on the site in Public Open Space and road reserves with opportunities to plant trees in these areas as well.

Step 4 Referral Advice

The Decision Making flowchart in Figure 1 of the Black Cockatoo Referral Guidelines was applied to the subject land and is shown in sequence below:

1 Will your action(s) directly or indirectly impact on black cockatoo habitat (see Section 3)? – YES

2 Does your action involve loss of
    - o any breeding habitat (i.e. known, suitable or potential nesting trees) OR
    - o part of a night roosting site OR
    - o >1 ha of high quality foraging habitat OR
    - o >10 ha of low quality foraging habitat for one of the black cockatoo species – YES
3 Have you adopted the mitigation standards to remove the likelihood of significant impact? – Retention of trees will reduce impact but not below thresholds

RESULT – The clearing of more than 1ha of foraging habitat and one Marri/Jarrah potential breeding habitat tree may a significant impact and a Referral is recommended.

5 SUMMARY AND CONCLUSIONS

The Basic Fauna Survey and Black Cockatoo Habitat Assessment resulted in the following findings:

- The majority of the subject land is Degraded and Completely Degraded with five very small areas of Good Vegetation;
- There are four fauna habitats are described on the subject land being:
    - Open Woodland Habitat (3.87 ha);
    - Shrubland Habitat (2.05 ha);
    - Parkland Cleared Habitat (36.61 ha); and
    - Cleared Habitat (21.89 ha).
- The fauna habitats are assessed as Highly Degraded Fauna Habitat due to the high levels of disturbance and clearing and fragmentation;
- Conservation Significant species that may have habitat on the subject land include Carnaby's Black Cockatoos and Forest Red-tailed Black Cockatoo habitat. The Rainbow Bee-eater and Quenda/Southern Brown Bandicoot could occur on the subject land;
- The subject land contains 32.67 ha of foraging habitat for Carnaby's Black Cockatoos and Forest Red-tailed Black Cockatoos;
- The subject land contains 96 potential breeding habitat trees, of which nine may have hollows suitable for breeding; and
- Clearing of the Black Cockatoo habitat is not likely to lead to a significant impact according to the EPBC Act Significant Impact Guidelines 1.1, however, according to the Black Cockatoo Referral Guidelines the amount of clearing for the proposed development will be above the thresholds for a significant impact on foraging and breeding habitat and is therefore likely to require referral under the EPBC Act.

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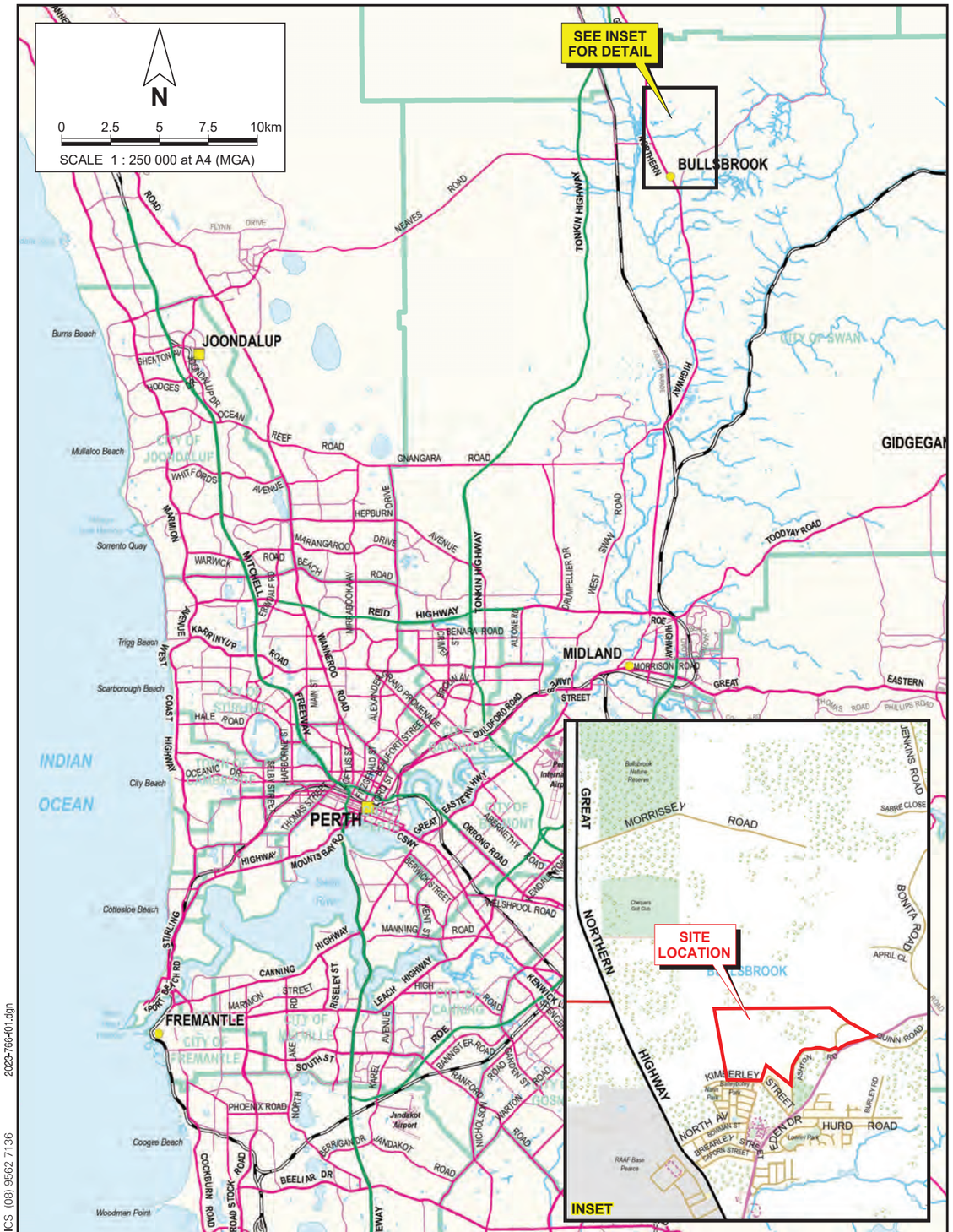
FIGURES



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PINPOINT CARTOGRAPHICS (08) 9562 7136

pgv ENVIRONMENTAL

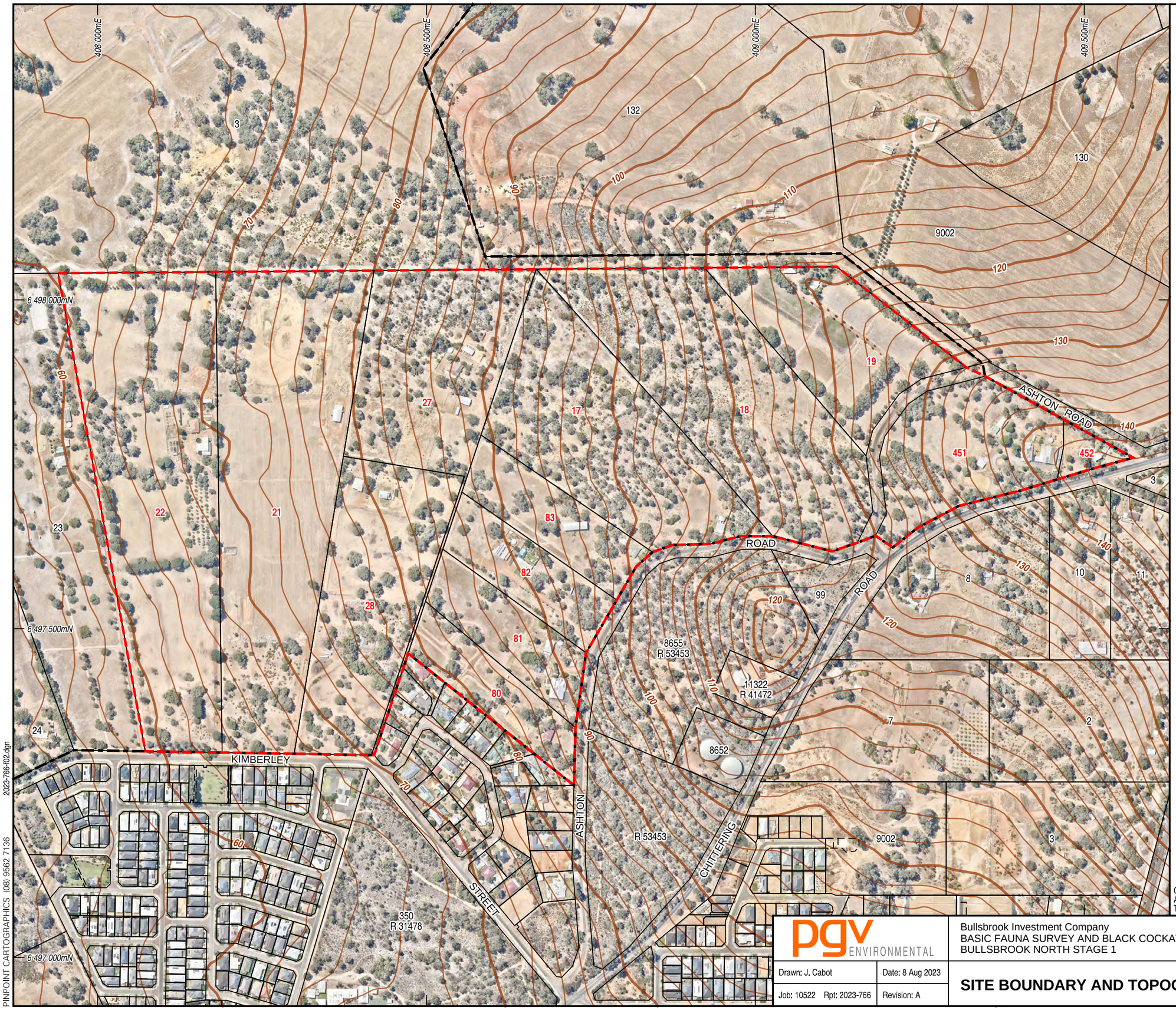
Bullsbrook Investment Company
BASIC FAUNA SURVEY AND BLACK COCKATOO HABITAT ASSESSMENT
BULLSBROOK NORTH STAGE 1

Drawn: J. Cabot | Date: 8 Aug 2023

Job: 10405 Rpt: 2023-766 | Revision: A

SITE LOCATION

Figure 1



N

0 50 100 150 200 250m

SCALE 1 : 5 500 at A3 (MGA)

Legend

- Site Boundary
- Bullsbrook North District Structure Plan Boundary
- Cadastral Boundary
- Easement Boundary
- Topographic Contour

CADASTRAL SOURCE: Landgate, April 2023.
AERIAL PHOTOGRAPHY SOURCE: NearMap, flown February 2023.
TOPOGRAPHIC CONTOUR SOURCE: Landgate, 1:50,000 Topographic Mapping.

PINPOINT CARTOGRAPHICS (08) 9562 7136

2023-766-f02.dgn

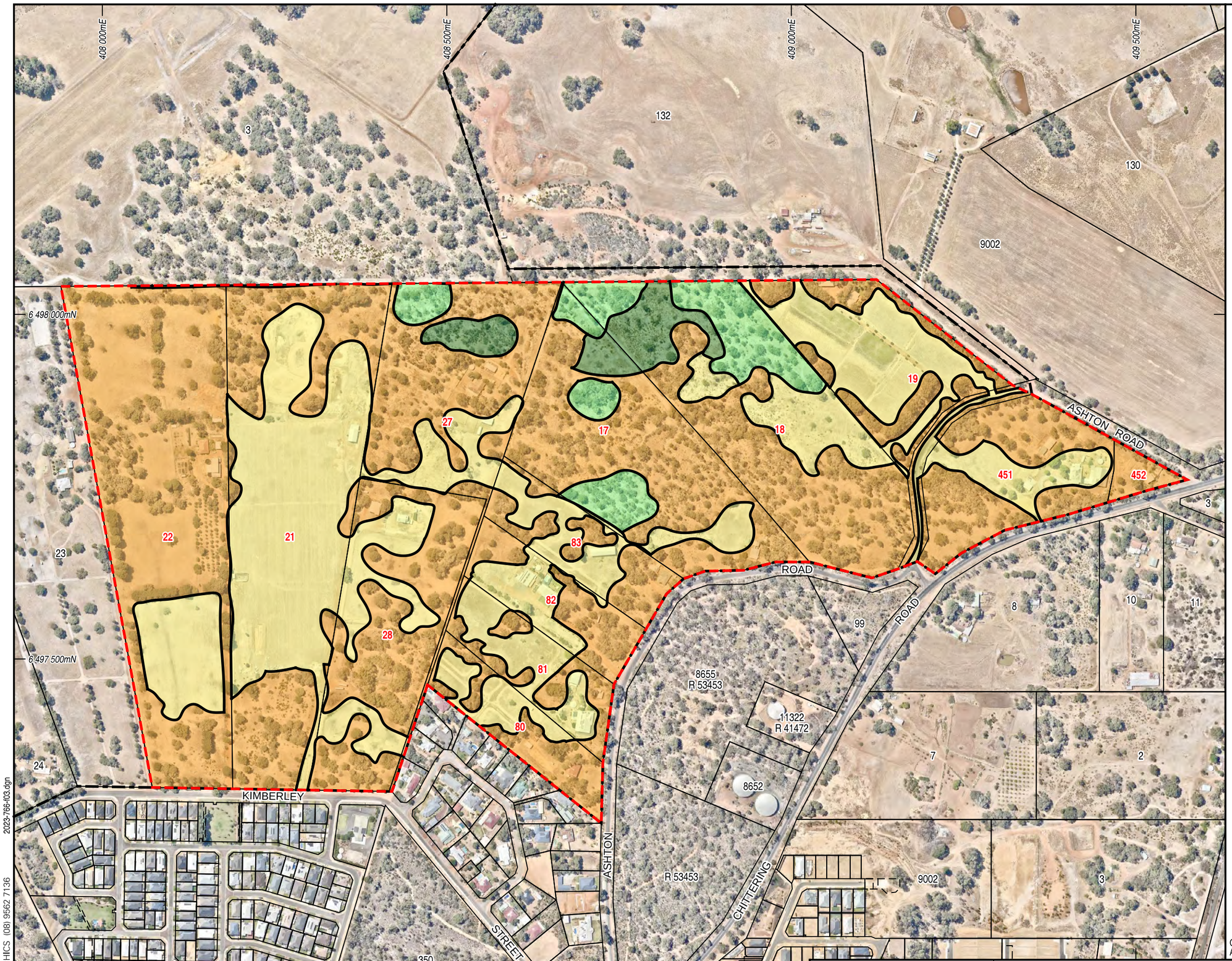
pgv ENVIRONMENTAL

Bullsbrook Investment Company
BASIC FAUNA SURVEY AND BLACK COCKATOO HABITAT ASSESSMENT
BULLSBROOK NORTH STAGE 1

Drawn: J. Cabot	Date: 8 Aug 2023
Job: 10522 Rpt: 2023-766	Revision: A

SITE BOUNDARY AND TOPOGRAPHY

Figure 2



N

0 50 100 150 200 250m

SCALE 1 : 5 500 at A3 (MGA)

Legend

- Site Boundary
- Bullsbrook North District Structure Plan Boundary
- Cadastral Boundary
- Easement Boundary

Fauna Habitats

- Open Woodland Habitat
- Shrubland Habitat
- Parkland Cleared Habitat
- Cleared Habitat

CADASTRAL SOURCE: Landgate, April 2023.
AERIAL PHOTOGRAPHY SOURCE: NearMap, flown February 2023.

pgv ENVIRONMENTAL

Bullsbrook Investment Company
BASIC FAUNA SURVEY AND BLACK COCKATOO HABITAT ASSESSMENT
BULLSBROOK NORTH STAGE 1

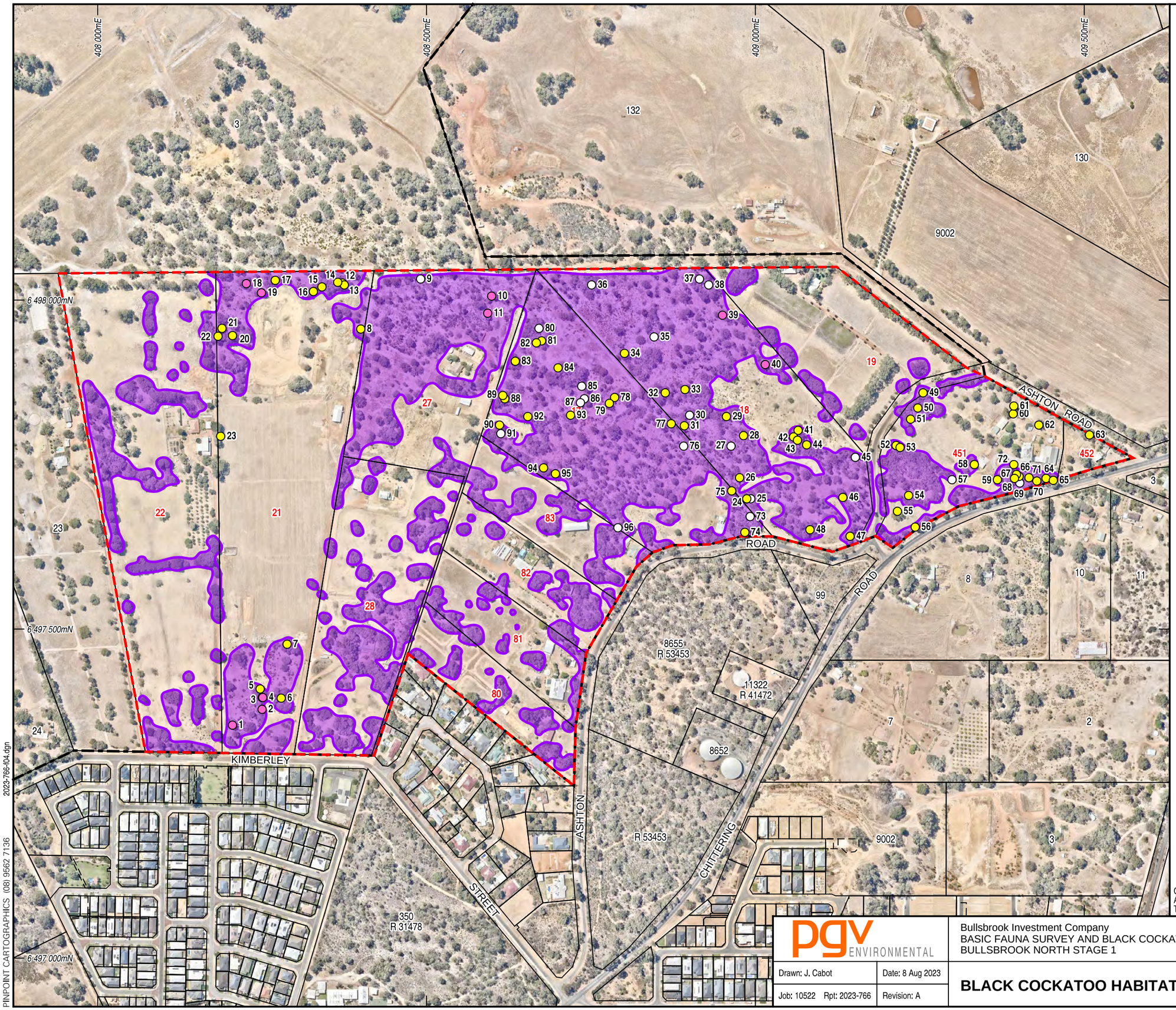
Drawn: J. Cabot	Date: 8 Aug 2023
Job: 10522 Rpt: 2023-766	Revision: A

FAUNA HABITATS

Figure 3

2023-766-f03.dgn

PINPOINT CARTOGRAPHICS (08) 9562 7136



N

0 50 100 150 200 250m

SCALE 1 : 5 500 at A3 (MGA)

Legend

- Site Boundary
- Bullsbrook North District Structure Plan Boundary
- Cadastral Boundary
- Easement Boundary
- Black Cockatoo Habitat

Significant Trees

- Marri (*Corymbia calophylla*)
- Jarrah (*Eucalyptus marginata*)
- Standind Dead Tree
- 54 Tree Number

CADASTRAL SOURCE: Landgate, April 2023.
AERIAL PHOTOGRAPHY SOURCE: NearMap, flown February 2023.
TOPOGRAPHIC CONTOUR SOURCE: Landgtate, 1:50,000 Topographic Mapping.

pgv ENVIRONMENTAL

Bullsbrook Investment Company
BASIC FAUNA SURVEY AND BLACK COCKATOO HABITAT ASSESSMENT
BULLSBROOK NORTH STAGE 1

Drawn: J. Cabot | Date: 8 Aug 2023
Job: 10522 Rpt: 2023-766 | Revision: A

BLACK COCKATOO HABITAT

Figure 4

2023-766-f04.dgn

PINPOINT CARTOGRAPHICS (08) 9562 7136

N

0 1 2 3 4 5km

SCALE 1 : 90 000 at A3 (MGA)

Legend

- Site Boundary
- Bullsbrook North District Structure Plan Boundary
- 12km Radius from Site
- Black Cockatoo Habitat - DBCA Manged Land (8,062ha)
- Black Cockatoo Habitat - Outside DBCA Managed Land (9,911ha)
- Confirmed Breeding Site
- Confirmed Roosting Site

COCKATOO HABITAT SOURCE: DBCA, August 2021.

pgv ENVIRONMENTAL	Bullsbrook Investment Company BASIC FAUNA SURVEY AND BLACK COCKATOO HABITAT ASSESSMENT BULLSBROOK NORTH STAGE 1	Figure 5
Drawn: J. Cabot	Date: 8 Aug 2023	
Job: 10522 Rpt: 2023-766	Revision: A	**BLACK COCKATOO HABITAT CONTEXT PLAN**

PINPOINT CARTOGRAPHICS (08) 9562 7136 2023-766-I05.dgn

APPENDIX 1

DBCA Fauna Database Searches

NAME_SCI	NAME_COM	CLASS	CONS_CODE	Date	SOURCE_ID	SOURCE	CERTAINTY	METHOD	TYPE	COUNT	LOCALITY	SITE	ACCURACY_M	NAME_ID	FAMILY
Botaurus poiciloptilus	Australasian bittern	BIRD	EN	6/04/1939	AVIF:4978	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	MUCHEA	Muchea	10000	24345	Ardeidae
Calyptorhynchus banksii naso	Forest red-tailed black cockatoo	BIRD	VU	15/09/2017	68239	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24731	Cacatuidae
Calyptorhynchus banksii naso	Forest red-tailed black cockatoo	BIRD	VU	15/11/2017	68240	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24731	Cacatuidae
Calyptorhynchus banksii naso	Forest red-tailed black cockatoo	BIRD	VU	15/01/2018	68236	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24731	Cacatuidae
Calyptorhynchus banksii naso	Forest red-tailed black cockatoo	BIRD	VU	15/02/2018	68237	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24731	Cacatuidae
Calyptorhynchus banksii naso	Forest red-tailed black cockatoo	BIRD	VU	15/03/2018	68238	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24731	Cacatuidae
Calyptorhynchus banksii naso	Forest red-tailed black cockatoo	BIRD	VU	15/09/2017	Calyptorhynchus banksii subsp. naso|||15/09/2017	WL_REG17		Survey		0		Calyptorhynchus banksii subsp. naso|||15/09/2017	200	24731	Psittacidae
Calyptorhynchus banksii naso	forest red-tailed black cockatoo	BIRD	VU	16/02/2013	80792	TFAUNA	Very certain	Community survey	Day sighting	1	Bullsbrook	Bullsbrook Bridle Trail, Chittering Road.	10000	24731	Cacatuidae
Calyptorhynchus banksii naso	forest red-tailed black cockatoo	BIRD	VU	16/05/2009	80793	TFAUNA	Very certain	Community survey	Day sighting	1	Bullsbrook	Burley Park, Corner of Chittering Rd & Quinn Rd	1000	24731	Cacatuidae
Calyptorhynchus banksii naso	forest red-tailed black cockatoo	BIRD	VU	9/04/2017	95852	TFAUNA	Moderately certain	Community survey	Sighting	43	MUCHEA	Muchea Nature Reserve, cnr Carl and Arbuckle. Site Code: CHIMUCR001	1000	24731	Cacatuidae
Calyptorhynchus banksii naso	forest red-tailed black cockatoo	BIRD	VU	13/08/2018	100272	TFAUNA	Very certain	Community survey	Sighting	26	Bullsbrook	2018 site code SWABULR002; Jess/Smith Rd Bullsbrook - reported 2012 as between Kingsford Place and Jess Road on the bridle trail	1000	24731	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	13/11/2003	218299|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Chequers Golf Club North	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	9/01/2004	218290|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Burley Park	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/02/2004	218291|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Burley Park	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/02/2004	218301|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Chequers Golf Club North	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	13/04/2004	218292|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Burley Park	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	22/05/2004	218303|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Chequers Golf Club North	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	20/06/2004	218304|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Chequers Golf Club North	100	24734	Cacatuidae

NAME_SCI	NAME_COM	CLASS	CONS_CODE	Date	SOURCE_ID	SOURCE	CERTAINTY	METHOD	TYPE	COUNT	LOCALITY	SITE	ACCURACY_M	NAME_ID	FAMILY
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	23/09/2004	218297|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Burley Park	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	26/09/2004	449715|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Neaves Rd NR & Bush Forever site	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	9/10/2004	218298|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Burley Park	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	9/10/2004	218421|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Jess Road Bushland	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	19/06/2005	456100|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Burley Park	100	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/06/2017	68106	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/07/2017	68107	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/08/2017	68108	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/09/2017	68109	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/10/2017	68110	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/11/2017	68111	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/12/2017	68112	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/01/2018	68102	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/02/2018	68103	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/03/2018	68104	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/04/2018	68105	FAUNASURVEY_WLS	Certain		sighting	1	Bullsbrook	Bullsbrook college bushland	200	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/11/2017	Calyptorhynchus latirostris|||15/11/2017	WL_REG17		Survey		0		Calyptorhynchus latirostris|||15/11/2017	200	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	11/12/2007	15210	TFAUNA	Very certain	Survey	Day sighting	2	Muchea	Site 1 Old West Rd	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	7/04/2011	24368	TFAUNA	Very certain	Community survey	Day sighting	18	Perth Hills	2013 Site code is SWABULR002	1000	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/04/2012	24369	TFAUNA	Very certain	Community survey	Day sighting	117	Perth Hills	2013 Site code is SWABULR002	1000	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	6/05/2012	24370	TFAUNA	Very certain	Community survey	Day sighting	7	Perth Hills	2013 Site code is SWABULR002	1000	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	7/04/2013	24371	TFAUNA	Very certain	Community survey	Day sighting	120	Perth Hills	2013 Site code is SWABULR002	1000	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	1/04/1978	26012	TFAUNA	Very certain	Survey	Day sighting	1	Twin Swamps Nature Reserve	Twin Swamps Reserve	30	24734	Psittacidae

NAME_SCI	NAME_COM	CLASS	CONS_CODE	Date	SOURCE_ID	SOURCE	CERTAINTY	METHOD	TYPE	COUNT	LOCALITY	SITE	ACCURACY_M	NAME_ID	FAMILY
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	30/08/2003	27370	TFAUNA	Very certain	Survey	Day sighting	1	BULLSBROOK	Pearce Aerodrome	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	23/01/1978	27371	TFAUNA	Very certain	Survey	Day sighting	9	BULLSBROOK	Pearce	30	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	9/04/2008	29693	TFAUNA	Very certain	Monitoring	Secondary sign	1	MUCHEA	Muchea, Brand Highway	30	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	19/04/2008	29697	TFAUNA	Very certain	Monitoring	Secondary sign	1	MUCHEA	Muchea South Road, Muchea	1000	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/09/2007	29698	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	19/07/2003	29699	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	25/12/2003	29700	TFAUNA	Very certain	Survey	Day sighting	57	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	25/12/2003	29701	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	19/07/2003	29702	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/12/2002	29703	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	21/10/2002	29704	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	30/09/2002	29705	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	21/09/2002	29706	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/09/2002	29707	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/09/2002	29708	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	13/09/2002	29709	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	10/09/2002	29710	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	31/08/2002	29711	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	9/06/2002	29712	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	30/05/2002	29713	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Muchea	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	12/05/2003	30317	TFAUNA	Very certain	Survey	Day sighting	1	LOWER CHITTERING	Lower Chittering	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	2/10/2005	31104	TFAUNA	Very certain	Survey	Day sighting	1	BULLSBROOK	Jumperkine Hill	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	3/12/2005	32532	TFAUNA	Very certain	Survey	Day sighting	50	BULLSBROOK	Great Northern Hwy, Bullsbrook	1000	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	11/08/2007	32589	TFAUNA	Very certain	Survey	Day sighting	24	BULLSBROOK	Great Northern Hwy, Bullsbrook	1000	24734	Psittacidae

NAME_SCI	NAME_COM	CLASS	CONS_CODE	Date	SOURCE_ID	SOURCE	CERTAINTY	METHOD	TYPE	COUNT	LOCALITY	SITE	ACCURACY_M	NAME_ID	FAMILY
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	1/01/2010	32683	TFAUNA	Very certain	Survey	Day sighting	1	BULLSBROOK	Gnangara	1000	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	11/07/2003	34116	TFAUNA	Very certain	Survey	Day sighting	1	MUCHEA	Carabooda	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	18/01/2005	34426	TFAUNA	Very certain	Survey	Day sighting	1	BULLSBROOK	Bullsbrook	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	6/05/2004	34427	TFAUNA	Very certain	Survey	Day sighting	1	BULLSBROOK	Bullsbrook	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	7/03/2004	34428	TFAUNA	Very certain	Survey	Day sighting	1	BULLSBROOK	Bullsbrook	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	21/12/2006	34524	TFAUNA	Very certain	Survey	Day sighting	30	BULLSBROOK	Brockman River	1000	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	21/12/2006	34525	TFAUNA	Very certain	Survey	Day sighting	30	BULLSBROOK	Brockman River	1000	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	19/04/2008	36225	TFAUNA	Very certain	Monitoring	Secondary sign	1	MUCHEA	Archibald Road, Muchea	1000	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	1/08/1961	36798	TFAUNA	Very certain	Historical (written)	Day sighting	6	BULLSBROOK	3 miles S of Bullsbrook	300	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	6/04/2014	80428	TFAUNA	Moderately certain	Community survey	Day sighting	328	Bullsbrook	Jess/Smith Rd Bullsbrook - reported 2012 as between Kingsford Place and Jess Road on the bridle trail (see comments)	1000	24734	Psittacidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	29/09/1977	4021|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	LOWER CHITTERING	LOWER CHITTERING	18000	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	10/03/1978	22405|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	LOWER CHITTERING	LOWER CHITTERING	18000	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	12/02/1980	84145|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	LOWER CHITTERING	LOWER CHITTERING	18000	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	white-tailed black cockatoo	BIRD	EN	3/04/2016	84652	TFAUNA	Moderately certain	Community survey	Dusk sighting	178	BULLSBROOK	SWABULR002	1000	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	white-tailed black cockatoo	BIRD	EN	9/04/2017	95964	TFAUNA	Moderately certain	Community survey	Sighting	5	BULLSBROOK	bush behind 36 Rosella Way, Lower Chittering. Site Code: SWABULR004	1000	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	white-tailed black cockatoo	BIRD	EN	13/08/2018	100413	TFAUNA	Very certain	Community survey	Sighting	5	Bullsbrook	2018 site code SWABULR004; bush behind 36 Rosella Way, Lower Chittering	1000	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	white-tailed black cockatoo	BIRD	EN	13/08/2018	100597	TFAUNA	Very certain	Community survey	Sighting	328	Bullsbrook	2018 site code SWABULR002; Jess/Smith Rd Bullsbrook	1000	48400	Cacatuidae

NAME_SCI	NAME_COM	CLASS	CONS_CODE	Date	SOURCE_ID	SOURCE	CERTAINTY	METHOD	TYPE	COUNT	LOCALITY	SITE	ACCURACY_M	NAME_ID	FAMILY
Dasyurus geoffroii	chuditch, western quoll	MAMMAL	VU	27/11/2002	6594	TFAUNA	Not Sure	Opportunistic sighting	Secondary sign	0	Bullsbrook	Lot 24 Strachan Rd, Bullsbrook	300	24092	Dasyuridae
Dasyurus geoffroii	chuditch, western quoll	MAMMAL	VU	2/09/2006	12662	TFAUNA	Very certain	Community survey	Night sighting	1	Walyunga National Park	Walyunga National Park	300	24092	Dasyuridae
Dasyurus geoffroii	Chuditch, western quoll	MAMMAL	VU		MAMM:M56288	WAM_MAMMALS	WAM Vouchered	Collection	Specimen	1	WALYUNGA NATIONAL PARK	BRIGADOON	10000	24092	Dasyuridae
Euoplos inornatus	inornate trapdoor spider (northern Jarrah Forest)	INVERTEBRATE	P3	1/01/1950	6308	TFAUNA	Very certain	Historical (written)	Caught or trapped	1	Bullsbrook	Near Bullsbrook, 4.8km along Chittering Road.	10000	48579	Idiopidae
Falco peregrinus	Peregrine falcon	BIRD	OS	12/02/1980	84145|237	BIRDATLAS1	Moderately certain	Observational	Sighting	1	LOWER CHITTERING	LOWER CHITTERING	18000	25624	Falconidae
Falco peregrinus	Peregrine falcon	BIRD	OS	28/10/2004	435652|237	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BULLSBROOK	Bullsbrook NR	500	25624	Falconidae
Isoodon fusciventer	quenda, southwestern brown bandicoot	MAMMAL	P4	12/12/2007	15211	TFAUNA	Very certain	Survey	Caught or trapped	2	Muchea	Site 1 Old West Rd	300	48588	Peramelidae
Isoodon fusciventer	quenda, southwestern brown bandicoot	MAMMAL	P4	15/05/2012	67851	TFAUNA	Moderately certain	Community survey	Dead	1	BULLSBROOK	In reserve between Kimberly St & North Ave	1000	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	25/11/2017	68203	FAUNASURVEY_WLS	Certain		motion camera	1	Bullsbrook	Bullsbrook college bushland	200	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	26/12/1993	MAMM:M46708	WAM_MAMMALS	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	BULLSBROOK	10000	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4		MAMM:M2823	WAM_MAMMALS	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	BULLSBROOK	10000	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4		MAMM:M2942	WAM_MAMMALS	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	EAST	10000	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	21/05/2008	1807GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1807GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	22/05/2008	1810GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1810GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	22/05/2008	1809GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1809GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	20/05/2008	1805GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1805GAA	30	48588	Peramelidae

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Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	23/05/2008	1819GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1819GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	20/05/2008	1779GAA	FAUNAFILE		Biological survey		0	Neaves Road NR, west of Railway Parade, cross section of Neaves Road and Kirby Road	1779GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	23/05/2008	1797GAA	FAUNAFILE		Biological survey		0	Neaves Road NR, west of Railway Parade, cross section of Neaves Road and Kirby Road	1797GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	20/05/2008	1804GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1804GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	22/05/2008	1812GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1812GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	22/05/2008	1791GAA	FAUNAFILE		Biological survey		0	Neaves Road NR, west of Railway Parade, cross section of Neaves Road and Kirby Road	1791GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	22/05/2008	1811GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1811GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	21/05/2008	1808GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1808GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	22/05/2008	1790GAA	FAUNAFILE		Biological survey		0	Neaves Road NR, west of Railway Parade, cross section of Neaves Road and Kirby Road	1790GAA	30	48588	Peramelidae

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Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	23/05/2008	1799GAA	FAUNAFILE		Biological survey		0	Neaves Road NR, west of Railway Parade, cross section of Neaves Road and Kirby Road	1799GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	23/05/2008	1798GAA	FAUNAFILE		Biological survey		0	Neaves Road NR, west of Railway Parade, cross section of Neaves Road and Kirby Road	1798GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	23/05/2008	1815GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1815GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	23/05/2008	1817GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1817GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	23/05/2008	1820GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1820GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	23/05/2008	1818GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1818GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	22/05/2008	1813GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1813GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	23/05/2008	1816GAA	FAUNAFILE		Biological survey		0	Twin Swamps NR, south of Warbrook Road, east of Railway Parade	1816GAA	30	48588	Peramelidae
Isoodon fusciventer	Quenda, southwestern brown bandicoot	MAMMAL	P4	25/11/2017	Isoodon obesulus subsp. fusciventer|||25/11/2017	WL_REG17		Survey		0		Isoodon obesulus subsp. fusciventer|||25/11/2017	200	48588	Peramelidae
Isoodon fusciventer	quenda, southwestern brown bandicoot	MAMMAL	P4	2/01/2016	81276	TFAUNA	Moderately certain	Opportunistic sighting	Day sighting	2	Bullsbrook	143 Taylor Rd, Bullsbrook	1000	48588	Peramelidae
Isoodon fusciventer	quenda, southwestern brown bandicoot	MAMMAL	P4	1/01/1953	97100	TFAUNA	Very certain	Survey	Caught or trapped	1	Bullsbrook		10000	48588	Peramelidae

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Isoodon fusciventer	quenda, southwestern brown bandicoot	MAMMAL	P4	26/08/2019	100063	TFAUNA	Very certain	Opportunistic sighting	Sighting	1	Bullsbrook	38 Caporn Street	30	48588	Peramelidae
Isoodon fusciventer	quenda, southwestern brown bandicoot	MAMMAL	P4	7/01/2020	132855	TFAUNA	Very Certain (photo, specimen, expert)	Opportunistic sighting	Sighting	1	Blussbrook	Bowman Street	1000	48588	Peramelidae
Leioproctus contrarius	a short-tongued bee	INVERTEBRATE	P3	1/01/1954	3468	TFAUNA	Very certain	Survey	Caught or trapped	1	Bullsbrook	Bullsbrook area	10000	33982	Colletidae
Leioproctus contrarius	a short-tongued bee	INVERTEBRATE	P3	28/12/1954	6198	TFAUNA	Very certain	Historical (written)	Caught or trapped	1	Bullsbrook	Bullsbrook	50000	33982	Colletidae
Leioproctus douglasiellus	a short-tongued bee	INVERTEBRATE	EN	1/01/1954	6197	TFAUNA	Very certain	Survey	Caught or trapped	3	Pearce	Pearce, Western Australia	10000	33983	Colletidae
Leioproctus douglasiellus	a short-tongued bee	INVERTEBRATE	EN	1/10/1954	18664	TFAUNA	Very certain	Survey	Caught or trapped	1	Pearce	Pearce, Western Australia	10000	33983	Colletidae
Macrotis lagotis	bilby, dalgyte, ninu	MAMMAL	VU	1/01/1974	96536	TFAUNA	Very certain	Survey	Caught or trapped	1	Bullsbrook		10000	24168	Thylacomyidae
Neelaps calonotos	black-striped snake, black-striped burrowing snake	REPTILE	P3	8/03/1999	15121	TFAUNA	Very certain	Survey	Caught or trapped	1	Muchea	Muchea	10000	25249	Elapidae
Neelaps calonotos	black-striped snake, black-striped burrowing snake	REPTILE	P3	20/01/1960	15125	TFAUNA	Very certain	Survey	Caught or trapped	1	Bullsbrook	Pearce Aerodrome, Bullsbrook	1000	25249	Elapidae
Neelaps calonotos	Black-striped snake, black-striped burrowing snake	REPTILE	P3	20/01/1960	REPT:R13439	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	BULLSBROOK	10000	25249	Elapidae
Neelaps calonotos	Black-striped snake, black-striped burrowing snake	REPTILE	P3	8/03/1999	REPT:R136104	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	MUCHEA	MUCHEA	10000	25249	Elapidae
Phascogale tapoatafa wambenger	South-western brush-tailed phascogale, wambenger	MAMMAL	CD	8/12/1992	MAMM:M40656	WAM_MAMMALS	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	ALMERIA PARK	10000	48070	Dasyuridae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/07/1953	4040	TFAUNA	Very certain	Survey	Caught or trapped	1	Bullsbrook	Warbrook, crossing road in sub-swampy country between railway line and Great Northern Hwy	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1963	8829	TFAUNA	Very certain	Survey	Caught or trapped	1	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1964	8830	TFAUNA	Very certain	Survey	Caught or trapped	4	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1965	8831	TFAUNA	Very certain	Survey	Caught or trapped	9	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae

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Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1966	8832	TFAUNA	Very certain	Survey	Caught or trapped	65	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1967	8833	TFAUNA	Very certain	Survey	Caught or trapped	27	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1968	8834	TFAUNA	Very certain	Survey	Caught or trapped	17	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1969	8835	TFAUNA	Very certain	Survey	Caught or trapped	8	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1970	8836	TFAUNA	Very certain	Survey	Caught or trapped	26	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1970	8837	TFAUNA	Very certain	Survey	Caught or trapped	27	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1971	8838	TFAUNA	Very certain	Survey	Caught or trapped	15	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1972	8839	TFAUNA	Very certain	Survey	Caught or trapped	13	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1973	8840	TFAUNA	Very certain	Survey	Caught or trapped	8	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1974	8841	TFAUNA	Very certain	Survey	Caught or trapped	8	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1975	8842	TFAUNA	Very certain	Survey	Caught or trapped	3	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1976	8843	TFAUNA	Very certain	Survey	Caught or trapped	9	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1977	8844	TFAUNA	Very certain	Survey	Caught or trapped	9	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1978	8845	TFAUNA	Very certain	Survey	Caught or trapped	6	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1979	8846	TFAUNA	Very certain	Survey	Caught or trapped	2	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1980	8847	TFAUNA	Very certain	Survey	Caught or trapped	3	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1981	8848	TFAUNA	Very certain	Survey	Caught or trapped	3	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1982	8849	TFAUNA	Very certain	Survey	Caught or trapped	5	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1983	8850	TFAUNA	Very certain	Survey	Caught or trapped	3	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1984	8851	TFAUNA	Very certain	Survey	Caught or trapped	2	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1985	8852	TFAUNA	Very certain	Survey	Caught or trapped	2	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1990	8853	TFAUNA	Very certain	Survey	Caught or trapped	2	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1992	8854	TFAUNA	Very certain	Survey	Caught or trapped	1	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1994	8855	TFAUNA	Very certain	Survey	Caught or trapped	14	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae

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Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1995	8856	TFAUNA	Very certain	Survey	Caught or trapped	41	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1996	8857	TFAUNA	Very certain	Survey	Caught or trapped	33	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1997	8858	TFAUNA	Very certain	Survey	Caught or trapped	37	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1998	8859	TFAUNA	Very certain	Survey	Caught or trapped	32	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/1999	8860	TFAUNA	Very certain	Survey	Caught or trapped	58	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/2000	8861	TFAUNA	Very certain	Survey	Caught or trapped	57	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/2001	8862	TFAUNA	Very certain	Survey	Caught or trapped	30	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/2002	8863	TFAUNA	Very certain	Survey	Caught or trapped	23	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/01/2003	8864	TFAUNA	Very certain	Survey	Caught or trapped	26	Twin Swamps Nature Reserve	Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	25/12/2003	8870	TFAUNA	Very certain	Survey	Caught or trapped	1	Twin Swamps Nature Reserve	Dam of NE-swamp at Twin Swamps NR	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	1/05/1954	11392	TFAUNA	Very certain	Survey	Caught or trapped	1	Bullsbrook	Warbrook, between railway line and Great Northern Highway	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	22/12/1994	97905	TFAUNA	Very certain	Opportunistic sighting	Sighting	3	Bullsbrook	93 Ellenbrook Road, Bullsbrook	1000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R13385	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	WARBROOK	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R13386	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	WARBROOK	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R21559	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R21560	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R21561	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R21562	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R21563	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R29346	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R29347	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	BULLSBROOK	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R29352	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	ELLENBROOK	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	25/04/1900	REPT:R29366	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS RESERVE	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	7/05/1964	REPT:R29342	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae

NAME_SCI	NAME_COM	CLASS	CONS_CODE	Date	SOURCE_ID	SOURCE	CERTAINTY	METHOD	TYPE	COUNT	LOCALITY	SITE	ACCURACY_M	NAME_ID	FAMILY
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	7/05/1964	REPT:R29343	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	2/06/1964	REPT:R29340	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMP	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	14/10/1964	REPT:R29376	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	ELLENBROOK	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	27/01/1965	REPT:R29339	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	ELLENBROOK	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	14/07/1965	REPT:R29320	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	4/08/1966	REPT:R29349	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	11/08/1966	REPT:R29350	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	2/09/1966	REPT:R29345	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	22/10/1971	REPT:R42201	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	BULLSBROOK	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR	13/12/1974	REPT:R47843	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R11092	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	WARBROOK	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R11093	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	WARBROOK	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R114378	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	ELLENBROOK NATURE RESERVE	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R114379	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	ELLENBROOK NATURE RESERVE	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R114381	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS NATURE RESERV	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R114382	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	ELLENBROOK NATURE RESERVE	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R146998	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS NATURE RESERV	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R21858	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	BULLSBROOK RESERVE	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R21859	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	BULLSBROOK RESERVE	50000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R29337	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R29338	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	ELLENBROOK	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R29341	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R29344	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R29348	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	TWIN SWAMPS	10000	25345	Cheluidae

NAME_SCI	NAME_COM	CLASS	CONS_CODE	Date	SOURCE_ID	SOURCE	CERTAINTY	METHOD	TYPE	COUNT	LOCALITY	SITE	ACCURACY_M	NAME_ID	FAMILY
Pseudemydura umbrina	Western swamp tortoise	REPTILE	CR		REPT:R95403	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	BULLSBROOK	ELLEN SWAMPS RESERVE	50000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	4/11/2019	127152	TFAUNA	Not Sure	Opportunistic sighting	Sighting	2	RAAF Base Pearce	one of the sewerage ponds located at the base	30	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	28/11/1978	138569	TFAUNA	Very certain	Opportunistic sighting	Taken into care	1	Ellen Brook	Crossing Ellen Brook Road 0.7km south of Warbrook Road	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	27/10/1982	138570	TFAUNA	Very certain	Opportunistic sighting	Taken into care	1	West of Twin Swamps Nature Reserve	Railway Road 300-500 south of railway/Warbrook Road crossing	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	24/08/1990	138571	TFAUNA	Very certain	Opportunistic sighting	Caught or trapped	1	East of Twin Swamps Nature Reserve	Private property in clay pan about 1km east of TSNR	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	24/08/1990	138572	TFAUNA	Very certain	Opportunistic sighting	Caught or trapped	1	East of Twin Swamps Nature Reserve	Private property in clay pan about 1km east of TSNR	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	3/02/1994	138573	TFAUNA	Very certain	Opportunistic sighting	Dead	1	East of Twin Swamps Nature Reserve	Edge of clay pan about 1km east of TSNR	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	7/09/1994	138574	TFAUNA	Very certain	Opportunistic sighting	Caught or trapped	1	Sproxton Clay Pan	1km east of Twin Swamps Nature Reserve	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	7/09/1994	138575	TFAUNA	Very certain	Opportunistic sighting	Sighting	2	East of Twin Swamps Nature Reserve	Sproxton clay plan about 1km east of TSNR	1000	25345	Cheluidae
Pseudemydura umbrina	western swamp tortoise	REPTILE	CR	8/06/1962	138576	TFAUNA	Very certain	Opportunistic sighting	Sighting	2	Warbrook Road		1000	25345	Cheluidae
Rostratula australis	Australian painted snipe	BIRD	EN	14/09/2012	22936	TFAUNA	Very certain		Day sighting	1	Bullsbrook	in reeds at the RAAF Base Pearce, Bullsbrook	1000	48237	Rostratulidae
Synemon gratiosa	graceful sunmoth	INVERTEBRATE	P4	12/03/2019	127296	TFAUNA	Very Certain (photo, specimen, expert)	Survey	Caught or trapped	1	Bullsbrook	Kimberley Road Bushland	1000	33992	Castniidae
Westralunio carteri	Carter's freshwater mussel	INVERTEBRATE	VU	21/11/1971	85338	TFAUNA	Very Certain (photo, specimen, expert)	Survey	Caught or trapped	1	WALYUNGA NATIONAL PARK	Wooroloo Brook, Darling Range; at bridge on road to Walyunga Lookout	10000	34113	Hyriidae
Westralunio carteri	Carter's freshwater mussel	INVERTEBRATE	VU	26/04/2010	85419	TFAUNA	Very Certain (photo, specimen, expert)	Survey	Caught or trapped	1	BULLSBROOK	Ellen Brook, Warbrook Rd	10000	34113	Hyriidae

APPENDIX 2

Atlas of Living Australia Report

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/d03ef73f-d3a7-42af-be70-c61413d68718	Abantiades albofasciatus	(Swinhoe, 1892)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Hepialidae	Abantiades		1
https://biodiversity.org.au/afd/taxa/0b7ee188-ef4f-416e-8532-4826d9dc7755	Abantiades argentangulum	Moore & Edwards, 2014	species	Animalia	Arthropoda	Insecta	Lepidoptera	Hepialidae	Abantiades		1
https://biodiversity.org.au/afd/taxa/d2dac84e-c302-4ac7-9fdc-6ba4a02b476a	Abispa (Abispa) ephippium	(Fabricius, 1775)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Abispa		6
https://biodiversity.org.au/afd/taxa/8698c1d0-2079-477f-832a-0771c8df7cad	Acanthagenys rufogularis	Gould, 1838	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Acanthagenys	Spiny-cheeked Honeyeater	2
https://biodiversity.org.au/afd/taxa/500e1350-1d00-4f1c-b9d3-d02b949cdd47	Acanthiza (Acanthiza) apicalis	Gould, 1847	species	Animalia	Chordata	Aves	Passeriformes	Acanthizidae	Acanthiza	Red-rumped Tit	13
https://biodiversity.org.au/afd/taxa/aa581ac7-f29a-4e72-be0d-48a5e0a64de3	Acanthiza (Geobasileus) chrysorrhoa	(Quoy & Gaimard, 1830)	species	Animalia	Chordata	Aves	Passeriformes	Acanthizidae	Acanthiza	Yellow-tail	44
https://biodiversity.org.au/afd/taxa/4b7b9c4a-1b60-4a43-ab70-b57bfc790138	Acanthiza (Geobasileus) inornata	Gould, 1841	species	Animalia	Chordata	Aves	Passeriformes	Acanthizidae	Acanthiza	Masters' Tit	19
https://biodiversity.org.au/afd/taxa/895ee633-7ac2-4281-afc7-7f56180ef2b9	Acanthodela protophaes	(Meyrick, 1883)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Acanthodela		3
https://biodiversity.org.au/afd/taxa/0242155c-714e-4f53-b973-333aab1343fb	Acanthorhynchus superciliosus	Gould, 1837	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Acanthorhynchus	Western Spinebill	28
https://biodiversity.org.au/afd/taxa/d470af0d-c131-48f7-961d-a55686e6a185	Accipiter (Leucospiza) fasciatus	(Vigors & Horsfield, 1827)	species	Animalia	Chordata	Aves	Accipitriformes	Accipitridae	Accipiter	Grey-headed Goshawk	4
https://biodiversity.org.au/afd/taxa/02725816-5d59-41e1-aa00-f7cc41cd66dc	Accipiter (Paraspizias) cirrocephalus	(Vieillot, 1817)	species	Animalia	Chordata	Aves	Accipitriformes	Accipitridae	Accipiter	Collared Sparrowhawk	3
https://biodiversity.org.au/afd/taxa/2ba88fd9-4afa-444f-8165-f1ebb0fbf728	Achyra affinitalis	(Lederer, 1863)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Achyra		18
https://biodiversity.org.au/afd/taxa/28befb60-bea4-4900-97a0-079e218e9eca	Acontia nivipicta	Butler, 1886	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Acontia		2
https://biodiversity.org.au/afd/taxa/8c181054-63bc-4139-81dc-6a8d98d0bdba	Acrida conica	(Fabricius, 1781)	species	Animalia	Arthropoda	Insecta	Orthoptera	Acrididae	Acrida	Giant Green Slant-face	1
https://biodiversity.org.au/afd/taxa/75b82e11-dfd2-4c27-b371-7046f006f0a3	Aedes (Ochlerotatus) hesperonotius	Marks, 1959	species	Animalia	Arthropoda	Insecta	Diptera	Culicidae	Aedes		1
https://biodiversity.org.au/afd/taxa/06c31d5c-61c7-400e-a036-6afa17b80ca8	Aedes (Rampamyia) notoscriptus	(Skuse, 1889)	species	Animalia	Arthropoda	Insecta	Diptera	Culicidae	Aedes		1
https://biodiversity.org.au/afd/taxa/ee694d26-6d4d-4837-99ad-9b25d3454d9d	Aegotheles (Aegotheles) cristatus	(Shaw, 1790)	species	Animalia	Chordata	Aves	Apodiformes	Aegothelidae	Aegotheles	Australian Owlet-nightjar	1
NZOR-6-5212	Aeshna brevistyla	Rambur	species	Animalia	Arthropoda	Insecta	Odonata	Aeshnidae	Aeshna		2
https://biodiversity.org.au/afd/taxa/94c7793f-d9a8-4abb-9834-23a4b0e1af3a	Agonoscelis rutila	(Fabricius, 1775)	species	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Agonoscelis	Horehound Bug	2
https://biodiversity.org.au/afd/taxa/00c78f45-da89-497c-b96d-0f4b5a4d82d1	Agrilus (Agrilus) hypoleucus	Gory & Laporte, 1837	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Agrilus		4
https://biodiversity.org.au/afd/taxa/d9d5caed-f028-4a4c-97cb-c686690ea582	Agrius convolvuli	(Linnaeus, 1758)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Sphingidae	Agrius		1
https://biodiversity.org.au/afd/taxa/cf72658d-bef6-4ea2-9b87-228f9ec2ff69	Agrius godarti	(W.S. Macleay, 1826)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Sphingidae	Agrius		1
https://biodiversity.org.au/afd/taxa/54b867e9-2d2c-49fb-bcb1-647a6a6a64e8	Agrotis infusa	(Boisduval, 1832)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Agrotis	Bogong Moth	1
https://biodiversity.org.au/afd/taxa/3922736f-1e6b-4b8e-9faf-806b1ce78f33	Agrotis ipsilon	(Hufnagel, 1766)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Agrotis		2
https://biodiversity.org.au/afd/taxa/579f62c4-22c2-4150-87af-61e9031dc4f3	Agrotis munda	Walker, 1857	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Agrotis		13
https://biodiversity.org.au/afd/taxa/c8f27237-108c-4b58-96d5-cce925952b04	Agrotis porphyricollis	GuenÃ©e, 1852	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Agrotis		2
https://biodiversity.org.au/afd/taxa/bd96f702-29b7-442f-91f2-5f2847e3850e	Alcaeus hermannsburgi	(Distant, 1910)	species	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Alcaeus		1
https://biodiversity.org.au/afd/taxa/bdb83ea0-a8a7-4a77-81be-b0930263cd58	Aleucosia maculosa	(Newman, 1841)	species	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Aleucosia		2
https://biodiversity.org.au/afd/taxa/69e130f2-e064-409c-aca0-a3edb796357a	Alona rigidicaudis	(Smirnov, 1971)	species	Animalia	Arthropoda	Branchiopoda	Diplostraca	Chydoridae	Alona		1
https://biodiversity.org.au/afd/taxa/b817ed58-14c6-4169-bcad-66f7a227e72a	Amblyomma triguttatum	Koch, 1844	species	Animalia	Arthropoda	Arachnida	Ixodida	Ixodidae	Amblyomma		1
https://biodiversity.org.au/afd/taxa/0724a2b5-5216-4f98-96b0-7761e4133204	Amegilla (Notomegilla) chlorocyanea	(Cockerell, 1914)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Amegilla	Blue Banded Bee	8
https://biodiversity.org.au/afd/taxa/5e6e1218-6b3b-4cab-aff2-aca4d7cc02fa	Amegilla (Zonamegilla) cingulata	(Fabricius, 1775)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Amegilla		1
https://biodiversity.org.au/afd/taxa/471a22c7-262b-46b3-bc0c-9994e51334f7	Amelora goniota	Guest, 1887	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Amelora		2
https://biodiversity.org.au/afd/taxa/caa10ee6-08ae-47ff-853d-d4d447321f3e	Amelora pachyspila	Turner, 1919	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Amelora		2
https://biodiversity.org.au/afd/taxa/e635e4da-4544-4a85-acb5-e81dbe5b7160	Amitermes modicus	(Hill, 1942)	species	Animalia	Arthropoda	Insecta	Blattodea	Termitidae	Amitermes		2
https://biodiversity.org.au/afd/taxa/18359185-4e14-4e47-ab55-0b92a5a036b3	Amitermes obeuntis	(Silvestri, 1909)	species	Animalia	Arthropoda	Insecta	Blattodea	Termitidae	Amitermes		1
https://biodiversity.org.au/afd/taxa/d928fa93-709d-481c-b32a-d0fc7d204472	Amitermes procerus	Gay, 1968	species	Animalia	Arthropoda	Insecta	Blattodea	Termitidae	Amitermes		1
https://biodiversity.org.au/afd/taxa/af7f208f-b696-4e99-ae7a-5bbc7df05c5b	Anachloris tofocolorata	Schmidt, 2001	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Anachloris		6
https://biodiversity.org.au/afd/taxa/b895689f-e622-4c9e-8e81-6d6d15cdd2a2	Anachloris uncinata	(GuenÃ©e, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Anachloris		31
https://biodiversity.org.au/afd/taxa/81be58f5-caf7-4f3d-b1eb-d4f83eb0af5a	Anas (Anas) superciliosa	Gmelin, 1789	species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Anas	Parera	17
https://biodiversity.org.au/afd/taxa/d0d5b903-32e8-48ee-b7c0-91f5ea9433a9	Anas (Nettion) castanea	(Eyton, 1838)	species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Anas	Chestnut Teal	1
https://biodiversity.org.au/afd/taxa/efaa935b-e248-456a-b85e-b048b465b676	Anas (Nettion) gracilis	Buller, 1869	species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Anas	Oceanic Teal	3
https://biodiversity.org.au/afd/taxa/29796f05-7bba-4837-8fa2-9b58ba1bd3b8	Anax papuensis	(Burmeister, 1839)	species	Animalia	Arthropoda	Insecta	Odonata	Aeshnidae	Anax		4
https://biodiversity.org.au/afd/taxa/8f0d7066-fe80-47ed-a26d-4567d15b5d85	Anestia ombrophanes	Meyrick, 1886	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Anestia		7
https://biodiversity.org.au/afd/taxa/bf3fcd09-dc47-4ec8-9612-1b4089c7258a	Anilios australis	(Gray, 1845)	species	Animalia	Chordata	Reptilia	Squamata	Typhlopidae	Anilios	Southern Blind Snake	2
https://biodiversity.org.au/afd/taxa/5897729c-7781-4bf7-910e-aafa6be0e43a	Anilios waitii	(Boulenger, 1895)	species	Animalia	Chordata	Reptilia	Squamata	Typhlopidae	Anilios	Beaked Blind Snake	2
https://biodiversity.org.au/afd/taxa/98d54aa9-9a0a-493c-a2ab-33e3853f3af0	Anisynta sphenosema	(Meyrick & Lower, 1902)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Hesperiidae	Anisynta	Wedge Skipper	2
https://biodiversity.org.au/afd/taxa/747b1d28-cd9d-4a82-ae98-31888ef987f2	Anoplognathus chloropyrus	(Drapiez, 1819)	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Anoplognathus		1
NZOR-6-54439	Anser anser	Linnaeus	species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Anser		1
https://biodiversity.org.au/afd/taxa/dd695ee8-faf5-41a8-8741-06111c16b5a8	Antaresia childreni	(Gray, 1842)	species	Animalia	Chordata	Reptilia	Squamata	Pythonidae	Antaresia	Children's Python	1
https://biodiversity.org.au/afd/taxa/59b7c7f5-1d07-4ab0-90ef-9be0885de1dd	Anthochaera (Anellobia) lunulata	Gould, 1838	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Anthochaera	Western Wattlebird	22
https://biodiversity.org.au/afd/taxa/8204979f-5302-41ea-943f-01d3c420f7bb	Anthochaera (Anthochaera) carunculata	(Shaw, 1790)	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Anthochaera	Red Wattlebird	42
https://biodiversity.org.au/afd/taxa/f05bd22b-e51f-49b8-8df7-026955602baf	Anthrenocerus australis	(Hope, 1843)	species	Animalia	Arthropoda	Insecta	Coleoptera	Dermestidae	Anthrenocerus	Australian Carpet Beetle	1
https://biodiversity.org.au/afd/taxa/e53a981f-22da-4f2f-a489-85c3ee79473e	Anthus (Anthus) novaeseelandiae	(Gmelin, 1789)	species	Animalia	Chordata	Aves	Passeriformes	Motacillidae	Anthus	Australian Pipit	8
https://biodiversity.org.au/afd/taxa/86ece03e-acae-4057-8061-5eae8e0c1f03	Antichiropus variabilis	Attems, 1911	species	Animalia	Arthropoda	Diplopoda	Polydesmida	Paradoxosomatidae	Antichiropus		1
https://biodiversity.org.au/afd/taxa/e130fae3-af3b-4cca-968c-a40e04243152	Antigastra catalaunalis	(Duponchel, 1831)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Antigastra		6
https://biodiversity.org.au/afd/taxa/98438f53-d19f-4b89-84c3-7d32a510271b	Antiporus femoralis	(Boheman, 1858)	species	Animalia	Arthropoda	Insecta	Coleoptera	Dytiscidae	Antiporus		4
https://biodiversity.org.au/afd/taxa/c7af5779-1437-495c-b844-e3922079ce0f	Aphanosperma occidentalis	Britton, 1969	species	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Aphanosperma		2
https://biodiversity.org.au/afd/taxa/c63ca6b5-e002-428b-9caf-f401aa17135b	Aphantes melanochorda	(Turner, 1919)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Aphantes		1
https://biodiversity.org.au/afd/taxa/5ebff4cf-11b2-444a-b60c-6ff6a17ba18d	Aphis (Aphis) nerii	Boyer de Fonscolombe, 1841	species	Animalia	Arthropoda	Insecta	Hemiptera	Aphididae	Aphis	Oleander Aphid	1
https://biodiversity.org.au/afd/taxa/7fc692cd-088b-4f29-bdcf-335d2cd0eb9b	Apiocera flabellata	Paramonov, 1953	species	Animalia	Arthropoda	Insecta	Diptera	Apioceridae	Apiocera		1
https://biodiversity.org.au/afd/taxa/cf854087-be13-445a-a7b1-8987d040af78	Apiocera pulchra	Paramonov, 1953	species	Animalia	Arthropoda	Insecta	Diptera	Apioceridae	Apiocera		1
https://biodiversity.org.au/afd/taxa/1a490f00-368f-427c-8d4c-fa3f3271d75f	Apis (Apis) mellifera	Linnaeus, 1758	species	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Apis		34
https://biodiversity.org.au/afd/taxa/152c2fa6-25d4-4c75-9e42-ce3ce5fb9ac3	Aporocera (Aporocera) flaviventris	(Saunders, 1843)	species	Animalia	Arthropoda	Insecta	Coleoptera	Chrysomelidae	Aporocera		2
https://biodiversity.org.au/afd/taxa/23e2ccef-06b0-4749-abc6-d8a710b94f69	Aquila (Uroaetus) audax	(Latham, 1801)	species	Animalia	Chordata	Aves	Accipitriformes	Accipitridae	Aquila	Wedge-tailed Eagle	12
https://biodiversity.org.au/afd/taxa/5baac49d-ce92-448d-b22f-6595060dca85	Aquita tactalis	(Walker, 1863)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nolidae	Aquita		2
https://biodiversity.org.au/afd/taxa/0c640437-7997-4a99-94e4-14bb92af5670	Araneus dimidiatus	(L. Koch, 1871)	species	Animalia	Arthropoda	Arachnida	Araneae	Araneidae	Araneus		1
https://biodiversity.org.au/afd/taxa/3da69b6c-5152-4f96-bf75-ce208d759c5f	Archaeosynthemis leachii	(Selys, 1871)	species	Animalia	Arthropoda	Insecta	Odonata	Synthemistidae	Archaeosynthemis		3
https://biodiversity.org.au/afd/taxa/2798ca0f-8c21-449a-93b6-a64a0fbc9287	Archaeosynthemis occidentalis	Tillyard, 1910	species	Animalia	Arthropoda	Insecta	Odonata	Synthemistidae	Archaeosynthemis		4
https://biodiversity.org.au/afd/taxa/2f288969-92ff-4ed4-91f6-eae354efefad	Archiargiolestes pusillus	(Tillyard, 1908)	species	Animalia	Arthropoda	Insecta	Odonata	Megapodagrionidae	Archiargiolestes		17
https://biodiversity.org.au/afd/taxa/b129c2db-7d93-4688-a17f-2f77f1a09ae1	Archimantis sobrina	Saussure, 1872	species	Animalia	Arthropoda	Insecta	Mantodea	Mantidae	Archimantis	Large Brown Mantid	5
https://biodiversity.org.au/afd/taxa/143cc9f0-bc3c-45b7-8e1c-21fbe9319bba	Ardea alba	Linnaeus, 1758	species	Animalia	Chordata	Aves	Ciconiiformes	Ardeidae	Ardea	Baluun	1
https://biodiversity.org.au/afd/taxa/cf8e02dd-2a6e-41dc-b14b-0e446444250a	Ardea pacifica	Latham, 1801	species	Animalia	Chordata	Aves	Ciconiiformes	Ardeidae	Ardea	White-necked Heron	5
https://biodiversity.org.au/afd/taxa/89218f01-d9b8-43e0-a663-e53d92dae24a	Ardozyga nyctias	(Meyrick, 1904)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Gelechiidae	Ardozyga		2
https://biodiversity.org.au/afd/taxa/b2bc11cf-b219-4416-811e-86493963f82d	Ardozyga stratifera	(Meyrick, 1904)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Gelechiidae	Ardozyga		2
https://biodiversity.org.au/afd/taxa/0c5d2393-45b6-4394-9f85-766e7c1c78e9	Arenopsaltria fullo	(Walker, 1850)	species	Animalia	Arthropoda	Insecta	Hemiptera	Cicadidae	Arenopsaltria	Sandgrinder	1
https://biodiversity.org.au/afd/taxa/33013eb9-e3e1-4e2b-95a4-89d7505ad0a1	Argiope protensa	L. Koch, 1872	species	Animalia	Arthropoda	Arachnida	Araneae	Araneidae	Argiope		2

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/9367c374-2234-41e5-aed0-fdbb083d6f2d	Arhodia lasiocamparia	GuenÃ©e, 1858	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Arhodia		2
https://biodiversity.org.au/afd/taxa/5996300f-967f-4c5c-b9ac-0585402d1cbc	Arniscus humeralis	(Dallas, 1851)	species	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Arniscus		1
https://biodiversity.org.au/afd/taxa/cfab7de8-e9a2-4195-b5fd-4d3d93d534dc	Arotrophora arcuatalis	(Walker, 1866)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Arotrophora		6
https://biodiversity.org.au/afd/taxa/429cd14f-2018-47e4-b084-037f6bb03249	Arrade destituta	(Walker, 1865)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Arrade		11
https://biodiversity.org.au/afd/taxa/6c3c2da2-508b-43c4-b0df-c69a99c0aae0	Artamus (Angroyan) cinereus	Vieillot, 1817	species	Animalia	Chordata	Aves	Passeriformes	Artamidae	Artamus	Black-faced Woodswallow	15
https://biodiversity.org.au/afd/taxa/320aeab1-aead-4b82-a580-8cd3ae99fdef	Artamus (Angroyan) cyanopterus	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Artamidae	Artamus	Dusky Woodswallow	10
https://biodiversity.org.au/afd/taxa/d6dfb3a5-dd9e-4307-986f-e3b50c2cb476	Assara holophragma	(Meyrick, 1887)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Assara		6
https://biodiversity.org.au/afd/taxa/a4794e71-b678-4a5a-9f57-2dea3b49dd00	Assara subarcuella	(Meyrick, 1879)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Assara		2
https://biodiversity.org.au/afd/taxa/f2f806e5-6103-4dc7-bb84-45998bf1aba1	Astraeus (Depollus) aberrans	van de Poll, 1886	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Astraeus		1
https://biodiversity.org.au/afd/taxa/c8ebe0f4-773e-4e8b-bfec-39e2cbc00918	Astrapometis saburalis	(Walker, 1859)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Astrapometis		1
https://biodiversity.org.au/afd/taxa/1bc681c1-19dc-4ff2-bb14-2d579a7d20b8	Athetis tenuis	(Butler, 1886)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Athetis		1
https://biodiversity.org.au/afd/taxa/e453dbf4-ac86-44b6-8776-de892b568f51	Austracantha minax	(Thorell, 1859)	species	Animalia	Arthropoda	Arachnida	Araneae	Araneidae	Austracantha		9
https://biodiversity.org.au/afd/taxa/db0d46fc-429c-4309-9bd6-eadc2d391e73	Australothis rubrescens	(Walker, 1858)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Australothis		1
https://biodiversity.org.au/afd/taxa/148d56da-bca5-4a9d-9ef5-530830d3a14a	Austroaeschna (Austroaeschna) anacantha	Tillyard, 1908	species	Animalia	Arthropoda	Insecta	Odonata	Telephlebiidae	Austroaeschna		3
https://biodiversity.org.au/afd/taxa/0cb18aba-116d-465d-94e6-784ecd86f7e4	Austroagrion cyane	(Selys, 1876)	species	Animalia	Arthropoda	Insecta	Odonata	Coenagrionidae	Austroagrion		2
https://biodiversity.org.au/afd/taxa/730a92ee-159b-4372-af6b-99de4bf94c6b	Austrocroce mira	(McKeown, 1939)	species	Animalia	Arthropoda	Insecta	Neuroptera	Nemopteridae	Austrocroce		1
https://biodiversity.org.au/afd/taxa/41d32c25-20dd-4dd4-b52c-cbccfafa38a0	Austrolestes analis	(Rambur, 1842)	species	Animalia	Arthropoda	Insecta	Odonata	Lestidae	Austrolestes		2
https://biodiversity.org.au/afd/taxa/2fe21bed-d7f5-4e45-8deb-5d4e5b08fc4d	Austrolestes annulosus	(Selys, 1862)	species	Animalia	Arthropoda	Insecta	Odonata	Lestidae	Austrolestes		2
https://biodiversity.org.au/afd/taxa/3029a74e-2791-45fa-bcb4-b1e7e8b88b55	Austromyzinum nubilipennis	(Turner, 1910)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Tiphiidae	Austromyzinum		1
https://biodiversity.org.au/afd/taxa/ed463183-2fd4-439e-92e1-7b07d2c7cf23	Austrosynthemis cyanitincta	(Tillyard, 1908)	species	Animalia	Arthropoda	Insecta	Odonata	Synthemistidae	Austrosynthemis		1
https://biodiversity.org.au/afd/taxa/d37d230d-c913-4248-b32e-c601761d1813	Austrothemis nigrescens	(Martin, 1901)	species	Animalia	Arthropoda	Insecta	Odonata	Libellulidae	Austrothemis		3
https://biodiversity.org.au/afd/taxa/3e6a9e28-aaf9-45e8-bcd4-f764aeda8bdc	Authomaema pentacosma	(Lower, 1900)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Authomaema		2
https://biodiversity.org.au/afd/taxa/615bdd63-9e8b-4f8d-9637-489c2a80c281	Aythya (Nyroca) australis	(Eyton, 1838)	species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Aythya	Brownhead	1
https://biodiversity.org.au/afd/taxa/b6dd9851-c39d-4bfe-9d22-70d08cbc96fd	Backobourkia heroine	(L. Koch, 1871)	species	Animalia	Arthropoda	Arachnida	Araneae	Araneidae	Backobourkia		2
https://biodiversity.org.au/afd/taxa/0b73e8bb-c141-4f07-8b14-47c3510c9c98	Badumna insignis	(L. Koch, 1872)	species	Animalia	Arthropoda	Arachnida	Araneae	Desidae	Badumna		4
https://biodiversity.org.au/afd/taxa/02f34d75-4830-4abe-9b78-8c941d5ae573	Ballarra longipalpus	Hunt & Cokendolpher, 1991	species	Animalia	Arthropoda	Arachnida	Opiliones	Neopilionidae	Ballarra		1
https://biodiversity.org.au/afd/taxa/8f3f660a-5391-47f7-8a77-a22d5569029b8	Balta hebardi	Princis, 1969	species	Animalia	Arthropoda	Insecta	Blattodea	Ectobiidae	Balta		3
https://biodiversity.org.au/afd/taxa/5fed5ecf-2199-4f64-a9f7-90b39f88a90a	Barnardius zonarius	(Shaw, 1805)	species	Animalia	Chordata	Aves	Psittaciformes	Psittacidae	Barnardius	Australian Ringneck	202
https://biodiversity.org.au/afd/taxa/588a782c-be72-4e20-a241-af5f3876a658	Bembix littoralis	Turner, 1908	species	Animalia	Arthropoda	Insecta	Hymenoptera	Crabronidae	Bembix		1
https://biodiversity.org.au/afd/taxa/d571ec3b-df38-426b-8a53-288e938e2694	Berosus (Berosus) approximans	Fairmaire, 1879	species	Animalia	Arthropoda	Insecta	Coleoptera	Hydrophilidae	Berosus		1
https://biodiversity.org.au/afd/taxa/89e14434-af3f-4ced-aae7-dd7844bec1e6	Berosus (Berosus) discolor	Blackburn, 1888	species	Animalia	Arthropoda	Insecta	Coleoptera	Hydrophilidae	Berosus		1
https://biodiversity.org.au/afd/taxa/cbbc328d-ec39-4159-9ef8-87943acad0c6	Berosus (Enoplurus) australiae	Mulsant & Rey, 1858	species	Animalia	Arthropoda	Insecta	Coleoptera	Hydrophilidae	Berosus		1
https://biodiversity.org.au/afd/taxa/728c4971-dbba-4587-9f2a-010c08c4d270	Berosus (Enoplurus) macumbensis	Blackburn, 1896	species	Animalia	Arthropoda	Insecta	Coleoptera	Hydrophilidae	Berosus		1
https://biodiversity.org.au/afd/taxa/9e337148-71dc-4871-96da-c9f24d7e9b1e	Bida radiosella	(Walker, 1863)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Bida		4
https://biodiversity.org.au/afd/taxa/48e09a45-e2af-4b68-a012-92fc13a4d09f	Blackbolbus frontalis	(GuÃ©rin-MÃ©neville, 1838)	species	Animalia	Arthropoda	Insecta	Coleoptera	Bolboceratidae	Blackbolbus		1
https://biodiversity.org.au/afd/taxa/213868e8-2366-4af1-865c-b1fe771c77bb	Blackburnium reichei	(GuÃ©rin-MÃ©neville, 1838)	species	Animalia	Arthropoda	Insecta	Coleoptera	Bolboceratidae	Blackburnium		1
https://biodiversity.org.au/afd/taxa/31b7f51d-fcdb-4e53-a761-2d385fe0a18d	Bostrychopsis jesuita	(Fabricius, 1775)	species	Animalia	Arthropoda	Insecta	Coleoptera	Bostrichidae	Bostrychopsis		2
https://biodiversity.org.au/afd/taxa/dba78701-cae9-4afb-a41a-6697c52c5e34	Botaurus poiciloptilus	(Wagler, 1827)	species	Animalia	Chordata	Aves	Ciconiiformes	Ardeidae	Botaurus	Australasian Bittern	1
https://biodiversity.org.au/afd/taxa/90eb5e4f-76a0-4692-be76-1eef39581bea	Bothriembryon (Bothriembryon) indutus	(Menke, 1843)	species	Animalia	Mollusca	Gastropoda	Stylommatophora	Bothriembryontidae	Bothriembryon		2
https://biodiversity.org.au/afd/taxa/477ea9f7-c06e-46fd-a1c1-41adc611ee82	Brachyurophis fasciolatus	(GÃ¼nther, 1872)	species	Animalia	Chordata	Reptilia	Squamata	Elapidae	Brachyurophis	Narrow-banded Shovel-nosed Snake	1
https://biodiversity.org.au/afd/taxa/33cc201a-3634-4cec-bd9c-c2859966203c	Brachyurophis semifasciatus	GÃ¼nther, 1863	species	Animalia	Chordata	Reptilia	Squamata	Elapidae	Brachyurophis	Southern Shovel-nosed Snake	4
https://biodiversity.org.au/afd/taxa/0c868946-1ba2-431f-a908-a3c5455cb051	Brevicyttara cyclospila	(Turner, 1945)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Cossidae	Brevicyttara		2
https://biodiversity.org.au/afd/taxa/5bf31cd8-1098-46e9-95df-88fd479d2d1e	Brunotartessus fulvus	(Walker, 1851)	species	Animalia	Arthropoda	Insecta	Hemiptera	Cicadellidae	Brunotartessus		1
https://biodiversity.org.au/afd/taxa/37b92c1b-8854-4213-a3e3-c14c4bf0e687	Bubas bison	(Linnaeus, 1767)	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Bubas		2
https://biodiversity.org.au/afd/taxa/2b11a727-32e5-4ee0-a1fd-0ca79555bcf3	Buciara bipartita	Walker, 1869	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Buciara		2
24490001	Bullastra lessoni	(Deshayes, 1831)	species	Animalia	Mollusca	Gastropoda		Lymnaeidae	Austropeplea	Freshwater Snail	1
https://biodiversity.org.au/afd/taxa/2c33a1fd-34f4-48ec-9ae6-38b51f2aa7ea	Cacatua (Cacatua) galerita	(Latham, 1790)	species	Animalia	Chordata	Aves	Psittaciformes	Cacatuidae	Cacatua	Sulphur-crested Cockatoo	4
https://biodiversity.org.au/afd/taxa/ab8816d0-2599-4813-a4c7-00d45d0c7ed0	Cacatua (Licmetis) pastinator	(Gould, 1841)	species	Animalia	Chordata	Aves	Psittaciformes	Cacatuidae	Cacatua	Western Corella	4
https://biodiversity.org.au/afd/taxa/34b31e86-7ade-4cba-960f-82a6ae586206	Cacatua (Licmetis) sanguinea	Gould, 1843	species	Animalia	Chordata	Aves	Psittaciformes	Cacatuidae	Cacatua	Little Corella	10
https://biodiversity.org.au/afd/taxa/1268648b-451b-4cb1-b931-ef54dcab9ba0	Cacatua (Licmetis) tenuirostris	(Kuhl, 1820)	species	Animalia	Chordata	Aves	Psittaciformes	Cacatuidae	Cacatua	Long-billed Corella	2
https://biodiversity.org.au/afd/taxa/408ee81c-6558-4ddf-b732-f9ad7d09f1ae	Cacomantis (Vidgenia) flabelliformis	(Latham, 1801)	species	Animalia	Chordata	Aves	Cuculiformes	Cuculidae	Cacomantis	Fan-tailed Cuckoo	3
https://biodiversity.org.au/afd/taxa/7deb7494-2acb-4722-b644-1adc915b6b47	Cadmus (Cadmus) excrementarius	Suffrian, 1859	species	Animalia	Arthropoda	Insecta	Coleoptera	Chrysomelidae	Cadmus		1
https://biodiversity.org.au/afd/taxa/c00e098c-3d52-4cfa-bca0-4f3a0fb41247	Calathusa ischnodes	(Turner, 1903)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Calathusa		6
https://biodiversity.org.au/afd/taxa/295263ef-b54f-4a28-86c7-37d9d61b62df	Callibracon capitator	(Fabricius, 1775)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Braconidae	Callibracon		1
NZOR-6-7529	Calliphora vomitoria sensu	auct	species	Animalia	Arthropoda	Insecta	Diptera	Calliphoridae	Calliphora		2
https://biodiversity.org.au/afd/taxa/a7b48a73-14d8-405a-958a-17f1fe46f945	Calotemognatha varicollis	(Carter, 1913)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Calotemognatha		2
https://biodiversity.org.au/afd/taxa/70eed478-5390-40c7-8660-97810fef7365	Calotemognatha yarelli	(Gory & Laporte, 1838)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Calotemognatha		3
https://biodiversity.org.au/afd/taxa/39083a3e-faf5-4b48-a5f0-69c2bfa32d68	Calyptorhynchus (Calyptorhynchus) banksii	(Latham, 1790)	species	Animalia	Chordata	Aves	Psittaciformes	Cacatuidae	Calyptorhynchus	Red-tailed Black Cockatoo	33
https://biodiversity.org.au/afd/taxa/e18ae8ab-640e-4199-9f78-d2dde7f6f198	Campion australasiae	(GuÃ©rin-MÃ©neville, 1844)	species	Animalia	Arthropoda	Insecta	Neuroptera	Mantispidae	Campion		1
https://biodiversity.org.au/afd/taxa/b6fa0e0e-ebf4-40a1-86d2-ff358ae053de	Campion tenuistrigus	(Gerstaecker, 1885)	species	Animalia	Arthropoda	Insecta	Neuroptera	Mantispidae	Campion		2
https://biodiversity.org.au/afd/taxa/df0e1cf0-aed0-4e5d-affc-cdbcdcdaae2a	Camponotus chalceus	Crawley, 1915	species	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Camponotus		4
https://biodiversity.org.au/afd/taxa/30ee9d69-b5f3-4f81-8b7c-10074fbdc485	Capra hircus	Linnaeus, 1758	species	Animalia	Chordata	Mammalia	Artiodactyla	Bovidae	Capra	Goat	2
https://biodiversity.org.au/afd/taxa/f374cb87-e7d8-4308-a8d0-d3ca23f2ee00	Carposina telesia	Meyrick, 1910	species	Animalia	Arthropoda	Insecta	Lepidoptera	Carposinidae	Carposina		1
https://biodiversity.org.au/afd/taxa/02755c89-eab2-4a68-872c-31cbf1803ca6	Casbia eutactopis	Turner, 1947	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Casbia		2
https://biodiversity.org.au/afd/taxa/41d01e6b-e265-424d-8d6d-e39966b4ce8f	Casmerodius modesta	J.E. Gray, 1831	species	Animalia	Chordata	Aves	Ciconiiformes	Ardeidae	Casmerodius	Eastern Great Egret	1
https://biodiversity.org.au/afd/taxa/107d0cfc-85c1-4126-b65a-008fa1e9bf65	Castiarina aeraticollis	(Carter, 1930)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		2
https://biodiversity.org.au/afd/taxa/e34028a2-3006-46be-af16-1baf61481eba	Castiarina amabilis	(Gory & Laporte, 1838)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		1
https://biodiversity.org.au/afd/taxa/02d0aa55-ed80-433a-a720-0aa971fe2c2a	Castiarina anchoralis	(Gory & Laporte, 1838)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		1
https://biodiversity.org.au/afd/taxa/5367bae3-f497-4907-9237-abf53ab25e4f	Castiarina aquila	(Barker, 1980)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		2
https://biodiversity.org.au/afd/taxa/9b27ace8-a0ca-44ae-b292-738dbca34420	Castiarina aureola	(Carter, 1913)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		4
https://biodiversity.org.au/afd/taxa/5a2d93bf-0657-459a-ad9f-c17b7fd5b9d3	Castiarina crocicolor	(Gory & Laporte, 1838)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		2
https://biodiversity.org.au/afd/taxa/184702bb-ac7f-44e8-b382-ead35eff5069	Castiarina filiformis	(Blackburn, 1892)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		2
https://biodiversity.org.au/afd/taxa/1e159e05-e603-49fa-a0a5-4362cc0e4b5e	Castiarina flaviceps	(Carter, 1913)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		7
https://biodiversity.org.au/afd/taxa/8ea6166a-9229-4783-80df-b8adb70e9b2f	Castiarina hostilis	(Blackburn, 1892)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		1
https://biodiversity.org.au/afd/taxa/99992944-b7c4-448e-92ae-d50205e00ab1	Castiarina mimesis	Barker, 1993	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		3

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/693b9f16-5207-4d19-8979-24f459ac31a8	Castiarina nonyma	Barker, 1996	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		4
https://biodiversity.org.au/afd/taxa/8833cc4a-73e7-48b6-9a8f-37b76b612dd6	Castiarina pallidiventris	(Gory & Laporte, 1838)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		12
https://biodiversity.org.au/afd/taxa/1719f5e7-2613-4ac5-a8e7-fdc28c627346	Castiarina parallela	(White, 1859)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		1
https://biodiversity.org.au/afd/taxa/36f99ede-f626-4588-9c23-dfcc0241289c	Castiarina placida	(Thomson, 1879)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		8
https://biodiversity.org.au/afd/taxa/9436bf4e-feb2-4f3f-91a4-be354b0de2d6	Castiarina robusta	(Saunders, 1869)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		1
https://biodiversity.org.au/afd/taxa/7ffbf204-cb65-4632-9312-3c1047ae3ea9	Castiarina rufipennis	(Kirby, 1818)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		26
https://biodiversity.org.au/afd/taxa/f5013a8e-bca0-4063-a07a-e17577f0aba0	Castiarina simulata	(Gory & Laporte, 1838)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		7
https://biodiversity.org.au/afd/taxa/4e4cd88d-b79c-458a-a9a1-a766e97cfda1	Castiarina subcincta	Barker, 1996	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Castiarina		1
https://biodiversity.org.au/afd/taxa/b66b0c3d-3c09-4ec3-81b3-2c27904ed6ae	Catasarcus nephelodes	Thompson, 1968	species	Animalia	Arthropoda	Insecta	Coleoptera	Curculionidae	Catasarcus		1
https://biodiversity.org.au/afd/taxa/0a56e2e4-b38d-402e-b774-594a83d4522e	Catasarcus opimus	Pascoe, 1870	species	Animalia	Arthropoda	Insecta	Coleoptera	Curculionidae	Catasarcus		1
https://biodiversity.org.au/afd/taxa/7c1c010b-60d6-4ad5-9f42-bdafb24fe1ed	Catoryctis eugramma	Meyrick, 1890	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Catoryctis		1
https://biodiversity.org.au/afd/taxa/7058a23d-ab34-4b20-a8ff-b41704dd2973	Ceryerda cursitans	Simon, 1909	species	Animalia	Arthropoda	Arachnida	Araneae	Gnaphosidae	Ceryerda		6
https://biodiversity.org.au/afd/taxa/d6156ed3-bda2-42d6-a948-07d94c7e6559	Chalcites basalis	(Horsfield, 1821)	species	Animalia	Chordata	Aves	Cuculiformes	Cuculidae	Chalcites	Horsfield's Bronze-cuckoo	5
https://biodiversity.org.au/afd/taxa/99e4518d-7877-46c8-a809-7e4e4d5bad81	Chalcites lucidus	(Gmelin, 1788)	species	Animalia	Chordata	Aves	Cuculiformes	Cuculidae	Chalcites	Shining Bronze-cuckoo	7
https://biodiversity.org.au/afd/taxa/737198bf-0ca6-43e1-a428-f9e0f257f5c3	Chalcites osculans	Gould, 1847	species	Animalia	Chordata	Aves	Cuculiformes	Cuculidae	Chalcites	Black-eared Cuckoo	3
https://biodiversity.org.au/afd/taxa/424418ac-76a5-48b0-ad53-bf6da2ab96f5	Chasmoptera huttii	(Westwood, 1848)	species	Animalia	Arthropoda	Insecta	Neuroptera	Nemopteridae	Chasmoptera		1
https://biodiversity.org.au/afd/taxa/6540db4d-6ad2-4d02-a1a3-0ce812f68bca	Chauliognathus tricolor	(Castelnau, 1840)	species	Animalia	Arthropoda	Insecta	Coleoptera	Cantharidae	Chauliognathus		1
https://biodiversity.org.au/afd/taxa/27653d1b-205d-4cc4-931e-3a5396332ee7	Cheilomenes sexmaculata	(Fabricius, 1781)	species	Animalia	Arthropoda	Insecta	Coleoptera	Coccinellidae	Cheilomenes		2
https://biodiversity.org.au/afd/taxa/967549e7-7fa9-4770-b86e-5e3520d3c43d	Chelodina (Macrochelodina) oblonga	Gray, 1841	species	Animalia	Chordata	Reptilia	Testudines	Chelidae	Chelodina	Northern Snake-necked Turtle	1
https://biodiversity.org.au/afd/taxa/57815553-1b85-49b5-a46d-035c0a35622f	Chelodina (Macrodiremys) colliei	Gray, 1856	species	Animalia	Chordata	Reptilia	Testudines	Chelidae	Chelodina	South-western Long-necked Turtle	1
https://biodiversity.org.au/afd/taxa/7954bd26-ddb3-4e7e-823c-4a692b7bde74	Chenonetta jubata	(Latham, 1801)	species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Chenonetta	Australian Wood Duckmaned Goose	26
https://biodiversity.org.au/afd/taxa/5851a3f8-4962-477f-bd38-4f86473472f5	Cheramoeca leucosterna	(Gould, 1841)	species	Animalia	Chordata	Aves	Passeriformes	Hirundinidae	Cheramoeca	White-backed Swallow	1
https://biodiversity.org.au/afd/taxa/8dac12c2-6d68-4b92-9acc-0a1e1b26f171	Cherax preissii	(Erichson, 1846)	species	Animalia	Arthropoda	Malacostraca	Decapoda	Parastacidae	Cherax	Koonac	3
https://biodiversity.org.au/afd/taxa/8ce899d0-e1ad-4646-a161-6fe48388abbc	Cherax quinquecarinatus	(Gray, 1845)	species	Animalia	Arthropoda	Malacostraca	Decapoda	Parastacidae	Cherax	Djilgi	2
https://biodiversity.org.au/afd/taxa/8fc77349-3688-4294-a764-8d8bb1bc2df7	Chlaenius (Pelasmomimus) greyanus	White, 1841	species	Animalia	Arthropoda	Insecta	Coleoptera	Carabidae	Chlaenius		1
https://biodiversity.org.au/afd/taxa/d0eb223e-c5e4-48ad-8416-a0a8220d75fd	Chlenias banksiaria	(Le Guillou, 1841)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Chlenias		1
https://biodiversity.org.au/afd/taxa/0fc44003-1617-4f53-baff-1be37f0141c4	Chloroclystis insigillata	(Walker, 1862)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Chloroclystis		1
https://biodiversity.org.au/afd/taxa/ab3d2810-2de2-4068-a47c-6525bd1c36b6	Chlorocoma cadmaria	(GuenÃ©e, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Chlorocoma		2
https://biodiversity.org.au/afd/taxa/7816f9b5-70e6-495a-9226-fd5c84f51990	Chlorocoma rhodothrix	Turner, 1922	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Chlorocoma		1
https://biodiversity.org.au/afd/taxa/5d1f294c-d87a-4644-84ca-fe1f160902db	Chortoicetes terminifera	(Walker, 1870)	species	Animalia	Arthropoda	Insecta	Orthoptera	Acrididae	Chortoicetes	Australian Plague Locust	3
https://biodiversity.org.au/afd/taxa/f5f5b062-43f9-436d-ae93-8dcdcb7f71c6	Christinus marmoratus	(Gray, 1845)	species	Animalia	Chordata	Reptilia	Squamata	Gekkonidae	Christinus	Marbled Gecko	5
https://biodiversity.org.au/afd/taxa/5fa0da9c-420a-44de-821e-116cf5048142	Chrysis lincea	Fabricius, 1775	species	Animalia	Arthropoda	Insecta	Hymenoptera	Chrysididae	Chrysis		1
NZOR-6-34659	Chrysococcyx lucidus	Gmelin	species	Animalia	Chordata	Aves	Cuculiformes	Cuculidae	Chalcites	Shining Cuckoo	2
https://biodiversity.org.au/afd/taxa/26827e31-fa72-44bc-86cb-7ce377d0f2f9	Chrysodeixis argentifera	(GuenÃ©e, 1852)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Chrysodeixis		3
https://biodiversity.org.au/afd/taxa/326649d3-5119-406d-a661-f63a8c779dd2	Chrysolarentia gypsomela	(Lower, 1892)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Chrysolarentia		5
https://biodiversity.org.au/afd/taxa/be9b6968-ffb7-4140-87b8-5e990007704f	Chrysopogon albopunctatus	(Macquart, 1846)	species	Animalia	Arthropoda	Insecta	Diptera	Asilidae	Chrysopogon		7
https://biodiversity.org.au/afd/taxa/4ec69148-31ab-4830-83e5-3fbe5151b098	Ciampa arietaria	(GuenÃ©e, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Ciampa		3
https://biodiversity.org.au/afd/taxa/3308b448-6a73-47e9-8c7f-e1dd5fec5e09	Ciampa melanostrepta	(Lower, 1893)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Ciampa		1
https://biodiversity.org.au/afd/taxa/b39dfdf7-ce6a-4712-9304-13c7c7e0a604	Cincloramphus (Maclennania) mathewsi	Iredale, 1911	species	Animalia	Chordata	Aves	Passeriformes	Locustellidae	Cincloramphus	Rufous Songlark	5
https://biodiversity.org.au/afd/taxa/576c0cd7-73db-4202-9570-f45ea07d0ba9	Cirromitra tetratherma	(Lower, 1896)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Cirromitra		4
https://biodiversity.org.au/afd/taxa/eb73616a-9b0c-4a98-93be-a3e72bf1bef7	Clarana clarana	(Meyrick, 1881)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Clarana		2
https://biodiversity.org.au/afd/taxa/de840853-a3a3-4ec5-9dc0-7f12680a054f	Climacteris (Climacteris) rufus	Gould, 1841	species	Animalia	Chordata	Aves	Passeriformes	Climacteridae	Climacteris	Rufous Treecreeper	2
https://biodiversity.org.au/afd/taxa/d560c2ba-faff-4973-a2d1-f4dbcf06bbf0	Clogmia albipunctata	(Williston, 1893)	species	Animalia	Arthropoda	Insecta	Diptera	Psychodidae	Clogmia		2
https://biodiversity.org.au/afd/taxa/1351b437-2eb5-4949-990b-b18eb45252af	Coccinella transversalis	Fabricius, 1781	species	Animalia	Arthropoda	Insecta	Coleoptera	Coccinellidae	Coccinella	Transverse Ladybird	10
https://biodiversity.org.au/afd/taxa/7af45089-4a0f-4303-a417-1708623809af	Colluricincla (Colluricincla) harmonica	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Pachycephalidae	Colluricincla	Grey Shrike-thrush	17
https://biodiversity.org.au/afd/taxa/bf8abc11-ebe1-4f1a-9950-805e5bfcf90a	Columba (Columba) livia	Gmelin, 1789	species	Animalia	Chordata	Aves	Columbiformes	Columbidae	Columba	Rock Pigeon	1
https://biodiversity.org.au/afd/taxa/3049b5f8-5129-423d-b610-95a6e7ecfb91	Colymbomorpha vittata	Britton, 1959	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Colymbomorpha	Spring Beetle	2
https://biodiversity.org.au/afd/taxa/1f018b0d-2177-41a4-b1b4-5213f5d4e918	Comptosia tendens	(Walker, 1849)	species	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Comptosia		1
https://biodiversity.org.au/afd/taxa/44f60c7c-8b2b-4ecf-bc78-1bee5c2003d3	Conobrosis acervata	(Meyrick, 1914)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Conobrosis		3
https://biodiversity.org.au/afd/taxa/0a7f6150-7af3-4f1f-9d1c-31a2ac41363d	Copamyntis leptocosma	(Turner, 1904)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Copamyntis		2
https://biodiversity.org.au/afd/taxa/856e5658-3f4e-4c37-bf52-5f86b7b333e5	Coptocercus rubripes	(Boisduval, 1835)	species	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Coptocercus		4
https://biodiversity.org.au/afd/taxa/522a22ec-3318-4e17-97e7-8d8af150146b	Coptotermes michaelseni	Silvestri, 1909	species	Animalia	Arthropoda	Insecta	Blattodea	Rhinotermitidae	Coptotermes		1
https://biodiversity.org.au/afd/taxa/69c22b10-ff42-4bef-bb0f-88dc01a8f96c	Coracina (Coracina) novaehollandiae	(Gmelin, 1789)	species	Animalia	Chordata	Aves	Passeriformes	Campephagidae	Coracina	Black-faced Cuckoo-shrike	48
https://biodiversity.org.au/afd/taxa/6d7d78ca-a477-4c03-b09c-6cb3dcc31936	Corgatha pleuroplaca	Turner, 1936	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Corgatha		1
https://biodiversity.org.au/afd/taxa/bc165f53-184b-4531-8754-f82328676445	Cormocephalus aurantiipes	(Newport, 1844)	species	Animalia	Arthropoda	Chilopoda	Scolopendromorpha	Scolopendridae	Cormocephalus		4
https://biodiversity.org.au/afd/taxa/8117f68b-5460-4626-8400-e171464e08ad	Corvus coronoides	Vigors & Horsfield, 1827	species	Animalia	Chordata	Aves	Passeriformes	Corvidae	Corvus	Australian Raven	95
https://biodiversity.org.au/afd/taxa/3f192e7c-5eec-4696-9bc7-68211c69f473	Coryphistes ruricola	(Burmeister, 1838)	species	Animalia	Arthropoda	Insecta	Orthoptera	Acrididae	Coryphistes	Bark-mimicking Grasshopper	3
https://biodiversity.org.au/afd/taxa/d5a8bde0-f56a-4af9-962a-d168b3e3308b	Coturnix (Coturnix) pectoralis	Gould, 1837	species	Animalia	Chordata	Aves	Galliformes	Phasianidae	Coturnix	Grey Quail	1
https://biodiversity.org.au/afd/taxa/0f5df411-17dd-4719-91de-158fb1a77b27	Cracticus nigrogularis	(Gould, 1837)	species	Animalia	Chordata	Aves	Passeriformes	Artamidae	Cracticus	Pied Butcherbird	3
https://biodiversity.org.au/afd/taxa/681ea214-3788-4cc6-8b97-0b325d6bba6b	Cracticus torquatus	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Artamidae	Cracticus	Grey Butcherbird	12
https://biodiversity.org.au/afd/taxa/3fdcdf54-68f7-4fc8-a94a-2e09f6801dcd	Crenadactylus ocellatus	(Gray, 1845)	species	Animalia	Chordata	Reptilia	Squamata	Diplodactylidae	Crenadactylus	South-western Clawless Gecko	3
https://biodiversity.org.au/afd/taxa/ee90eb32-3d7c-41d6-8bf6-3ffda1ad8b9b	Crinia georgiana	Tschudi, 1838	species	Animalia	Chordata	Amphibia	Anura	Myobatrachidae	Crinia	Tschudi's Froglet	38
https://biodiversity.org.au/afd/taxa/5f46e9da-17dd-4e0c-add0-79c61b9f616a	Crinia glauerti	Loveridge, 1933	species	Animalia	Chordata	Amphibia	Anura	Myobatrachidae	Crinia	Glauert's Froglet	15
https://biodiversity.org.au/afd/taxa/0446dbe0-12c9-4a5e-a65b-b0b59c673089	Crinia insignifera	Moore, 1954	species	Animalia	Chordata	Amphibia	Anura	Myobatrachidae	Crinia	Sign-bearing Froglet	2
https://biodiversity.org.au/afd/taxa/cb702a02-a19c-4d9e-84d0-281496cc3e40	Crinia pseudinsignifera	Main, 1957	species	Animalia	Chordata	Amphibia	Anura	Myobatrachidae	Crinia	Bleating Froglet	19
https://biodiversity.org.au/afd/taxa/99bf0d55-0713-48d3-b5f1-a0517221578b	Crocidosema plebejana	Zeller, 1847	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Crocidosema		16
https://biodiversity.org.au/afd/taxa/dd3fe5ee-e526-4a37-ad58-72f1c8f73474	Cryphaea xylina	(Turner, 1917)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Cryphaea		4
https://biodiversity.org.au/afd/taxa/d7b2b8ef-9597-4048-9265-7c456b5ba90c	Crypsiphona ocultaria	(Donovan, 1805)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Crypsiphona		11
https://biodiversity.org.au/afd/taxa/238cfcda-851b-4a34-93ec-953a2b2922ae	Cryptoblabes euraphella	(Meyrick, 1879)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Cryptoblabes		3
https://biodiversity.org.au/afd/taxa/1142a7e2-ff49-4b09-9e2b-50587ce05801	Cryptoblepharus buchananii	(Gray, 1838)	species	Animalia	Chordata	Reptilia	Squamata	Scincidae	Cryptoblepharus	Buchanaâ€™s Snake-eyed Skink	10
https://biodiversity.org.au/afd/taxa/897cc242-5185-4b99-b38f-369638ab5ffb	Cryptoblepharus pannosus	Horner, 2007	species	Animalia	Chordata	Reptilia	Squamata	Scincidae	Cryptoblepharus	Ragged Snake-eyed Skink	1

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/d32ba5d4-cf49-4577-a478-691307ec7d6e	Cryptophlebia ombrodelta	(Lower, 1898)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Cryptophlebia		1
https://biodiversity.org.au/afd/taxa/3e61a01b-0ec9-4383-9540-b97bd073fc7a	Ctenotus inornatus	(Gray, 1845)	species	Animalia	Chordata	Reptilia	Squamata	Scincidae	Ctenotus	Bar-shouldered Ctenotus	1
https://biodiversity.org.au/afd/taxa/41c5176c-133e-4145-af0f-23258983b231	Culama dasythrix	Turner, 1945	species	Animalia	Arthropoda	Insecta	Lepidoptera	Cossidae	Culama		2
https://biodiversity.org.au/afd/taxa/5c17f3e1-359e-4c3a-97fe-8146ae3f840e	Culex (Culex) annulirostris	Skuse, 1889	species	Animalia	Arthropoda	Insecta	Diptera	Culicidae	Culex	Common Banded Mosquito	1
https://biodiversity.org.au/afd/taxa/974c4aef-d8bb-4773-8189-10701364c15f	Culex (Culex) globocoxitus	Dobrotworsky, 1953	species	Animalia	Arthropoda	Insecta	Diptera	Culicidae	Culex		2
https://biodiversity.org.au/afd/taxa/a9b2251c-0ee0-4e28-92c5-9e62c7121073	Cyclodomorphus celatus	Shea & Miller, 1995	species	Animalia	Chordata	Reptilia	Squamata	Scincidae	Cyclodomorphus	Western Slender Blue-tongue	1
https://biodiversity.org.au/afd/taxa/f83c15ca-4ff5-4c37-be49-ce49a431f0ca	Cygnus (Chenopis) atratus	(Latham, 1790)	species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Cygnus	Black Swan	4
https://biodiversity.org.au/afd/taxa/1fc76c4d-4830-4129-9b86-1c7e944c3c50	Dacelo (Dacelo) novaeguineae	(Hermann, 1783)	species	Animalia	Chordata	Aves	Coraciiformes	Alcedinidae	Dacelo	Kookaburra	65
https://biodiversity.org.au/afd/taxa/57fcbc39-071b-4a1f-bb6c-2e607919b357	Danaus chrysippus	(Linnaeus, 1758)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Danaus	Lesser Wanderer	3
https://biodiversity.org.au/afd/taxa/a5ea37bf-956a-430a-b719-3985da2b7ba9	Danaus petilia	(Stoll, 1790)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Danaus	Lesser Wanderer	10
https://biodiversity.org.au/afd/taxa/e24dc381-5c20-4580-b2ed-695fefce2622	Danaus plexippus	(Linnaeus, 1758)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Danaus	Wanderer	8
https://biodiversity.org.au/afd/taxa/8bf4b8b0-f432-4e9d-8ea6-08fc20c8090c	Daphoenositta (Neositta) chrysoptera	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Neosittidae	Daphoenositta	Varied Sittella	7
https://biodiversity.org.au/afd/taxa/8770492b-ee4c-4bec-b319-cb8d8fb0a492	Dasygaster padockina	(Le Guillou, 1841)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Dasygaster		2
https://biodiversity.org.au/afd/taxa/c28fcdb3-8a0f-4877-b3d0-cf6378d42db6	Dasyhesma robusta	Michener, 1965	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Dasyhesma		8
https://biodiversity.org.au/afd/taxa/741a9edf-3e5e-4548-9f35-7b76dc5a87ae	Dasyhesma scholtziae	Exley, 2004	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Dasyhesma		2
https://biodiversity.org.au/afd/taxa/558915f1-ed5c-4406-bdc5-41d5084abdbd	Dasypodia selenophora	GuenÃ©e, 1852	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Dasypodia		21
https://biodiversity.org.au/afd/taxa/a2260672-36df-48be-8a9e-d85a77237ba5	Dasyurus geoffroii	Gould, 1841	species	Animalia	Chordata	Mammalia	Dasyuromorphia	Dasyuridae	Dasyurus	Western Quoll	2
https://biodiversity.org.au/afd/taxa/8ff21448-35e3-4fc9-898a-8aa404ac2fe2	Debiliana GROUP debiliana	(Walker, 1863)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Debiliana		8
https://biodiversity.org.au/afd/taxa/ca07f77a-e8ce-401e-b20a-3cd7fda43231	Delias aganippe	(Donovan, 1805)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pieridae	Delias	Wood White	1
https://biodiversity.org.au/afd/taxa/19f72aa6-8444-4978-af79-3a7c027dd862	Delma fraseri	Gray, 1831	species	Animalia	Chordata	Reptilia	Squamata	Pygopodidae	Delma	Fraser's Delma	1
https://biodiversity.org.au/afd/taxa/97874787-7705-41c8-8b3b-6594bd06cc20	Destolmia lineata	Walker, 1855	species	Animalia	Arthropoda	Insecta	Lepidoptera	Notodontidae	Destolmia		2
https://biodiversity.org.au/afd/taxa/0c5ae789-ae33-4479-ac10-3528a90761a8	Diatenes gerula	GuenÃ©e, 1852	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Diatenes		2
https://biodiversity.org.au/afd/taxa/8f2d4aeb-50eb-438f-a145-5f12e356ffd8	Dicaeum (Dicaeum) hirundinaceum	(Shaw, 1792)	species	Animalia	Chordata	Aves	Passeriformes	Dicaeidae	Dicaeum	Mistletoebird	7
https://biodiversity.org.au/afd/taxa/5eb4f567-5adf-40ff-9441-62a333a1d51b	Dichromodes anelictis	Meyrick, 1890	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		21
https://biodiversity.org.au/afd/taxa/e6b65ba6-ed0a-4e20-9449-c8ab766dfaf2	Dichromodes aristadelpha	Lower, 1903	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		2
https://biodiversity.org.au/afd/taxa/8f233323-1cd8-4c12-9695-a2b1e9131ab5	Dichromodes consignata	(Walker, 1861)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		17
https://biodiversity.org.au/afd/taxa/abc9104e-6524-40d0-a8bd-e65174575e2f	Dichromodes denticulata	Turner, 1930	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		1
https://biodiversity.org.au/afd/taxa/60c836d7-ddb3-4921-b1c8-85ab88236e05	Dichromodes euprepes	Prout, 1910	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		2
https://biodiversity.org.au/afd/taxa/1381e177-debf-4b05-8647-829007e12291	Dichromodes haematopa	Turner, 1906	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		2
https://biodiversity.org.au/afd/taxa/ec80b05b-3b04-425e-a808-a60adaff7635	Dichromodes indicataria	(Walker, 1866)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		9
https://biodiversity.org.au/afd/taxa/26902a34-d5d4-4c76-9a01-ee6663ddeb34	Dichromodes leptozona	Turner, 1930	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		11
https://biodiversity.org.au/afd/taxa/67883201-f012-41b5-b98e-d78c728edd23	Dichromodes orthotis	Meyrick, 1890	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		18
https://biodiversity.org.au/afd/taxa/2149213e-1b45-4bb9-a6ab-9cff0a4ba56c	Dichromodes orthozona	Lower, 1903	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		8
https://biodiversity.org.au/afd/taxa/0434554f-45e3-46b3-ab94-98013c4ba09d	Dichromodes poecilotis	Meyrick, 1890	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		26
https://biodiversity.org.au/afd/taxa/09c6ba69-a0a2-4a41-ad8f-bf9194be9f0d	Dichromodes semicanescens	L.B. Prout, 1913	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dichromodes		29
https://biodiversity.org.au/afd/taxa/6ae14740-ed24-4641-9cf5-88afccdff70c	Dictyotus caenosus	(Westwood, 1837)	species	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Dictyotus	Brown Shield Bug	1
https://biodiversity.org.au/afd/taxa/51210b39-d335-482c-b1d0-908a1ddb0b2f	Dictyotus conspicuus	Gross, 1975	species	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Dictyotus		1
https://biodiversity.org.au/afd/taxa/9b1c2ba7-4750-468d-97f6-00b05f80abff	Dinophalus atmoscia	(Meyrick, 1890)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dinophalus		3
https://biodiversity.org.au/afd/taxa/a1b850c6-3aa9-4296-b29c-a4fc0144ae79	Dinophalus serpentaria	(GuenÃ©e, 1864)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Dinophalus		6
https://biodiversity.org.au/afd/taxa/0f638a2e-3d61-4cb6-a0a4-275dfe71657e	Diphucrania notulata	(Germar, 1848)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Diphucrania		1
https://biodiversity.org.au/afd/taxa/030e1e11-aea3-4d57-92f3-2b58c728256e	Diphucrania roseocuprea	(Hope, 1846)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Diphucrania		4
https://biodiversity.org.au/afd/taxa/0519208b-fe23-41e0-ab67-e1320ab89d30	Diphucrania stigmata	(Gory & Laporte, 1839)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Diphucrania		2
https://biodiversity.org.au/afd/taxa/a064e0ce-9140-4ab1-a143-bacc1835e9ee	Diphucrania tyrrhena	(Carter, 1923)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Diphucrania		11
https://biodiversity.org.au/afd/taxa/ebec0833-c589-4fd2-82a5-610853df11c9	Diphucrania viridiceps	(Kerremans, 1898)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Diphucrania		1
https://biodiversity.org.au/afd/taxa/c437f86d-edcd-44c3-b2f7-4fda1d11b316	Diplacodes bipunctata	(Brauer, 1865)	species	Animalia	Arthropoda	Insecta	Odonata	Libellulidae	Diplacodes		15
https://biodiversity.org.au/afd/taxa/0c6260a5-59f2-4feb-8372-db2138b29fc3	Diplacodes haematodes	(Burmeister, 1839)	species	Animalia	Arthropoda	Insecta	Odonata	Libellulidae	Diplacodes		2
https://biodiversity.org.au/afd/taxa/4f9d014d-1d42-4751-890f-5cc4e1880bf4	Diplodactylus granariensis	Storr, 1979	species	Animalia	Chordata	Reptilia	Squamata	Diplodactylidae	Diplodactylus	Wheat-belt Stone Gecko	1
https://biodiversity.org.au/afd/taxa/a3345886-a655-4dd1-9256-65b8a4e91b08	Dolopsis chalcophragma	(Meyrick, 1889)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Dolopsis		4
https://biodiversity.org.au/afd/taxa/0995e2a7-3222-4fd6-ac14-3d53ca819176	Doratifera quadriguttata	(Walker, 1855)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Limacodidae	Doratifera		4
https://biodiversity.org.au/afd/taxa/2a4e373b-913a-4e2a-a53f-74828f6dae7e	Dromaius novaehollandiae	(Latham, 1790)	species	Animalia	Chordata	Aves	Struthioniformes	Casuariidae	Dromaius	Emu	20
https://biodiversity.org.au/afd/taxa/4084ab92-7a98-420a-a1da-fbb5b970006d	Drymaplaneta semivitta	(Walker, 1868)	species	Animalia	Arthropoda	Insecta	Blattodea	Blattidae	Drymaplaneta		1
https://biodiversity.org.au/afd/taxa/3900049b-f2de-47c7-838b-c571c71ba4c7	Earias paralella	T.P. Lucas, 1898	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nolidae	Earias		5
https://biodiversity.org.au/afd/taxa/8fd1977b-9edf-4ddf-b6cf-24a09db4d18c	Egretta novaehollandiae	(Latham, 1790)	species	Animalia	Chordata	Aves	Ciconiiformes	Ardeidae	Egretta	Matuka	18
https://biodiversity.org.au/afd/taxa/e382a431-801d-4a24-9a5a-03a262be9279	Elanus axillaris	(Latham, 1801)	species	Animalia	Chordata	Aves	Accipitriformes	Accipitridae	Elanus	Black-shouldered Kite	11
https://biodiversity.org.au/afd/taxa/1a5b5d24-d7b5-43e9-b2d7-15ff1821fc7e	Elapognathus coronatus	(Schlegel, 1837)	species	Animalia	Chordata	Reptilia	Squamata	Elapidae	Elapognathus	Western Crowned Snake	1
https://biodiversity.org.au/afd/taxa/4e105955-f831-45f9-9d93-8421ac4aca99	Eleale aulicodes	Gorham, 1876	species	Animalia	Arthropoda	Insecta	Coleoptera	Cleridae	Eleale		2
https://biodiversity.org.au/afd/taxa/7233b5af-d31d-4a44-b71b-85c9e27fd88f	Enchocrates phaedryntis	Meyrick, 1888	species	Animalia	Arthropoda	Insecta	Lepidoptera	Depressariidae	Enchocrates		6
https://biodiversity.org.au/afd/taxa/7afc2e38-ddbb-44d7-a0d0-0f2226094ad4	Endeolena aurinatella	(Walker, 1864)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Endeolena		1
https://biodiversity.org.au/afd/taxa/d2e4a111-e471-4a55-97c5-a2fd9175a22a	Endosimilis stilbealis	(Walker, 1859)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Endosimilis		1
https://biodiversity.org.au/afd/taxa/a2be3cbf-90b3-4ab9-aed6-0929d5862364	Endotricha pyrosalis	GuenÃ©e, 1854	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Endotricha		1
https://biodiversity.org.au/afd/taxa/b048f739-16e8-40d6-a86d-eca601c371b8	Enochrus (Methydrus) eyrensis	(Blackburn, 1895)	species	Animalia	Arthropoda	Insecta	Coleoptera	Hydrophilidae	Enochrus		2
https://biodiversity.org.au/afd/taxa/ea7087ca-2b95-4b8b-bbef-3090be7a9a96	Entometa fervens	(Walker, 1855)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Lasiocampidae	Entometa		4
https://biodiversity.org.au/afd/taxa/2edd024c-e0d5-4514-840f-24448eac13f3	Eochrois epidesma	(Meyrick, 1886)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Eochrois		1
https://biodiversity.org.au/afd/taxa/9b4ad548-8bb3-486a-ab0a-905506c463ea	Eolophus roseicapilla	(Vieillot, 1817)	species	Animalia	Chordata	Aves	Psittaciformes	Cacatuidae	Eolophus	Galah	58
https://biodiversity.org.au/afd/taxa/a390a6d9-ca4f-459f-8959-e9305918590e	Eopsaltria (Eopsaltria) griseogularis	Gould, 1838	species	Animalia	Chordata	Aves	Passeriformes	Petroicidae	Eopsaltria	Western Yellow Robin	1
https://biodiversity.org.au/afd/taxa/75e8b301-ddf9-42ef-8fae-65a1dfab2643	Eosphora najas	Ehrenberg, 1830	species	Animalia	Rotifera	Monogononta	Ploima	Notommatidae	Eosphora		1
https://biodiversity.org.au/afd/taxa/4a55b0ed-5e8c-49d7-8513-27288f4adb96	Epharpastis daedala	Meyrick, 1887	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tineodidae	Epharpastis		2
https://biodiversity.org.au/afd/taxa/441414e1-8259-4435-9813-77638e8abbd6	Ephestia elutella	(HÃ¼bner, 1796)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Ephestia		1
https://biodiversity.org.au/afd/taxa/ffffae21-3184-41f6-b8bd-a9fd358fdd87	Ephestiopsis oenobarella	(Meyrick, 1879)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Ephestiopsis		1
https://biodiversity.org.au/afd/taxa/2797eeb1-2ba7-424b-835a-357521235c3f	Epicoma contristis	HÃ¼bner, 1823	species	Animalia	Arthropoda	Insecta	Lepidoptera	Notodontidae	Epicoma		1
https://biodiversity.org.au/afd/taxa/b7e0118a-75e2-46db-b537-9058f7ba7356	Epicyme rubropunctaria	(Doubleday, 1843)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Epicyme		3
https://biodiversity.org.au/afd/taxa/ef0eebf7-35de-41cf-8091-77820287b8d1	Epiphyas liadelpha	(Meyrick, 1910)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Epiphyas		2
https://biodiversity.org.au/afd/taxa/e5afebdc-33cd-4e99-b4a2-f09fd12b76e7	Epiphyas postvittana	(Walker, 1863)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Epiphyas		3
https://biodiversity.org.au/afd/taxa/c95af018-43ab-43b8-8e14-037604db64f6	Epthianura (Epthianura) albifrons	(Jardine & Selby, 1828)	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Epthianura	White-fronted Chat	3
https://biodiversity.org.au/afd/taxa/140080d1-cb9c-4e80-9b8c-8e084ed413e2	Epthianura (Parepthianura) tricolor	Gould, 1841	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Epthianura	Crimson Chat	1
https://biodiversity.org.au/afd/taxa/4cecb93f-bdf5-4c87-9bce-159ba0a0a115	Epyaxa sodaliata	(Walker, 1862)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Epyaxa		4

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/863fe242-b3ac-4a53-9ee9-831535a6b2e7	Epyaxa subidaria	(GuenÃ©e, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Epyaxa		5
https://biodiversity.org.au/afd/taxa/8172ded2-e2a6-4a86-90b0-4702e7b66a6b	Equus (Asinus) asinus	Linnaeus, 1758	species	Animalia	Chordata	Mammalia	Perissodactyla	Equidae	Equus	Donkey	1
https://biodiversity.org.au/afd/taxa/89d4b12d-8aaf-4360-9638-674ab7291083	Eretes australis	(Erichson, 1842)	species	Animalia	Arthropoda	Insecta	Coleoptera	Dytiscidae	Eretes		1
https://biodiversity.org.au/afd/taxa/c2215594-23a7-4e56-bb81-38b6108f0dd1	Eriophora pustulosa	(Walckenaer, 1842)	species	Animalia	Arthropoda	Arachnida	Araneae	Araneidae	Eriophora		3
https://biodiversity.org.au/afd/taxa/8e4bd073-9dae-4ec0-b1f8-d82286cdeb7e	Eristalinus (Lathyrophthalmus) punctulatus	(Macquart, 1847)	species	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Eristalinus		1
https://biodiversity.org.au/afd/taxa/5d937df2-e9dc-43a1-b829-2087ca5529ff	Ethmostigmus rubripes	(Brandt, 1840)	species	Animalia	Arthropoda	Chilopoda	Scolopendromorpha	Scolopendridae	Ethmostigmus		1
https://biodiversity.org.au/afd/taxa/a2cded5f-7277-44e4-8c41-1b04dd8690c9	Ethonion breve	(Carter, 1923)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Ethonion		1
https://biodiversity.org.au/afd/taxa/6671d23d-f916-4bb5-a995-200a5b0968eb	Ethonion roei	(Saunders, 1868)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Ethonion		1
https://biodiversity.org.au/afd/taxa/a82a6581-a07c-4484-85f7-a7483ba8ef61	Etiella behrii	(Zeller, 1848)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Etiella		1
https://biodiversity.org.au/afd/taxa/4f5ab623-d62d-4df2-9cad-05a3857a5988	Etiella chrysoporella	Meyrick, 1879	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Etiella		7
https://biodiversity.org.au/afd/taxa/be0286d0-9062-436a-a18b-c8533484deb0	Eublemma inconspicua	(Walker, 1865)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Eublemma		9
https://biodiversity.org.au/afd/taxa/bb9ca04b-020d-4e1d-a71b-ccf52e57e6ae	Euchaetis inceptella	(Walker, 1864)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Euchaetis		1
https://biodiversity.org.au/afd/taxa/f4a754fc-9516-4d0d-943e-f3d76b65961e	Euchaetis iozona	(Lower, 1893)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Euchaetis		2
https://biodiversity.org.au/afd/taxa/f7b7f1c6-a408-4465-917a-f5748cd15573	Euchaetis metallota	Meyrick, 1883	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Euchaetis		12
https://biodiversity.org.au/afd/taxa/8c2a0fa4-5de4-463c-a4dc-f4f6f2617be0	Eucyclodes buprestaria	(GuenÃ©e, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Eucyclodes		2
https://biodiversity.org.au/afd/taxa/c5835a16-cb39-49df-a8e7-3f392c4eca89	Eucyclops edytae	Tang & Knott, 2009	species	Animalia	Arthropoda	Maxillopoda	Cyclopoida	Cyclopidae	Eucyclops	Copepod	1
https://biodiversity.org.au/afd/taxa/b5ed8bd3-8c30-4703-b08c-6b154fab63a3	Eudesmeola lawsoni	(R. Felder & Rogenhofer, 1874)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Eudesmeola		2
https://biodiversity.org.au/afd/taxa/9d1d87b5-5573-4578-8974-c9898dc341c3	Eulechria heliophanes	(Lower, 1894)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Eulechria		1
https://biodiversity.org.au/afd/taxa/22733091-ad72-4da0-9295-e57c5daa3d75	Eumerus obliquus	(Fabricius, 1805)	species	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Eumerus		1
https://biodiversity.org.au/afd/taxa/70140ef1-3513-45fe-9437-77b1b14a4df9	Euoniticellus fulvus	(Goeze, 1777)	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Euoniticellus		2
https://biodiversity.org.au/afd/taxa/58521ae6-c841-4aa0-a275-efe9d6b3068e	Euoniticellus intermedius	(Reiche, 1849)	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Euoniticellus	Northern Sandy Dung Beetle	31
https://biodiversity.org.au/afd/taxa/37be4f00-f299-4d5c-ab68-d3fefa879ea7	Euoniticellus pallipes	(Fabricius, 1781)	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Euoniticellus	Southern Sandy Dung Beetle	30
https://biodiversity.org.au/afd/taxa/2c9251b8-4256-4eef-ad8f-68313a3bd3ed	Euoplos inornatus	(Rainbow & Pulleine, 1918)	species	Animalia	Arthropoda	Arachnida	Araneae	Idiopidae	Euoplos	Inornate Trapdoor Spider (northern Jarrah Forest)	3
https://biodiversity.org.au/afd/taxa/c4148fa4-ca18-463d-b761-b2a37c5c109c	Euproctis niphobola	Turner, 1902	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Euproctis		2
https://biodiversity.org.au/afd/taxa/aed5e8e8-e92b-4225-a30d-aaf3b370db11	Eupselia beltera	Turner, 1947	species	Animalia	Arthropoda	Insecta	Lepidoptera	Hypertrophidae	Eupselia		1
https://biodiversity.org.au/afd/taxa/78761d15-64d4-4e91-badf-770770f7778b	Eupselia iridizona	Lower, 1899	species	Animalia	Arthropoda	Insecta	Lepidoptera	Hypertrophidae	Eupselia		1
https://biodiversity.org.au/afd/taxa/a4c5c306-8f2a-4218-bcc4-a1afee2b7ab7	Eurepa yumbena	Otte & Alexander, 1983	species	Animalia	Arthropoda	Insecta	Orthoptera	Gryllidae	Eurepa		1
https://biodiversity.org.au/afd/taxa/70a29d57-3aea-43e3-b675-98c01960979d	Falco (Falco) longipennis	Swainson, 1838	species	Animalia	Chordata	Aves	Falconiformes	Falconidae	Falco	Australian Hobby	2
https://biodiversity.org.au/afd/taxa/083b413f-8746-4788-8dc1-3da495d78a79	Falco (Hierofalco) peregrinus	Tunstall, 1771	species	Animalia	Chordata	Aves	Falconiformes	Falconidae	Falco	Duck Hawk	2
https://biodiversity.org.au/afd/taxa/0628244e-287b-4001-946e-5a41ef056f41	Falco (Ieracidea) berigora	Vigors & Horsfield, 1827	species	Animalia	Chordata	Aves	Falconiformes	Falconidae	Falco	Chicken Hawk	3
https://biodiversity.org.au/afd/taxa/8f6b91ae-4019-490c-a133-73acb05d25e8	Falco (Tinnunculus) cenchroides	Vigors & Horsfield, 1827	species	Animalia	Chordata	Aves	Falconiformes	Falconidae	Falco	Wala	16
https://biodiversity.org.au/afd/taxa/dc2918a1-3d48-4628-b156-cf38c14c6c97	Faveria tritalis	(Walker, 1863)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Faveria		16
https://biodiversity.org.au/afd/taxa/7de6b16a-f854-4b4b-88cf-81868ce74ad8	Felis catus	Linnaeus, 1758	species	Animalia	Chordata	Mammalia	Carnivora	Felidae	Felis	Cat	10
https://biodiversity.org.au/afd/taxa/24c0a166-87a3-47ce-a4a2-c1ee5941d82a	Fisera hypoleuca	(Turner, 1919)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Fisera		4
https://biodiversity.org.au/afd/taxa/bb53b420-0a1f-4a49-9d1e-2a6154c685a8	Fulica atra	Linnaeus, 1758	species	Animalia	Chordata	Aves	Gruiformes	Rallidae	Fulica	Eurasian Coot	2
https://biodiversity.org.au/afd/taxa/4cee8a8f-3848-4095-8734-254056585182	Galaxias occidentalis	Ogilby, 1899	species	Animalia	Chordata	Actinopterygii	Salmoniformes	Galaxiidae	Galaxias	Western Galaxias	1
https://biodiversity.org.au/afd/taxa/b5e44fea-a0a2-412b-a1f7-476b3c1e8e03	Gallinula (Gallinula) tenebrosa	Gould, 1846	species	Animalia	Chordata	Aves	Gruiformes	Rallidae	Gallinula	Dusky Moorhen	2
https://biodiversity.org.au/afd/taxa/e96c4568-a10f-4ea9-a741-a551b1f22bc1	Gambusia holbrooki	Girard, 1859	species	Animalia	Chordata	Actinopterygii	Cyprinodontiformes	Poeciliidae	Gambusia	Top Minnow	1
https://biodiversity.org.au/afd/taxa/48b55567-78e6-402a-b265-43c4adf565e8	Garrha absumptella	(Walker, 1864)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Garrha		1
https://biodiversity.org.au/afd/taxa/96041039-3f04-4e2f-b83d-1b5c8a68376d	Garrha carnea	(Zeller, 1855)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Garrha		4
https://biodiversity.org.au/afd/taxa/a8b54d4a-70b9-458a-80f4-79109fc46226	Garrha idiosema	(Turner, 1917)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Garrha		2
https://biodiversity.org.au/afd/taxa/8a8aec47-2e99-4a59-aea2-214c803f841c	Garrha mesodesma	(Meyrick, 1889)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Garrha		1
https://biodiversity.org.au/afd/taxa/c1cbc4ca-5b2a-4329-a9a8-b00181054bdb	Garrha oncospila	(Turner, 1946)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Garrha		1
https://biodiversity.org.au/afd/taxa/59a14540-36ab-4dec-86ff-329ec3ce2af0	Garrha platyporphyra	(Turner, 1946)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Garrha		2
https://biodiversity.org.au/afd/taxa/4fc894fa-7f87-40d9-b950-19e1ba40fd78	Garrha pudica	(Zeller, 1855)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Garrha		1
https://biodiversity.org.au/afd/taxa/1e037046-a99b-4282-8aa9-92bec2fc903b	Garrha rubella	(Turner, 1939)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Garrha		2
https://biodiversity.org.au/afd/taxa/00067a34-0239-42f0-9335-aed46533933f	Gasteruption breviscutum	Kieffer, 1911	species	Animalia	Arthropoda	Insecta	Hymenoptera	Gasteruptiidae	Gasteruption		1
https://biodiversity.org.au/afd/taxa/a505061e-e848-4f4b-810d-54fda5828a1b	Gastrina cristaria	GuenÃ©e, 1857	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Gastrina		1
https://biodiversity.org.au/afd/taxa/7ef23364-cb69-4935-84da-98752b8f835e	Gastrinodes argoplaca	(Meyrick, 1892)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Gastrinodes		8
https://biodiversity.org.au/afd/taxa/c18cc9f6-d13c-4b1d-ae6d-ee5b79750507	Gastrinodes bitaeniaria	(Le Guillou, 1841)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Gastrinodes		1
https://biodiversity.org.au/afd/taxa/febdd33c-9403-4fad-83fd-5d6d0753df9e	Gastrinopa xylistis	Lower, 1903	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Gastrinopa		4
https://biodiversity.org.au/afd/taxa/6ccdb357-d666-4097-b0f6-88bb1a392112	Gavicalis virescens	(Vieillot, 1817)	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Gavicalis	Singing Honeyeater	46
https://biodiversity.org.au/afd/taxa/64c33410-27eb-4e05-87e5-675c6aba13c5	Gehyra variegata	(DumÃ©ril & Bibron, 1836)	species	Animalia	Chordata	Reptilia	Squamata	Gekkonidae	Gehyra	Tree Dtella	3
https://biodiversity.org.au/afd/taxa/c875d96f-82a1-459b-ac49-35057cfa0e70	Geitoneura minyas	(Waterhouse & Lyell, 1914)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Geitoneura	Western Xenica	2
https://biodiversity.org.au/afd/taxa/d393da76-46e5-456e-b555-b80655cdd271	Genduara acedesta	(Turner, 1911)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Lasiocampidae	Genduara		4
https://biodiversity.org.au/afd/taxa/b619c53b-e671-4052-8b96-21e42037bbbe	Genduara subnotata	(Walker, 1869)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Lasiocampidae	Genduara		2
https://biodiversity.org.au/afd/taxa/75e90438-cf36-403e-9223-a7d4737b1fd1	Gerygone fusca	(Gould, 1838)	species	Animalia	Chordata	Aves	Passeriformes	Acanthizidae	Gerygone	Fuscous Warbler	70
https://biodiversity.org.au/afd/taxa/f0a6a2c3-adad-4c57-9cae-17956131ecf0	Gliciphila melanops	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Gliciphila	Tawny-crowned Honeyeater	2
https://biodiversity.org.au/afd/taxa/b07aed34-2184-4ce6-b8f3-106e477c7eb1	Glycyphana (Glycyphaniola) stolata	(Fabricius, 1781)	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Glycyphana		1
https://biodiversity.org.au/afd/taxa/30dfcca6-8f44-4913-b8ad-0dda0533b8be	Goniaea australasiae	(Leach, 1814)	species	Animalia	Arthropoda	Insecta	Orthoptera	Acrididae	Goniaea	Gumleaf Grasshopper	5
https://biodiversity.org.au/afd/taxa/ce17b284-d607-496a-992f-f3129bfd3997	Grallina cyanoleuca	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Monarchidae	Grallina	Magpie-lark	34
https://biodiversity.org.au/afd/taxa/ace0a82b-ba52-4b4d-93cb-a412010fddb0	Gryllotalpa australis	Erichson, 1842	species	Animalia	Arthropoda	Insecta	Orthoptera	Gryllotalpidae	Gryllotalpa		1
https://biodiversity.org.au/afd/taxa/4c642a6d-3dd9-41bd-bd6d-79c981d9c197	Gryllotalpa pluvialis	(MjÃ¶berg, 1913)	species	Animalia	Arthropoda	Insecta	Orthoptera	Gryllotalpidae	Gryllotalpa		1
https://biodiversity.org.au/afd/taxa/5291343e-fdeb-4a65-8ba5-928f5b96acf5	Gymnorhina tibicen	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Artamidae	Gymnorhina	Australian Magpie	119
https://biodiversity.org.au/afd/taxa/048eeb2a-2c2e-473b-8016-c7f6824e92b8	Habronestes bradleyi	(O.P.-Cambridge, 1869)	species	Animalia	Arthropoda	Arachnida	Araneae	Zodariidae	Habronestes		1
https://biodiversity.org.au/afd/taxa/31113d80-ed4f-4bb0-9a65-48080e4c6dd1	Haliastur sphenurus	(Vieillot, 1818)	species	Animalia	Chordata	Aves	Accipitriformes	Accipitridae	Haliastur	Whistling Eagle-hawk	4
https://biodiversity.org.au/afd/taxa/c97ec903-a388-468e-a5a5-fb2229a06340	Havinthus rufovarius	Bergroth, 1895	species	Animalia	Arthropoda	Insecta	Hemiptera	Reduviidae	Havinthus		1
https://biodiversity.org.au/afd/taxa/9a386f42-e1a0-4109-b295-969d6a6639b8	Hednota bivittella	(Donovan, 1805)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Hednota		1
https://biodiversity.org.au/afd/taxa/6407a890-1405-48e3-a945-d52796cb4f3f	Hednota crypsichroa	Lower, 1893	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Hednota		1
https://biodiversity.org.au/afd/taxa/8bd56c10-3d69-463b-a01f-597da65178ba	Hednota dichospila	(Turner, 1937)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Hednota		1
https://biodiversity.org.au/afd/taxa/8de28b31-050d-415a-95fc-cb561d2fb4cb	Hednota longipalpella	(Meyrick, 1879)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Hednota		6
https://biodiversity.org.au/afd/taxa/0fa027bf-cc4d-4c61-905a-4930ee94cf39	Hednota pedionoma	(Meyrick, 1885)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Hednota		2
https://biodiversity.org.au/afd/taxa/1e540286-d6f2-43a1-bf27-180858eb9f98	Helea perforata	(Latreille, 1817)	species	Animalia	Arthropoda	Insecta	Coleoptera	Tenebrionidae	Helea		3
https://biodiversity.org.au/afd/taxa/c1d18a1e-5aec-4441-aa3c-e0ac799f51e8	Heleioporus albopunctatus	Gray, 1841	species	Animalia	Chordata	Amphibia	Anura	Limnodynastidae	Heleioporus	Western Spotted Frog	3
https://biodiversity.org.au/afd/taxa/c527388c-1cc7-4a10-800a-243b5a2dcd3c	Heleioporus barycragus	Lee, 1967	species	Animalia	Chordata	Amphibia	Anura	Limnodynastidae	Heleioporus	Western Marsh Frog	4

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/cf991494-ccee-433d-b049-f2a0996a0a3b	Heleioporus eyrei	(Gray, 1845)	species	Animalia	Chordata	Amphibia	Anura	Limnodynastidae	Heleioporus	Moaning Frog	11
https://biodiversity.org.au/afd/taxa/16fcc761-685a-4527-b5e4-e6c7042ae2c6	Heleioporus inornatus	(Lee & Main, 1954)	species	Animalia	Chordata	Amphibia	Anura	Limnodynastidae	Heleioporus	Plains Frog	1
https://biodiversity.org.au/afd/taxa/643c69f3-d060-4f65-a48a-e8d8466aa60b	Helicoverpa armigera	(HÃ¼bner, 1808)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Helicoverpa		1
https://biodiversity.org.au/afd/taxa/5c55fcda-c856-4584-a07b-07f9eb7b8875	Helicoverpa punctigera	(Wallengren, 1860)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Helicoverpa		2
https://biodiversity.org.au/afd/taxa/5e0ff2a3-c0b4-49b6-8314-dfe9e790169d	Heliothis punctifera	Walker, 1857	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Heliothis		1
https://biodiversity.org.au/afd/taxa/146f01aa-333f-4744-a8a2-f90a8e9c6050	Hellula hydralis	GuenÃ©e, 1854	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Hellula		25
https://biodiversity.org.au/afd/taxa/b89f6072-46a2-4c1f-a417-fd45ee4d5c3f	Hemicordulia tau	(Selys, 1871)	species	Animalia	Arthropoda	Insecta	Odonata	Corduliidae	Hemicordulia		8
https://biodiversity.org.au/afd/taxa/1a132b29-a7e7-499f-8086-eba8a14c77b6	Hemiergis initialis	(Werner, 1910)	species	Animalia	Chordata	Reptilia	Squamata	Scincidae	Hemiergis	Southwestern Earless Skink	1
https://biodiversity.org.au/afd/taxa/630adc1f-a781-4aed-9785-ac67078ffd06	Hemiergis quadrilineata	(DumÃ©ril & Bibron, 1839)	species	Animalia	Chordata	Reptilia	Squamata	Scincidae	Hemiergis	Two-toed Earless Skink	1
https://biodiversity.org.au/afd/taxa/3e1b019f-3659-4c9e-8d45-3e7b357aac4b	Hesperotermes infrequens	(Hill, 1927)	species	Animalia	Arthropoda	Insecta	Blattodea	Termitidae	Hesperotermes		1
https://biodiversity.org.au/afd/taxa/de170309-275c-4b5d-9a27-48a93536ac5a	Heteronychus arator	(Fabricius, 1775)	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Heteronychus	African Black Beetle	1
https://biodiversity.org.au/afd/taxa/9c63e271-8a12-4ba0-93bd-1d687dd652a1	Heteropternis obscurella	(Blanchard, 1853)	species	Animalia	Arthropoda	Insecta	Orthoptera	Acrididae	Heteropternis		2
https://biodiversity.org.au/afd/taxa/e948fd99-7550-4d1b-866a-75666cc61f96	Heteroscenes pallidus	(Latham, 1801)	species	Animalia	Chordata	Aves	Cuculiformes	Cuculidae	Heteroscenes	Pallid Cuckoo	12
https://biodiversity.org.au/afd/taxa/805db4b0-5a73-472f-8a44-89721c4640fd	Heterotermes intermedius	Hill, 1932	species	Animalia	Arthropoda	Insecta	Blattodea	Rhinotermitidae	Heterotermes		1
https://biodiversity.org.au/afd/taxa/ebf62841-becb-4e3f-88c8-b5d41ccc9cbe	Heteroteucha kershawi	(Lower, 1893)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Heteroteucha		1
https://biodiversity.org.au/afd/taxa/b47a4ecd-416b-458c-886a-1dc3490e8175	Hieraaetus (Hieraaetus) morphnoides	(Gould, 1841)	species	Animalia	Chordata	Aves	Accipitriformes	Accipitridae	Hieraaetus	Little Eagle	3
https://biodiversity.org.au/afd/taxa/f44f30a7-f6ed-4479-bb61-98f932701328	Hippodamia variegata	(Goeze, 1777)	species	Animalia	Arthropoda	Insecta	Coleoptera	Coccinellidae	Hippodamia		1
https://biodiversity.org.au/afd/taxa/d9061bb7-6e32-4e47-bb5c-ebd6f1919ec0	Hippotion celerio	(Linnaeus, 1758)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Sphingidae	Hippotion		2
https://biodiversity.org.au/afd/taxa/4e118c73-06a7-4131-bd67-5da5d2d61fd7	Hirundo (Hirundo) neoxena	Gould, 1843	species	Animalia	Chordata	Aves	Passeriformes	Hirundinidae	Hirundo	Welcome Swallow	17
https://biodiversity.org.au/afd/taxa/4e11a86f-c82f-429e-a7bc-ad2c50c1bca9	Hobartina amblyiodes	(Turner, 1931)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Notodontidae	Hobartina		2
https://biodiversity.org.au/afd/taxa/0dad39b6-1188-4fe7-8e42-6ebf797f1794	Hoggicosa bicolor	(Hogg, 1905)	species	Animalia	Arthropoda	Arachnida	Araneae	Lycosidae	Hoggicosa		1
https://biodiversity.org.au/afd/taxa/b81a8dc8-b9e0-4851-81e3-89297aace5ca	Holconia westralia	Hirst, 1991	species	Animalia	Arthropoda	Arachnida	Araneae	Sparassidae	Holconia		21
https://biodiversity.org.au/afd/taxa/90e848e6-1ed2-49e2-bc7a-04572be79c8e	Holocnemus pluchii	(Scopoli, 1763)	species	Animalia	Arthropoda	Arachnida	Araneae	Pholcidae	Holocnemus		1
https://biodiversity.org.au/afd/taxa/08396e68-1686-479d-89f0-56360d145115	Hololepta (Hololepta) australica	Marseul, 1853	species	Animalia	Arthropoda	Insecta	Coleoptera	Histeridae	Hololepta		2
https://biodiversity.org.au/afd/taxa/61c83128-fc72-426f-95e0-15b870528c22	Homalictus (Homalictus) dotatus	(Cockerell, 1912)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Homalictus		6
https://biodiversity.org.au/afd/taxa/ce69a115-a5e4-4332-b737-23baf53f77e9	Hoplostega ochroma	(Meyrick, 1886)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Hoplostega		16
https://biodiversity.org.au/afd/taxa/96c19766-8f88-44af-ae41-8ad6d20c9cf1	Hydrophilus (Hydrophilus) albipes	Castelnau, 1840	species	Animalia	Arthropoda	Insecta	Coleoptera	Hydrophilidae	Hydrophilus		1
https://biodiversity.org.au/afd/taxa/5ac1cf3f-ff43-490d-ac23-ea3ca00005e3	Hygraula nitens	(Butler, 1880)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Hygraula		26
https://biodiversity.org.au/afd/taxa/7685fef2-1975-4417-b16a-91f991c9bee0	Hylaeus (Euprosopis) violaceus	(Smith, 1853)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus		10
https://biodiversity.org.au/afd/taxa/215bdb2f-083a-41d8-b632-f7afa5a949b9	Hylaeus (Euprosopoides) musgravei	Cockerell, 1929	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus		2
https://biodiversity.org.au/afd/taxa/ae509348-06f3-46a2-b661-4094a62bfb46	Hylaeus (Macrohylaeus) alcyoneus	(Erichson, 1842)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus		2
https://biodiversity.org.au/afd/taxa/d20497ec-daef-4804-8d57-375b1c8b9ad8	Hylaeus (Planihylaeus) quadriceps	(Smith, 1879)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus		2
https://biodiversity.org.au/afd/taxa/31169355-0a49-4be3-93a0-503448d6762a	Hylaeus (Prosopisteron) quadratus	(Smith, 1853)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus		2
https://biodiversity.org.au/afd/taxa/6da97c42-23e2-435a-ba9f-f3f1432fa1c4	Hylaeus (Prosopisteron) sanguinipictus	(Cockerell, 1914)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus		2
https://biodiversity.org.au/afd/taxa/c2e705dd-ac7a-4beb-8af6-6b5eaf068630	Hyleoides zonalis	Smith, 1853	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hyleoides		4
https://biodiversity.org.au/afd/taxa/092b9246-16a8-461b-ac39-4363bebc9ce9	Hypertropha chlaenota	Meyrick, 1887	species	Animalia	Arthropoda	Insecta	Lepidoptera	Hypertrophidae	Hypertropha		3
https://biodiversity.org.au/afd/taxa/4e213a56-e4cf-461a-96d5-62b19ac1e401	Hypobapta barnardi	Goldfinch, 1929	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Hypobapta		7
https://biodiversity.org.au/afd/taxa/8eedd21f-c32c-44c9-82ca-c354557eb81d	Hypoperigea tonsa	(GuenÃ©e, 1852)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Hypoperigea		3
https://biodiversity.org.au/afd/taxa/11fa5231-a17e-4d72-bd5f-d0a63ec4975e	Hypoprora tyra	(Swinhoe, 1902)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Hypoprora		1
https://biodiversity.org.au/afd/taxa/bd136580-4ebe-4749-b652-3cfd934679a3	Hypsidia niphosema	(Lower, 1908)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Drepanidae	Hypsidia		3
https://biodiversity.org.au/afd/taxa/7361418f-6c31-47c3-9975-171c924b37e8	Icerya acaciae	(Morrison & Morrison, 1923)	species	Animalia	Arthropoda	Insecta	Hemiptera	Monophlebidae	Icerya		1
https://biodiversity.org.au/afd/taxa/224aad53-2948-4f19-b326-0cdd3eba4d44	Idaea costaria	(Walker, 1863)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Idaea		9
https://biodiversity.org.au/afd/taxa/3965ccbe-1b54-44b2-a8de-2039b2227ba1	Idaea inversata	(GuenÃ©e, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Idaea		10
https://biodiversity.org.au/afd/taxa/63a9074f-5f2e-4f8f-a80f-4c1aa0d90b02	Idaea philocosma	(Meyrick, 1888)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Idaea		3
https://biodiversity.org.au/afd/taxa/3f2bff77-e834-46ca-8bd5-adba797a1bfb	Idiodes apicata	GuenÃ©e, 1857	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Idiodes		1
https://biodiversity.org.au/afd/taxa/259086df-3dba-4f1c-989c-356eb82a056d	Idiodes idiocrossa	(Turner, 1947)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Idiodes		1
https://biodiversity.org.au/afd/taxa/cd1d1b8a-dea2-4df1-af19-a7aaa41ea89a	Idiommata blackwallii	(O.P.-Cambridge, 1870)	species	Animalia	Arthropoda	Arachnida	Araneae	Barychelidae	Idiommata		1
https://biodiversity.org.au/afd/taxa/d955c860-024c-489e-89dc-158a50e0ed3e	Idiosoma jarrah	Rix & Harvey, 2018	species	Animalia	Arthropoda	Arachnida	Araneae	Idiopidae	Idiosoma		2
https://biodiversity.org.au/afd/taxa/bb832480-4122-4475-b3b7-22f637c9c7db	Iphierga macarista	Turner, 1917	species	Animalia	Arthropoda	Insecta	Lepidoptera	Psychidae	Iphierga		6
https://biodiversity.org.au/afd/taxa/eba0227f-f618-41b7-b5f6-1e4041ae1d5c	Ischnura aurora	(Brauer, 1865)	species	Animalia	Arthropoda	Insecta	Odonata	Coenagrionidae	Ischnura		3
https://biodiversity.org.au/afd/taxa/de3bdeb9-41ec-4566-b676-9a1bfb579362	Ischnura heterosticta	(Burmeister, 1839)	species	Animalia	Arthropoda	Insecta	Odonata	Coenagrionidae	Ischnura		1
https://biodiversity.org.au/afd/taxa/7078f0b5-759e-448e-94a6-a9ffb93ba61b	Isomoralla curriculata	(Meyrick, 1920)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Isomoralla		1
https://biodiversity.org.au/afd/taxa/7ab4afa0-70ec-4a57-8429-7299ea4440eb	Isoodon fusciventer	(J.E. Gray, 1841)	species	Animalia	Chordata	Mammalia	Peramelemorphia	Peramelidae	Isoodon	Quenda	3
https://biodiversity.org.au/afd/taxa/260436e4-342d-4e7d-b2a3-f26003586d04	Isopeda leishmanni	Hogg, 1903	species	Animalia	Arthropoda	Arachnida	Araneae	Sparassidae	Isopeda		1
https://biodiversity.org.au/afd/taxa/5820f14a-6524-4b5e-8c29-7b8092a77ad4	Isopedella cana	(Simon, 1908)	species	Animalia	Arthropoda	Arachnida	Araneae	Sparassidae	Isopedella		1
https://biodiversity.org.au/afd/taxa/17213008-d097-4fe4-b191-8da0371271e2	Isturgia penthearia	(GuenÃ©e, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Isturgia		16
https://biodiversity.org.au/afd/taxa/c27d2d2d-1c9f-4f42-8d04-3097e30a2562	Junonia villida	(Fabricius, 1787)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Junonia	Meadow Argus	10
https://biodiversity.org.au/afd/taxa/751c4197-55cb-4e3c-bc52-3f308bf33e83	Kahaono wallacei	Evans, 1966	species	Animalia	Arthropoda	Insecta	Hemiptera	Cicadellidae	Kahaono		1
https://biodiversity.org.au/afd/taxa/bf8d2470-6c86-4483-b695-51fa1a373ec1	Kalotermes aemulus	Sewell & Gay, 1978	species	Animalia	Arthropoda	Insecta	Blattodea	Kalotermitidae	Kalotermes		1
https://biodiversity.org.au/afd/taxa/c29d7af4-2592-48b6-9e88-5fd0cfcb03e6	Kobonga umbrimargo	(Walker, 1858)	species	Animalia	Arthropoda	Insecta	Hemiptera	Cicadidae	Kobonga		1
https://biodiversity.org.au/afd/taxa/92358f59-80ae-482f-8979-5679b23e92cc	Lalage (Lalage) tricolor	(Swainson, 1825)	species	Animalia	Chordata	Aves	Passeriformes	Campephagidae	Lalage	Australian White-winged Triller	1
https://biodiversity.org.au/afd/taxa/e5757d76-2787-40dd-9880-80902f6f8956	Lancetes lanceolatus	(Clark, 1863)	species	Animalia	Arthropoda	Insecta	Coleoptera	Dytiscidae	Lancetes		2
https://biodiversity.org.au/afd/taxa/bed0da1d-99da-4bed-92ed-4c61441389f8	Lasioglossum (Chilalictus) castor	Walker, 1995	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		2
https://biodiversity.org.au/afd/taxa/a859dc81-d181-4e09-9630-153f2e448c45	Lasioglossum (Chilalictus) chapmani	(Cockerell, 1910)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		1
https://biodiversity.org.au/afd/taxa/71854944-f7e7-4e10-989d-59298c2f7515	Lasioglossum (Chilalictus) ebeneum	Walker, 1995	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		7
https://biodiversity.org.au/afd/taxa/1959f400-eee7-4719-8a60-538af420b1bc	Lasioglossum (Chilalictus) hemichalceum	(Cockerell, 1923)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		32
https://biodiversity.org.au/afd/taxa/8634ccfb-2dea-48d4-8853-6f91018440f2	Lasioglossum (Chilalictus) lanarium	(Smith, 1853)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		5
https://biodiversity.org.au/afd/taxa/49f8cdc0-d524-4569-bd9c-b2393e328b60	Lasioglossum (Chilalictus) mirandum	(Cockerell, 1914)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		5
https://biodiversity.org.au/afd/taxa/b3ec75ad-a607-4515-b8a8-e1f330e38b80	Lasioglossum (Chilalictus) plebeium	(Cockerell, 1914)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		1
https://biodiversity.org.au/afd/taxa/8c202b37-bd9d-404d-8456-3e0d663033f2	Lasioglossum (Chilalictus) supralucens	(Cockerell, 1916)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		2
https://biodiversity.org.au/afd/taxa/8b99e834-14c3-4aa2-8c5f-a10c55688998	Lasioglossum (Chilalictus) vitripenne	(Smith, 1879)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		1
https://biodiversity.org.au/afd/taxa/422b9adc-ce80-423f-b708-43f58670785d	Lasioglossum (Parasphecodes) hiltacum	(Smith, 1853)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		23
https://biodiversity.org.au/afd/taxa/867c5363-04e2-454f-bb6f-ff06713e2737	Lasioglossum (Parasphecodes) lichatum	(Smith, 1853)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum		2
https://biodiversity.org.au/afd/taxa/c7d8dbc8-dcde-4182-85ba-907182f95ea9	Latrodectus hasseltii	Thorell, 1870	species	Animalia	Arthropoda	Arachnida	Araneae	Theridiidae	Latrodectus	Jockey Spider	8
https://biodiversity.org.au/afd/taxa/bda16534-6079-4d93-a36a-659bad74ae72	Leioproctus (Andrenopsis) douglasiellus	Michener, 1965	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Leioproctus	A Short-tongued Bee	9
https://biodiversity.org.au/afd/taxa/b5f1ca19-d69a-4fe9-b62b-edda5264f559	Leioproctus (Colletellus) velutinellus	Michener, 1965	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Leioproctus		1
https://biodiversity.org.au/afd/taxa/7036b0ec-7f13-4825-9a06-304242bc985a	Leioproctus (Colletopsis) contrarius	Michener, 1965	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Leioproctus	A Short-tongued Bee	2
https://biodiversity.org.au/afd/taxa/b7532c47-337f-4071-9d1f-afb1bac2a5b1	Leioproctus (Exleycolletes) microdontus	(Cockerell, 1929)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Leioproctus		2
https://biodiversity.org.au/afd/taxa/f37def20-f4b9-4fd5-b14b-83b2e0f51e20	Lepidurus apus	(Linnaeus, 1758)	species	Animalia	Arthropoda	Branchiopoda	Notostraca	Triopsidae	Lepidurus		1

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/36c9b836-29a5-43d3-8427-06ec942d75a3	Leponosandrus lepismoides	(Walker, 1871)	species	Animalia	Arthropoda	Insecta	Orthoptera	Anostostomatidae	Leponosandrus		1
https://biodiversity.org.au/afd/taxa/78c96276-bff1-43f7-a8e5-fbca2249965b	Leptocneria reducta	(Walker, 1855)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Leptocneria		1
https://biodiversity.org.au/afd/taxa/f4bdd4ee-47b1-4aa2-b359-81ae94e17269	Leucania diatrecta	Butler, 1886	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Leucania		8
https://biodiversity.org.au/afd/taxa/b17388f8-4468-4a91-b434-659bf3739561	Lialis burtonis	Gray, 1835	species	Animalia	Chordata	Reptilia	Squamata	Pygopodidae	Lialis	Burton's Snake-lizard	2
https://biodiversity.org.au/afd/taxa/ada6105e-c2de-4b93-9687-8e64d10863a7	Lichmera (Lichmera) indistincta	(Vigors & Horsfield, 1827)	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Lichmera	Brown Honeyeater	117
https://biodiversity.org.au/afd/taxa/dfff5b7a-3f00-4ce7-a9f6-1af927f14848	Limbodessus inornatus	(Sharp, 1882)	species	Animalia	Arthropoda	Insecta	Coleoptera	Dytiscidae	Limbodessus		1
https://biodiversity.org.au/afd/taxa/26e63f8d-45e7-4aac-bd73-d1a754421349	Limnaecia chionospila	Meyrick, 1897	species	Animalia	Arthropoda	Insecta	Lepidoptera	Cosmopterigidae	Limnaecia		4
https://biodiversity.org.au/afd/taxa/ac5ce2ed-f580-4aa7-a037-690b9f9fbf99	Limnodynastes dorsalis	(Gray, 1841)	species	Animalia	Chordata	Amphibia	Anura	Limnodynastidae	Limnodynastes	Western Banjo Frog	8
https://biodiversity.org.au/afd/taxa/dc3a97c6-d284-4627-8e85-8afaa3bb7fa8	Limnoxenus zealandicus	(Broun, 1880)	species	Animalia	Arthropoda	Insecta	Coleoptera	Hydrophilidae	Limnoxenus		4
https://biodiversity.org.au/afd/taxa/78225c2e-2fd0-48fe-b8d7-9ee2106c8906	Liparetrus striatus	Blanchard, 1850	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Liparetrus		6
https://biodiversity.org.au/afd/taxa/1a2d7242-f1d6-46d4-925a-a7ac5d9a2434	Lipotriches (Austronomia) australica	(Smith, 1875)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lipotriches		41
https://biodiversity.org.au/afd/taxa/96dd7eb9-d9d1-4083-a454-cc473fffe1c9	Lipotriches (Austronomia) flavoviridis	(Cockerell, 1905)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lipotriches		78
https://biodiversity.org.au/afd/taxa/d7f6c1e6-2c4a-42d3-9885-93742ff71f98	Lissomma postcarneata	(Prout, 1910)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Lissomma		6
https://biodiversity.org.au/afd/taxa/9e602831-9ffb-4491-83bb-fafcf96fc3fe	Lissopimpla excelsa	(Costa, 1864)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae	Lissopimpla		1
https://biodiversity.org.au/afd/taxa/cfed1332-ab8f-4009-8949-90aa3630ba67	Litoria adelaidensis	(Gray, 1841)	species	Animalia	Chordata	Amphibia	Anura	Hylidae	Litoria	Slender Tree Frog	15
https://biodiversity.org.au/afd/taxa/2f87aff4-450a-41a7-afe3-5f1423236b68	Litoria moorei	(Copland, 1957)	species	Animalia	Chordata	Amphibia	Anura	Hylidae	Litoria	Motorbike Frog	6
https://biodiversity.org.au/afd/taxa/715a2874-1942-4762-866c-1194990e7a91	Lophoictinia isura	(Gould, 1838)	species	Animalia	Chordata	Aves	Accipitriformes	Accipitridae	Lophoictinia	Square-tailed Kite	2
https://biodiversity.org.au/afd/taxa/659162c3-5cb2-4f8f-94f4-bb1cc3b6425c	Loweria platydesma	(Lower, 1901)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Loweria		4
https://biodiversity.org.au/afd/taxa/4f8d196e-6b81-44cb-beeb-64cd15c2ae19	Lychas marmoreus	(C.L. Koch, 1845)	species	Animalia	Arthropoda	Arachnida	Scorpiones	Buthidae	Lychas		7
https://biodiversity.org.au/afd/taxa/0eb43903-cf30-4e93-9a53-1eb3318087b3	Macrobathra alternatella	(Walker, 1864)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Cosmopterigidae	Macrobathra		3
https://biodiversity.org.au/afd/taxa/7a402ec9-f9f3-46f4-9cb1-701e0188c921	Macropus fuliginosus	(Desmarest, 1817)	species	Animalia	Chordata	Mammalia	Diprotodontia	Macropodidae	Macropus	Western Grey Kangaroo	49
https://biodiversity.org.au/afd/taxa/5a0997f4-c48c-4353-a66f-dd557119ec5c	Mallada signatus	(Schneider, 1851)	species	Animalia	Arthropoda	Insecta	Neuroptera	Chrysopidae	Mallada		1
https://biodiversity.org.au/afd/taxa/a6f866fa-5b13-4b6d-a134-6abd20fa572f	Malurus (Leggeornis) pulcherrimus	Gould, 1844	species	Animalia	Chordata	Aves	Passeriformes	Maluridae	Malurus	Blue-breasted Fairy-wren	2
https://biodiversity.org.au/afd/taxa/702a989c-9e87-40d5-9694-e6b94dc6521e	Malurus (Malurus) splendens	(Quoy & Gaimard, 1830)	species	Animalia	Chordata	Aves	Passeriformes	Maluridae	Malurus	Splendid Fairy-wren	142
https://biodiversity.org.au/afd/taxa/41cdea6a-9c0f-4b64-b59c-53822470a4da	Malurus (Musciparus) leucopterus	Dumont, 1824	species	Animalia	Chordata	Aves	Passeriformes	Maluridae	Malurus	White-winged Fairy-wren	1
https://biodiversity.org.au/afd/taxa/5c0d591a-0a98-48c6-8a4b-f925d43521cd	Manorina (Myzantha) flavigula	(Gould, 1840)	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Manorina	Yellow-throated Miner	4
https://biodiversity.org.au/afd/taxa/1f701f08-4aed-4edf-a45e-1d18a659182f	Maratus pavonis	(Dunn, 1947)	species	Animalia	Arthropoda	Arachnida	Araneae	Salticidae	Maratus		7
https://biodiversity.org.au/afd/taxa/a6861226-214e-400e-8ca3-23b127054480	Megachile (Eutricharaea) chrysopyga	Smith, 1853	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		18
https://biodiversity.org.au/afd/taxa/120c7497-f842-4b02-a2ed-36f7e318d931	Megachile (Eutricharaea) macularis	Dalla Torre, 1896	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		24
https://biodiversity.org.au/afd/taxa/0bc334cd-5caa-41f9-8af3-da9b3aad910e	Megachile (Eutricharaea) obtusa	Smith, 1853	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		22
https://biodiversity.org.au/afd/taxa/1a9bd784-a0c8-46a8-9e8c-0fabc4da9273	Megachile (Eutricharaea) serricauda	Cockerell, 1910	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		8
https://biodiversity.org.au/afd/taxa/4bff5ae8-c3d5-443f-8103-7d32270ea7ff	Megachile (Hackeriapis) tosticauda	Cockerell, 1912	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		1
https://biodiversity.org.au/afd/taxa/9f8cdb0f-0c09-456a-8fb1-6f5949828b82	Megachile (Schizomegachile) monstrosa	Smith, 1868	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		2
https://biodiversity.org.au/afd/taxa/a60cbf8f-5096-41ec-b9d0-df308a864f89	Megachile apicata	Smith, 1853	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		2
https://biodiversity.org.au/afd/taxa/f4bad98b-a1fe-449c-95c9-575972fa43d0	Megachile aurifrons	Smith, 1853	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		13
https://biodiversity.org.au/afd/taxa/34154a4f-ab12-4980-9c76-4ac51081e143	Megachile clypeata	Smith, 1853	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		2
https://biodiversity.org.au/afd/taxa/f437a84e-ce1e-4565-8b6c-4154b4fe4209	Megachile fultoni	Cockerell, 1913	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		2
https://biodiversity.org.au/afd/taxa/a2665ace-ee67-4396-8f4d-f2497e9550f4	Megachile ignita	Smith, 1853	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		20
https://biodiversity.org.au/afd/taxa/02513e18-9841-4ceb-8ecf-576793a3449c	Megachile latericauda	Cockerell, 1921	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		2
https://biodiversity.org.au/afd/taxa/8d05b465-6b60-4cc6-8753-3083471a7f48	Megachile preissi	Cockerell, 1910	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		2
https://biodiversity.org.au/afd/taxa/f11f7314-65fb-4702-9173-938be01eb2e1	Megachile semiluctuosa	Smith, 1853	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		2
https://biodiversity.org.au/afd/taxa/90848061-77fe-4881-b9a7-f59e2ad7e95b	Megachile speluncarum	Meade-Waldo, 1915	species	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile		6
https://biodiversity.org.au/afd/taxa/b9802dbc-b97b-40fa-8025-8ad985506554	Megacmonotus magnus	(McLachlan, 1871)	species	Animalia	Arthropoda	Insecta	Neuroptera	Ascalaphidae	Megacmonotus		2
https://biodiversity.org.au/afd/taxa/a4a4001b-66c8-421b-92b3-078e80414c6d	Megalorhipida leucodactyla	(Fabricius, 1794)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pterophoridae	Megalorhipida		4
https://biodiversity.org.au/afd/taxa/4560f190-f134-485d-880b-27bf7960f0bb	Megaporus howittii	(Clark, 1862)	species	Animalia	Arthropoda	Insecta	Coleoptera	Dytiscidae	Megaporus		1
https://biodiversity.org.au/afd/taxa/623f0c55-e927-42a7-b0e6-220fec9d9691	Melangyna (Austrosyrphus) viridiceps	(Macquart, 1847)	species	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Melangyna		2
https://biodiversity.org.au/afd/taxa/7b537819-13c2-4974-969e-c95c6b00201d	Melanodryas (Melanodryas) cucullata	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Petroicidae	Melanodryas	Hooded Robin	1
https://biodiversity.org.au/afd/taxa/bdcc0acc-980a-4f51-b8c0-85447ce59bea	Melithreptus (Eidopsarus) brevirostris	(Vigors & Horsfield, 1827)	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Melithreptus	Brown-headed Honeyeater	4
https://biodiversity.org.au/afd/taxa/95efb4b0-67a8-4093-8bda-d55b2fa836be	Melithreptus (Melithreptus) lunatus	(Vieillot, 1802)	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Melithreptus	White-naped Honeyeater	1
https://biodiversity.org.au/afd/taxa/087e16f8-32a3-4e92-ac89-71a7483d15c4	Melobasis costipennis	Kerremans, 1898	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Melobasis		4
https://biodiversity.org.au/afd/taxa/683687f5-c7db-4447-a51a-34d8797c5d0b	Melobasis cuprifera	(Laporte & Gory, 1837)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Melobasis		1
https://biodiversity.org.au/afd/taxa/26271d50-30a1-457f-8ff5-f987231964bd	Melobasis gloriosa	(Laporte & Gory, 1837)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Melobasis		1
https://biodiversity.org.au/afd/taxa/ce8a3b07-0dae-4be2-9ecc-666abb2f85fd	Melobasis lathami	(Laporte & Gory, 1837)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Melobasis		9
https://biodiversity.org.au/afd/taxa/c1e8ec0e-a05a-4633-a60f-e0cd1539365d	Melobasis rubromarginata	Saunders, 1876	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Melobasis		3
https://biodiversity.org.au/afd/taxa/715b2939-34de-4ac6-bac3-62c7f3972292	Melobasis uniformis	Carter, 1923	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Melobasis		1
https://biodiversity.org.au/afd/taxa/3ef95407-5296-4235-bd98-4d0021569089	Melobasis vittata	Blackburn, 1887	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Melobasis		1
https://biodiversity.org.au/afd/taxa/dba6cff0-686f-4c61-a263-a4ba54dc2cc1	Menemerus bivittatus	(Dufour, 1831)	species	Animalia	Arthropoda	Arachnida	Araneae	Salticidae	Menemerus		1
https://biodiversity.org.au/afd/taxa/ada5e2b7-1b23-410d-a3cf-1a81853a7de8	Menetia greyii	Gray, 1845	species	Animalia	Chordata	Reptilia	Squamata	Scincidae	Menetia	Common Dwarf Skink	2
https://biodiversity.org.au/afd/taxa/fd6c27dc-bb92-4345-aa0f-467baaef0d54	Meritastis pyrosemana	(Meyrick, 1881)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Meritastis		3
https://biodiversity.org.au/afd/taxa/67234716-4e6c-4380-a559-f0fb4e68c696	Merophyas divulsana	(Walker, 1863)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Merophyas		1
https://biodiversity.org.au/afd/taxa/9f9ddea7-8c74-46df-8ed9-3233d681e354	Merops (Merops) ornatus	Latham, 1801	species	Animalia	Chordata	Aves	Coraciiformes	Meropidae	Merops	Rainbow Bee-eater	20
https://biodiversity.org.au/afd/taxa/5fb8f066-4b41-48be-a021-aa3ddf3ad2d5	Mesodina cyanophracta	Lower, 1911	species	Animalia	Arthropoda	Insecta	Lepidoptera	Hesperiidae	Mesodina	Blue Iris-skipper	3
https://biodiversity.org.au/afd/taxa/55f2faa7-94dc-4a2c-9c49-c7665f6c90a4	Metaballus frontalis	(Walker, 1869)	species	Animalia	Arthropoda	Insecta	Orthoptera	Tettigoniidae	Metaballus		4
https://biodiversity.org.au/afd/taxa/d81938e8-7972-4d68-8a1b-5701b9a17a05	Metaparagia maculata	(Meade-Waldo, 1910)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Metaparagia		6
https://biodiversity.org.au/afd/taxa/7f86301f-3992-4650-88f4-25f17d14897c	Metioche vittaticollis	(StÃ¥l, 1861)	species	Animalia	Arthropoda	Insecta	Orthoptera	Trigonidiidae	Metioche		1
https://biodiversity.org.au/afd/taxa/39dcb491-26b8-42bd-bade-f199025506a0	Meyriccia latro	(Zeller, 1873)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Meyriccia		6
https://biodiversity.org.au/afd/taxa/0b7c528a-4104-4a96-853e-05a37c327067	Microcarbo melanoleucos	(Vieillot, 1817)	species	Animalia	Chordata	Aves	Pelecaniformes	Phalacrocoracidae	Microcarbo	Little Cormorant	7
https://biodiversity.org.au/afd/taxa/77e3b031-9fba-4789-8e85-5f459d9f76d4	Microcerotermes serratus	(Froggatt, 1898)	species	Animalia	Arthropoda	Insecta	Blattodea	Termitidae	Microcerotermes		1
https://biodiversity.org.au/afd/taxa/64d63ac4-ae2d-4477-a433-fecf32fa6d86	Microdes squamulata	GuenÃ©e, 1857 [1858]	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Microdes		1
https://biodiversity.org.au/afd/taxa/5f6beca9-ce09-4110-9626-8f17b07f8888	Microdes villosata	GuenÃ©e, 1857	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Microdes		4
https://biodiversity.org.au/afd/taxa/316c5ff9-137b-4356-a46d-5d136aecb1d1	Microeca (Microeca) fascinans	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Petroicidae	Microeca	Jacky Winter	1
https://biodiversity.org.au/afd/taxa/5be359c8-dff8-4709-935e-db9c764cdda0	Micromus tasmaniae	(Walker, 1860)	species	Animalia	Arthropoda	Insecta	Neuroptera	Hemerobiidae	Micromus		1
https://biodiversity.org.au/afd/taxa/de272308-a7fb-46cf-bcfd-1bc245862c9b	Mictis profana	(Fabricius, 1803)	species	Animalia	Arthropoda	Insecta	Hemiptera	Coreidae	Mictis	Crusader Bug	1
https://biodiversity.org.au/afd/taxa/ffd0b271-5135-4a10-9c76-555669ca7200	Mimaglossa nauplialis	(Walker, 1859)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Mimaglossa		3
https://biodiversity.org.au/afd/taxa/e746c95b-8681-4e7c-813d-b82c17a71dee	Miniargiolestes minimus	(Tillyard, 1908)	species	Animalia	Arthropoda	Insecta	Odonata	Megapodagrionidae	Miniargiolestes		5
https://biodiversity.org.au/afd/taxa/b7da8abe-b0a1-4c34-ac00-01f08832f1c6	Missulena granulosa	(O.P.-Cambridge, 1869)	species	Animalia	Arthropoda	Arachnida	Araneae	Actinopodidae	Missulena		3
https://biodiversity.org.au/afd/taxa/528ed023-e74a-4b91-82cb-170b3bef9a34	Mnesampela privata	(GuenÃ©e, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Mnesampela		4

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/a2ca35ec-6541-450b-83d4-506ea5bd7017	Moerarchis clathrata	(R. Felder & Rogenhofer, 1875)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tineidae	Moerarchis		19
https://biodiversity.org.au/afd/taxa/29766037-e53a-4786-904a-462c221c010b	Mogulones larvatus	(Schultze, 1897)	species	Animalia	Arthropoda	Insecta	Coleoptera	Curculionidae	Mogulones	Paterson's Curse Crown Weevil	1
https://biodiversity.org.au/afd/taxa/595bc07a-1bbf-4220-830e-5c14a5a8f742	Monistria discrepans	(Walker, 1871)	species	Animalia	Arthropoda	Insecta	Orthoptera	Pyrgomorphidae	Monistria	Common Pyrgomorph	1
https://biodiversity.org.au/afd/taxa/a76d0963-5f6c-4ceb-9ad9-657084199b34	Monopis crocicapitella	(Clemens, 1859)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tineidae	Monopis		2
https://biodiversity.org.au/afd/taxa/f6f6d149-b76d-4e58-aa3c-7f9406175b45	Monopis icterogastra	(Zeller, 1852)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tineidae	Monopis		3
https://biodiversity.org.au/afd/taxa/7a39c977-3c87-4d6d-842f-9844d0c9ccd7	Monopis meliorella	(Walker, 1863)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tineidae	Monopis		13
https://biodiversity.org.au/afd/taxa/e57c5e45-a109-49ff-9539-2b3d7583ced1	Morethia obscura	Storr, 1972	species	Animalia	Chordata	Reptilia	Squamata	Scincidae	Morethia	Shrubland Morethia Skink	2
https://biodiversity.org.au/afd/taxa/941a2703-db06-494e-9d53-7820948e5ec9	Morosaphycita oculiferella	(Meyrick, 1879)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Morosaphycita		1
https://biodiversity.org.au/afd/taxa/cc44be1d-e4b1-4ab8-a95a-ba9c0dd08714	Munychryia periclyta	Common & McFarland, 1970	species	Animalia	Arthropoda	Insecta	Lepidoptera	Anthelidae	Munychryia		1
https://biodiversity.org.au/afd/taxa/107696b5-063c-4c09-a015-6edfdb6f4d52	Mus musculus	Linnaeus, 1758	species	Animalia	Chordata	Mammalia	Rodentia	Muridae	Mus	House Mouse	2
https://biodiversity.org.au/afd/taxa/1b11ebd1-7e44-4d81-8c12-7141ffddfc78	Myiagra (Seisura) inquieta	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Monarchidae	Myiagra	Restless Flycatcher	2
https://biodiversity.org.au/afd/taxa/2f7f8115-ead6-4e62-bb8c-e49ae2fd3b93	Myrmecia gratiosa	Clark, 1951	species	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Myrmecia		1
https://biodiversity.org.au/afd/taxa/397a4f2e-c8ed-4428-bda1-476530c66a14	Myrmecia gulosa	(Fabricius, 1775)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Myrmecia		1
https://biodiversity.org.au/afd/taxa/1490b47c-2908-4093-9a84-45c4138c2fd0	Myrmecia mandibularis	Smith, 1858	species	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Myrmecia		3
https://biodiversity.org.au/afd/taxa/72b56966-ff6a-4c5b-9919-a71c1145c191	Myrmecia vindex	Smith, 1858	species	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Myrmecia		2
https://biodiversity.org.au/afd/taxa/0841e0b8-f03a-42d8-8bbe-76b4fc7d520e	Mythimna (Pseudaletia) convecta	(Walker, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Mythimna		1
https://biodiversity.org.au/afd/taxa/dc38b13f-aca3-4e90-9420-607582807260	Nacaduba biocellata	(C. & R. Felder, 1865)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Lycaenidae	Nacaduba	Two-spotted Line-blue	5
https://biodiversity.org.au/afd/taxa/8b2912ee-b480-4308-854a-528b30e8dc59	Nacoleia mesochlora	(Meyrick, 1884)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Nacoleia		2
https://biodiversity.org.au/afd/taxa/6388c877-2bde-4fd9-8fb0-067ae333e79b	Nacoleia rhoeoalis	(Walker, 1859)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Nacoleia		4
https://biodiversity.org.au/afd/taxa/8b97af4e-a0ef-44d5-87ee-3aced755cca0	Nannophya dalei	(Tillyard, 1908)	species	Animalia	Arthropoda	Insecta	Odonata	Libellulidae	Nannophya		5
https://biodiversity.org.au/afd/taxa/9d860493-5392-4d8e-a242-eac9dbe36b84	Nearcha dasyzona	(Lower, 1903)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Nearcha		3
https://biodiversity.org.au/afd/taxa/1afb535b-e3e8-442c-b341-1cdb8e70ecfa	Nearcha pseudophaes	Lower, 1893	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Nearcha		3
https://biodiversity.org.au/afd/taxa/fc7dfe09-fa38-4b12-af6a-27a815572a3e	Nearcha staurotis	Meyrick, 1890	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Nearcha		1
https://biodiversity.org.au/afd/taxa/7c6e50b1-4931-4f90-a43e-552cf71dcb65	Necterosoma darwini	(Babington, 1841)	species	Animalia	Arthropoda	Insecta	Coleoptera	Dytiscidae	Necterosoma		1
https://biodiversity.org.au/afd/taxa/8b1eb1bb-9fdb-4ef7-b2a3-2874072c7b07	Neelaps bimaculatus	(DumÃ©ril, Bibron & DumÃ©ril, 1854)	species	Animalia	Chordata	Reptilia	Squamata	Elapidae	Neelaps	Black-naped Snake	6
https://biodiversity.org.au/afd/taxa/ef82ba0e-0d48-447e-963d-40517d3b25f9	Neelaps calonotus	(DumÃ©ril, Bibron & DumÃ©ril, 1854)	species	Animalia	Chordata	Reptilia	Squamata	Elapidae	Neelaps	Black-striped Burrowing Snake	3
https://biodiversity.org.au/afd/taxa/b9af926f-c8e2-41ce-b1aa-8cef8d131d82	Nematobola isorista	Meyrick, 1893	species	Animalia	Arthropoda	Insecta	Lepidoptera	Roeslerstammiidae	Nematobola		1
https://biodiversity.org.au/afd/taxa/22541be5-9e4b-43c5-85d9-1454ef8fc505	Neocuris discoflava	Fairmaire, 1877	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Neocuris		10
https://biodiversity.org.au/afd/taxa/4a04512b-b357-4e2b-9dad-374c5c7d2b84	Neocuris thoracica	Fairmaire, 1877	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Neocuris		3
https://biodiversity.org.au/afd/taxa/d3e1f2df-ce9b-4e42-ab17-ac74aa0e954c	Neolucia agricola	(Westwood, 1851)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Lycaenidae	Neolucia	Fringed Blue	1
https://biodiversity.org.au/afd/taxa/908e6ef4-de96-4951-a603-cb62caae6fdc	Neophema (Neonanodes) elegans	(Gould, 1838)	species	Animalia	Chordata	Aves	Psittaciformes	Psittacidae	Neophema	Elegant Parrot	2
https://biodiversity.org.au/afd/taxa/68fc5ba7-463f-4a86-8314-e42a5a8d0455	Ninox (Ninox) boobook	(Latham, 1801)	species	Animalia	Chordata	Aves	Strigiformes	Strigidae	Ninox		1
https://biodiversity.org.au/afd/taxa/856ed4e8-dbcf-487f-80c8-9c78591d2ff6	Ninox (Ninox) novaeseelandiae	(Gmelin, 1788)	species	Animalia	Chordata	Aves	Strigiformes	Strigidae	Ninox	Southern Boobook	2
https://biodiversity.org.au/afd/taxa/f32525fc-1691-4749-94af-659627756eac	Nisista serrata	(Walker, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Nisista		1
https://biodiversity.org.au/afd/taxa/c6db8a47-6be3-4943-9952-b56c75db5ab0	Nola celaenephes	(Turner, 1944)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nolidae	Nola		3
https://biodiversity.org.au/afd/taxa/7752f54b-1b72-486e-8011-785945b06c45	Nola euraphes	(Turner, 1944)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nolidae	Nola		1
https://biodiversity.org.au/afd/taxa/229de5a2-b185-4bb6-ad99-551cc4d9c099	Nola eurylopha	Turner, 1944	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nolidae	Nola		2
https://biodiversity.org.au/afd/taxa/f3e4be9c-6811-4df9-aef0-12e4a29dd4ad	Nola pothina	Turner, 1944	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nolidae	Nola		1
https://biodiversity.org.au/afd/taxa/55e89bf4-7e57-4cfb-bc86-a6d85f77e7ed	Nola pycnopasta	(Turner, 1944)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nolidae	Nola		13
https://biodiversity.org.au/afd/taxa/5e75008a-4ead-4d59-b784-4bf586a9d88d	Nomophila corticalis	(Walker, 1869)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Nomophila		4
https://biodiversity.org.au/afd/taxa/d968d4e0-11a2-4f15-a6bc-3756e6418e6f	Notamacropus irma	(Jourdan, 1837)	species	Animalia	Chordata	Mammalia	Diprotodontia	Macropodidae	Notamacropus	Western Brush Wallaby	1
https://biodiversity.org.au/afd/taxa/9e6273e9-5b3f-44ae-9ad6-319d1362d01a	Nothorhaphium aemulans	(Becker, 1922)	species	Animalia	Arthropoda	Insecta	Diptera	Dolichopodidae	Nothorhaphium		1
https://biodiversity.org.au/afd/taxa/467ed571-2ea5-43b7-b594-178d483b5154	Notiobia (Anisotarsus) dampierii	(Castelnau, 1867)	species	Animalia	Arthropoda	Insecta	Coleoptera	Carabidae	Notiobia		2
https://biodiversity.org.au/afd/taxa/56e85231-a01d-4db9-b0d7-89481f09f3e6	Nyctemera amicus	(White, 1841)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Nyctemera		1
https://biodiversity.org.au/afd/taxa/c5126b2c-3118-46a9-a21a-8b95b28596fc	Nycterephes anthracica	(Lower, 1905)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Nycterephes		3
https://biodiversity.org.au/afd/taxa/dec8c88f-7f20-4f30-b2af-c75d09fb066c	Nycticorax caledonicus	(Gmelin, 1789)	species	Animalia	Chordata	Aves	Ciconiiformes	Ardeidae	Nycticorax	Crane	3
https://biodiversity.org.au/afd/taxa/054b8aa4-fd1e-42ec-b103-094624ff5c1b	Nyctophilus geoffroyi	Leach, 1821	species	Animalia	Chordata	Mammalia	Chiroptera	Vespertilionidae	Nyctophilus	Lesser Long-eared Bat	1
https://biodiversity.org.au/afd/taxa/7b31b043-a8c7-4e48-9681-dcea0569d8db	Nyssus coloripes	Walckenaer, 1805	species	Animalia	Arthropoda	Arachnida	Araneae	Corinnidae	Nyssus		3
https://biodiversity.org.au/afd/taxa/2118456c-631c-4c4c-b995-72ce9d40d16e	Occasitermes occasus	(Silvestri, 1909)	species	Animalia	Arthropoda	Insecta	Blattodea	Termitidae	Occasitermes		1
https://biodiversity.org.au/afd/taxa/96a7e1ef-d604-4331-97a2-0d99cab925ae	Ochrogaster lunifer	Herrich-SchÃ¤ffer, [1855]	species	Animalia	Arthropoda	Insecta	Lepidoptera	Notodontidae	Ochrogaster		3
https://biodiversity.org.au/afd/taxa/0eff7442-3f34-40ba-8b60-9d52ec5d3578	Ocirrhoe dallasi	Gross, 1975	species	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Ocirrhoe		1
https://biodiversity.org.au/afd/taxa/a7b00ef0-108f-44d9-bf89-a062c8674335	Ocyphaps lophotes	(Temminck, 1822)	species	Animalia	Chordata	Aves	Columbiformes	Columbidae	Ocyphaps	Crested Pigeon	11
https://biodiversity.org.au/afd/taxa/d8af29b8-05d6-451a-ac51-ba27f3aa07b7	Oecobius navus	Blackwall, 1859	species	Animalia	Arthropoda	Arachnida	Araneae	Oecobiidae	Oecobius		4
https://biodiversity.org.au/afd/taxa/7c160670-01f6-45ed-8d51-f3aeabdf774a	Oenochroma pallida	Warren, 1898	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Oenochroma		1
https://biodiversity.org.au/afd/taxa/a3e148b8-2a20-4d4b-8467-ac7d27fd15d9	Oenochroma vinaria	GuenÃ©e, 1857	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Oenochroma		2
https://biodiversity.org.au/afd/taxa/908da9f7-4e75-4bdb-82a1-de5107d4b736	Oenosandra boisduvalii	Newman, 1856	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oenosandridae	Oenosandra		5
https://biodiversity.org.au/afd/taxa/3a561002-ef17-4bc5-9c86-f41b2658b3a3	Ogyris amaryllis	Hewitson, 1862	species	Animalia	Arthropoda	Insecta	Lepidoptera	Lycaenidae	Ogyris	Amaryllis Azure	3
https://biodiversity.org.au/afd/taxa/6e61b4ab-a84f-42e7-ad78-d2f84c02d3bb	Ommatoiulus moreleti	(Lucas, 1860)	species	Animalia	Arthropoda	Diplopoda	Julida	Julidae	Ommatoiulus		3
https://biodiversity.org.au/afd/taxa/fe5365be-9cbe-4519-b1de-ea668c40b8ff	Onitis alexis	Klug, 1835	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Onitis	Bronze Dung Beetle	23
https://biodiversity.org.au/afd/taxa/2b165243-c341-4395-8360-0d18c76a27db	Onitis aygulus	(Fabricius, 1781)	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Onitis		18
https://biodiversity.org.au/afd/taxa/5abd68a7-7b33-4e1f-9d37-97aff4f8b209	Onitis caffer	Boheman, 1857	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Onitis		9
https://biodiversity.org.au/afd/taxa/261409ca-6d6b-476f-8f9e-fa7e22f23972	Onthophagus binodis	Thunberg, 1818	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Onthophagus	Humpbacked Dung Beetle	2
https://biodiversity.org.au/afd/taxa/3ad08ff9-e24f-4234-8a57-33c045caff1a	Onthophagus ferox	Harold, 1867	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Onthophagus	Western Dung Beetle	8
https://biodiversity.org.au/afd/taxa/01fc01b5-45c5-46aa-8bf1-e9526211f7fe	Onthophagus taurus	(Schreber, 1759)	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Onthophagus	Bullhorned Dung Beetle	40
https://biodiversity.org.au/afd/taxa/ba72b1cb-a2f8-431c-b75c-b15494851978	Orthetrum caledonicum	(Brauer, 1865)	species	Animalia	Arthropoda	Insecta	Odonata	Libellulidae	Orthetrum		5
https://biodiversity.org.au/afd/taxa/4df73026-423d-4a0f-a9c5-cb82f319167f	Orthodera ministralis	(Fabricius, 1775)	species	Animalia	Arthropoda	Insecta	Mantodea	Mantidae	Orthodera	Green Mantid	2
https://biodiversity.org.au/afd/taxa/692effa3-b719-495f-a86f-ce89e2981652	Oryctolagus cuniculus	(Linnaeus, 1758)	species	Animalia	Chordata	Mammalia	Lagomorpha	Leporidae	Oryctolagus	Rabbit	6
https://biodiversity.org.au/afd/taxa/6f0e0562-211a-4a01-bf38-6f481070dec5	Oxyopes gracilipes	(White, 1849)	species	Animalia	Arthropoda	Arachnida	Araneae	Oxyopidae	Oxyopes		1
https://biodiversity.org.au/afd/taxa/378bdcd1-f52a-4907-9f71-0541b05437da	Pachycephala (Alisterornis) rufiventris	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Pachycephalidae	Pachycephala	Rufous Whistler	61
https://biodiversity.org.au/afd/taxa/f3522116-9bfc-483a-b765-fee8b17fb100	Pachycephala (Pachycephala) occidentalis	E.P. Ramsay, 1878	species	Animalia	Chordata	Aves	Passeriformes	Pachycephalidae	Pachycephala	Western Whistler	9
https://biodiversity.org.au/afd/taxa/30edbd1a-6367-4d84-87f1-3566e6cc54d6	Pachycephala (Pachycephala) pectoralis	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Pachycephalidae	Pachycephala	Golden Whistler	14
https://biodiversity.org.au/afd/taxa/93b89e13-504e-4459-ad50-a66c5a614e2c	Pachyplocia griseata	Warren, 1896	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Pachyplocia		2

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/de179f89-9593-4f0a-bdc0-d3945e9e01c9	Pachysaga australis	(Walker, 1869)	species	Animalia	Arthropoda	Insecta	Orthoptera	Tettigoniidae	Pachysaga		1
https://biodiversity.org.au/afd/taxa/46905981-7b21-4d6d-a61d-71f882e5634c	Pantydia capistrata	T.P. Lucas, 1894	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Pantydia		1
https://biodiversity.org.au/afd/taxa/c7a1ad76-0826-46fe-94c7-09d0e7a8b30a	Pantydia diemeni	GuenÃ©e, 1852	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Pantydia		3
https://biodiversity.org.au/afd/taxa/598aa06d-0a19-4c4c-96c6-b60b094bcc59	Pantydia sparsa	GuenÃ©e, 1852	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Pantydia		3
https://biodiversity.org.au/afd/taxa/b8098726-68e8-418e-be5a-d3cb03f7a163	Paracolletes (Anthoglossa) nigrocinctus	Cockerell, 1914	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Paracolletes		2
https://biodiversity.org.au/afd/taxa/3153b97b-1bdd-4338-98b6-cea694974b83	Paracolletes (Paracolletes) crassipes	Smith, 1853	species	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Paracolletes		6
https://biodiversity.org.au/afd/taxa/62326504-c699-4f73-9423-9b0b539c11a2	Paracyclops intermedius	Tang & Knott, 2009	species	Animalia	Arthropoda	Maxillopoda	Cyclopoida	Cyclopidae	Paracyclops	Copepod	8
https://biodiversity.org.au/afd/taxa/773e594e-74c9-498f-b671-40472fe6c29d	Paraoxypilus tasmaniensis	Saussure, 1870	species	Animalia	Arthropoda	Insecta	Mantodea	Amorphoscelidae	Paraoxypilus		1
https://biodiversity.org.au/afd/taxa/eedd1767-9b38-4f83-80ba-a8cbe6867550	Parapalaeosepsis plebeia	(De Meijere, 1906)	species	Animalia	Arthropoda	Insecta	Diptera	Sepsidae	Parapalaeosepsis		1
https://biodiversity.org.au/afd/taxa/f6c69e1f-2966-410e-ac19-185ae3dfb77c	Pararguda nasuta	(Lewin, 1805)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Lasiocampidae	Pararguda		2
https://biodiversity.org.au/afd/taxa/e3103245-2da1-4cc5-952d-49153f466bbf	Pardalotus (Pardalotinus) striatus	(Gmelin, 1789)	species	Animalia	Chordata	Aves	Passeriformes	Pardalotidae	Pardalotus	Striated Pardalote	51
https://biodiversity.org.au/afd/taxa/5254fe03-630b-44b2-9233-df51a7b8f25f	Pardalotus (Pardalotus) punctatus	(Shaw, 1792)	species	Animalia	Chordata	Aves	Passeriformes	Pardalotidae	Pardalotus	Spotted Pardalote	3
https://biodiversity.org.au/afd/taxa/032ef633-e508-4fd9-b0c6-58ca1b0bd545	Paropsis blandina	Blackburn, 1901	species	Animalia	Arthropoda	Insecta	Coleoptera	Chrysomelidae	Paropsis		1
https://biodiversity.org.au/afd/taxa/17e198fd-93d4-4e43-b664-da368bad137f	Paropsis latona	Blackburn, 1901	species	Animalia	Arthropoda	Insecta	Coleoptera	Chrysomelidae	Paropsis		2
https://biodiversity.org.au/afd/taxa/8f5b5c15-9a70-45f5-852b-caa490123d72	Paropsisterna basalis	(Chapuis, 1877)	species	Animalia	Arthropoda	Insecta	Coleoptera	Chrysomelidae	Paropsisterna		2
https://biodiversity.org.au/afd/taxa/eaa3f132-9191-4cce-83a2-8129ae075469	Paropsisterna crocata	(Boisduval, 1835)	species	Animalia	Arthropoda	Insecta	Coleoptera	Chrysomelidae	Paropsisterna		2
https://biodiversity.org.au/afd/taxa/a2399fe3-c90f-4fb1-a710-fe81643ff56e	Parvipsitta porphyrocephala	(Dietrichsen, 1837)	species	Animalia	Chordata	Aves	Psittaciformes	Psittacidae	Parvipsitta	Purple-crowned Lorikeet	1
https://biodiversity.org.au/afd/taxa/1c610d7e-660c-4309-bf90-d9341d8213f1	Pasiphilodes testulata	(GuenÃ©e, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Pasiphilodes		2
https://biodiversity.org.au/afd/taxa/43abe3ea-7ccc-41cc-920f-d9cfa107207e	Pelecanus conspicillatus	Temminck, 1824	species	Animalia	Chordata	Aves	Pelecaniformes	Pelecanidae	Pelecanus	Australian Pelican	2
https://biodiversity.org.au/afd/taxa/12521f6f-d06c-4f05-bc88-ac56877c4a1e	Pentasteron securifer	Baehr & JocquÃ©, 2001	species	Animalia	Arthropoda	Arachnida	Araneae	Zodariidae	Pentasteron		1
https://biodiversity.org.au/afd/taxa/92948586-2ae2-4dca-83e9-c4112863aaa6	Peraglyphis scepasta	Common, 1963	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Peraglyphis		10
https://biodiversity.org.au/afd/taxa/d6d43d2a-b1f5-4022-81db-7dcc8d4d2f11	Perga brullei	Westwood, 1880	species	Animalia	Arthropoda	Insecta	Hymenoptera	Pergidae	Perga		1
https://biodiversity.org.au/afd/taxa/c2a0beb5-ab72-4669-b933-df478bb0d6d3	Persectania ewingii	(Westwood, 1839)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Persectania		1
https://biodiversity.org.au/afd/taxa/e23e308f-870b-4d6c-b3c8-5a1e18bd2dc0	Persicoptera pulchrinalis	(GuenÃ©e, 1854)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Persicoptera		2
https://biodiversity.org.au/afd/taxa/e0da46e4-450b-4ded-ba66-2afe81ef28b5	Petalura hesperia	Watson, 1958	species	Animalia	Arthropoda	Insecta	Odonata	Petaluridae	Petalura		10
https://biodiversity.org.au/afd/taxa/7d38efed-12ce-4aa3-b51a-67f89b109ded	Petrochelidon (Hylochelidon) nigricans	(Vieillot, 1817)	species	Animalia	Chordata	Aves	Passeriformes	Hirundinidae	Petrochelidon	Tree Martin	38
https://biodiversity.org.au/afd/taxa/f29f01e6-0bfe-4621-b068-42dac6c758dc	Petrochelidon (Petrochelidon) ariel	(Gould, 1842)	species	Animalia	Chordata	Aves	Passeriformes	Hirundinidae	Petrochelidon	Fairy Martin	3
https://biodiversity.org.au/afd/taxa/a3e5376b-f9e6-4bdf-adae-1e7add9f5c29	Petroica (Petroica) boodang	(Lesson, 1838)	species	Animalia	Chordata	Aves	Passeriformes	Petroicidae	Petroica	Scarlet Robin	72
https://biodiversity.org.au/afd/taxa/10dbd908-00f3-4ec2-9a9c-a2fd4782eaf1	Petroica (Petroica) goodenovii	(Vigors & Horsfield, 1827)	species	Animalia	Chordata	Aves	Passeriformes	Petroicidae	Petroica	Red-capped Robin	19
https://biodiversity.org.au/afd/taxa/29472c00-22e3-42c3-b562-107bd28d1bdc	Phalacrocorax (Phalacrocorax) carbo	(Linnaeus, 1758)	species	Animalia	Chordata	Aves	Pelecaniformes	Phalacrocoracidae	Phalacrocorax	Great Cormorant	1
https://biodiversity.org.au/afd/taxa/c96b19fd-2a54-4361-a5cf-baecf741310e	Phalacrocorax (Phalacrocorax) sulcirostris	(Brandt, 1837)	species	Animalia	Chordata	Aves	Pelecaniformes	Phalacrocoracidae	Phalacrocorax	Little Black Cormorant	1
https://biodiversity.org.au/afd/taxa/55994a9e-8ba7-4ff9-89a2-e22586ab25d1	Phalacrocorax (Phalacrocorax) varius	(Gmelin, 1789)	species	Animalia	Chordata	Aves	Pelecaniformes	Phalacrocoracidae	Phalacrocorax	Black-and-white Shag	1
https://biodiversity.org.au/afd/taxa/b300c30c-39fe-4ed3-ab12-4fff02818d0f	Phallaria ophiusaria	GuenÃ©e, 1857	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Phallaria		1
https://biodiversity.org.au/afd/taxa/7da6fd6f-c180-4e68-b9e7-70d02e6f8448	Phaps (Phaps) chalcoptera	(Latham, 1790)	species	Animalia	Chordata	Aves	Columbiformes	Columbidae	Phaps	Common Bronzewing	61
https://biodiversity.org.au/afd/taxa/b6930f29-3f26-415e-a760-c12c320c2931	Phascogale tapoatafa	(Meyer, 1793)	species	Animalia	Chordata	Mammalia	Dasyuromorphia	Dasyuridae	Phascogale	Brush-tailed Phascogale	1
https://biodiversity.org.au/afd/taxa/8899ed59-044b-4ae8-a741-0c29bedb7975	Phaulacridium vittatum	(SjÃ¶stedt, 1920)	species	Animalia	Arthropoda	Insecta	Orthoptera	Acrididae	Phaulacridium	Wingless Grasshopper	1
https://biodiversity.org.au/afd/taxa/869dfe23-30b7-4605-a74e-cfc812e1f6e4	Philobota xanthastis	(Meyrick, 1889)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Philobota		17
https://biodiversity.org.au/afd/taxa/4b4e014a-9e2e-44f1-9d9e-a1912e8e3b7b	Philotarsopsis guttata	(Tillyard, 1923)	species	Animalia	Arthropoda	Insecta	Psocodea	Philotarsidae	Philotarsopsis		1
https://biodiversity.org.au/afd/taxa/8da02929-14b3-4b61-9840-7bcf196fe9f5	Phlogistus agraphus	Elston, 1922	species	Animalia	Arthropoda	Insecta	Coleoptera	Cleridae	Phlogistus		1
https://biodiversity.org.au/afd/taxa/0cf87549-56ab-44a0-9dae-98a9152228d6	Pholcus phalangioides	(Fuesslin, 1775)	species	Animalia	Arthropoda	Arachnida	Araneae	Pholcidae	Pholcus		3
https://biodiversity.org.au/afd/taxa/20743a8a-4e99-4bb5-887c-deb16ac9e9cb	Phoracantha punctata	(Donovan, 1805)	species	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Phoracantha		2
https://biodiversity.org.au/afd/taxa/bf610eb5-3521-4788-87ee-a5315edd986a	Phoracantha semipunctata	(Fabricius, 1775)	species	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Phoracantha		3
https://biodiversity.org.au/afd/taxa/4e971936-cff5-4877-a113-b5bd5f07d28a	Phrissogonus laticostata	(Walker, 1862)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Phrissogonus		24
https://biodiversity.org.au/afd/taxa/ccd1aa1a-371d-446c-bc13-971d839f8f7f	Phryganeutis cinerea	Meyrick, 1884	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Phryganeutis		4
https://biodiversity.org.au/afd/taxa/148208ff-e6ea-40bd-9999-9f1a6b8acc1e	Phylidonyris (Meliornis) niger	(Bechstein, 1811)	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Phylidonyris	White-cheeked Honeyeater	113
https://biodiversity.org.au/afd/taxa/da002998-b551-4328-ac4e-5e04fc72708b	Phylidonyris (Meliornis) novaehollandiae	(Latham, 1790)	species	Animalia	Chordata	Aves	Passeriformes	Meliphagidae	Phylidonyris	New Holland Honeyeater	47
https://biodiversity.org.au/afd/taxa/fa6229c1-7d13-4717-b036-fe0a667ef870	Phyllococerus purpurascens	Waterhouse, 1876	species	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Phyllococerus		1
https://biodiversity.org.au/afd/taxa/26f469e3-8e38-4f52-8b37-ad5817ef8493	Physeema convergens	(Walker, 1850)	species	Animalia	Arthropoda	Insecta	Hemiptera	Cicadidae	Physeema		3
https://biodiversity.org.au/afd/taxa/96fbc0ed-c0ea-4d4e-884f-1deaa862ecb2	Phytotrypa anazancla	(Meyrick, 1889)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Phytotrypa		3
https://biodiversity.org.au/afd/taxa/934ecab5-798d-45b9-bade-16b3380d08a0	Pieris rapae	(Linnaeus, 1758)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pieridae	Pieris	Cabbage White Butterfly	9
https://biodiversity.org.au/afd/taxa/2e16e72c-bed7-42a7-b8b0-0ad30f5e252a	Piloprepes antidoxa	Meyrick, 1889	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Piloprepes		2
https://biodiversity.org.au/afd/taxa/5e56298f-4aa9-4c3a-ae3b-8729f9e2ac32	Pison tibiale	Smith, 1869	species	Animalia	Arthropoda	Insecta	Hymenoptera	Crabronidae	Pison		1
https://biodiversity.org.au/afd/taxa/3dd39f84-1293-4c04-ac87-2474f5c887b0	Platalea (Platibis) flavipes	Gould, 1838	species	Animalia	Chordata	Aves	Ciconiiformes	Threskiornithidae	Platalea	Yellow-legged Spoonbill	3
https://biodiversity.org.au/afd/taxa/12efe8e2-13c3-4551-8c7c-2fd6923b0d9e	Platycercus (Violania) icterotis	(Temminck & Kuhl, 1820)	species	Animalia	Chordata	Aves	Psittaciformes	Psittacidae	Platycercus	Western Rosella	1
https://biodiversity.org.au/afd/taxa/6d49aa09-3cf7-450c-92f8-468369b87b81	Platynectes (Platynectes) aenescens	Sharp, 1882	species	Animalia	Arthropoda	Insecta	Coleoptera	Dytiscidae	Platynectes		2
https://biodiversity.org.au/afd/taxa/a5f83a90-288d-4f93-ad46-5a6e3018da19	Plebs cyphoxis	(Simon, 1908)	species	Animalia	Arthropoda	Arachnida	Araneae	Araneidae	Plebs		3
https://biodiversity.org.au/afd/taxa/a3d7cc8f-0883-4ce0-bd25-b06dcebc01cf	Plectophila thrasycosma	(Meyrick, 1915)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Plectophila		1
https://biodiversity.org.au/afd/taxa/0a4129c5-26c9-4fa2-824d-9a70126164b0	Plesanemma fucata	(R. Felder & Rogenhofer, 1875)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Plesanemma		2
https://biodiversity.org.au/afd/taxa/10a966de-78df-48be-89bc-172646a5abd8	Plesiolaea maritima	(Lower, 1897)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Plesiolaea		1
https://biodiversity.org.au/afd/taxa/6617f80d-3f99-46d7-9567-534d79a98108	Pletholax gracilis	Cope, 1864	species	Animalia	Chordata	Reptilia	Squamata	Pygopodidae	Pletholax	Keeled Legless Lizard	1
https://biodiversity.org.au/afd/taxa/6bf208a1-338f-41a0-82a7-d817918d4a2f	Plotiopsis balonnensis	(Conrad, 1850)	species	Animalia	Mollusca	Gastropoda	Cerithimorpha	Thiaridae	Plotiopsis	Gastropod	1
https://biodiversity.org.au/afd/taxa/0e526884-3eb4-490c-9362-3eb8065ee0d4	Plutella xylostella	(Linnaeus, 1758)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Plutellidae	Plutella		6
https://biodiversity.org.au/afd/taxa/ac48e985-2adb-4c1e-bce9-39906cf6761d	Podalonia tydei	(Le Guillou, 1841)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Sphecidae	Podalonia		1
https://biodiversity.org.au/afd/taxa/8bec5cc6-ac31-4d23-9df3-856034968af9	Podargus strigoides	(Latham, 1801)	species	Animalia	Chordata	Aves	Caprimulgiformes	Podargidae	Podargus	Tawny Frogmouth	1
https://biodiversity.org.au/afd/taxa/f2562e04-de31-42b2-bd6f-39a257e79464	Podomyrma adelaidae	(Smith, 1858)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Podomyrma		3
https://biodiversity.org.au/afd/taxa/07ad3a7a-19af-4f2f-8022-54d78159edd5	Poecilasthena anthodes	(Meyrick, 1891)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Poecilasthena		1
https://biodiversity.org.au/afd/taxa/523cecf0-ce09-4e08-b7c2-fa8731544617	Poecilasthena pulchraria	(Doubleday, 1843)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Poecilasthena		7
https://biodiversity.org.au/afd/taxa/ad2e304f-70f9-4a7c-9cc6-c519817fcb0b	Poecilasthena xylocyma	(Meyrick, 1891)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Poecilasthena		8
https://biodiversity.org.au/afd/taxa/b373ab3c-2a15-4644-b975-142dfecdb815	Poecilometis apicalis	(Westwood, 1837)	species	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Poecilometis		1
https://biodiversity.org.au/afd/taxa/a3dcddc8-c8c4-47be-b54e-8e0f7777566c	Poecilometis patruelis	StÃ¥l, 1860	species	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Poecilometis		1
https://biodiversity.org.au/afd/taxa/f777ebe8-250f-4b8e-9e25-b5944a2ea023	Pogona minor	(Sternfeld, 1919)	species	Animalia	Chordata	Reptilia	Squamata	Agamidae	Pogona	Dwarf Bearded Dragon	1
https://biodiversity.org.au/afd/taxa/e27d813a-0e26-45c5-9396-687d368a2c37	Polistes (Polistella) humilis	(Fabricius, 1781)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Polistes	Common Paper Wasp	7
https://biodiversity.org.au/afd/taxa/3134a393-7059-4099-a417-45ff499e1836	Polistes (Polistella) stigma	(Fabricius, 1793)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Polistes		1

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/7fcc9d58-823e-4095-9ca2-512ef3b93e4b	Polistes (Polistes) dominulus	(Christ, 1791)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Polistes		1
https://biodiversity.org.au/afd/taxa/928f9b98-d671-4c9d-8ffc-0698b21271f9	Pollanisus cupreus	Walker, 1854	species	Animalia	Arthropoda	Insecta	Lepidoptera	Zygaenidae	Pollanisus		2
https://biodiversity.org.au/afd/taxa/4aa8a4c4-b71e-474a-8338-7cb97849f6ff	Pollanisus viridipulverulenta	(GuÃ©rin-MÃ©neville, 1839)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Zygaenidae	Pollanisus		1
https://biodiversity.org.au/afd/taxa/171b0bfe-3afa-42bf-91ac-5cd85d3e43d1	Polytelis anthopeplus	(Lear, 1831)	species	Animalia	Chordata	Aves	Psittaciformes	Psittacidae	Polytelis	Regent Parrot	4
https://biodiversity.org.au/afd/taxa/adff994b-1001-4012-8bb7-0d9eb80dcde7	Prasinocyma rhodocosma	(Meyrick, 1888)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Prasinocyma		11
https://biodiversity.org.au/afd/taxa/a7f8a052-4d46-44a6-82bb-995d2c65f18e	Prasinocyma semicrocea	(Walker, 1861)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Prasinocyma		7
https://biodiversity.org.au/afd/taxa/b3675af7-fc48-47c7-97d4-1da8dcd40bf9	Praxis dirigens	Walker, 1858	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Praxis		1
https://biodiversity.org.au/afd/taxa/f05e4133-2784-42a1-8507-e34d53f707d6	Prionyx globosus	(Smith, 1856)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Sphecidae	Prionyx		1
https://biodiversity.org.au/afd/taxa/0c8623ec-0140-42fa-a8a9-c895b2321918	Protenaster australis	(Gray, 1851)	species	Animalia	Echinodermata	Echinoidea	Spatangoida	Schizasteridae	Protenaster	Heart Urchin	1
https://biodiversity.org.au/afd/taxa/123d0a02-1136-4f5e-95f4-1d51802c410b	Proteuxoa epiplecta	(GuenÃ©e, 1868)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Proteuxoa		1
https://biodiversity.org.au/afd/taxa/de7cce0d-7b4d-42c7-9bf9-2863803cb884	Proteuxoa florescens	(Walker, 1857)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Proteuxoa		4
https://biodiversity.org.au/afd/taxa/74577915-f04a-4a1b-bf8d-1aba4faf4753	Proteuxoa sarcomorpha	(Lower, 1902)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Proteuxoa		2
https://biodiversity.org.au/afd/taxa/9c669694-22a5-4e0b-a6fa-f0e71eed2cea	Proteuxoa tibiata	(GuenÃ©e, 1852)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Proteuxoa		1
https://biodiversity.org.au/afd/taxa/c6c2ad9d-4f52-451b-b123-6680187d8794	Pseudanapaea denotata	(Walker, 1865)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Limacodidae	Pseudanapaea		2
https://biodiversity.org.au/afd/taxa/f4da01d2-4937-4be2-92b2-de9fe2ae55ca	Pseudanapaea transvestita	Hering, 1931	species	Animalia	Arthropoda	Insecta	Lepidoptera	Limacodidae	Pseudanapaea		1
https://biodiversity.org.au/afd/taxa/3e76ec1f-622b-452b-b556-904da60adea2	Pseudapines geminata	(Van Duzee, 1905)	species	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Pseudapines	Pittosporum Bug	1
https://biodiversity.org.au/afd/taxa/6aa9025b-46ff-4427-b69c-6f81b59599d3	Pseudechis australis	(Gray, 1842)	species	Animalia	Chordata	Reptilia	Squamata	Elapidae	Pseudechis	King Brown Snake	1
https://biodiversity.org.au/afd/taxa/8308a376-50a5-483b-ac9f-39d702b817ec	Pseudemydura umbrina	Siebenrock, 1901	species	Animalia	Chordata	Reptilia	Testudines	Chelidae	Pseudemydura	Western Swamp Turtle	59
https://biodiversity.org.au/afd/taxa/895f3296-2b6c-48c2-a258-af796b671474	Pseudogobius olorum	(Sauvage, 1880)	species	Animalia	Chordata	Actinopterygii	Perciformes	Gobiidae	Pseudogobius	Bluespot Goby	2
https://biodiversity.org.au/afd/taxa/dcf303b1-0371-4c8b-b431-c2e147941926	Pseudonaja affinis	GÃ¼nther, 1872	species	Animalia	Chordata	Reptilia	Squamata	Elapidae	Pseudonaja	Dugite	4
https://biodiversity.org.au/afd/taxa/ddceda0c-0df4-4ff0-8f11-c4d546336c4b	Pseudozarba orthopetes	(Meyrick, 1897)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Pseudozarba		2
https://biodiversity.org.au/afd/taxa/b7784bed-c80d-44a8-9905-e3a1e63fb1a4	Psilosticha pristis	(Meyrick, 1892)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Psilosticha		18
https://biodiversity.org.au/afd/taxa/9c43c6d2-a083-4e6f-824d-d0b520662354	Psychopsis mimica	Newman, 1842	species	Animalia	Arthropoda	Insecta	Neuroptera	Psychopsidae	Psychopsis		1
https://biodiversity.org.au/afd/taxa/072c3304-9e6a-4a8a-983c-d8f3b951b26f	Pterodroma (Pterodroma) macroptera	(A. Smith, 1840)	species	Animalia	Chordata	Aves	Procellariiformes	Procellariidae	Pterodroma	Mutton-bird	1
https://biodiversity.org.au/afd/taxa/8ad936c1-e0c5-442d-a5e9-38343924448f	Ptilocnemus lemur	(Westwood, 1840)	species	Animalia	Arthropoda	Insecta	Hemiptera	Reduviidae	Ptilocnemus		1
https://biodiversity.org.au/afd/taxa/66f82bb4-ae71-4543-a99e-35452536c4c8	Purpureicephalus spurius	(Kuhl, 1820)	species	Animalia	Chordata	Aves	Psittaciformes	Psittacidae	Purpureicephalus	Red-capped Parrot	80
https://biodiversity.org.au/afd/taxa/5c9ab00e-2da3-49d9-9979-651b2bd4eba3	Pyralis farinalis	Linnaeus, 1758	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Pyralis		2
https://biodiversity.org.au/afd/taxa/19d57eff-503e-4811-b799-8e5f4a29e5df	Pyroderces falcatella	(Stainton, 1859)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Cosmopterigidae	Pyroderces		2
https://biodiversity.org.au/afd/taxa/178a17ff-2135-48e8-856b-39f546f02092	Rattus rattus	(Linnaeus, 1758)	species	Animalia	Chordata	Mammalia	Rodentia	Muridae	Rattus	Black Rat	4
https://biodiversity.org.au/afd/taxa/6b6a81b1-4928-488e-a45b-d42868c263a7	Raveniella peckorum	Rix & Harvey, 2010	species	Animalia	Arthropoda	Arachnida	Araneae	Anapidae	Raveniella		1
https://biodiversity.org.au/afd/taxa/1a2dcf1e-4352-46ca-8399-1507b83925fe	Rentinus dilatatus	(Westwood, 1838)	species	Animalia	Arthropoda	Insecta	Hemiptera	Fulgoridae	Rentinus		1
https://biodiversity.org.au/afd/taxa/85164eb6-0e1f-4311-94be-6ed652c1f56d	Requena verticalis	Walker, 1869	species	Animalia	Arthropoda	Insecta	Orthoptera	Tettigoniidae	Requena		2
https://biodiversity.org.au/afd/taxa/cddecf56-3979-4ad6-a31c-8519af2ac503	Rhantus suturalis	(W.S. Macleay, 1825)	species	Animalia	Arthropoda	Insecta	Coleoptera	Dytiscidae	Rhantus		3
https://biodiversity.org.au/afd/taxa/af7380c6-32cc-411d-a79e-500b2a20f147	Rhinodia rostraria	GuenÃ©e, 1857	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Rhinodia		2
https://biodiversity.org.au/afd/taxa/97a59c84-af21-4cdc-bac7-a97c5201db42	Rhipidura (Rhipidura) albiscapa	Gould, 1840	species	Animalia	Chordata	Aves	Passeriformes	Rhipiduridae	Rhipidura	Grey Fantail	113
https://biodiversity.org.au/afd/taxa/1c4dce12-16f6-49ab-b578-0673551214fd	Rhipidura (Sauloprocta) leucophrys	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Rhipiduridae	Rhipidura	Willie Wagtail	45
https://biodiversity.org.au/afd/taxa/39bbc8df-e685-4995-a4bf-955201edac65	Rhodomantis disparilis	(Westwood, 1889)	species	Animalia	Arthropoda	Insecta	Mantodea	Mantidae	Rhodomantis		1
https://biodiversity.org.au/afd/taxa/c7bf86ad-6ca4-4fd8-a786-72f6285f9871	Rhytidoponera mayri	(Emery, 1883)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Rhytidoponera		2
https://biodiversity.org.au/afd/taxa/81aa2878-5c8c-45b1-9517-834a03e477ea	Rhytidoponera metallica	(Smith, 1858)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Rhytidoponera		5
https://biodiversity.org.au/afd/taxa/28ee3b73-b677-43e3-b250-87cd81055ac1	Salma mnesibrya	(Meyrick, 1884)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Salma		7
https://biodiversity.org.au/afd/taxa/d718fa20-b17e-449f-8363-64a4c43f4e53	Sandava scitisignata	(Walker, 1862)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Sandava		12
https://biodiversity.org.au/afd/taxa/bbd6c97b-3ed8-4d6b-931f-ab6344b295f3	Sceliodes cordalis	(Doubleday, 1843)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Sceliodes		1
https://biodiversity.org.au/afd/taxa/1a03ac28-58ba-46c9-a175-fe9cf12c6cf5	Sceliphron laetum	(Smith, 1856)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Sphecidae	Sceliphron		1
https://biodiversity.org.au/afd/taxa/929eaaba-a8ba-4d4c-bcc1-e9dc8d12b001	Scolioplecta rigida	(Meyrick, 1910)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Scolioplecta		4
https://biodiversity.org.au/afd/taxa/d057765c-a936-4673-8518-2131e76bf335	Scoparia exhibitalis	Walker, 1866	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Scoparia		4
https://biodiversity.org.au/afd/taxa/9f01b07d-449b-4420-8f56-7da16e856b6c	Scopula axiotis	(Meyrick, 1888)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Scopula		2
https://biodiversity.org.au/afd/taxa/a7255079-40c3-4493-ad2a-a6048780afb3	Scopula optivata	(Walker, 1861)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Scopula		17
https://biodiversity.org.au/afd/taxa/494d559f-0dde-436d-bef8-6248a3cdb39c	Scopula sublinearia	(Walker, 1866)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Scopula		3
https://biodiversity.org.au/afd/taxa/7c1392ff-c0bc-43b8-87a5-889f43887b43	Sericophorus relucens	Smith, 1856	species	Animalia	Arthropoda	Insecta	Hymenoptera	Crabronidae	Sericophorus		2
https://biodiversity.org.au/afd/taxa/55598199-2b14-4f74-9821-9916f8cff2e5	Sericophorus viridis	(Saussure, 1855)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Crabronidae	Sericophorus		1
https://biodiversity.org.au/afd/taxa/031b2b69-e9fc-44c6-9df9-03c1470d5ec3	Sericornis (Sericornis) frontalis	(Vigors & Horsfield, 1827)	species	Animalia	Chordata	Aves	Passeriformes	Acanthizidae	Sericornis	White-fronted Scrubwren	4
https://biodiversity.org.au/afd/taxa/c74464f4-57fd-4386-90fe-c68e1d629729	Simoselaps bertholdi	(Jan, 1859)	species	Animalia	Chordata	Reptilia	Squamata	Elapidae	Simoselaps	Jan's Banded Snake	1
https://biodiversity.org.au/afd/taxa/09e007e5-22c5-44ff-9654-4bcf4f1fcdb4	Simosyrphus grandicornis	(Macquart, 1842)	species	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Simosyrphus		9
https://biodiversity.org.au/afd/taxa/986aa1db-7d6d-4a45-95f7-3ed68b0564f1	Smeringopus natalensis	Lawrence, 1947	species	Animalia	Arthropoda	Arachnida	Araneae	Pholcidae	Smeringopus		4
https://biodiversity.org.au/afd/taxa/f933497e-60d2-4f80-bc5e-08d8b1349c2c	Smicrornis brevirostris	(Gould, 1838)	species	Animalia	Chordata	Aves	Passeriformes	Acanthizidae	Smicrornis	Brown Weebill	45
https://biodiversity.org.au/afd/taxa/b200510f-c3f7-4a51-a22e-ed0b58d9bd15	Spectrotrota fimbrialis	Warren, 1891	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae	Spectrotrota		23
https://biodiversity.org.au/afd/taxa/43d8a366-7295-4c45-9e53-bc6fa4cf93bb	Sphex luctuosus	Smith, 1856	species	Animalia	Arthropoda	Insecta	Hymenoptera	Sphecidae	Sphex		1
https://biodiversity.org.au/afd/taxa/f5b6af6e-af3c-4e96-93e8-1502ce8bdf0d	Sphodropoda tristis	(Saussure, 1871)	species	Animalia	Arthropoda	Insecta	Mantodea	Mantidae	Sphodropoda		1
https://biodiversity.org.au/afd/taxa/b259eb3c-57a3-4cd6-a6df-5151d33bafc6	Spilonota constrictana	(Meyrick, 1881)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Spilonota		1
https://biodiversity.org.au/afd/taxa/941de859-ed16-490f-86be-70c8fcf42e72	Spilosoma glatignyi	(Le Guillou, 1841)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Spilosoma		3
https://biodiversity.org.au/afd/taxa/43adf129-76b1-4e81-9593-cd4f5ac7c829	Spoladea recurvalis	(Fabricius, 1775)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Spoladea		2
https://biodiversity.org.au/afd/taxa/b2669Ofc-d652-4777-9ead-3421170129ed	Stagonopleura (Zonaeginthus) oculata	(Quoy & Gaimard, 1830)	species	Animalia	Chordata	Aves	Passeriformes	Estrildidae	Stagonopleura	Red-eared Firetail	1
https://biodiversity.org.au/afd/taxa/521ff45c-7d85-4306-b4a5-23ffbd30111e	Stangeia xerodes	(Meyrick, 1886)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pterophoridae	Stangeia		6
https://biodiversity.org.au/afd/taxa/093b24db-34bf-4f75-97fe-2329e21c3b18	Steatoda grossa	(C.L. Koch, 1838)	species	Animalia	Arthropoda	Arachnida	Araneae	Theridiidae	Steatoda		2
https://biodiversity.org.au/afd/taxa/e3fa6417-87d6-48e3-a2fb-6a5f664abbb1	Stigmodera gratiosa	Chevrolat, 1843	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Stigmodera		2
https://biodiversity.org.au/afd/taxa/15ca28e9-1d01-43a6-ac4f-5943aa760b4f	Stigmodera sanguinosa	Hope, 1846	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Stigmodera		2
https://biodiversity.org.au/afd/taxa/cd7709bc-ac13-4b4b-b751-1e18f7d2f3b6	Storena formosa	Thorell, 1870	species	Animalia	Arthropoda	Arachnida	Araneae	Zodariidae	Storena		1
https://biodiversity.org.au/afd/taxa/8ce669b4-fb53-4be0-9203-b02444eca02a	Strepera (Neostrepera) versicolor	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Artamidae	Strepera	Grey Currawong	5
https://biodiversity.org.au/afd/taxa/0bb16cc7-899d-48c5-ba6a-4a4846f75248	Strepsicrates macropetana	(Meyrick, 1881)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tortricidae	Strepsicrates		2
NZOR-6-117936	Streptopelia chinensis	Scopoli	species	Animalia	Chordata	Aves	Columbiformes	Columbidae	Streptopelia	Spotted Dove	1
https://biodiversity.org.au/afd/taxa/9a942ab6-c29b-4de5-ab2a-72c9ef99605a	Strophurus spinigerus	(Gray, 1842)	species	Animalia	Chordata	Reptilia	Squamata	Diplodactylidae	Strophurus	South-western Spiny-tailed Gecko	2
https://biodiversity.org.au/afd/taxa/dadc6ab4-e986-4173-a476-2760b9760061	Sturnus (Sturnus) vulgaris	Linnaeus, 1758	species	Animalia	Chordata	Aves	Passeriformes	Sturnidae	Sturnus	Common Starling	1
https://biodiversity.org.au/afd/taxa/948d8ca1-62fc-4d03-a79d-4be2de837264	Sus scrofa	Linnaeus, 1758	species	Animalia	Chordata	Mammalia	Artiodactyla	Suidae	Sus	Pig	1
https://biodiversity.org.au/afd/taxa/44dea5cf-f8a3-4d2b-9b8a-9a94647dc6ab	Suta gouldii	(Gray, 1841)	species	Animalia	Chordata	Reptilia	Squamata	Elapidae	Suta	Gould's Hooded Snake	3
https://biodiversity.org.au/afd/taxa/5a1a02f8-eecf-4259-8168-ac9c6d4c0b1d	Swanea laticornis	(SjÃ¶stedt, 1921)	species	Animalia	Arthropoda	Insecta	Orthoptera	Morabidae	Swanea		1
https://biodiversity.org.au/afd/taxa/63960318-d34c-4f4f-891c-29d98b681ac2	Symphylistis leptocyma	Turner, 1930	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Symphylistis		7
https://biodiversity.org.au/afd/taxa/c188e141-68f6-47ad-8327-c9fe56075c0a	Synemon leucospila	Meyrick, 1891	species	Animalia	Arthropoda	Insecta	Lepidoptera	Castniidae	Synemon		2
https://biodiversity.org.au/afd/taxa/591cd6f0-1e4a-451b-a28c-2bad13d491a7	Synemon parthenoides	R. Felder, 1874	species	Animalia	Arthropoda	Insecta	Lepidoptera	Castniidae	Synemon		1

Species	Species Name	Scientific Name Authorship	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Vernacular Name	Number of records
https://biodiversity.org.au/afd/taxa/381ef11d-89bf-464e-9438-2aaebf2cf095	Syneora mundifera	(Walker, 1860)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Syneora		4
https://biodiversity.org.au/afd/taxa/cb748125-0c06-4649-8ed8-e379e81e53c1	Tachybaptus novaehollandiae	(Stephens, 1826)	species	Animalia	Chordata	Aves	Podicipediformes	Podicipedidae	Tachybaptus	Australian Little Grebe	11
https://biodiversity.org.au/afd/taxa/0d4c9c0c-51d3-44e0-a365-fe0f8b791c66	Tachyglossus aculeatus	(Shaw, 1792)	species	Animalia	Chordata	Mammalia	Monotremata	Tachyglossidae	Tachyglossus	Short-beaked Echidna	6
https://biodiversity.org.au/afd/taxa/65adf5ac-7539-4192-8117-85bd336c1fcd	Tachystola stenoptera	(Meyrick, 1884)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Tachystola		1
https://biodiversity.org.au/afd/taxa/8931bcfb-95ea-44b1-96c9-ce036191e15c	Tadorna (Casarca) tadornoides	(Jardine & Selby, 1828)	species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Tadorna	Chestnut Sheldrake	10
https://biodiversity.org.au/afd/taxa/d3ff58f5-a0e7-422c-bff0-bdf38387a991	Tanyzancla calliophthalma	(Meyrick, 1889)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Tanyzancla		3
https://biodiversity.org.au/afd/taxa/2e407d03-f15f-4bfb-8cb0-0e8dab31bb38	Tanyzancla melanocrossa	(Meyrick, 1889)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Tanyzancla		4
https://biodiversity.org.au/afd/taxa/e45a70ce-d159-4d7c-a812-11aef7c9b612	Tapeigaster argyrospila	Bezzi, 1923	species	Animalia	Arthropoda	Insecta	Diptera	Heteromyzidae	Tapeigaster		2
https://biodiversity.org.au/afd/taxa/9c444ffa-1c83-400f-96fb-4485205f1bfa	Tapinogyna perichroa	(Lower, 1903)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Tapinogyna		2
https://biodiversity.org.au/afd/taxa/562a5c6b-51e8-457e-9b5d-c921af5e18ed	Tarsipes rostratus	Gervais & Verreaux, 1842	species	Animalia	Chordata	Mammalia	Diprotodontia	Tarsipedidae	Tarsipes	Honey Possum	4
https://biodiversity.org.au/afd/taxa/49b45fba-598c-4957-9264-9a59bb67c50d	Tasmanicosa godeffroyi	(L. Koch, 1865)	species	Animalia	Arthropoda	Arachnida	Araneae	Lycosidae	Tasmanicosa		1
https://biodiversity.org.au/afd/taxa/53e737da-fc86-4534-beaf-d0eb86b1e9e7	Tasmanicosa leuckartii	(Thorell, 1870)	species	Animalia	Arthropoda	Arachnida	Araneae	Lycosidae	Tasmanicosa		2
https://biodiversity.org.au/afd/taxa/b8a8a73b-6484-4354-916e-28991dab6c25	Telecrates basileia	(Turner, 1902)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Telecrates		1
https://biodiversity.org.au/afd/taxa/5b33c3d7-07c7-4023-b5bb-b821e48b3142	Temognatha bruckii	(Thomson, 1878)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Temognatha		1
https://biodiversity.org.au/afd/taxa/10c3a1af-6c55-41a9-836c-fd385ce9d136	Temognatha chalcodera	(Thomson, 1878)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Temognatha		2
https://biodiversity.org.au/afd/taxa/ba53a695-0dd5-4884-9872-7ebb9235690f	Temognatha flavocincta	(Gory & Laporte, 1838)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Temognatha	Jewel Beetle	1
https://biodiversity.org.au/afd/taxa/61995ae8-d1ab-4dcf-a94f-d119c86ecb0c	Temognatha obscuripennis	(Mannerheim, 1837)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Temognatha		1
https://biodiversity.org.au/afd/taxa/8d51e063-e8a6-4904-9503-2e59fadf339c	Temognatha rectipennis	(Blackburn, 1891)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Temognatha		6
https://biodiversity.org.au/afd/taxa/959f58df-013a-4c3c-b374-c6a8fa6edc7e	Temognatha reichei	(Gory & Laporte, 1838)	species	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Temognatha		2
https://biodiversity.org.au/afd/taxa/e55f2d1e-5bcf-41c3-97b4-b2df4ec470b4	Thalaina angulosa	Walker, 1865	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Thalaina		4
https://biodiversity.org.au/afd/taxa/c8bf8d38-b06f-4337-b9c7-d413b173b48f	Thallarcha eremicola	Pescott, 1951	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Thallarcha		4
https://biodiversity.org.au/afd/taxa/cb4b3f9d-280d-4a3a-a45a-602ec426f14b	Thallarcha fusa	Hampson, 1900	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Thallarcha		2
https://biodiversity.org.au/afd/taxa/e41ddad1-8eb0-403a-a3b7-6a3f55dbe011	Thallarcha rhaptophora	Lower, 1915	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Thallarcha		6
https://biodiversity.org.au/afd/taxa/31ee4129-8d8d-45eb-b6ef-0e72e16d0764	Thomisus spectabilis	Doleschall, 1859	species	Animalia	Arthropoda	Arachnida	Araneae	Thomisidae	Thomisus		2
https://biodiversity.org.au/afd/taxa/f5f5ddd8-ae6a-431b-9e08-3e992b12fa64	Threskiornis moluccus	(Cuvier, 1829)	species	Animalia	Chordata	Aves	Ciconiiformes	Threskiornithidae	Threskiornis	Black-necked Ibis	11
https://biodiversity.org.au/afd/taxa/c319dbaf-a363-4853-b333-75f14c47fc82	Threskiornis spinicollis	(Jameson, 1835)	species	Animalia	Chordata	Aves	Ciconiiformes	Threskiornithidae	Threskiornis	Letter Bird	27
https://biodiversity.org.au/afd/taxa/019c2615-faf5-40ba-887f-3ea2d07f4633	Thrips imaginis	Bagnall, 1926	species	Animalia	Arthropoda	Insecta	Thysanoptera	Thripidae	Thrips	Plague Thrips	1
https://biodiversity.org.au/afd/taxa/ff034710-5f08-4685-a348-ed5f58056118	Thudaca haplonota	Meyrick, 1893	species	Animalia	Arthropoda	Insecta	Lepidoptera	Hypertrophidae	Thudaca		13
https://biodiversity.org.au/afd/taxa/f9ebdfb1-7a0d-410f-b28e-3ce7cf356000	Thyreus waroonensis	(Cockerell, 1913)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Thyreus		6
https://biodiversity.org.au/afd/taxa/1a6623ab-8d46-4da0-957c-f27b663f7ef0	Tiliqua rugosa	(Gray, 1825)	species	Animalia	Chordata	Reptilia	Squamata	Scincidae	Tiliqua	Boggi	39
https://biodiversity.org.au/afd/taxa/7bcaa094-b0b1-4c63-8ee9-1503f5408817	Tineodes adactylalis	GuenÃ©e, 1854	species	Animalia	Arthropoda	Insecta	Lepidoptera	Tineodidae	Tineodes		4
https://biodiversity.org.au/afd/taxa/5c419d2d-9259-429b-9cd3-023662fc4b7a	Tmesothynnus zelebori	(Saussure, 1868)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Tiphiidae	Tmesothynnus		1
https://biodiversity.org.au/afd/taxa/135cc880-f84e-4470-a1c1-fbce3a0ed534	Todiramphus (Todiramphus) sanctus	(Vigors & Horsfield, 1827)	species	Animalia	Chordata	Aves	Coraciiformes	Alcedinidae	Todiramphus	Sacred Kingfisher	19
https://biodiversity.org.au/afd/taxa/92bec3c2-6528-4901-86fb-355ac39b382d	Trachymantis dentifrons	(StÃ¥l, 1877)	species	Animalia	Arthropoda	Insecta	Mantodea	Mantidae	Trachymantis		3
https://biodiversity.org.au/afd/taxa/cf03e458-24d7-4791-8a53-f44074678dc0	Trachyops australis	Dallas, 1851	species	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Trachyops		2
https://biodiversity.org.au/afd/taxa/5185cfe8-f011-43bf-a04e-1d2ae810775d	Tranes vigorsii	Boheman, 1843	species	Animalia	Arthropoda	Insecta	Coleoptera	Curculionidae	Tranes		6
https://biodiversity.org.au/afd/taxa/13f8f6f4-21db-44a5-8c33-5dafb6fcbc69	Trichiocercus sparshalli	(Curtis, 1830)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Notodontidae	Trichiocercus		14
https://biodiversity.org.au/afd/taxa/49808d6d-d630-43e7-8c56-9117fb4f19ee	Trichoptilus ceramodes	Meyrick, 1886	species	Animalia	Arthropoda	Insecta	Lepidoptera	Pterophoridae	Trichoptilus		3
https://biodiversity.org.au/afd/taxa/28764895-7f9d-4d22-ac06-31e9ff91055e	Trocnada dorsigera	Walker, 1858	species	Animalia	Arthropoda	Insecta	Hemiptera	Cicadellidae	Trocnada		1
https://biodiversity.org.au/afd/taxa/ec9b82b2-4ce8-47b1-8eef-4aa17ab9dca1	Turneromyia senex	(Turner, 1910)	species	Animalia	Arthropoda	Insecta	Hymenoptera	Pompilidae	Turneromyia		1
https://biodiversity.org.au/afd/taxa/4e712566-8c49-4f8f-a8aa-8df157cddc10	Tymbophora peltastis	Meyrick, 1890	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Tymbophora		3
https://biodiversity.org.au/afd/taxa/221d8498-3374-4348-abc4-e2d6ff478cb4	Tympanophora andreae	Rentz, 2001	species	Animalia	Arthropoda	Insecta	Orthoptera	Tettigoniidae	Tympanophora		2
https://biodiversity.org.au/afd/taxa/86fb93fd-4551-4b38-9a12-62b6b433729b	Tyto javanica	(Gmelin, 1788)	species	Animalia	Chordata	Aves	Strigiformes	Tytonidae	Tyto	Eastern Barn Owl	3
https://biodiversity.org.au/afd/taxa/63b9d1e1-44e4-4b99-92a2-df17d9784942	Udea hyalistis	(Lower, 1902)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Udea		2
https://biodiversity.org.au/afd/taxa/daed54be-fbcf-49a2-940b-8f2569a0eb41	Underwoodisaurus milii	(Bory de Saint-Vincent, 1825)	species	Animalia	Chordata	Reptilia	Squamata	Carphodactylidae	Underwoodisaurus	Thick-tailed Gecko	1
https://biodiversity.org.au/afd/taxa/6a656905-79bd-41b6-8a45-5308a9f02472	Uraba lugens	Walker, 1863	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nolidae	Uraba		2
https://biodiversity.org.au/afd/taxa/6c33bbf4-9f47-4d92-a4f3-4a485ba1ccae	Uresiphita ornithopteralis	(GuenÃ©e, 1854)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Uresiphita		20
https://biodiversity.org.au/afd/taxa/3853fe16-ec36-44da-8fd8-2f9fe53e0170	Utetheisa pulchelloides	Hampson, 1907	species	Animalia	Arthropoda	Insecta	Lepidoptera	Erebidae	Utetheisa		4
https://biodiversity.org.au/afd/taxa/e8d7b862-1d56-4d27-84a1-937f7915a0de	Vanellus (Lobivanellus) tricolor	(Vieillot, 1818)	species	Animalia	Chordata	Aves	Charadriiformes	Charadriidae	Vanellus	Banded Lapwing	7
https://biodiversity.org.au/afd/taxa/5457e4b9-38c9-4f26-82dc-4b2c8ef10ab6	Vanessa kershawi	(McCoy, 1868)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Vanessa	Australian Painted Lady	23
https://biodiversity.org.au/afd/taxa/8313e5d6-0b23-4360-bffd-a81e9f83bc9d	Varanus gouldii	(Gray, 1838)	species	Animalia	Chordata	Reptilia	Squamata	Varanidae	Varanus	Gould's Goanna	3
https://biodiversity.org.au/afd/taxa/b89281d8-9f0a-4582-a2d8-21904dd6b5b1	Varanus tristis	(Schlegel, 1839)	species	Animalia	Chordata	Reptilia	Squamata	Varanidae	Varanus	Black-headed Monitor	4
https://biodiversity.org.au/afd/taxa/30afdc05-c995-4a3d-a342-9c29762996c2	Venator immansueta	(Simon, 1909)	species	Animalia	Arthropoda	Arachnida	Araneae	Lycosidae	Venator		3
https://biodiversity.org.au/afd/taxa/ef70e7c7-a3ca-4476-ac64-c2cbdc663562	Vespadelus regulus	(Thomas, 1906)	species	Animalia	Chordata	Mammalia	Chiroptera	Vespertilionidae	Vespadelus	Southern Forest Bat	1
https://biodiversity.org.au/afd/taxa/2869ce8a-8212-46c2-8327-dfb7fabb8296	Vulpes vulpes	Linnaeus, 1758	species	Animalia	Chordata	Mammalia	Carnivora	Canidae	Vulpes	Fox	9
https://biodiversity.org.au/afd/taxa/e7edd9e8-5bd2-4b41-b903-730d86751e0b	Wingia lambertella	(Wing, 1850)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Oecophoridae	Wingia		4
https://biodiversity.org.au/afd/taxa/71c9326f-b797-4286-9fae-375b7fc2f53d	Xanthagrion erythroneurum	(Selys, 1876)	species	Animalia	Arthropoda	Insecta	Odonata	Coenagrionidae	Xanthagrion		1
https://biodiversity.org.au/afd/taxa/a6e37294-2095-4222-8c74-2bf2ca08f4c1	Xanthodes congenita	(Hampson, 1912)	species	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Xanthodes		1
https://biodiversity.org.au/afd/taxa/3d2d3066-d2e2-4edd-a0c5-81ccc2961b35	Xanthorhoe vacuaria	(GuenÃ©e, 1857 [1858])	species	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Xanthorhoe		2
https://biodiversity.org.au/afd/taxa/cff21565-2bc4-4a67-8c0c-600ae7c10fd8	Zanda baudinii	Lear, 1832	species	Animalia	Chordata	Aves	Psittaciformes	Cacatuidae	Zanda	Baudin's Black-cockatoo	8
https://biodiversity.org.au/afd/taxa/b7d8720e-447d-40a3-b7de-fdff2aaee7c6	Zaspilothynnus gilesi	Turner, 1910	species	Animalia	Arthropoda	Insecta	Hymenoptera	Tiphiidae	Zaspilothynnus		2
https://biodiversity.org.au/afd/taxa/fe0d4e5e-6bd5-4e46-a77c-00e8cec73410	Zosterops lateralis	(Latham, 1801)	species	Animalia	Chordata	Aves	Passeriformes	Zosteropidae	Zosterops	Silvereye	126
https://biodiversity.org.au/afd/taxa/125adc68-3bee-4ba9-86c3-3709572dcd13	Zygometis xanthogaster	(L. Koch, 1875)	species	Animalia	Arthropoda	Arachnida	Araneae	Thomisidae	Zygometis		3
NZOR-6-47151	Albugo candida	(Pers.) Kuntze	species	Chromista	Oomycota	Peronosporea	Albuginales	Albuginaceae	Albugo		1

APPENDIX 3

Protected Matters Search Tool Report

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

EPBC Act Protected Matters Report

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

Report created: 12-Apr-2023

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	43
Listed Migratory Species:	8

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	145
Commonwealth Heritage Places:	None
Listed Marine Species:	12
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	7
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	6
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Assemblages of plants and invertebrate animals of tumulus (organic mound) springs of the Swan Coastal Plain	Endangered	Community known to occur within area	In buffer area only
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area	In feature area
Clay Pans of the Swan Coastal Plain	Critically Endangered	Community likely to occur within area	In feature area
Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands of the Swan Coastal Plain	Endangered	Community known to occur within area	In feature area
Shrublands and Woodlands on Muchea Limestone of the Swan Coastal Plain	Endangered	Community known to occur within area	In feature area
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community may occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calyptorhynchus banksii naso			
Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area	In feature area
Leipoa ocellata			
Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis			
Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Zanda baudinii listed as Calyptorhynchus baudinii			
Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Zanda latirostris listed as Calyptorhynchus latirostris			
Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Species or species habitat known to occur within area	In feature area
FISH			
Galaxiella nigrostriata			
Blackstriped Dwarf Galaxias, Black-stripe Minnow [88677]	Endangered	Species or species habitat likely to occur within area	In buffer area only
INSECT			
Hesperocolletes douglasi			
Douglas' Broad-headed Bee, Rottnest Bee [66734]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
MAMMAL			
Bettongia penicillata ogilbyi			
Woylie [66844]	Endangered	Species or species habitat likely to occur within area	In feature area
Dasyurus geoffroii			
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area	In feature area
Petrogale lateralis lateralis			
Black-flanked Rock-wallaby, Moororong, Black-footed Rock Wallaby [66647]	Endangered	Translocated population known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
OTHER			
Westralunio carteri			
Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat may occur within area	In buffer area only
PLANT			
Acacia anomala			
Grass Wattle, Chittering Grass Wattle [8153]	Vulnerable	Species or species habitat known to occur within area	In feature area
Acacia aphylla			
Leafless Rock Wattle [13553]	Vulnerable	Species or species habitat may occur within area	In feature area
Andersonia gracilis			
Slender Andersonia [14470]	Endangered	Species or species habitat likely to occur within area	In feature area
Anigozanthos viridis subsp. terraspectans			
Dwarf Green Kangaroo Paw [3435]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Anthocercis gracilis			
Slender Tailflower [11103]	Vulnerable	Species or species habitat may occur within area	In feature area
Banksia mimica			
Summer Honeypot [82765]	Endangered	Species or species habitat may occur within area	In feature area
Caladenia huegelii			
King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Caleana dixonii listed as Paracaleana dixonii			
Sandplain Duck Orchid [87944]	Endangered	Species or species habitat may occur within area	In feature area
Chamelaucium lullfitzii listed as Chamelaucium sp. Gingin (N.G.Marchant 6)			
Gingin Wax [92777]	Endangered (listed as Chamelaucium sp. Gingin	Species or species habitat likely to occur within area	In feature area
Conospermum densiflorum subsp. unicephalatum			
One-headed Smokebush [64871]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Darwinia foetida			
Muchea Bell [83190]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Diplolaena andrewsii			
[6601]	Endangered	Species or species habitat known to occur within area	In feature area
Diuris micrantha			
Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diuris purdiei			
Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area	In feature area
Drakaea elastica			
Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Eleocharis keigheryi			
Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Eucalyptus leprophloia			
Scaly Butt Mallee, Scaly-butt Mallee [56712]	Endangered	Species or species habitat may occur within area	In feature area
Eucalyptus x balanites			
Cadda Road Mallee, Cadda Mallee [87816]	Endangered	Species or species habitat may occur within area	In buffer area only
Grevillea althoferorum			
[64906]	Endangered	Species or species habitat likely to occur within area	In feature area
Grevillea christineae			
Christine's Grevillea [64520]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Grevillea corrugata			
a shrub [65445]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Grevillea curviloba subsp. curviloba			
Curved-leaf Grevillea [64908]	Endangered	Species or species habitat known to occur within area	In feature area
Grevillea curviloba subsp. incurva			
Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat known to occur within area	In feature area
Grevillea flexuosa			
Zig Zag Grevillea [2957]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Macarthuria keigheryi			
Keighery's Macarthuria [64930]	Endangered	Species or species habitat may occur within area	In buffer area only
Synaphea sp. Fairbridge Farm (D. Papenfus 696)			
Selena's Synaphea [82881]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Thelymitra dedmaniarum			
Cinnamon Sun Orchid [65105]	Endangered	Species or species habitat likely to occur within area	In feature area
Thelymitra stellata			
Star Sun-orchid [7060]	Endangered	Species or species habitat likely to occur within area	In feature area
REPTILE			
Pseudemydura umbrina			
Western Swamp Tortoise [1760]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Motacilla cinerea			
Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

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

Commonwealth Land Name	State	Buffer Status
Defence		
Defence - MUCHEA ARMAMENT RANGE [50073]	WA	In buffer area only
Defence - MUCHEA ARMAMENT RANGE [50088]	WA	In buffer area only
Defence - PEARCE - AP11OBSTRUCTION BEACON NO.5 [50244]	WA	In buffer area only
Defence - PEARCE - AP15 WATER TREATMENT PLANT [50247]	WA	In buffer area only
Defence - PEARCE - AP15 WATER TREATMENT PLANT [50245]	WA	In buffer area only
Defence - PEARCE - AP15 WATER TREATMENT PLANT [50246]	WA	In buffer area only
Defence - PEARCE - AP17 WATER SUPPLY TANKS [50004]	WA	In feature area
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50044]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50053]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50051]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50050]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50047]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50028]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50029]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50054]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50055]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50052]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50048]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50049]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50045]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50033]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50039]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50032]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50036]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50031]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50030]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50037]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50035]	WA	In buffer area only
Defence - PEARCE - AP19 HF RECEIVER STATION BULLSBROOK [50034]	WA	In buffer area only
Defence - PEARCE - AP2 OBSTRUCTION BEACON NO.2 [50240]	WA	In feature area
Defence - PEARCE - AP3 RADAR STATION BULLSBROOK [50194]	WA	In buffer area only
Defence - PEARCE - AP4 AERIAL FARM [50250]	WA	In feature area
Defence - PEARCE - AP4 AERIAL FARM [50252]	WA	In feature area
Defence - PEARCE - AP4 AERIAL FARM [50253]	WA	In feature area
Defence - PEARCE - AP4 AERIAL FARM [50251]	WA	In feature area
Defence - PEARCE - AP4 AERIAL FARM [50248]	WA	In feature area
Defence - PEARCE - AP4 AERIAL FARM [50249]	WA	In feature area
Defence - PEARCE - AP5 OPERATIONS SITE [50018]	WA	In feature area
Defence - PEARCE - AP6 OBSTRUCTION BEACON NO.3 [50241]	WA	In buffer area only
Defence - PEARCE - AP7 OBSTRUCTION BEACON NO.1 [50242]	WA	In feature area
Defence - PEARCE - AP8 BORE SITES [50005]	WA	In buffer area only
Defence - PEARCE - AP9 OBSTRUCTION BEACON NO.4 [50243]	WA	In feature area
Defence - PEARCE - RAAF BASE [50017]	WA	In feature area
Defence - PEARCE - RAAF BASE [50010]	WA	In feature area
Defence - PEARCE - RAAF BASE [50013]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50016]	WA	In feature area
Defence - PEARCE - RAAF BASE [50011]	WA	In feature area
Defence - PEARCE - RAAF BASE [50012]	WA	In feature area
Defence - PEARCE - RAAF BASE [50014]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50015]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50008]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Defence - PEARCE - RAAF BASE [50009]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50007]	WA	In buffer area only
Defence - PEARCE - RAAF BASE [50006]	WA	In buffer area only
Defence - VACANT LAND - BULLSBROOK AP102 [50255]	WA	In feature area
Unknown		
Commonwealth Land - [50313]	WA	In buffer area only
Commonwealth Land - [51386]	WA	In feature area
Commonwealth Land - [50945]	WA	In feature area
Commonwealth Land - [50944]	WA	In feature area
Commonwealth Land - [50943]	WA	In feature area
Commonwealth Land - [50941]	WA	In feature area
Commonwealth Land - [50942]	WA	In feature area
Commonwealth Land - [50940]	WA	In feature area
Commonwealth Land - [50890]	WA	In buffer area only
Commonwealth Land - [50893]	WA	In feature area
Commonwealth Land - [50892]	WA	In feature area
Commonwealth Land - [50899]	WA	In feature area
Commonwealth Land - [50898]	WA	In feature area
Commonwealth Land - [50298]	WA	In buffer area only
Commonwealth Land - [50891]	WA	In feature area
Commonwealth Land - [50897]	WA	In feature area
Commonwealth Land - [50895]	WA	In feature area
Commonwealth Land - [50920]	WA	In feature area
Commonwealth Land - [50287]	WA	In buffer area only
Commonwealth Land - [50921]	WA	In feature area
Commonwealth Land - [50922]	WA	In feature area
Commonwealth Land - [50923]	WA	In feature area

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50912]	WA	In feature area
Commonwealth Land - [50911]	WA	In feature area
Commonwealth Land - [50910]	WA	In feature area
Commonwealth Land - [50926]	WA	In feature area
Commonwealth Land - [50927]	WA	In feature area
Commonwealth Land - [50284]	WA	In buffer area only
Commonwealth Land - [50908]	WA	In feature area
Commonwealth Land - [50286]	WA	In buffer area only
Commonwealth Land - [50285]	WA	In buffer area only
Commonwealth Land - [50280]	WA	In buffer area only
Commonwealth Land - [50904]	WA	In feature area
Commonwealth Land - [50909]	WA	In feature area
Commonwealth Land - [50296]	WA	In buffer area only
Commonwealth Land - [50295]	WA	In buffer area only
Commonwealth Land - [50290]	WA	In buffer area only
Commonwealth Land - [50283]	WA	In buffer area only
Commonwealth Land - [50297]	WA	In buffer area only
Commonwealth Land - [50282]	WA	In buffer area only
Commonwealth Land - [50925]	WA	In feature area
Commonwealth Land - [50928]	WA	In feature area
Commonwealth Land - [50929]	WA	In feature area
Commonwealth Land - [50281]	WA	In buffer area only
Commonwealth Land - [50291]	WA	In buffer area only
Commonwealth Land - [50292]	WA	In buffer area only
Commonwealth Land - [50924]	WA	In feature area
Commonwealth Land - [50293]	WA	In buffer area only
Commonwealth Land - [50299]	WA	In feature area

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50936]	WA	In feature area
Commonwealth Land - [50931]	WA	In feature area
Commonwealth Land - [50935]	WA	In feature area
Commonwealth Land - [50274]	WA	In buffer area only
Commonwealth Land - [50937]	WA	In feature area
Commonwealth Land - [50277]	WA	In buffer area only
Commonwealth Land - [50939]	WA	In feature area
Commonwealth Land - [50276]	WA	In buffer area only
Commonwealth Land - [50938]	WA	In feature area
Commonwealth Land - [50930]	WA	In feature area
Commonwealth Land - [50886]	WA	In feature area
Commonwealth Land - [50932]	WA	In feature area
Commonwealth Land - [50279]	WA	In buffer area only
Commonwealth Land - [50294]	WA	In buffer area only
Commonwealth Land - [51377]	WA	In buffer area only
Commonwealth Land - [50278]	WA	In buffer area only
Commonwealth Land - [50275]	WA	In buffer area only
Commonwealth Land - [50273]	WA	In buffer area only
Commonwealth Land - [51383]	WA	In feature area
Commonwealth Land - [50302]	WA	In buffer area only
Commonwealth Land - [50300]	WA	In buffer area only
Commonwealth Land - [51385]	WA	In feature area
Commonwealth Land - [51384]	WA	In feature area
Commonwealth Land - [50889]	WA	In feature area
Commonwealth Land - [50888]	WA	In buffer area only
Commonwealth Land - [50887]	WA	In feature area
Commonwealth Land - [50288]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50289]	WA	In buffer area only
Commonwealth Land - [50913]	WA	In feature area
Commonwealth Land - [50915]	WA	In feature area
Commonwealth Land - [50916]	WA	In feature area
Commonwealth Land - [50917]	WA	In feature area
Commonwealth Land - [50918]	WA	In feature area
Commonwealth Land - [50919]	WA	In feature area
Commonwealth Land - [50903]	WA	In feature area
Commonwealth Land - [50902]	WA	In feature area
Commonwealth Land - [50901]	WA	In feature area
Commonwealth Land - [50900]	WA	In feature area
Commonwealth Land - [50907]	WA	In feature area
Commonwealth Land - [50905]	WA	In feature area
Commonwealth Land - [50906]	WA	In feature area

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area overfly marine area	In buffer area only

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Bullsbrook	Nature Reserve	WA	In feature area
NTWA Bushland covenant (0121)	Conservation Covenant	WA	In buffer area only
Paruna	Private Nature Reserve	WA	In buffer area only

Protected Area Name	Reserve Type	State	Buffer Status
Twin Swamps	Nature Reserve	WA	In buffer area only
Unnamed WA46564	Nature Reserve	WA	In feature area
Unnamed WA53453	Nature Reserve	WA	In feature area
Walyunga	National Park	WA	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

RFA Name	State	Buffer Status
South West WA RFA	Western Australia	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Natural Gas Pipeline Expansion	2006/2813	Controlled Action	Post-Approval	In buffer area only
Perth-Darwin National Highway alignment (Swan Valley Section), WA	2013/7042	Controlled Action	Post-Approval	In buffer area only
Sand quarry development, Lot 2, Bingham Road, Bullsbrook, WA	2017/8104	Controlled Action	Assessment Approach	In buffer area only
Not controlled action				
Boral Bricks Western Australia Pty Ltd, Muchea East Road, Muchea, Western Australia	2019/8522	Not Controlled Action	Completed	In buffer area only
Eradication of the European House Borer, Perth metropolitan area, WA	2009/5027	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

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

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

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

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APPENDIX 4

Conservation Codes

Conservation Codes for Western Australian Flora and Fauna

Threatened, Extinct and Specially Protected fauna or flora are species which have been adequately searched for and are deemed to be, in the wild, threatened, extinct or in need of special protection, and have been gazetted as such.

The lists of Threatened, Extinct and Specially Protected species are listed under Part 2 of the Biodiversity Conservation Act 2016.

Categories of Threatened, Extinct and Specially Protected fauna and flora are:

T Threatened species

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

> ***Threatened fauna*** is the species of fauna that are listed as critically endangered, endangered or vulnerable threatened species.
>
> ***Threatened flora*** is the species of flora that are listed as critically endangered, endangered or vulnerable threatened species.

The assessment of the conservation status of threatened species is in accordance with the BC Act listing criteria and the requirements of Ministerial Guideline (Number 1) and Ministerial Guideline (Number 2) that adopts the use of the International Union for Conservation of Nature (IUCN) Red List of Threatened Species Categories and Criteria 4, and is based on the national distribution of the species.

CR Critically endangered species

Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines.

EN Endangered species

Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines.

VU Vulnerable species

Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines.

Extinct Species

EX Presumed extinct species

Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

EW Extinct in the wild species

Species that "*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

CD Species of special conservation interest (conservation dependent fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Currently only fauna are listed as species of special conservation interest.

OS Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Currently only fauna are listed as species otherwise in need of special protection.

P Priority species

Priority is not a listing category under the BC Act.

All fauna and flora are protected in WA following the provisions in Part 10 of the BC Act. The protection applies even when a species is not listed as threatened or specially protected, and regardless of land tenure (State managed land (Crown land), private land, or Commonwealth land).

Species that may possibly be threatened species that do not meet the criteria for listing under the BC Act because of insufficient survey or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of prioritisation for survey and evaluation of conservation status so that consideration can be given to potential listing as threatened.

Species that are adequately known, meet criteria for near threatened, or are rare but not threatened, or that have been recently removed from the threatened species list or conservation dependent or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of priority status is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

Priority 1: Poorly-known species

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, for example, agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation.

Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements for threatened listing and appear to be under immediate threat from known threatening processes. These species are in urgent need of further survey.

Priority 2: Poorly-known species

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, for example, national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation.

Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements for threatened listing and appear to be under threat from known threatening processes. These species are in urgent need of further survey.

Priority 3: Poorly-known species

Species that are known from several locations and the species does not appear to be under imminent threat or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat.

Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. These species need further survey.

Priority 4: Rare, Near Threatened and other species in need of monitoring

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as a conservation dependent specially protected species.

(c) Species that have been removed from the list of threatened species or lists of conservation dependent or other specially protected species, during the past five years for reasons other than taxonomy.

(d) Other species in need of monitoring.

Western Australian Ecological Communities

Threatened Ecological Communities

The BC Act provides for the statutory listing of threatened ecological communities (TECs) by the Minister.

Presumed Totally Destroyed (PD)

An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.

Critically Endangered (CR)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.

Endangered (EN)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

Vulnerable (VU)

An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

Priority Ecological Communities

Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community List under priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community. Ecological communities that are adequately known, and are rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

Priority One: Poorly-known ecological communities

Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤ 100ha).

Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.

Priority Two: Poorly-known ecological communities

Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

Priority Three: Poorly known ecological communities

(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:

(ii) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or;

(iii) munities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc.

Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.

Priority Four: Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.

(i) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands.

(ii) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for a higher threat category.

(iii) Ecological communities that have been removed from the list of threatened communities during the past five years.

Priority Five: Conservation Dependent ecological communities

Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Commonwealth of Australia Conservation Codes

Threatened Flora and Fauna

Threatened fauna and flora may be listed under Section 178 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in any one of the following six categories:

Extinct

A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.

Extinct in the wild

A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time:

a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.

Critically endangered

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing an extremely high risk of extinction in the wild.

Endangered

A taxon is Endangered when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing a very high risk of extinction in the wild.

Vulnerable

A taxon is Vulnerable when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing a high risk of extinction in the wild.

Conservation dependent

A native species is eligible to be included in the conservation dependent category at a particular time if, at that time:

a) the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or
b) the following subparagraphs are satisfied:
   i. the species is a species of fish;

ii. the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised;
iii. the plan of management is in force under a law of the Commonwealth or of a State or Territory;
iv. cessation of the plan of management would adversely affect the conservation status of the species.

The EPBC Act does not provide for listing in a data deficient category. Where sufficient data (evidence) is unavailable to allow assessment by the Threatened Species Scientific Committee against the criteria for listing, the species are found to be ineligible. A recommendation is made to the Minister to not include the species in any category under the EPBC Act. For reasons of transparency and to inform future research, the Threatened Species Scientific Committee publishes the names of those species found to be data deficient. As data deficient is not a listing category under the EPBC Act, this has no statutory implications and the species is not considered to be listed under the EPBC Act.

Threatened Ecological Communities

Threatened Ecological communities under the EPBC Act are listed in three categories.

Critically endangered

If, at that time, an ecological community is facing an extremely high risk of extinction in the wild in the immediate future (indicative timeframe being the next 10 years).

Endangered

If, at that time, an ecological community is not critically endangered but is facing a very high risk of extinction in the wild in the near future (indicative timeframe being the next 20 years).

Vulnerable

If, at that time, an ecological community is not critically endangered or endangered, but is facing a high risk of extinction in the wild in the medium–term future (indicative timeframe being the next 50 years).

APPENDIX 5

Tree Data

North Bullbrook Stage 1									
Tree #	Species	Easting	Northing	Photo	Height	Diameter	2nd Branch	3rd Branch	Notes
1	Jarrah	408205	6497354	9:31	14	58			no hollows
2	Jarrah	408250	6497378		14	50	49		no hollows
3	Jarrah	408250	6497396	9:32 L	12	69			no hollows
4	Jarrah	408251	6497396	9:32 R	17	73			no hollows
5	Marri	408247	6497409		20	59			no hollows
6	Marri	408279	6497395	9:36	20	96	20	18	no hollows, foraging Carnaby's 9:39x2
7	Marri	408288	6497477		19	59			no hollows, foraging Carnaby's and Red-tails 9:41
8	Marri	408400	6497956		18	54	44		no hollows, foraging
9	Dead	408491	6498032	10:04	20	77			no hollows
10	Jarrah	408599	6498006	10:06	18	94	93		no hollows, one live trunk one dead
11	Jarrah	408593	6497980	10:09	17	163			no hollows, burnt out trunk
12	Marri	408372	6498026		18	55	47	44	no hollows
13	Marri	408375	6498023		18	86			no hollows
14	Marri	408365	6498027		17	62			no hollows, leaning
15	Marri	408341	6498020	10:19	19	139			no hollows, nice tree, branches into three trunks from 1.6m up
16	Marri	408328	6498013	10:21	18	97			no hollows, lots of foraging Carnaby's and Red-tails, new and old
17	Marri	408270	6498030		20	54			no hollows
18	Jarrah	408226	6498025	10:24	20	89			no hollows
19	Jarrah	408249	6498011		19	71			small hollows, foraging
20	Marri	408205	6497946	10:32	22	109			no hollows
21	Marri	408189	6497957		20	79			no hollows
22	Marri	408183	6497945		20	85			no hollows
23	Marri	408187	6497793		18	53			no hollows, foraging
24	Marri	408987	6497698		25	85			small hollows, foraging
25	Dead	408993	6497698		20	68			no hollows
26	Marri	408976	6497730	11:01	12	80			no hollows, stags, unhealthy
27	Dead	408963	6497778	11:07	13	54			small hollows
28	Marri	408982	6497794		19	76			no hollows, lots foraging Red-tails
29	Marri	408956	6497823	11:11	12	79			Large vertical hollow 20cm diam. 11:12 "H" on tree
30	Dead	408900	6497825	11:16	13	79			medium hollow 12m up, 45degrees
31	Marri	408892	6497809		16	73			no hollows, dead branches, unhealthy
32	Marri	408863	6497859	11:33	12	137			Vertical hollow 15cm diam, coppicing "H"
33	Marri	408893	6497864		19	96			no hollows
34	Marri	408801	6497919		20	80			no hollows
35	Dead	408846	6497944		12	124			spout
36	Dead	408751	6498023		10	87			spout
37	Dead	408915	6498032	11:52	11	70			spouts "H"
38	Dead	408929	6498023		19	79			no hollows
39	Jarrah	408950	6497977	11:54	24	124			Hollows 20cm diam horizontal, burnt out base
40	Jarrah	409015	6497902		21	62	35	28	no hollows
41	Marri	409065	6497802		17	97			no hollows
42	Marri	409058	6497792		19	76			no hollows
43	Marri	409064	6497787		20	75			no hollows
44	Marri	409078	6497780		14	50	42		no hollows
45	Dead	409152	6497761	12:07	15	109			Spouts horizontal
46	Marri	409133	6497700		16	80			no hollows, dead branches
47	Marri	409144	6497641		17	55	31		no hollows
48	Marri	409083	6497651		12	98	36		no hollows
49	Marri	409255	6497859		16	55			no hollows
50	Marri	409247	6497836	10:13	17	86			Large hollow, not suitable for cockies
51	Marri	409236	6497819		13	66	28		no hollows, foraging
52	Marri	409214	6497779		17	61			no hollows, foraging Carnaby's
53	Marri	409220	6497776		17	58	44	43	no hollows
54	Marri	409233	6497703		17	72			no hollows
55	Marri	409216	6497679		19	76			no hollows
56	Marri	409243	6497655		18	65			no hollows
57	Dead	409299	6497727		18	60	52		no hollows
58	Marri	409333	6497750		18	90			no hollows, foraging Carnaby's
59	Marri	409368	6497727		16	50			no hollows, foraging Carnaby's
60	Marri	409392	6497827		13	52			no hollows
61	Marri	409393	6497839		18	88			no hollows
62	Marri	409431	6497810		19	62			no hollows
63	Marri	409508	6497795		17	51			no hollows
64	Marri	409442	6497729		17	75			no hollows
65	Marri	409453	6497726		18	55	46	44	no hollows
66	Marri	409401	6497732		18	57			no hollows
67	Marri	409397	6497735		12	52			no hollows
68	Marri	409394	6497729		20	68			no hollows
69	Dead	409402	6497722		19	97			small spouts
70	Marri	409416	6497730		20	68	55		no hollows
71	Marri	409428	6497725		20	62	48		no hollows, foraging Carnaby's
72	Marri	409393	6497750		21	83			no hollows
73	Dead	408992	6497671	11:03	21	119			Large hollow, vertical
74	Marri	408984	6497647		17	70			no hollows, foraging Carnaby's
75	Marri	408964	6497710		19	67			no hollows
76	Dead	408891	6497778	11:09	12	82			Large hollow

North Bullbrook Stage 1									
Tree #	**Species**	**Easting**	**Northing**	**Photo**	**Height**	**Diameter**	**2nd Branch**	**3rd Branch**	**Notes**
77	Marri	408872	6497812		12	72			no hollows, dead main trunk, lots of coppicing
78	Marri	408786	6497852		12	55			no hollows, dead branches
79	Marri	408778	6497843		17	55			no hollows
80	Dead	408671	6497957		10	89			no hollows
81	Marri	408675	6497938		18	62			no hollows
82	Marri	408667	6497935		19	67			no hollows
83	Marri	408635	6497907		18	92	24		no hollows
84	Marri	408700	6497897		18	57			no hollows, foraging Carnaby's
85	Dead	408736	6497869		13	87			small hollows, "H"
86	Dead	408740	6497850	11:32	20	102			small hollows, "H"
87	Dead	408734	6497844		13	88			small hollows, "H"
88	Marri	408619	6497850		20	72			no hollows, foraging Carnaby's
89	Marri	408616	6497855		18	75			no hollows
90	Marri	408611	6497810		17	65			no hollows
91	Dead	408613	6497797		11	72			small hollows
92	Marri	408654	6497823		16	67			no hollows, dead branches
93	Marri	408719	6497825		12	52	47	33, 31	no hollows
94	Marri	408678	6497745		19	68			no hollows, foraging Carnaby's
95	Marri	408696	6497736		16	57			no hollows, foraging Red-tails
96	Dead	408791	6497654		8	97			no hollows, branches with hollows broken off "H"

APPENDIX 12

Stage 1 Aboriginal Cultural Heritage Due Diligence Assessment



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ABN 47 065 099 228

Aboriginal Cultural Heritage Act (2021) Due Diligence Assessment North Bullsbrook Development – Stage 1, Western Australia.

Prepared for Whalan Consulting & the WPG Holdings No. 5 Pty Ltd.

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September 2023

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Disclaimer

The results, conclusions and recommendations contained within this report are based on information available at the time of its preparation. Whilst every effort has been made to ensure that all relevant data has been collated, the author can take no responsibility for omissions and/or inconsistencies that may result from information becoming available subsequent to the report's completion.

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Abbreviations

ACMC:	Aboriginal Cultural Material Committee
ACHA:	Aboriginal Cultural Heritage Act (2021)
AHA:	Aboriginal Heritage Act (1972)
ACH:	Aboriginal Cultural Heritage
ACHIS:	Aboriginal Cultural Heritage Inquiry System
AHIS:	Aboriginal Heritage Inquiry System
ACH Direct:	Aboriginal Cultural Heritage Directory
DDA:	Due Diligence Assessment
DPLH:	Department of Planning Lands and Heritage
SWALSC:	South West Aboriginal Land and Sea Council

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Introduction

Ethnosciences was commissioned by Whalan Consulting to undertake a Due Diligence Assessment (DDA) as required by Section 102 of the Aboriginal Cultural Heritage Act (2021) (ACHA) of the proposed North Bullsbrook urban development comprising approximately 354ha north of the existing Bullsbrook townsite and some 38km northeast of the Perth CBD (Figures 1 & 2). The land, which is currently zoned "Rural" under the Metropolitan Region Scheme (MRS) is owned by the Bullsbrook North Landowners Group (BNLG) coordinated by the Watson Project Management Group, with the assistance of Whalan Consulting. However, the proponents are seeking the rezoning of the Stage 1 area to 'Urban' and the Stage 2 area to 'Urban Deferred'.

The aim of the DDA is to determine if the proposed activities (Tier 3 as defined by the ACHA), would harm Aboriginal Cultural Heritage (ACH). This report focuses on Stage 1 of the proposed development, which includes the Lots currently zoned as 'Urban'. Stage 1 comprises Lots 21, 22, 27 & 28 Kimberley Street; Lots 17-19 & 80-83 Ashton Road and Lots 451 & 452 Chittering Road totalling 76.7ha (Figure 2).

The WA Government has recently announced following major public concerns about the lately introduced ACHA, its intention to repeal the Act and revert to an amended version of the Aboriginal Heritage Act (1972) (AHA). Though the intention is to repeal the ACHA, recent advice from the Department of Planning Lands and Heritage (DPLH) indicates that proponents are still obliged to fulfill the requirements of the ACHA (2021): "Any activities conducted from 1 July 2023 need to be compliant with the Aboriginal Cultural Heritage Act 2021 (ACH Act)" (letter received August 24, 2023, by Ethnosciences from the DPLH Aboriginal Heritage Conservation unit). The letter directs the reader to the DPLH website regarding heritage legal requirements, which notes that the ACHA (2022) is to be repealed, through a Bill to be presented to Parliament and further that: "By repealing the 2021 legislation it means all the extra burdens and obligations placed on landowners will be removed." According to the website as a result of the reintroduction of the AHA: "landowners will have

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one simple obligation: that is to **not knowingly damage an Aboriginal cultural heritage site**, which has been the law since 1972 (emphasis added @ https://www.wa.gov.au/organisation/department-of-planning-lands-and-heritage/aboriginal-heritage-laws' accessed August 24, 2023).

The ACHA explicitly protects both tangible heritage (e.g., archaeological sites) and intangible heritage (e.g., places associated with Creation/Dreaming narratives, or ritual or ceremonies).

DDA Methods

The DDA involved an examination of the Aboriginal Cultural Heritage Directory (ACH Direct.) using the online Aboriginal Cultural Heritage Inquiry System (ACHIS, formerly the AHIS), and a review of the ACH reports relevant to the activity area. As it transpires, the ACHIS does not indicate that any previous heritage investigations have been conducted over the subject land. The nearest study relating to urban development Bullsbrook is that of Wesson, McDonald and Locke. (1990) an archaeological and ethnographic survey of the Defence Housing Authority Housing Development, Chittering Road, Bullsbrook. Hovingh and Cue (2017) and McDonald (2017) conducted the archaeological and ethnographic investigations respectively for the Kingsford development. Other heritage surveys in the general vicinity of the North Bullsbrook development area include Smith and McDonald's (1989) archaeological and ethnographic survey of a water pipeline along the Great Northern Highway from Upper Swan to East Bullsbrook and several surveys for road works along the Great Northern Highway (for example, Prince, Lewington, and Lamond 1996; McDonald, Hales & Associates 1998 & McDonald, Hales & Associates 2003).

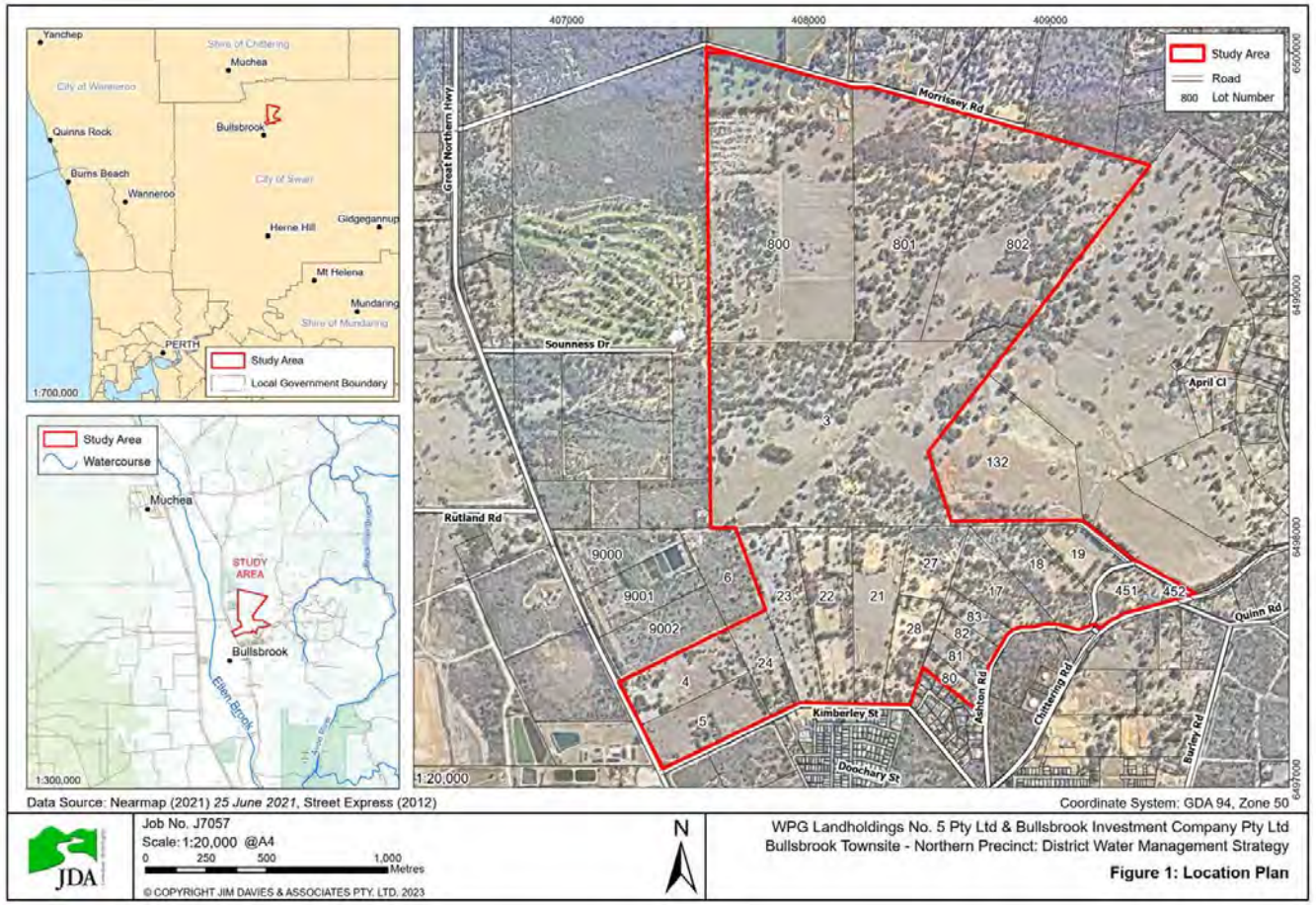

Figure 1: Location of North Bullsbrook District Structure Plan amendment area (Source: JDA 2023)

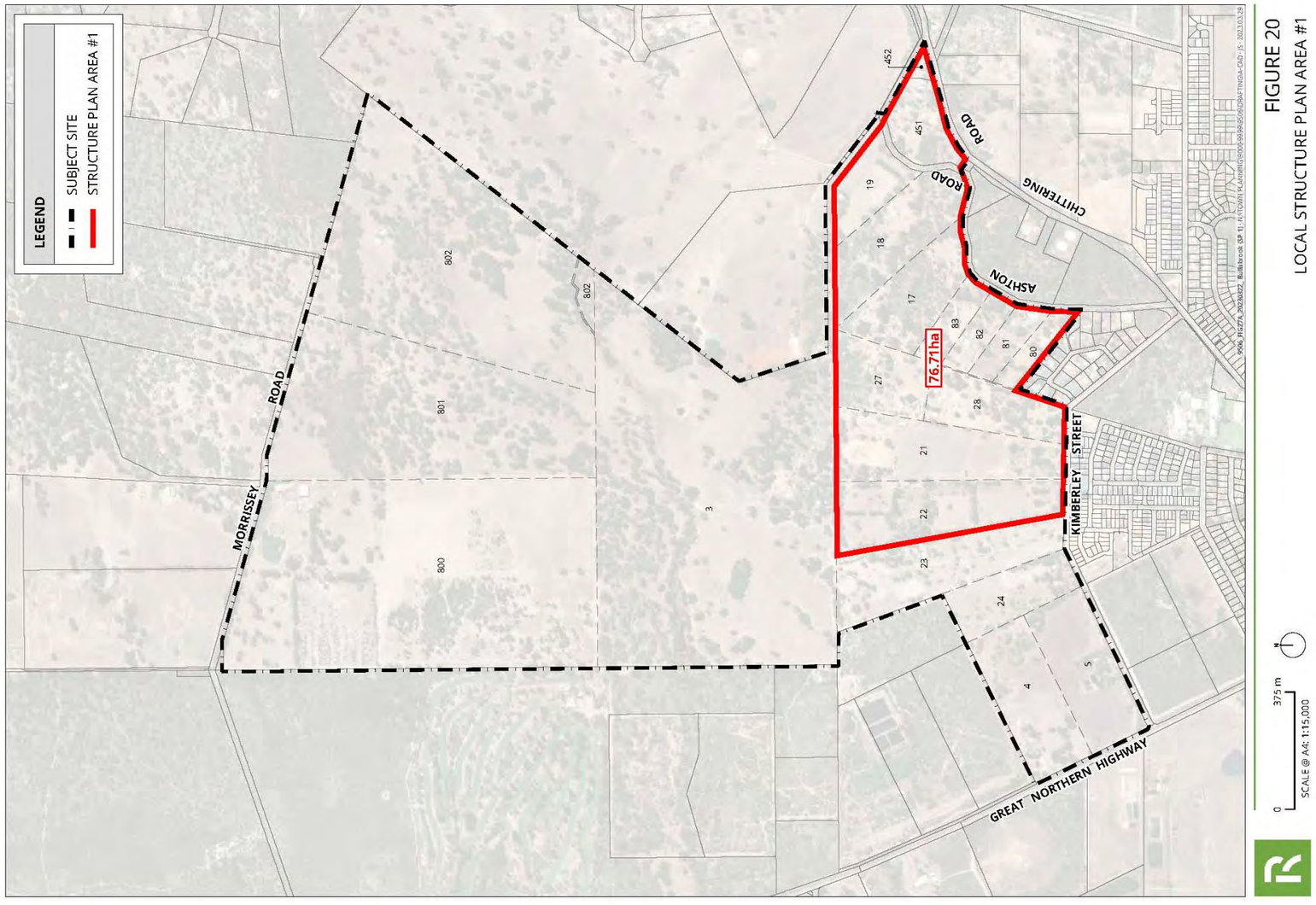

FIGURE 20
LOCAL STRUCTURE PLAN AREA #1

Figure 2: North Bullsbrook District Structure Plan amendment area Stage 1 (Source: Rowe Group)

DDA Results

The results of the DDA are summarised in Table 1 below. Two ACH Places are depicted on the ACHIS as overlapping fully or partially with Stage 1 of the North Bullsbrook development area: ACH Place ID 3525 Ellen Brook: Upper Swan and ACH Place ID 3583 Ki-It Monger Brook 2 (Figure 3). Both places are in essence intangible heritage, though ID 3583 also has a tangible element.

ID 3525 Ellen Brook: Upper Swan

ID 3525 Ellen Brook is listed as a place with a Creation/Dreaming Narrative. Typically, in the case of waterways, this involves the Waugal or Rainbow Serpent (McDonald, Coldrick & Christensen 2008). According to O'Connor, Quartermaine and Bodney (1989: 30) the Ellen Brook/Chandala Brook system is "associated with a Waugal myth". However, McDonald, Hales and Associates (1989) also record an association with the Dreamtime 'turtle', that is the '*yaakan*' or south western snake-necked turtle. O'Connor, Quartermaine and Bodney (1989: 30) also note, that at the time of writing, the creek system had been "the subject of a controversy between developers and Aboriginal people which achieved a degree of media publicity". They go on to say that the "exact dimensions of this site have not yet been recorded".

Ellen Brook is listed as having a 'restricted boundary', and therefore it is depicted on the public ACHIS as a large polygon of approximately 26.5km on its north–south axis and of variable width but some 10.5km at its widest point. In the Bullsbrook area the polygon extends more than 2km east of the junction of Great Northern Highway and Chittering Road. The ACHIS notes that the boundary is restricted: "To preserve confidentiality the exact location and extent of the place is not displayed on the map. However, the shaded region (generally with an area of at least 4km^2) provides a general indication of where the ACH is located." Ostensibly the DPLH apparently have a 'reliable boundary' for the place. Nevertheless, recent

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Aboriginal Cultural Material Committee (ACMC) [1]decisions in respect of the Kingsford development to the south of Bullsbrook indicate that the Committee/DPLH see the actual boundary of the place encompassing the entire Kingsford project area. This is despite the Aboriginal people consulted saying that the site is not within the project area. I've worked extensively along Ellen Brook on various projects since the late 1980s and typically the Aboriginal people consulted see the boundaries of the site basically corresponding to the dimensions of the brook itself and a buffer zone of approximately 30m. ID 3525 is also listed has having associated 'culturally sensitive' information though there are no gender or initiation restrictions. Again, it's not my experience that there is a great deal of 'culturally sensitive' information associated with the watercourse, other than a generalised narrative that it was created by the Waugal.

However, it is the DPLH/ACMC or the new Aboriginal Heritage Council views that matter and not mine when it comes to a heritage assessment. I suspect the maintenance of the extensive polygon is a result of the original comments by O'Connor, Quartermaine and Bodney (1989) that the "exact dimensions of this site have not yet been recorded".

[1] The ACMC is to be replaced by the newly formed Aboriginal Cultural Heritage Council, which was established by the ACHA (2021).

Lot	Protected Area	ACHP laces ID	ACH Pending	ACH Historic	AC Heritage Surveys
22	None Listed	3525 Ellen Brook: Upper Swan	None Listed	None Listed	None Listed
21	None Listed	3525 Ellen Brook: Upper Swan &	None Listed	None Listed	None Listed
27	None Listed	3525 Ellen Brook: Upper Swan & 3583 Ki-It Monger Brook 2	None Listed	None Listed	None Listed
28	None Listed	3525 Ellen Brook: Upper Swan & 3583 Ki-It Monger Brook 2	None Listed	None Listed	None Listed
80	None Listed	3525 Ellen Brook: Upper Swan & 3583 Ki-It Monger Brook 2	None Listed	None Listed	None Listed
81	None Listed	3525 Ellen Brook: Upper Swan & 3583 Ki-It Monger Brook 2	None Listed	None Listed	None Listed
82	None Listed	3525 Ellen Brook: Upper Swan & 3583 Ki-It Monger Brook 2	None Listed	None Listed	None Listed
83	None Listed	3525 Ellen Brook: Upper Swan & 3583 Ki-It Monger Brook 2	None Listed	None Listed	None Listed
17	None Listed	3525 Ellen Brook: Upper Swan & 3583 Ki-It Monger Brook 2	None Listed	None Listed	None Listed
18	None Listed	3525 Ellen Brook: Upper Swan & 3583 Ki-It Monger Brook 2	None Listed	None Listed	None Listed
19	None Listed	3525 Ellen Brook: Upper Swan & 3583 Ki-It Monger Brook 2	None Listed	None Listed	None Listed
451	None Listed	3525 Ellen Brook: Upper Swan & 3583 Ki-It Monger Brook 2	None Listed	None Listed	None Listed
452	None Listed	3525 Ellen Brook: Upper Swan & 3583 Ki-It Monger Brook 2	None Listed	None Listed	None Listed

Table 1: Results of the ACHIS search for each of the Lots in Stage 1 North Bullsbrook District Structure Plan Amendment Area

Note though the ACHA (2021) is to be repealed, the ACHIS still shows the categorisation developed for the 2021 Act, how this might change with the return to the AHA 1972, as amended, is uncertain.
Protected Area = A Protected Area, the highest protection under the ACH Act, may be declared for ACH that is of outstanding significance to a knowledge holder(s), and which is recognised as such through its social, spiritual, historical, scientific or aesthetic values as part of Aboriginal tradition.
ACH = Previous Registered Aboriginal Sites and 'Lodged' Other Heritage Places
ACH Pending = places with information being verified not fully function
ACH Historic = former 'Stored Data / Not a Site' Other Heritage Places

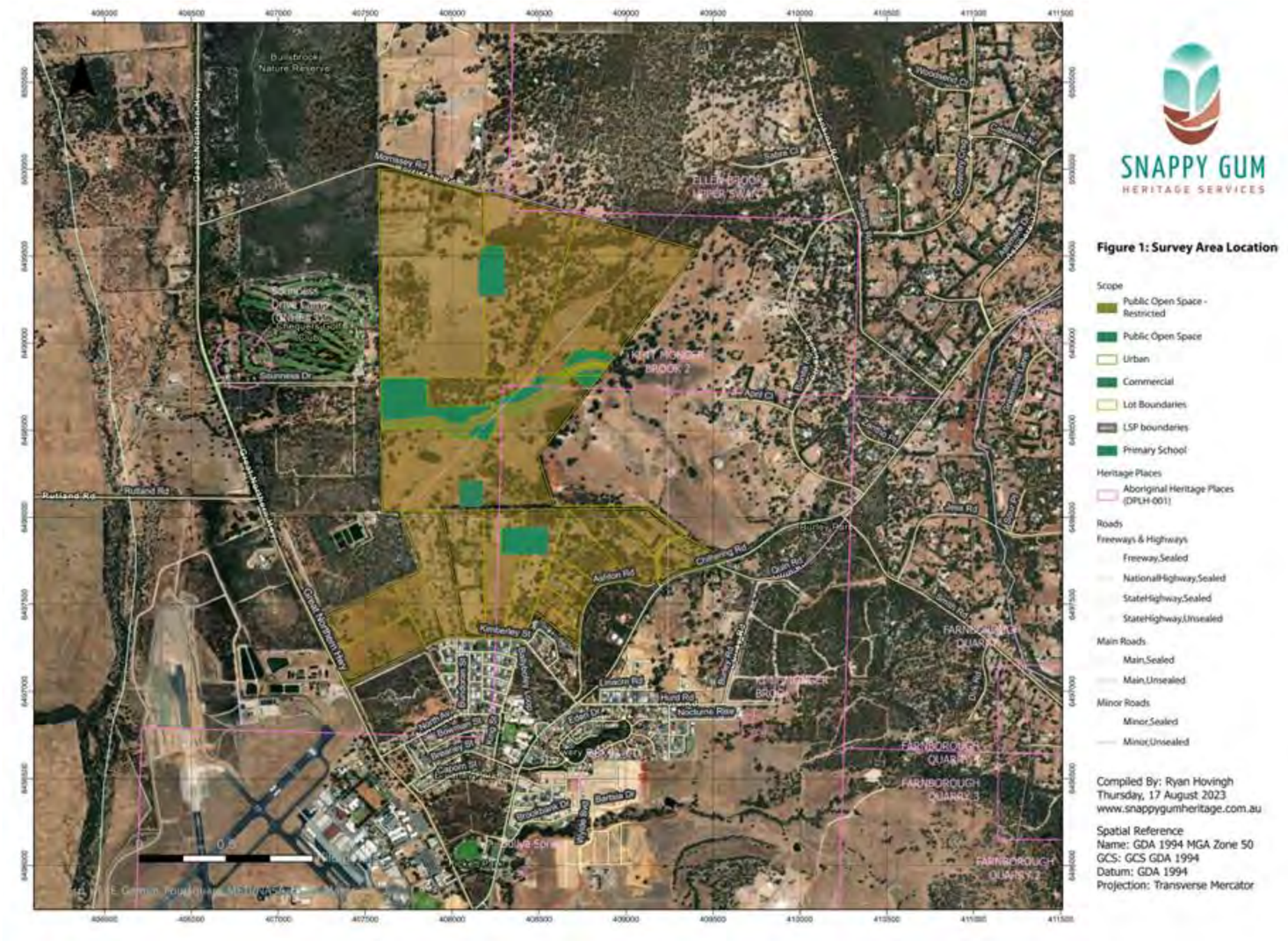

Figure 3: Plan of the North Bullsbrook development area showing ALH Places and ALH Historic (Source: Whalan & Associates)

ID 3583 Ki-It Monger Brook 2

ID 3583 Ki-It Monger Brook 2 relates to the brook itself, where ID 3941 Ki-It Monger Brook 1 is an artefact scatter located south of Hurd Road, Bullsbrook. ID 3583 is listed as a place with ritual/ceremonial; creation/dreaming narrative and a culturally modified tree. The place was listed in part as a result of ethnographic investigations by my colleague, the late Ralph Locke and me (for example, Smith & McDonald 1989 & McDonald, Hales & Associates 1998). Unlike the generalised narrative that Ellenbrook was created by the Waugal, Ki-It Monger Brook has a specific creation/dreaming narrative and was associated with a specific ritual event (McDonald 2017) and unlike Ellenbrook the place does have 'culturally sensitive' information associated with it.

As with ID 3525, the place has a 'restricted boundary', and therefore it is depicted on the public ACHIS as a large polygon of some 4km^2. Though again the DPLH note that they have a reliable boundary for the place. This would seem to be the case, as decisions in respect of the Kingsford development, through which the brook runs, meant that the proponents were dealing with a boundary approximately 30m from the banks of the brook. That being the case it can be concluded that ID 3583 Ki-It Monger Brook 2 does not impinge on Stage 1 of the proposed North Bullsbrook development.

Comments

The present study area is located in the geomorphological zone, which Lyon (1833, cited in Green 1979:176) reports was referred to by Nyungars as *Warget* which ran along the foot of the mountains [Darling Range] and "abounds with clay, red loam, and alluvial plains", where blue and flooded gums were common. The other Nyungar geomorphological zones were *Gandoo* and *Booyeembara*. *Booyeembara* was "the division along the coast, consisting principally of limestone rock; and generally bearing the Xanthorrhoea, and a species of the eucalyptus, called white gum" [i.e., Tuart]. The Nyungar word for rock – booyee -- forms the root of the word describing the geomorphological zone. Mount Brown, for example, was called *Booyeeanup* and *Booyeembara* Park in Fremantle also derives its name from this geomorphological zone. Gandoo, which was inland from and ran parallel to *Booyeembara* and

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is a "sandy division and abounds with that species of Eucalyptus, called Mahogany [Jarrah]" (e.g., the Bassendean Sands).

Research has shown that the archaeological signature of *Booyeembara*, *Gandoo* and *Warget* varies. For instance, Hallam's archaeological survey of the wider Perth Metropolitan Area, the Swan Archaeological Survey (Hallam 1986), which integrated archaeological and ethnohistorical data, recorded archaeological site characteristics, site location and their relationship to geomorphological zones on the Swan Coastal Plain. She notes over several time periods:

> In all periods there are barely any sites in the coastal dunes (QD) or coastal limestone (CL), and few in the sandhills around the lakes on the eastern margin of the limestone belt (KS). The bulk of sites lie around the lakes and swamps of the coastal sandplain (BS), the most extensive zone. The alluvial belt (PP), although limited in area, has many sites; and the small sample of the foothills carries its full quota.(Hallam 1986:1-2)

The present study area lies within Hallam's alluvial belt (PP), belt, i.e., the Pinjarra Plain. [2] Hallam reports that her archaeological data generally reflect the ethnohistorical sources that reed rhizomes (e.g., *yangeti* – *Typha domingensis*) in sand plain swamps, and yams (*warrine* - *Dioscorea hastifolia*) in alluvial and gravel were major Nyungar staples.

Hallam's findings have generally been confirmed by subsequent academic and consultancy research. For example, Bowdler, Strawbridge and Schwede (1991) compared the distribution of then recorded archaeological sites in the Perth Metropolitan Area across the different geomorphic divisions, finding similar results. Ongoing consultancy-based research has confirmed the general pattern described by Hallam (1986) and Bowdler, Strawbridge and Schwede (1991).

[2] Gozzard (2007:14-16) notes that the Pinjarra Plain is an alluvial tract of unconsolidated clays and loams, which consists of alluvial fans near the scarp and floodplains along the rivers. The Pinjarra Plain extends 1.5 to 5km west of the Ridge Hill Shelf.

The majority of artefact assemblages on the Swan Coastal Plain are dominated by quartz, although fossiliferous chert, dolerite, mylonite and silcrete may also be present in varying proportions. Importantly. with the exception of fossiliferous chert, which was apparently quarried from sources lying off the present coastline, all raw materials had to be procured or traded from the Darling Plateau or even further afield. The artefact assemblage recorded by Hovingh and Cue (2017) at ID 37159 (BBK17_01) on the Kingsford development to the south of the present study included fossiliferous chert, quartz, quartzite, dolerite and crystal quartz.

Archaeological research on the Swan Coastal Plain since the 1970s has indicated that Aboriginal archaeological sites are most likely to be found:

- on sandy, well drained dune ridges
- within approximately 350m of a potential water source, including (in decreasing frequency) wetlands, creeks, rivers, lakes, surface water, springs and soaks (Strawbridge 1988).
-

Tempus Archaeology's (2006) study of the Wungong urban development area indicates that archaeological sites on the Pinjarra Plain are not actually found on the alluvium per se but rather on sandy lenses across the zone. GHD (2012) indicate that north of Chittering and Hurd Roads, sands and deep sands are dominant, a conclusion that is supported by recent geotechnical testing, which found that sand was found in most test holes to a depth of at least 1.5m (Brown Geotechnical 2022). One surface water seasonal stream, a tributary of Ellen Brook, runs from east to west through the centre of Lot 3 to the north of the Stage 1 project area. The stream drains from a multiple use dampland to the east (JDA 2023: 7). No wetlands are mapped within the North Bullsbrook project area (JDA: 2023: 7). The apparent absence of wetlands, damplands, streams and other surface water sources would seem to lower the potential for archaeological material to be discovered in the Stage 1 development area.

As noted, ID 37159 (BBK17_01) was recorded by Hovingh and Cue (2017) in the Kingsford development and is located approximately 200m from Ki-it Monger Brook. Ssimilarly Place ID 3941 (Ki-It Monger Brook 1), which was recorded by Pearce in 1979, is also located adjacent to the Brook. Wesson, McDonald and Locke's (1990:8) survey of the Defence Housing

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Authority development on the south side of Chittering Road did not record any archaeological sites and the absence of a water source was considered to be the key reason for the result. Similarly, no archaeological sites were recorded by Smith and McDonald (1989) largely it was concluded because of the highly disturbed nature of the survey area, the road reserves of the Great Northen Highway and Chittering Road. However, a single isolated quartz artefact was found near the water supply tank at the end of the pipeline and another along Chittering Road near Ashton Road. Elsewhere two artefacts, manufactured from telegraph insulators, were found along the pipeline alignment on Great Northen Highway.

No ethnographic sites were reported in the Defence Housing Authority development area though the cultural significance of Ki-It Monger Brook, which is outside the development area, was reiterated (Wesson, McDonald and Locke 1990). With the exception of Ki-It Monger Brook (ID 3583), no other ethnographic sites were reported along the proposed pipeline route (Smith and McDonald 1989). McDonald, Hales & Associates (1998) did not locate any archaeological sites or other evidence of Aboriginal material culture within the planning to upgrade sections of Great Northern Highway. However, several historical campsites were recorded: GNHE #1 & GNHE #2 in the vicinity of Wandena Road (ACH Place ID 3452 Bullsbrook Camp), GNHE#3 Sounness Drive Campsite (ACH Place 20743). GNHE#4 is located between GNH, Truscott St, North Ave and Bearley St, Bullsbrook and GNHE#5 is situated in Pickett Park, Bullsbrook. Neither of the last two mentioned are listed on the ACHIS for some unknow reason. A spring was also reported in the Bullsbrook Nature Reserve.

Conclusions

Until the planned repeal of the ACHA (2021) proponents are bound by the Act and must undertake a DDA to ensure that planned activities do not harm ACH. Once the ACH is replaced by an amended version of the AHA (1972) proponents' sole obligation will be to "not knowingly damage an Aboriginal cultural heritage site", an obligation that applies to all land tenure.

This report is a DDA of Stage 1 of the North Bullsbrook urban development and involved an examination of the ACH Directory using the ACHIS and a review of available ACH reports. The key findings are:

- The land comprising Stage 1 does not seem to have been surveyed for Aboriginal Cultural Heritage.
- The ACHIS indicates that Stage 1 is overlapped in its entirety or partially by two ACH places: ID 3525 Ellen Brook: Upper Swan & ID 3583 Ki-It Monger Brook 2.
- No ACH Historic or pending are recorded on the land.

Though both ID 3525 and ID 3583 appear on the ACHIS with extensive dithered boundaries, previous work resulting in a s18 Ministerial consent for the Kingsford development indicates that the boundary of Ki-It Monger Brook ACH place is determined by an offset from its banks. However, the ACMC had determined that ACH place ID 3525 Ellen Brook would be impacted by the Kingsford development, though the Brook is approximately 2.5km to the west. It is possible that a similar decision would be made in respect of the North Bullsbrook development and as a result approval under the relevant Aboriginal Cultural Heritage legislation will be required. Several historic Aboriginal camps have been recorded around the Bullsbrook townsite, e.g., GNHE#4 and GNHE#5 and there is a possibility that others are yet to be recorded in the North Bullsbrook development area. Consequently, it would be advisable for the proponents to undertake an ethnographic survey (an ACH investigation meeting) for intangible ACH in the Stage 1 area with the relevant Aboriginal party, the Whadjuk People, who are represented by the South West Aboriginal Land and Sea Council (SWALSC).

Though the potential for archaeological material would seem to be low given the absence of surface water in the Stage 1 area it would probably be advisable to undertake an archaeological investigation to confirm the assumption that there are no archaeological sites on the land.

Recommendations

It is recommended that the proponents commission an ethnographic and archaeological survey of the North Bullsbrook Stage 1 development.

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APPENDIX 13

Stage 2 Aboriginal Cultural Heritage Due Diligence Assessment



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Aboriginal Cultural Heritage Act (2021) Due Diligence Assessment North Bullsbrook Development – Stage 2, Western Australia.

Prepared for WPG Landholdings No. 5 Pty Ltd.

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September 2023

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Disclaimer

The results, conclusions and recommendations contained within this report are based on information available at the time of its preparation. Whilst every effort has been made to ensure that all relevant data has been collated, the author can take no responsibility for omissions and/or inconsistencies that may result from information becoming available subsequent to the report's completion.

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Abbreviations

ACMC:	Aboriginal Cultural Material Committee
ACHA:	Aboriginal Cultural Heritage Act (2021)
AHA:	Aboriginal Heritage Act (1972)
ACH:	Aboriginal Cultural Heritage
ACHIS:	Aboriginal Cultural Heritage Inquiry System
AHIS:	Aboriginal Heritage Inquiry System
ACH Direct:	Aboriginal Cultural Heritage Directory
DDA:	Due Diligence Assessment
DPLH:	Department of Planning Lands and Heritage
SWALSC:	South West Aboriginal Land and Sea Council

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Introduction

Ethnosciences was commissioned by WPG Landholdings No. 5 Pty Ltd to undertake a Due Diligence Assessment (DDA) as required by Section 102 of the Aboriginal Cultural Heritage Act (2021) (ACHA) of the proposed North Bullsbrook urban development comprising approximately 354ha north of the existing Bullsbrook townsite and some 38km northeast of the Perth CBD (Figures 1 & 2). The land, which is currently zoned "Rural" under the Metropolitan Region Scheme (MRS), is owned by individual members of the Bullsbrook North Landowners Group (BNLG) coordinated by Watson Project Management Group. The proposed development of the North Bullsbrook area is being approached in two Stages. The proponents are initially seeking MRS rezoning of the Stage 1 area as 'Urban' and followed by the Stage 2 area to 'Urban Deferred'. This report focuses on Stage 2 of the proposed development, which comprises Lots 4 & 5 Great Northern Highway; Lots 23 & 24 Kimberley Street; Lot 3 Ashton Road and Lots 800, 801 & 802 Morrissey Road, Bullsbrook, totalling 277.3ha (Figure 2). The DDA of the Stage 1 area is discussed under a separate cover (McDonald 2023).

The aim of the DDA is to determine if the proposed activities (Tier 3 as defined by the ACHA), are likely to harm Aboriginal Cultural Heritage (ACH). The WA Government has recently announced following major public concerns about the lately introduced ACHA, its intention to repeal the Act and revert to an amended version of the Aboriginal Heritage Act (1972) (AHA). Though the intention is to repeal the ACHA, recent advice from the Department of Planning Lands and Heritage (DPLH) indicates that proponents are still obliged to fulfill the requirements of the ACHA (2021): "Any activities conducted from 1 July 2023 need to be compliant with the Aboriginal Cultural Heritage Act 2021 (ACH Act)" (letter received August 24, 2023, by Ethnosciences from the DPLH Aboriginal Heritage Conservation Unit). The letter directs the reader to the DPLH website regarding heritage legal requirements, which notes that the ACHA (2022) is to be repealed, through a Bill to be presented to Parliament and further that: "By repealing the 2021 legislation it means all the extra burdens and obligations placed on landowners will be removed." According to the website as a result of the reintroduction of the AHA: "landowners will have **one simple obligation**: that is to **not**

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knowingly damage an Aboriginal cultural heritage site, which has been the law since 1972 (emphasis added @ https://www.wa.gov.au/organisation/department-of-planning-lands-and-heritage/aboriginal-heritage-laws' accessed August 24, 2023).

The ACHA explicitly protects both tangible heritage (e.g., archaeological sites) and intangible heritage (e.g., places associated with Creation/Dreaming narratives, or ritual or ceremonies).

DDA Methods

The DDA involved an examination of the Aboriginal Cultural Heritage Directory (ACH Direct.) using the online Aboriginal Cultural Heritage Inquiry System (ACHIS, formerly the AHIS), and a review of available ACH reports relevant to the activity area. As it transpires, the ACHIS does not indicate that any specific previous heritage investigations have been conducted over the subject land. The nearest study listed relating to urban development in Bullsbrook is that of Wesson, McDonald and Locke (1990) an archaeological and ethnographic survey of the Defence Housing Authority Housing Development, Chittering Road, Bullsbrook. However, several studies focus on nearby projects such as those pertaining to road works along the Great Northern Highway (for example, Prince, Lewington, and Lamond 1996; McDonald, Hales & Associates 1998 & McDonald, Hales & Associates 2003). Smith and McDonald's (1989) archaeological and ethnographic surveyed a water pipeline alignment along the Great Northern Highway from Upper Swan to East Bullsbrook and Hovingh and Cue (2017) and McDonald (2017) conducted the archaeological and ethnographic investigations respectively for the Kingsford development to the south. Several regional archaeological and ethnographic studies are also listed on the ACHIS as encompassing the project area including Hallam (1986), Machin (1994), and the Centre for Social Research, ECU & McDonald, Hales and Associates (1997).

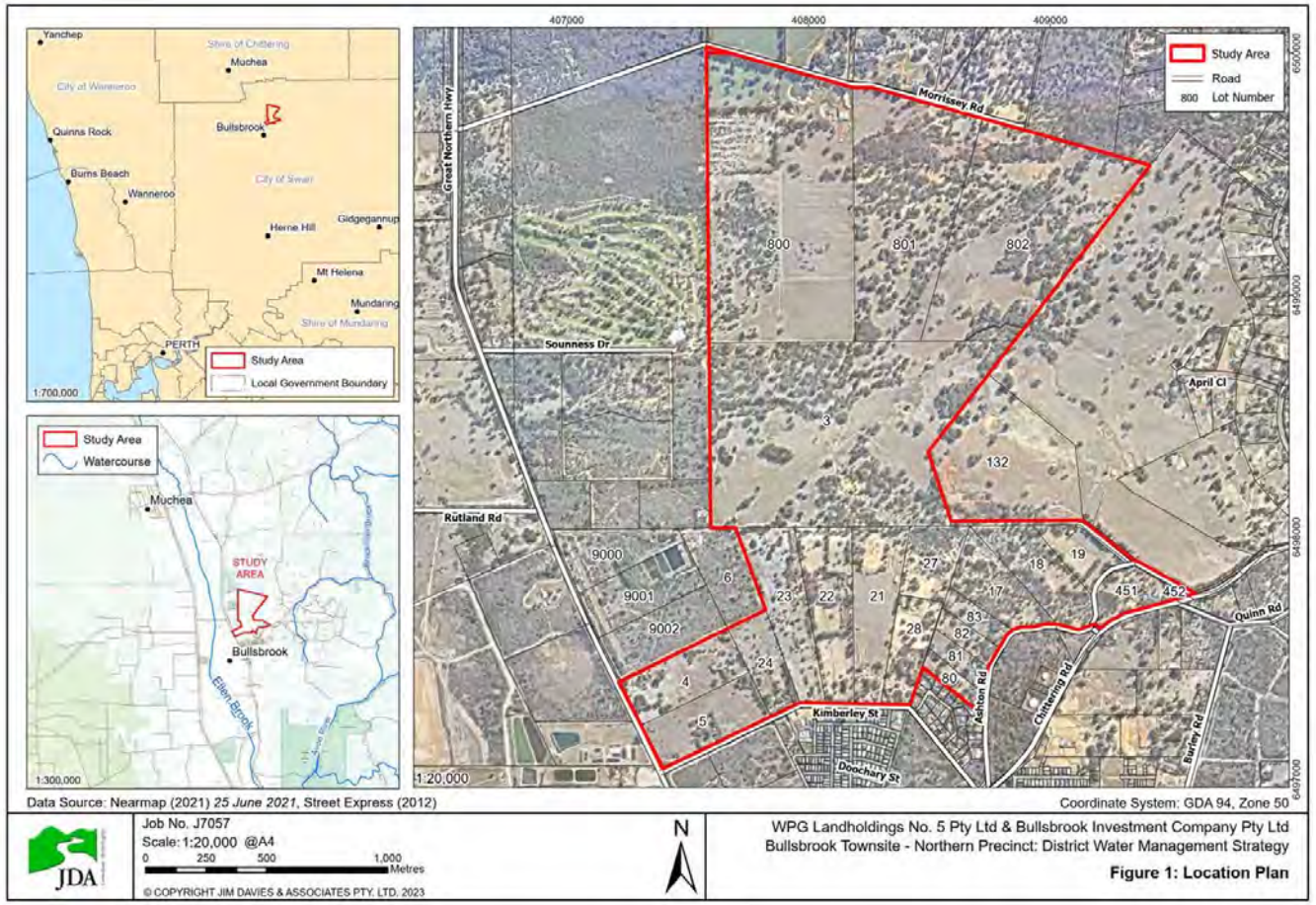

Figure 1: Location of North Bullsbrook District Structure Plan amendment area (Source: JDA 2023)

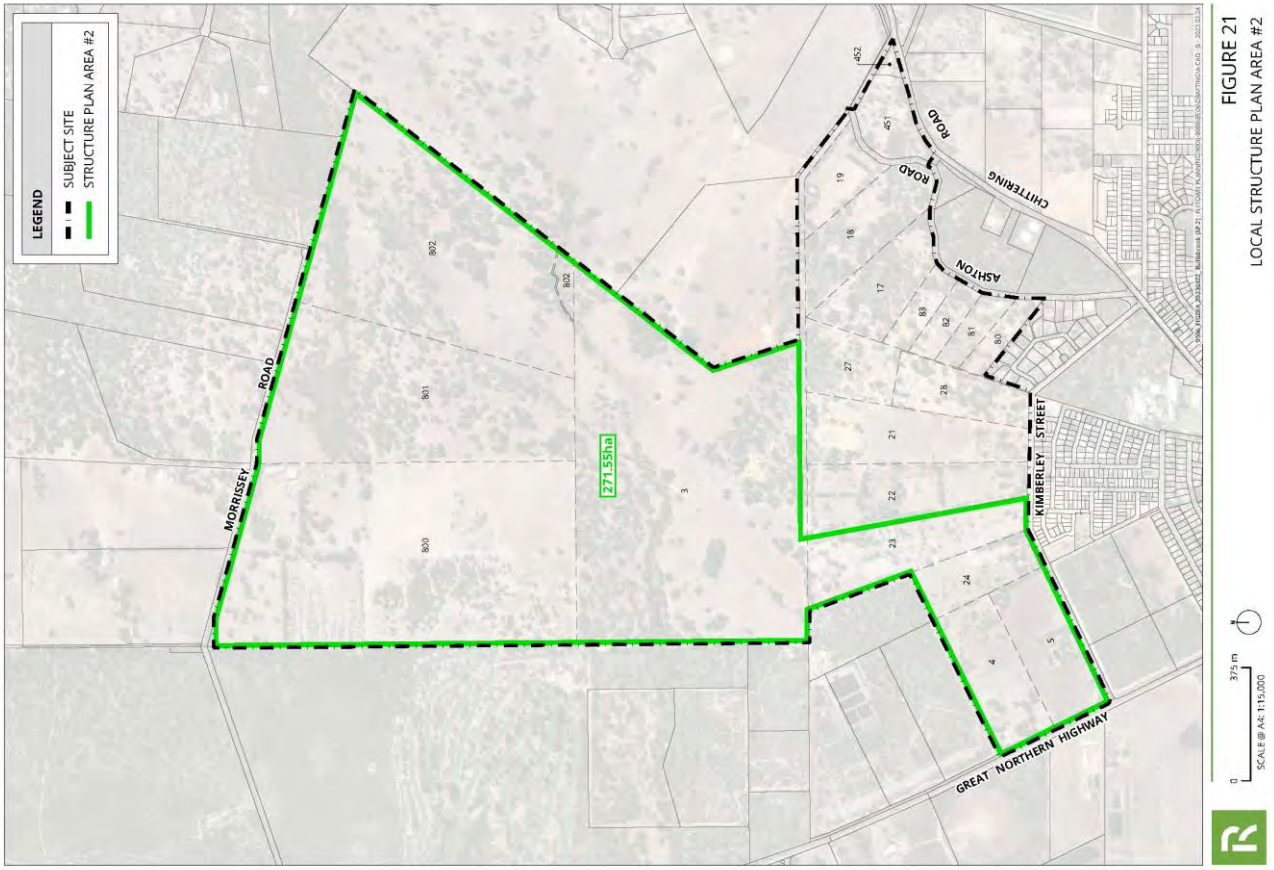

Figure 2: North Bullsbrook District Structure Plan amendment area Stage 2 (Source: Rowe Group)

DDA Results

The results of the DDA are summarised in Table 1 below. Two ACH Places are depicted on the ACHIS as overlapping fully or partially with Stage 2 of the North Bullsbrook development area: ACH Place ID 3525 Ellen Brook: Upper Swan and ACH Place ID 3583 Ki-It Monger Brook 2 (Figure 3). Both places are in essence intangible heritage, though ID 3583 also has a tangible element.

ID 3525 Ellen Brook: Upper Swan

ID 3525 Ellen Brook is listed as a place with a Creation/Dreaming Narrative. Typically, in the case of waterways, this involves the Waugal or Rainbow Serpent (O'Connor, Quartermaine, and Bodney 1989 & McDonald, Coldrick & Christensen 2008). According to O'Connor, Quartermaine and Bodney (1989: 30) the Ellen Brook/Chandala Brook system is "associated with a Waugal myth". However, McDonald, Hales and Associates (1989) also record an association with the Dreamtime 'turtle', that is the '*yaakan*' or south western snake-necked turtle. O'Connor, Quartermaine and Bodney (1989: 30) also note, that at the time of writing, the creek system had been "the subject of a controversy between developers and Aboriginal people which achieved a degree of media publicity". They go on to say that the "exact dimensions of this site have not yet been recorded".

Ellen Brook is listed as having a 'restricted boundary', and therefore it is depicted on the public ACHIS as a large polygon of approximately 26.5km on its north–south axis and of variable width but some 10.5km at its widest point. In the North Bullsbrook area, the polygon extends more than 3km east of the junction of Great Northern Highway and Morrisey Road. The ACHIS notes that the boundary is restricted: "To preserve confidentiality the exact location and extent of the place is not displayed on the map. However, the shaded region (generally with an area of at least 4km^2) provides a general indication of where the ACH is located." Ostensibly the DPLH apparently have a 'reliable boundary' for the place. Nevertheless, recent Aboriginal Cultural Material Committee (ACMC) [1] decisions in respect

[1] The ACMC is to be replaced by the newly formed Aboriginal Cultural Heritage Council, which was established by the ACHA (2021).

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of the Kingsford development to the south of Bullsbrook indicate that the Committee/DPLH see the actual boundary of the place encompassing the entire Kingsford project area. This is despite the Aboriginal people consulted reporting that the site does not overlap with the project area. I've worked extensively along Ellen Brook on various projects since the late 1980s and typically the Aboriginal people consulted see the boundaries of the site basically corresponding to the dimensions of the brook itself and a buffer zone of approximately 30m on either side. Unfortunately, the ACMC's statutory determinations override the views of local Aboriginal people in determining the legal status and extend of places. ID 3525 is also listed has having associated 'culturally sensitive' information though there are no gender or initiation restrictions. Again, it's not my experience that there is any substantial 'culturally sensitive' information associated with the watercourse, other than a generalised narrative that it was created by the Waugal and 'yaakan' or south western snake-necked turtle (McDonald 1989).

However, it is the DPLH/ACMC or the new Aboriginal Heritage Council determinations that matter and not my opinion when it comes to a heritage assessment. I suspect the maintenance of the extensive polygon is a result of the original comments by O'Connor, Quartermaine and Bodney (1989) that the "exact dimensions of this site have not yet been recorded".

Lot	Protected Area	ACH Places ID	ACH Pending	ACH Historic	Specific AC Heritage Surveys
4	None Listed	3525 Ellen Brook: Upper Swan	None Listed	None Listed	None Listed
5	None Listed	3525 Ellen Brook: Upper Swan &	None Listed	None Listed	None Listed
23	None Listed	3525 Ellen Brook: Upper Swan	None Listed	None Listed	None Listed
24	None Listed	3525 Ellen Brook: Upper Swan	None Listed	None Listed	None Listed
3	None Listed	3525 Ellen Brook: Upper Swan & 3583 Ki-It Monger Brook 2	None Listed	None Listed	None Listed
800	None Listed	3525 Ellen Brook: Upper Swan	None Listed	None Listed	None Listed
801	None Listed	3525 Ellen Brook: Upper Swan	None Listed	None Listed	None Listed
802	None Listed	3525 Ellen Brook: Upper Swan	None Listed	None Listed	None Listed

Table 1: Results of the ACHIS search for each of the Lots in Stage 2 North Bullsbrook District Structure Plan Amendment Area

Note though the ACHA (2021) is to be repealed, the ACHIS still shows the categorisation developed for the 2021 Act, how this might change with the return to the AHA 1972, as amended, is uncertain.

Protected Area = A Protected Area, the highest protection under the ACH Act, may be declared for ACH that is of outstanding significance to a knowledge holder(s), and which is recognised as such through its social, spiritual, historical, scientific or aesthetic values as part of Aboriginal tradition.

ACH= Previous Registered Aboriginal Sites and 'Lodged' Other Heritage Places
ACH Pending = places with information being verified not fully function
ACH Historic = former 'Stored Data / Not a Site' Other Heritage Places

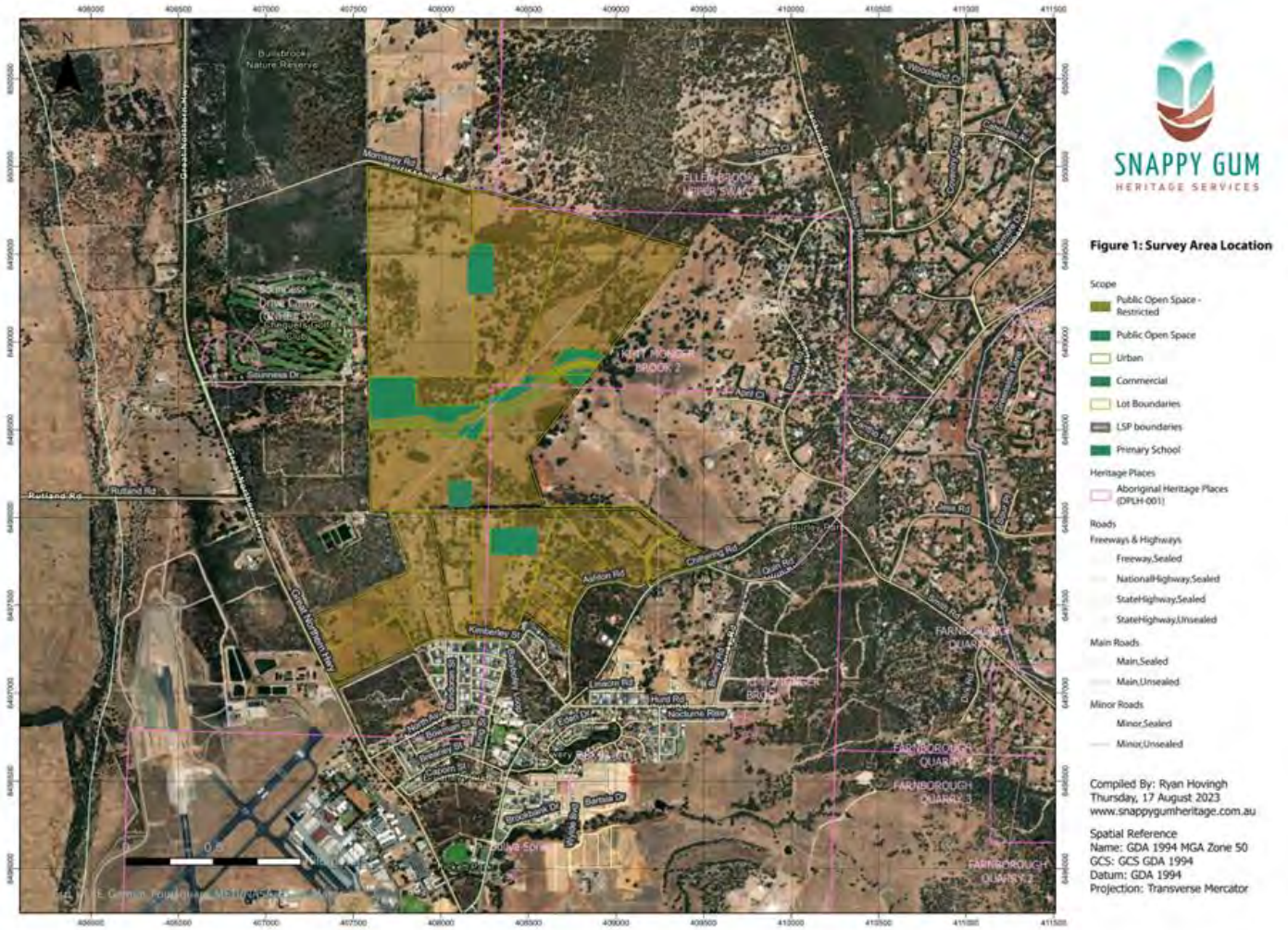

Figure 3: Plan of the North Bullsbrook development area showing ACH Places and ACH Historic (Source: Whalan & ACHIS)

ID 3583 Ki-It Monger Brook 2

ID 3583 Ki-It Monger Brook 2 relates to the brook itself, whereas ID 3941 Ki-It Monger Brook 1 is an artefact scatter located south of Hurd Road, Bullsbrook. ID 3583 is listed as a place with ritual/ceremonial; creation/dreaming narrative and a culturally modified tree. The place was listed in part as a result of ethnographic investigations by my colleague, the late Ralph Locke, and me (for example, Smith & McDonald 1989 & McDonald, Hales & Associates 1998). Unlike the generalised narrative that Ellenbrook was created by the Waugal, Ki-It Monger Brook has a specific creation/dreaming narrative and was associated with a specific ritual event (McDonald 2017) and unlike Ellenbrook the place does have 'culturally sensitive' information associated with it.

As with ID 3525, the place has a 'restricted boundary', and therefore it is depicted on the public ACHIS as a series of large polygon of some 4km^2. Though again the DPLH note that they have a reliable boundary for the place. This would seem to be the case, as decisions in respect of the Kingsford development, through which the brook runs, meant that the proponents were dealing with a boundary approximately 30m from the banks of the brook. That being the case it can be concluded that ID 3583 Ki-It Monger Brook 2 does not impinge on Stage 2 of the proposed North Bullsbrook development. However, it should be kept in mind that from time to time the decisions of the Aboriginal Cultural Heritage Council/ACMC and the DPLH are not always consistent.

Comments

The present study area is located in the geomorphological zone, which Lyon (1833, cited in Green 1979:176) reports was referred to by Nyungars as *Warget* which ran along the foot of the mountains [Darling Range] and "abounds with clay, red loam, and alluvial plains", where blue and flooded gums were common. The other Nyungar geomorphological zones were *Gandoo* and *Booyeembara*. *Booyeembara* (from the Nyungar word for rock: 'booyee') was "the division along the coast, consisting principally of limestone rock; and generally bearing the Xanthorrhoea, and a species of the eucalyptus, called white gum" [i.e., Tuart]. Gandoo, which was inland from and ran parallel to *Booyeembara* and is a "sandy division and abounds with that species of Eucalyptus, called Mahogany [Jarrah]" (e.g., the Bassendean Sands).

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Research has shown that the archaeological signature of *Booyeembara*, *Gandoo* and *Warget* varies. For instance, Hallam's archaeological survey of the wider Perth Metropolitan Area, the Swan Archaeological Survey (Hallam 1986), which integrated archaeological and ethnohistorical data, recorded archaeological site characteristics, site location and their relationship to geomorphological zones on the Swan Coastal Plain. She notes over several time periods:

> In all periods there are barely any sites in the coastal dunes (QD) or coastal limestone (CL), and few in the sandhills around the lakes on the eastern margin of the limestone belt (KS). The bulk of sites lie around the lakes and swamps of the coastal sandplain (BS), the most extensive zone. The alluvial belt (PP), although limited in area, has many sites; and the small sample of the foothills carries its full quota.(Hallam 1986:1-2)

The present study area lies within Hallam's alluvial belt (PP), i.e., the Pinjarra Plain. [2] Hallam reports that her archaeological data generally reflect the ethnohistorical sources that reed rhizomes (e.g., *yangeti* – *Typha domingensis*) in sand plain swamps, and yams (*warrine* - *Dioscorea hastifolia*) in alluvial and gravel were major Nyungar staples.

Hallam's findings have generally been confirmed by subsequent academic and consultancy research. For example, Bowdler, Strawbridge and Schwede (1991) compared the distribution of then recorded archaeological sites in the Perth Metropolitan Area across the different geomorphic divisions, finding similar results. Ongoing consultancy-based research has confirmed the general pattern described by Hallam (1986) and Bowdler, Strawbridge and Schwede (1991).

The majority of artefact assemblages on the Swan Coastal Plain are dominated by quartz, although fossiliferous chert, dolerite, mylonite and silcrete may also be present in varying proportions. Importantly. with the exception of fossiliferous chert, which was apparently quarried from sources lying off the present coastline, all raw materials had to be procured or

[2] Gozzard (2007:14-16) notes that the Pinjarra Plain is an alluvial tract of unconsolidated clays and loams, which consists of alluvial fans near the scarp and floodplains along the rivers. The Pinjarra Plain extends 1.5 to 5km west of the Ridge Hill Shelf.

traded from the Darling Plateau or even further afield. The artefact assemblage recorded by Hovingh and Cue (2017) at ID 37159 (BBK17_01) in the Kingsford development to the south of the present study area, included fossiliferous chert, quartz, quartzite, dolerite and crystal quartz.

Archaeological research on the Swan Coastal Plain since the 1970s has indicated that Aboriginal archaeological sites are most likely to be found:

- on sandy, well drained dune ridges
- within approximately 350m of a potential water source, including (in decreasing frequency) wetlands, creeks, rivers, lakes, surface water, springs and soaks (Strawbridge 1988).
-

Tempus Archaeology's (2006) study of the Wungong urban development area indicates that archaeological sites on the Pinjarra Plain are not actually found on the alluvium per se but rather on sandy lenses across the zone. GHD (2012) indicate that north of Chittering and Hurd Roads, sands and deep sands are dominant, a conclusion that is supported by recent geotechnical testing, which found that sand was found in most test holes to a depth of at least 1.5m (Brown Geotechnical 2022). One surface water seasonal stream, a tributary of Ellen Brook, runs from east to west through the centre of Lot 3 Ashton Road. The stream drains from a multiple use dampland to the east (JDA 2023: 7). No wetlands are mapped within the North Bullsbrook project area (JDA: 2023: 7). The presence of the seasonal watercourse would indicate a potential for archaeological material to be discovered in the Stage 2 development area.

As noted, ID 37159 (BBK17_01) was recorded by Hovingh and Cue (2017) in the Kingsford development and is located approximately 200m from Ki-it Monger Brook. Ssimilarly Place ID 3941 (Ki-It Monger Brook 1), which was recorded by Pearce in 1979, is also located adjacent to the Brook. Wesson, McDonald and Locke's (1990:8) survey of the Defence Housing Authority development on the south side of Chittering Road did not record any archaeological sites and the absence of a water source was considered to be the key reason for the result. Similarly, no archaeological sites were recorded by Smith and McDonald (1989) largely it was concluded because of the highly disturbed nature of the survey area, the road

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reserves of the Great Northen Highway and Chittering Road. However, a single isolated quartz artefact was found near the water supply tank at the end of the pipeline and another along Chittering Road near Ashton Road. Elsewhere two artefacts, manufactured from telegraph insulators,[3] were found along the pipeline alignment on Great Northen Highway.

McDonald, Hales & Associates (1998) did not locate any archaeological sites or other evidence of Aboriginal material culture within the designated upgrade sections of Great Northern Highway. However, several historical campsites were recorded: GNHE #1 & GNHE #2 in the vicinity of Wandena Road (ACH Place ID 3452 Bullsbrook Camp), GNHE#3 Sounness Drive Campsite (ACH Place ID 20743). GNHE#4 is located between the Great Northern Highway, Truscott St, North Ave and Bearley St, Bullsbrook and GNHE#5 is situated in Pickett Park, Bullsbrook. Neither of the last two mentioned are listed on the ACHIS for some unknown reason. A spring was also reported in the Bullsbrook Nature Reserve. No ethnographic sites were reported in the Defence Housing Authority development area though the cultural significance of Ki-It Monger Brook, which is outside the development area, was reiterated (Wesson, McDonald and Locke 1990). With the exception of Ki-It Monger Brook (ID 3583), no other ethnographic sites were reported along the proposed pipeline route (Smith and McDonald 1989). None of the regional studies (e.g., Machin 1994 & Centre for Social Research, ECU & McDonald, Hales and Associates 1997) reported any ethnographic sites in the North Bullsbrook Stage 2 project area.

Conclusions

Though the ACHA (2021) now has been repealed, proponents are still bound by the Act and must undertake a DDA to ensure that planned activities do not harm ACH, until such time as the AHA (1972, as amended) is assented to by the Governor, and becomes an Act of Parliament, i.e., law. Once that occurs a proponents' sole obligation will be to "not knowingly damage an Aboriginal cultural heritage site", an obligation that applies to all land tenure.

[3] Following the arrival of colonists, Aboriginal people throughout Australia utilised imported materials such as class bottles, ceramics and in the case mentioned above, telegraph insulators, to manufacture traditional artefacts, which fall under the ambit of Aboriginal heritage legislation.

This report is a DDA of Stage 2 of the North Bullsbrook urban development and involved an examination of the ACH Directory using the ACHIS and a review of available ACH reports. The key findings are:

- The land comprising Stage 2 does not seem to have been specifically surveyed for Aboriginal Cultural Heritage.
- The ACHIS indicates that Stage 2 is overlapped in its entirety or partially by two ACH places: ID 3525 Ellen Brook: Upper Swan & ID 3583 Ki-It Monger Brook 2.
- No ACH Historic or pending are recorded on the land.

Though both ID 3525 and ID 3583 appear on the ACHIS with extensive dithered boundaries, previous work resulting in a s18 Ministerial consent for the Kingsford development indicates that the boundary of Ki-It Monger Brook ACH place ID 3583 is determined by an offset from its banks. However, the ACMC had determined that ACH place ID 3525 Ellen Brook would be impacted by the Kingsford development, though the Brook is approximately 2.5km to the west. It is possible that a similar decision would be made in respect of the North Bullsbrook development. If so, approval under the relevant Aboriginal Cultural Heritage legislation would be required. Several historic Aboriginal camps have been recorded around the Bullsbrook townsite and along Gret Northern Highway, (e.g., ID 3452 Bullsbrook Camp, ID 20743 Sounness Drive Campsite, GNHE#4 and GNHE#5) and there is a possibility that others are yet to be recorded in the North Bullsbrook development area. Consequently, it would be advisable for the proponents to undertake an ethnographic survey (an ACH investigation meeting) for intangible ACH in the Stage 2 area with the relevant Aboriginal party, the Whadjuk People, who are represented by the South West Aboriginal Land and Sea Council (SWALSC).

Ongoing archaeological research on the Swan Coastal Plain indicates that there is a potential for archaeological material (tangible cultural heritage) to be found in the vicinity of the seasonal watercourse in Lot 3 and adjacent areas. It would therefore be prudent to undertake an archaeological investigation to assess that potential.

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Recommendations

It is recommended that the proponents commission an ethnographic and archaeological survey of the North Bullsbrook Stage 2 development area.

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