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Scott Road Waste Water Pumping Station

Native Vegetation Clearing Permit

Western Environmental Approvals Pty Ltd
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Scott Road Waste Water Pumping Station

Native Vegetation Clearing Permit

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Prepared for:
Mundijong Joint Venture c/- Kerrboyle Pty Ltd
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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.

Environmental Conclusions

In accordance with the scope of services, WEPL has conducted environmental field monitoring and/or testing in the preparation of this report. The nature and extent of monitoring and/or testing conducted is described in this report.

On all sites, varying degrees of non-uniformity of vertical and horizontal conditions in media (soil, water, air, waste or other media as described in the report) are encountered. Hence no monitoring, common testing or sampling technique can eliminate the possibility that monitoring or testing results/samples are not totally representative of media conditions encountered. The conclusions are based on the data and the environmental field monitoring and/or testing actually undertaken, and are therefore merely indicative of the environmental condition of the site at the time of preparing this report, including the presence or otherwise of contaminants or emissions. It should be recognised that site conditions, including the extent and concentration of contaminants, can change.

Within the limitations imposed by the scope of services, the monitoring, testing, sampling and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. To the maximum extent permitted by law, no other warranty, express or implied, is made.

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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.

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1. Introduction

1.1 Project Background and Location

The Mundijong Joint Venture c/- Kerrboyle Pty Ltd (the Mundijong Joint Venture) are proposing to undertake clearing associated with the Scott Road Interim Type 90 Wastewater Pump Station (WWPS) and associated pressure main to Byford (herein referred to as 'the Project'). The Project has been identified in Water Corporation's overall sewer catchment planning for the area. Once the Project has been constructed and installed, the Project will facilitate the disposal of sewage from future developments in the suburbs of Mundijong, Cardup, and Whitby.

The Tonkin Highway Extension Thomas Road to South Western Highway Project being delivered by Main Roads Western Australia (MRWA) has an approved action under the EPBC Act (2019/8608). A large proportion of the alignment of the pressure main for this Project falls within the approved boundary for EPBC Approval 2019/8608. In December 2000, MRWA referred a Project to the Environmental Protection Authority (EPA) to construct the Tonkin Highway Extension Thomas Road to South Western Highway Project, pursuant to Section 38 of the EP Act, from which the EPA set a level of assessment of Public Environmental Review (PER), with a Ministerial Statement 595 issued in June 2002.

The alignment of the WWPS and associated pressure main is situated in Mundijong, WA, approximately 35 km south of Perth Central Business District (CBD) and covers a distance of 6.25 km (Figure 1).

The WWPS is proposed to be within Lot 8002, Scott Road, on DP 410820 that has already been acquired by the Water Corporation (Cossill & Webley, 2025). This land is zoned as 'Urban' under the Metropolitan Region Scheme (MRS) and 'Urban Development' under the Shire of Serpentine Jarrahdale Local Planning Scheme No. 3 (LPS 3).

The majority of pressure main alignment traverses across Water Corporation easement and also within some Shire of Serpentine Jarrahdale land, MRWA road reserve and a parcel of freehold land at Lot 33 Hopkinson Road owned by Cardup Investments Pty Ltd. Water Corporation shall acquire the balance of the service corridor for the pressure main alignment at Lot 33 Hopkinson Road through the subdivision process. The pressure main alignment is made up of the following lots and zoned under the MRS detailed in Table 1 and shown in Table 1.

Western Environmental Approvals Pty Ltd (WEPL) undertook biological surveys that included a Survey Area which comprised of a 30 m buffer each side of the pressure main and a buffered survey area along Scott Road and Taylor Road to enable design considerations. The Survey Area covered 38.65 ha and is depicted in Figure 1.

Table 1: Lots Intersecting the Project Area

Address	Deposited Plan / Lot	MRS Zoning	Landowner
Copper Road	P ROAD	Residential	Shire of Serpentine Jarrahdale
Lot 7 Abernethy Road, BYFORD 6122	P008207 7	Urban development, Infrastructure Services	Water Corporation
ORTON ROAD	P ROAD	Urban development	Shire of Serpentine Jarrahdale
Subdivision Development 3000	P404193 3000	Urban development	Water Corporation
CARDUP SIDING ROAD	P ROAD	Local road	Shire of Serpentine Jarrahdale
Learmouth turn	P ROAD	Local road	Shire of Serpentine Jarrahdale
681 Hopkinson Road, CARDUP 6122	P226005 33	Urban development	Cardup Investments Pty Ltd
HOPKINSON ROAD	P ROAD	Primary distributor road	MRWA
Subdivision Development 382	P072074 382	Infrastructure Services	Water Corporation
900 Hopkinson Road, CARDUP 6122	P077690 391	Rural	Private
N/A	P401590 1	Infrastructure Services	Water Corporation
N/A	P401591 4	Infrastructure Services	Water Corporation
N/A	P401590 2	Infrastructure Services, Local road	Water Corporation
N/A	P410820 8002	Local road, Urban development, Infrastructure Services	Water Corporation
SCOTT ROAD	P ROAD	Local road	Shire of Serpentine Jarrahdale
Subdivision Development 8002	P410820 8002	Local road, Urban development, Infrastructure Services	Water Corporation

All native vegetation clearance included within this application is within the following lots and associated landowners:

- P008207 on Lot 7 - Water Corporation.
- P072074 on lot 382 - Water Corporation.
- P404194 on lot 2095 - Water Corporation.
- P410820 on lot 8002 - Water Corporation.

- P401590 on Lot 2 - Water Corporation.
- Scott Road - Shire of Serpentine and Jarrahdale.

Please note that native vegetation located within 681 Hopkinson Road, CARDUP 6122 has been cleared under an approved subdivision application for the Constellar Cardup Junction Project. The pressure main for this Project traverses through this property. The vegetation clearance has occurred post WEPL's biological survey and associated mapping occurred, so please note the figures within this report will show native vegetation non-native vegetation, and fauna values located within the pressure main footprint with the 681 Hopkinson Road, CARDUP 6122.

Due to above, the native vegetation extent within the clearing footprint has reduced from 0.70 ha to 0.58 ha. The number of potential nesting trees for black cockatoos has reduced from 28 to 20 potential nesting trees, with eight potential nesting trees for black cockatoos (7 Class 4 and 1 Class 5) located within the Constellar Cardup Junction Project footprint. There was 0.02 ha of suitable foraging habitat (8/10) for Forest Red-tailed black cockatoo within the Constellar Cardup Junction Project footprint that has been removed. There was no suitable foraging habitat for Baudin's black cockatoo and Carnaby's black cockatoo within the Constellar Cardup Junction Project footprint.

The total amount of native vegetation and fauna habitat clearance has been modified throughout this report and within the submitted Index of Biodiversity Surveys for Assessments (IBSA) package and in particular the vegetation to be cleared shapefile.

WEPL undertook an out of season Reconnaissance flora and vegetation assessment in accordance with the Environmental Protection Authority (EPA) (2016) *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessments*. Due to the size of the road reserves and condition of the vegetation present this was deemed adequate to define the presence of Threatened Flora and Communities in accordance with relevant Conservation Advice and Recovery Plans. Furthermore, this position is supported by the survey effort and outcomes undertaken for the Tonkin Highway Extension Thomas Road to South Western Highway Project which has both State and Commonwealth approval.

The Project Area assessed includes the following:

- The footprint of the proposed 6.25 km pressure main within a 10 m wide corridor that extends from Copper Road in Byford to Scott Road in Mundijong.
- The footprint of the WWPS located on Lot 8002 on Deposited Plan (DP) 410820, Scott Rd Mundijong.
- The footprint of the upgrade of Scott Road between the WWPS and Talyor Road to the east.
- The Project Area covers an area of 7.21 ha as depicted in Figure 1.

The pressure main is expected to be installed predominantly via open trench excavation, with some sections designed to implement trenchless drilling and under boring to avoid and minimise impacts where known environmental values are present. The trenchless drilling and under boring construction works are

anticipated to cover an area of 1.06 ha within the Project Area and will not require the clearing of any native vegetation. There are potential indirect impacts to native vegetation and associated fauna habitat that is discussed throughout this report. Due to the potential indirect impacts, the Disturbance Footprint and Project Area have the same footprint of 7.21 ha.

The Project will require the clearing of up to 0.58 ha of scattered native vegetation within the 7.21 ha Disturbance Footprint. The balance of the Disturbance Footprint comprises cleared completely degraded paddock, retained native vegetation within the trenchless drilling and under boring footprint that is representative of State and Commonwealth listed Threatened Ecological Communities (TECs), which provides foraging habitat values for black cockatoos and limited fauna habitat values.

1.2 Objectives

The proposed WWPS and pressure main necessitates the clearing of native vegetation in a linear alignment within the Project Area. The Mundijong Joint Venture has commissioned WEPL to prepare a Native Vegetation Clearing Permit Application (NVCP).

The scope of works included:

- "Reconnaissance" level field survey as per the Environmental Protection Authority (EPA) Technical Guidance for Flora and Vegetation Surveys (2016) comprising the following:
    - Desktop assessment including DBCA database searches for Threatened and Priority Flora locations and Threatened and Priority Ecological Communities.
    - An assessment of likelihood of occurrence (LoO) for Threatened and Priority Flora and Ecological Communities identified by the desktop assessment and based on survey results.
    - Reconnaissance level flora and vegetation survey.
    - Vegetation condition mapping and significant weed survey.
- Basic Fauna Survey.
- Assessment of Black Cockatoo Habitat, undertaken in in accordance with Commonwealth referral guidelines for Threatened Black Cockatoos (DAWE, 2022).
- Preparation of a supporting technical report including results of the desktop and field surveys as well as an assessment against the clearing principles for native vegetation under Schedule 5 of the *Environmental Protection Act 1986* (EP Act).
- Preparation of a geospatial data package prepared in accordance with IBSA).
- Preparation of a NVCP application form.

The Reconnaissance flora and vegetation survey was undertaken outside of the optimal survey season, with aim to assess habitat suitability for Threatened and Priority flora and ecological communities. The scope was deemed appropriate given the degraded condition of the Survey Area and the level of investigation for the project. As such, seasonal targeted surveys were considered unnecessary which is a position supported by the survey effort and outcomes undertaken for the Tonkin Highway Extension Thomas Road to South Western Highway Project by Woodman Environmental (2019) that has State and Commonwealth approval.

403341 403434 403527 403620 403713

6434298 6434205 6434112 6434019 6433926 6433833 6433740

Gallipoli Av
Galena Way
Larimar Pde
Copper Rd
Tourmaline Bvd
Tourmaline Bvd
Zircon Dr
Rosaline Cr
Agate Way
Astartea Pl
Tourmaline Bvd

403341 403434 403527 403620 403713

Figure 1a: Project Area Overview

N 0 10 20 30 40 m

SCALE: 1:1,850	SHEET SIZE: A3 COLOUR		
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

CLIENT: Cossil and Webley

Legend

- Project Area
- Survey Area
- Proposed Underboring Areas
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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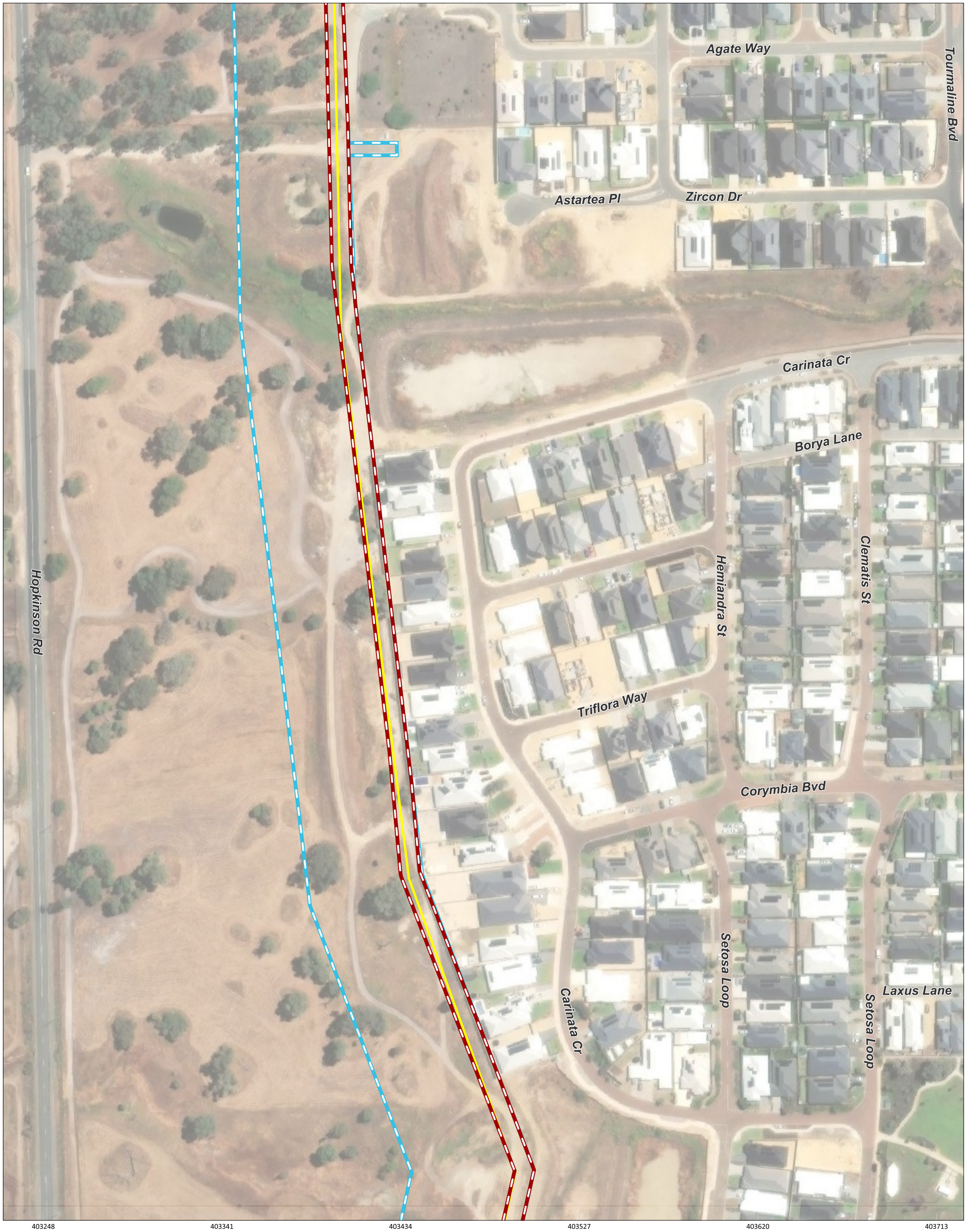


Figure 1b: Project Area Overview

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0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA		
SCALE: 1:1,850	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

Legend

- Project Area
- Survey Area
- Proposed Underboring Areas
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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Figure 1c: Project Area Overview

0 10 20 30 40 m

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SCALE: 1:1,850	SHEET SIZE: A3 COLOUR
PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032 / VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore / DATE: 4/12/2025

Legend

- Project Area
- Survey Area
- Proposed Underboring Areas
- Proposed Pipeline

No	Description	Drawn	Approved	Date
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Figure 1d: Project Area Overview

0 10 20 30 40 m

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PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,850
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Survey Area
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- Proposed Pipeline

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Figure 1e: Project Area Overview

0 10 20 30 40 m

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PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA			
SCALE: 1:1,850	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

Legend

- Project Area
- Survey Area
- Proposed Underboring Areas
- Proposed Pipeline

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403155 403248 403341 403434 403527 403620

6431787 6431694 6431601 6431508 6431415 6431322 6431229

Hopkinson Rd

Figure 1f: Project Area Overview

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,850
SHEET SIZE	A3 COLOUR
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- Project Area
- Survey Area
- Proposed Underboring Areas
- Proposed Pipeline

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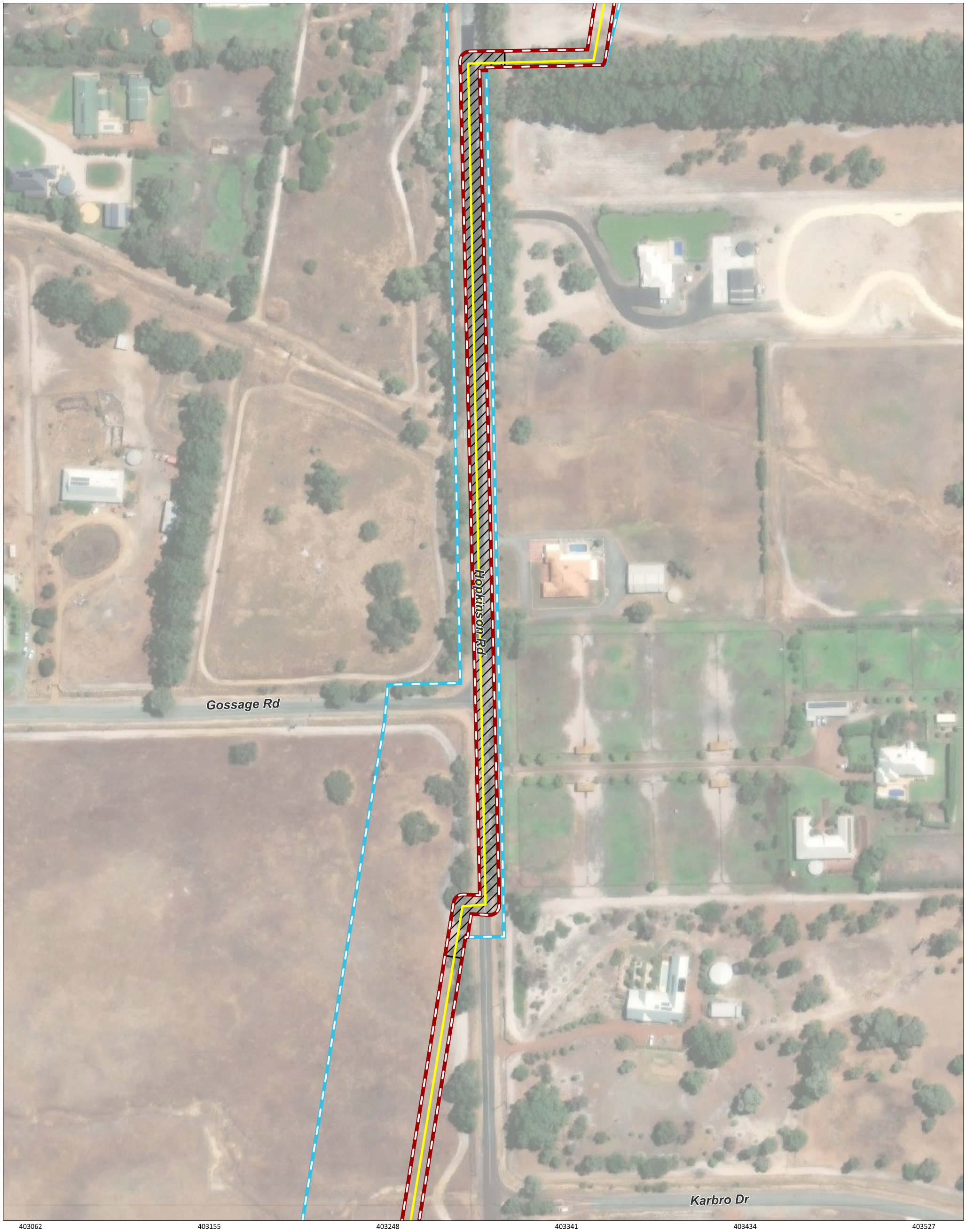
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6431322 6431229 6431136 6431043 6430950 6430857 6430764



403062 403155 403248 403341 403434 403527

Figure 1g: Project Area Overview

0 10 20 30 40 m

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Figure 1h: Project Area Overview

N 0 10 20 30 40 m		PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	
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402969 403062 403155 403248 403341

6430299 6430206 6430113 6430020 6429927 6429834 6429741

Hopkinson Rd

Figure 1i: Project Area Overview

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,850
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Survey Area
- Proposed Underboring Areas
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

NOTES:

WESTERN ENVIRONMENTAL

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Figure 1j: Project Area Overview

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,850
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Survey Area
- Proposed Underboring Areas
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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Figure 1l: Project Area Overview

0 10 20 30 40 m

N

SCALE: 1:1,850	SHEET SIZE: A3 COLOUR
PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	
CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032 / VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore / DATE: 4/12/2025

Legend

- Project Area
- Survey Area
- Proposed Underboring Areas
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

NOTES:

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Figure 1m: Project Area Overview

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,853
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Survey Area
- Proposed Underboring Areas
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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Figure 1n: Project Area Overview

N 0 10 20 30 40 m		PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	
SCALE: 1:1,853	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

Legend

- Project Area
- Survey Area
- Proposed Underboring Areas
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

NOTES:

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2. Previous Environmental Assessments and Approvals

2.1 Existing Approvals

2.1.1 Southern Sources Integration Assets and Ministerial Statement 845

The proposed pressure main route for the Project falls mostly within the Southern Sources Integration Assets (SSIA) pipeline corridor options, for which a strategic proposal under Part IV of the EP Act has been assessed (MS 845) on behalf of Water Corporation. MS 845 was approved by the EPA on 04 November 2025.

2.1.2 Whitby Pressure Main Derived Proposal

The Whitby Pressure Main project was located within Route 4 of the SSIA strategic proposal, which was strategically assessed by the EPA. Accordingly, the Whitby Pressure Main project was requested to be assessed as a derived proposal (not needing a full new assessment) in accordance with Section 39B(i) of the EP Act. This approach was adopted as the proponent was confident they had addressed the environmental factors identified as relevant for the SSIA strategic proposal, and would not impact any environmental factors that were not previously considered. The EPA declared the proposal to be derived on 16 February 2015, and subsequently approved the Whitby Pressure Main project (EPA, 2015).

This Project is being delivered by Parcel Property as the proponent, with costs being re-couped by the developer as per the DCWA entered into with Water Corporation WA. Upon successful completion of construction of the Project, ownership of the asset will be transferred to the Water Corporation. As a result of this approach, the Project is not able to utilise the existing Water Corporation approvals with the SSIA and MS 845 approval as these are specific approvals to Water Corporation as the proponent. This Project requires a separate environmental assessment and associated approvals under relevant Commonwealth and State legislation.

2.1.3 Tonkin Highway Extension Thomas Road to South Western Highway Project

The Tonkin Highway Extension Thomas Road to South Western Highway Project being delivered by MRWA has an approved action under the EPBC Act (2019/8608). A large proportion of the alignment of the pressure main for this Project falls within the approved boundary for EPBC Approval 2019/8608. In December 2000, MRWA referred a Project to the EPA to construct the Tonkin Highway Extension Thomas Road to South Western Highway Project, pursuant to Section 38 of the EP Act, from which the EPA set a level of assessment of Public Environmental Review (PER), with a Ministerial Statement 595 issued in June 2002.

2.1.4 Native Vegetation Clearing Permits

Several native vegetation clearing permits (NVCPs) have been approved within the road reserves intersecting and adjacent to the Project Area, these are summarised below in Table 2.

Table 2: Native Vegetation Clearing Permits within and within Close Proximity to the Project Area

NVCP Number	Proponent	Status	Purpose of clearing	Relevant to Project Area
8903/1 - Area Permit.	Shire of Serpentine Jarrahdale	Expired (Approved)	Road construction or upgrades	Within the Project Area along Hopkinson Road and adjacent to the Project Area
4635/1 - Area Permit	Shire of Serpentine Jarrahdale	Expired (Approved)	Mechanical Clearing	100 m west of Project Area along Gossage Road
9339/1 - Area Permit	Shire of Serpentine Jarrahdale	Amended	Road construction or upgrades	200 m east of the Project Area on Karnup Road and Bishop Road.
9339/2 - Area Permit	Shire of Serpentine Jarrahdale	Granted with offset condition with the requirement to plant 68 Marri (*Corymbia calophylla*) trees within Bishop Road reserve to provide suitable foraging habitat with black cockatoo species.	Road construction or upgrades	200 m east of the Project Area on Karnup Road and Bishop Road.

2.2 Previous Environmental Surveys and Reports

2.2.1 Preliminary Site Walkover in 2024 (WEPL, 2024)

WEPL have previously undertaken a preliminary site walkover and high-level environmental constraints analysis for the Project (WEPL, 2024). The investigation undertaken was to identify potential environmental values and inform design relating to the proposed alignment of the Scott Road WWPS to Byford. Detailed biological surveys were not conducted at this stage of the planning process but have since been undertaken by WEPL in 2025 to identify ecological values as part of the revised scope of works that includes the development of this NVCP (WEPL, 2025).

The site walkover and subsequent Environmental Assessment Letter Report identified the following environmental constraints that require design consideration and may represent a limitation to development: It should be noted the alignment of the pressure main has since been amended at the time of preparing this. The Project Area has been moved from behind the properties on the west side of Learmouth Turn, Byford, to the eastern verge side of Learmouth Turn, Byford WA.

- Potential TECs as listed under the BC Act and EPBC Act:

- *Corymbia calophylla - Kingia australis* woodlands on heavy soils, Swan Coastal Plain (SCP 3a); TEC listed as a critically endangered ecological community under the BC Act and endangered under the EPBC Act.
- Banksia Woodlands of the Swan Coastal Plain ecological community (Banksia Woodlands TEC); listed as Priority 3 by the Department of Biodiversity, Conservation and Attractions (DBCA) and Endangered under the EPBC Act.

- Black Cockatoo Habitat (including suitable or potential breeding trees); as defined by the Commonwealth referral guidelines for Threatened Black Cockatoos (DAWE, 2022).
- One Aboriginal Cultural Heritage (ACH) Places as listed on DPLH's Aboriginal Cultural Heritage Inquiry System (ACHIS) intersects the Project Area: Registered Aboriginal Site ID 396: SOUTH-EAST CORRIDOR 07 / CARDUP SIDING.
- Bush Forever Site (351).
- Geomorphic Wetlands of the Swan Coastal Plain (SCP):
  - Resource Enhancement Wetland (REW) (UFI 14540).
  - CCW (UFI 14945).

2.2.2 WEPL Biological Surveys in 2025

WEPL undertook biological surveys in July 2025 to define key flora, vegetation, fauna, and black cockatoo habitat values within the Survey Area.

The scope of work included:

- A desktop assessment to consider abiotic and biotic values of the Site, including potentially significant environmental values. This included a review of publicly available data, published information, and searches of the EPBC Act Protected Matters Search Tool (PMST), and database records held by the DBCA.
- Field surveys that comprised the following:
  - Reconnaissance level flora an vegetation assessment in accordance with the Environmental Protection Authority (EPA) Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessments (EPA, 2016). The survey included unit delineation and mapping: National Vegetation Information System (NVIS) Level V will be utilised for structural description of vegetation units and mapping (NVIS Technical Working Group 2017). Vegetation units will be interpreted and delineated in the field using structural and composition types, with boundaries drawn on aerial imagery.

- Vegetation condition mapping and delineation: Vegetation condition will be determined according to the condition rating scale as per the EPA's Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016).
- Establishment of relevés in each vegetation unit to sample and describe structure and key/dominant species present.
- Preparation of a flora inventory of common and key/dominant species.
- Plants will be collected for expert identification if they are unknown to the field botanist or have potential to be of conservation significance and will be processed according to Western Australian Herbarium protocols.
- Weeds of National Significance (WoNS) and declared pests will be recorded.
- A Basic fauna survey and LoO for Threatened or Priority fauna in accordance with the Technical Guidance for Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA 2020) (The Technical Guidance).
- Targeted black cockatoo habitat assessment as per Department of Climate Change, Energy, the Environment and Water (DCCEEW) Referral Guideline for 3 WA Threatened Black Cockatoo Species (2022) to identify potential breeding, foraging or roosting habitat.

- Preparation of a technical report detailing the findings of the desktop assessment and field surveys.
- Preparation of a geospatial data package prepared in accordance with IBSA requirements.

Refer to Appendix A for full details of the methodology for the biological surveys.

In addition to site assessment and surveys undertaken by WEPL, this NVCP has been developed considering information from a range of previous surveys and assessments as listed in Table 3, and other relevant reports as listed in Table 4.

Table 3: Previous Environmental Surveys and Assessments

Survey /Assessment Type	Survey Area	Contractor and Year
Reconnaissance Flora and Vegetation Survey, Basic Fauna and Targeted Black Cockatoo Assessment	Entire Project Area (Scott Road WWPS to Byford)	WEPL, 2025
Preliminary Site Assessment	Entire Project Area (Scott Road WWPS to Byford)	WEPL, 2024
Structure Plan	Lot 33 Hopkinson Road, Cardup.	CLE Town Planning & Design, 2022

Survey /Assessment Type	Survey Area	Contractor and Year
	Located adjacent to the east of the Project Area at Hopkinson Road and to the south of Cardup Siding Road.	
Environmental Assessment and Management Strategy	Lot 33 Hopkinson Road, Cardup. Located directly adjacent to the Project Area to the east of Hopkinson Road and to the south of Cardup Siding Road.	Emerge Associates, 2022a
Reconnaissance Flora and Vegetation Assessment	Lot 33 Hopkinson Road, Cardup. Located directly adjacent to the Project Area to the east of Hopkinson Road and to the south of Cardup Siding Road.	Emerge Associates, 2022b
Flora, Vegetation and Basic Fauna Assessment – Cardup brook	Lot 33 Hopkinson Road, Cardup. Located directly adjacent to the Project Area to the east of Hopkinson Road and to the south of Cardup Siding Road.	Emerge Associates, 2022c
Basic Fauna and Targeted Black Cockatoo Assessment	Lot 33 Hopkinson Road, Cardup. Located directly adjacent to the Project Area to the east of Hopkinson Road and to the south of Cardup Siding Road.	Emerge Associates, 2022d
Environmental Impact Assessment and EPBC Referral	Tonkin Highway Extension - Thomas Road to South Western Highway. Intersects with approximately 80 % of the Project Area.	Strategen-JBS&G, 2019
Basic Fauna Survey	Tonkin Highway Extension - Thomas Road to South Western Highway. Intersects with approximately 80 % of the Project Area.	Bamford, 2019
Black Cockatoo Breeding, feeding and Roosting Habitat Assessment	Tonkin Highway Extension - Thomas Road to South Western Highway. Intersects with approximately 80 % of the Project Area.	Kirkby, 2019
Reconnaissance flora and vegetation survey	Tonkin Highway Extension - Thomas Road to South Western Highway. Intersects with approximately 80 % of the Project Area.	Woodman, 2019
Detailed Flora and Vegetation Survey, Targeted Threatened and Priority Flora Survey	Tonkin Highway Extension - Thomas Road to South Western Highway. Intersects with approximately 80 % of the Project Area.	Eco Logical Australia, 2019

Survey /Assessment Type	Survey Area	Contractor and Year
Wetland Survey	SSIA	360 Environmental, 2008
Flora and Fauna Assessment	SSIA – Abernethy Road and Tonkin Highway Alignment	Maunsell (AECOM) 2007a
Flora and Fauna Assessment	SSIA – Mundijong Road Crossings	Maunsell (AECOM) 2007b
Infrastructure Route and Site Assessment	SSIA	Maunsell (AECOM) 2006a
Spring Flora and Fauna Survey Report	SSIA	Maunsell (AECOM) 2006a
Aboriginal Heritage Survey	SSIA – Proposed Southern Corridor Infrastructure Upgrade	Western Heritage Research Pty Ltd., 2006

Table 4: Other Relevant Reports

Document Type / Title	Project	Proponent	Relevance
Environmental Scoping Document (Cossill & Webley, 2025)	Scott Road interim type 90 WWPS, Mundijong	Mundijong Joint Venture	Developed for this project
Environmental Impact Assessment (EPA, 2010)	Southern Source Integration Assets: Pipeline Corridor	Water Corporation WA	Site intersects the Project Area

3. Legislation

This assessment was conducted in accordance with Commonwealth and State legislation, guidelines and advice, including:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- Western Australian *Environmental Protection Act 1986* (EP Act).
- Western Australian *Biodiversity Conservation Act 2016* (BC Act).
- Western Australian Biodiversity Conservation Regulations 2018.
- Commonwealth Department of the Environment (DotE). (2013). Matters of National Environmental Significance. Significant Impact Guidelines 1.1 - Environment Protection and Biodiversity Conservation Act 1999.
- Department of Biodiversity Conservation and Attractions [DBCA] (2023) Draft: Methods for survey and identification of Western Australian Threatened Ecological Communities. Communities and Communities Program, DBCA.
- Department of Sustainability Environment Population and Communities (DSEWPaC). (2011). Survey Guidelines for Australia's Threatened Mammals. Canberra, Australia.
- Former Department of Agriculture, Water and the Environment (DAWE) (2022) Referral Guidelines for 3 Threatened Black Cockatoo Species Carnaby's Cockatoo (*Zanda latirostris*), Baudin's Cockatoo (*Zanda baudinii*) and the Forest Red-tailed Black-cockatoo (*Calyptorhynchus banksii naso*).
- WA EPA. (2021). Statement of Environmental Principles, Factors and Objectives.
- Department of Climate Change, Energy, the Environment and Water (DCCEEW). (n.d) Habitat Scoring System for WA black cockatoo foraging habitat V1.9

As well as those listed above, the assessment complied with Environmental Protection Authority (EPA) requirements for terrestrial vertebrate and fauna surveys and flora and vegetation surveys in Western Australia, as outlined in:

- EPA. (2020). Technical Guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment. Known herein as the 'Fauna Technical Guidance'.
- EPA. (2016). Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment. Known herein as the 'Flora and Vegetation Technical Guidance.'

4. Survey Limitations and Constraints

Limitations and constraints of the fauna, flora and vegetation survey as outlined in the Flora and Vegetation Technical Guidance and Fauna Survey Technical Guidance (EPA, 2016) are detailed below in Table 5.

Table 5: Limitations and Constrains of the Fauna, Flora and Vegetation Survey

Possible Limitation	Degree of Limitation (Significant, Moderate or Negligible)	Potential Constraints on Survey Outcomes
Survey Level/ Scope	Negligible	The Reconnaissance flora and vegetation survey was undertaken outside of the optimal survey season, with aim to assess habitat suitability for Threatened and Priority flora and ecological communities. The scope was deemed appropriate given the degraded condition of the Survey Area and the level of investigation for the project. As such, seasonal targeted surveys were considered unnecessary which is a position supported by the survey effort and outcomes undertaken for the Tonkin Highway Extension Thomas Road to South Western Highway Project by Woodman Environmental (2019) that has State and Commonwealth approval. The basic fauna survey and targeted assessment of black cockatoo habitat was considered suitable based on species expected to be present and the extent and condition of the vegetation/habitat present within the Survey Area. The level of information collected during the surveys were suitable to provide information required to inform and support approvals and referrals.
Availability of contextual information at a regional and local scale	Negligible	All data required to complete the scope of works including regional and local contextual information was available. DBCA data was reviewed as part of the desktop assessment.
Site Access	Negligible	The entirety of the Survey Area was readily accessed by vehicle and on foot.
Survey Intensity and Extent	Negligible	Suitable survey effort by experienced ecologists was applied within the proposed survey level/scope. Survey effort included: • Two (2) two-person days sampling for flora and vegetation assessment • Eight relevés were sampled • Two (1) one-person days sampling of basic fauna survey and black cockatoo assessment Survey effort for the Black Cockatoo Habitat Survey included an assessment of every tree with a suitable diameter at breast height (DBH) to support black cockatoo breeding, as well as an assessment of all areas of potential foraging and roosting habitat within and immediately adjacent to the Survey Area boundary. All planned Survey Areas were adequately sampled in line with the project scope of works.
Experience	Moderate	The ecologist leading the flora and vegetation field survey (Daniel Rubick) has been conducting flora and vegetation surveys in WA for over four years, with over four years' experience in the SCP bioregion. The ecologist leading the fauna field survey (Jack Rogers) has been conducting cockatoo targeted assessments in WA as well as Targeted Ornithological

Possible Limitation	Degree of Limitation (Significant, Moderate or Negligible)	Potential Constraints on Survey Outcomes
		Surveys in the UK, with over four years' experience. Back-office support was provided by senior ecologists who have worked in the region for over ten years.
Timing, weather, season	Moderate	The out of season Reconnaissance flora and vegetation survey was completed in July and aimed to assess habitat suitability for Threatened and Priority Flora and Ecological Communities. The timing and weather experienced during Reconnaissance survey present a limitation as most Threatened and Priority Flora species identified within the desktop assessment were not flowering at the time of survey. Given the degraded condition of the Survey Area and the high level of disturbance, the LoO of these species was found to be low due to a lack of habitat being present. Timing of the survey is therefore not considered a significant limitation. The Targeted black cockatoo survey was undertaken in July which is within the recommended timing for both foraging and breeding habitat for Baudin's black cockatoos (March to April, August to January breeding), Carnaby's black cockatoo (year-round foraging, July to December breeding) and Forest red-tailed black cockatoo (year-round) (DAWE, 2022a). Targeted searches were undertaken for secondary evidence of the species presence (i.e. foraging evidence which can be done at any time of year) and to evaluate the potential suitability of the habitat. The temperatures and weather experienced during the fauna field surveys were not considered a limitation and did not affect the ability to record fauna or habitats.
Proportion of the flora and fauna recorded and/or collected, and any identification issues	Moderate	A total of 92 vascular flora species were recorded, including 34 introduced species. The number of species recorded was low to moderate relative to the extent of the area surveyed. This is attributed to the historic clearing and current agricultural grazing in the Survey Area, resulting in limited remnant vegetation. These factors were not considered a limitation to the survey as they reflect the existing condition of the Survey Area. Species sampling was in line with the Flora and Vegetation Technical Guidance for a reconnaissance level flora and vegetation, and the Fauna Technical Guidance for basic fauna and targeted black cockatoo habitat assessment. Surveyors were able to accurately identify all vertebrate fauna species observed during the survey.
Mapping Reliability	Negligible	The majority of the Survey Area was traversed by foot and mapping reliability is considered high. Mapping accuracy and reliability was not considered a limitation.
Disturbances (fire, flood etc.)	Negligible	Areas of disturbance associated with historic clearing for residential purposes and weeds were recorded but were not a constraint on the results of the survey.

5. Existing Environment

5.1 Historic and Current Land Use

5.1.1 Historic Land use

Aerial imagery of the Project Area is available via Landgate (n.d) dated to 1953. The data shows vegetation has been removed to create main roads, most of which are still in use to date. In the 1970s further clearing occurred, further dividing the land and developing racetracks. No infrastructure was yet developed. The development of housing and other permanent structures is not observed in the area until 1989, which grew exponentially through the early 2000s. The development of this area has continued to grow into residential properties.

5.1.2 Current Land Use

The pressure main alignment begins at Copper Road, Byford in the north and ends at Scott Road, Mundijong in the south, intersecting vacant lots delegated to either:

- 'Special control areas' in the Shire of Serpentine Jarrahdale LPS3.
- 'Urban development' for future water and wastewater management in the Cardup Structure Plan (CLE, 2022) and Byford District Structure Plan.
- Residential verge side in the Byford District Structure Plan (Hames Sharley, 2023).

The Shire of Serpentine Jarrahdale mapping and review of current aerial photography indicates the current land uses surrounding the Project Area include:

- North - land to the north of the Project Area is zoned as a mixture of rural and urban under the MRS and urban development, public open space and rural residential under the LPS 3. Aerial photography shows that this land use is consistent with zoning. There has been recent residential development progressing within previously disturbed agricultural lots.
- East - land to the east of the Project is zoned as a rural and urban under the MRS and rural residential, urban development and rural under the LPS 3. The Cardup Nature Reserve is located to the east of the Project Area to the south of Cardup Siding Road. Aerial photography shows that this land use is consistent with zoning. There has been recent residential development progressing within previously disturbed agricultural lots. Land within the Lot 33 Hopkinson Road, Cardup Structure plan remains undeveloped.
- South- land to the south of the Project Area is zoned as a rural and urban under the MRS and urban development and industrial development under the LPS 3. Aerial photography shows that this land use is consistent with zoning. There has been recent residential development progressing within previously disturbed agricultural lots.

- West - land directly to the west of the Project Area is zoned as primary regional roads under the MRS and the LPS 3. Land further to the west is a mixture of rural and industrial under the MRS and rural and rural residential under the LPS 3. Aerial photography shows that this land use is consistent with zoning. There has been recent residential development progressing within previously disturbed agricultural lots. Land to the west in the southern portion of the Project Area remains undeveloped.

5.2 Soils Surface Geology and Topography

5.2.1 Topography

Elevation across the Project Area is relatively flat with distant undulation throughout the boundary ranging between 24 m AHD and 30 m AHD (DPIRD-072). Both the lowest and greatest elevations are in the southern end of the Project Area, with the central and northern portions maintaining a range between 26 m AHD and 28 m AHD (Figure 2).

5.2.2 Geology and Soils

Regional surface geology mapping (DPIRD-017) indicates the Project Area is located within two land quality zones: the Pinjarra Zone (mu zone 213) and the Bassendean Zone (mu zone 212). The Pinjarra Zone is described by DPIRD (2019) as alluvial deposits from the early Pleistocene to recent, between the Bassendean Dunes Zone and the Darling Scarp and colluvial and shelf deposits adjacent to the Darling Scarp. The composition is clayey to sandy alluvial soils with wet areas. The Bassendean Zone is described by DPIRD (2019) as mid Pleistocene Bassendean sand and fixed dunes inland from coastal dune zone. The composition is non-calcareous sands and podsolised soils with low-lying wet areas.

Soil Landscape Systems mapping (DPIRD-064) identifies there are two soil systems correlating to the DPIRD-017 dataset within the Project Area. The Pinjarra System (213Pj) is described by DPIRD (2019) as a poorly draining coastal plain with variable alluvial and aeolian soils. The vegetation varies and includes Jarrah (*Eucalyptus marginata*), marri, Wandoo (*Eucalyptus Wandoo*), and various Paperbarks *(Melaleuca spp*) (paperbarks). The Bassendean System (212Bs) is described by DPIRD (2019) as sand dunes and sandplains with deep pale sand and semi-wet to wet soil. The vegetation includes woodlands of *Banksia spp* and *Melaleuca spp*, and mixed heaths.

The DPIRD Soil Landscape Mapping (DPIRD-027) indicates 14 soil subsystems throughout the Project Area. These subsystems are described in Table 6 and the soil systems are shown in (Figure 2).

Table 6: Soil Landscape Systems within the Project Area (DPIRD-027).

Soil Landscape Symbol	Soil Landscape Name	Description
213Pj_P1b	Pinjarra P1b phase	Flat to very gently undulating plain with deep acidic mottled yellow duplex soils. Moderately deep pale sand to loamy sand over clay: imperfectly drained and moderately susceptible to salinity in limited areas.
213Pj_P1d	Pinjarra P1d phase	Flat to very gently undulating plain with deep acidic mottled yellow duplex soils. Shallow pale sand to sandy loam over clay; imperfect to poorly drained and moderately susceptible to salinity.
213Pj_P1e	Pinjarra P1e phase	Flat to very gently undulating plain with deep acidic mottled yellow duplex soils. Shallow pale sand to sandy loam over very gravelly clay; moderately well drained.
213Pj_B1	Pinjarra B1 phase	Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands sometimes with a pale-yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2 m; Banksia dominant.
213Pj_P3	Pinjarra P3 phase	Flat to very gently undulating plain with deep, imperfect to poorly drained acidic gradational yellow or grey-brown earths and mottled yellow duplex soils, with loam to clay loam surface horizons.
213Pj_P9	Pinjarra P9 phase	Shallowly incised stream channels of minor creeks and rivers with deep acidic mottled yellow duplex soils.
213Pj_B2	Pinjarra B2 phase	Flat to very gently undulating sandplain with well to moderately well drained deep bleached grey sands with a pale-yellow B horizon or a weak iron-organic hardpan 1-2 m.
212Bs_B1	Bassendean B1 phase	Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands sometimes with a pale-yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2 m; banksia dominant.
212Bs_B3	Bassendean B3 phase	Closed depressions and poorly defined stream channels with moderately deep, poorly to very poorly drained bleached sands with an iron-organic pan, or clay subsoil. Surfaces are dark grey sand or sandy loam.
212Bs_B1	Bassendean B1 phase	Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands sometimes with a pale-yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2 m; Banksia dominant.
213Pj_P1c	Pinjarra P1c phase	Flat to very gently undulating plain with deep acidic mottled yellow duplex (or "effective duplex") soils. Deep pale brown to yellowish sand to sandy loam over clay; imperfectly drained and moderately susceptible to salinity in limited are
212Bs_B4	Bassendean B4 phase	Broad poorly drained sandplain with deep grey siliceous sands or bleached sands, underlain at depths generally greater than 1.5 m by clay or less frequently a strong iron-organic hardpan
212Bs_B2	Bassendean B2 phase	Flat to very gently undulating sandplain with well to moderately well drained deep bleached grey sands with a pale-yellow B horizon or a weak iron-organic hardpan 1-2 m

Soil Landscape Symbol	Soil Landscape Name	Description
212Bs_B6	Bassendean B6 phase	Sandplain and broad extremely low rises with imperfectly drained deep or very deep grey siliceous sands

Acid Sulfate Soils

ASS mapping by DWER (DWER-055) shows the entirety of the Project Area is in Class 2 for ASS risk. Class 2 indicates the area has a low to moderate risk of ASS occurring within 3 m of the natural soil surface and a high risk occurring beyond 3 m. A Geotechnical Investigation and ASS risk assessment is being undertaken for the Project by Douglas Partners. Results are pending at the time of completing this EIAR. The results of those investigations will need to be incorporated into the ASS and Dewatering Management plan required for the Project.



Figure 2 a: Soil Surface Geology and Topography

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- 2 Metre Contours (DPIRD-072)

Soil Landscape Mapping (DPIRD-027)

- Pinjarra P1b phase
- Pinjarra P1d phase
- Pinjarra P1e phase
- Pinjarra, B1 phase

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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Figure 2b: Soil Surface Geology and Topography

0 10 20 30 40 m

N

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR
PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032 / VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore / DATE: 5/12/2025

Legend

- Project Area
- 2 Metre Contours (DPIRD-072)

Soil Landscape Mapping (DPIRD-027)

- Pinjarra P1d phase
- Pinjarra P1e phase
- Pinjarra P3 phase
- Pinjarra, B1 phase

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403350 403425 403500 403575 403650

6433200 6433125 6433050 6432975 6432900 6432825

Pinjarra P1e phase

Pinjarra P3 phase

Pinjarra P9 phase

26 26 28 30

403350 403425 403500 403575 403650

Figure 2c: Soil Surface Geology and Topography

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- 2 Metre Contours (DPIRD-072)

Soil Landscape Mapping (DPIRD-027)

- Pinjarra P1e phase
- Pinjarra P3 phase
- Pinjarra P9 phase

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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Figure 2d: Soil Surface Geology and Topography

0 10 20 30 40 m
N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- 2 Metre Contours (DPIRD-072)

Soil Landscape Mapping (DPIRD-027)

- Pinjarra P1d phase
- Pinjarra P3 phase
- Pinjarra P9 phase
- Pinjarra, B2 phase

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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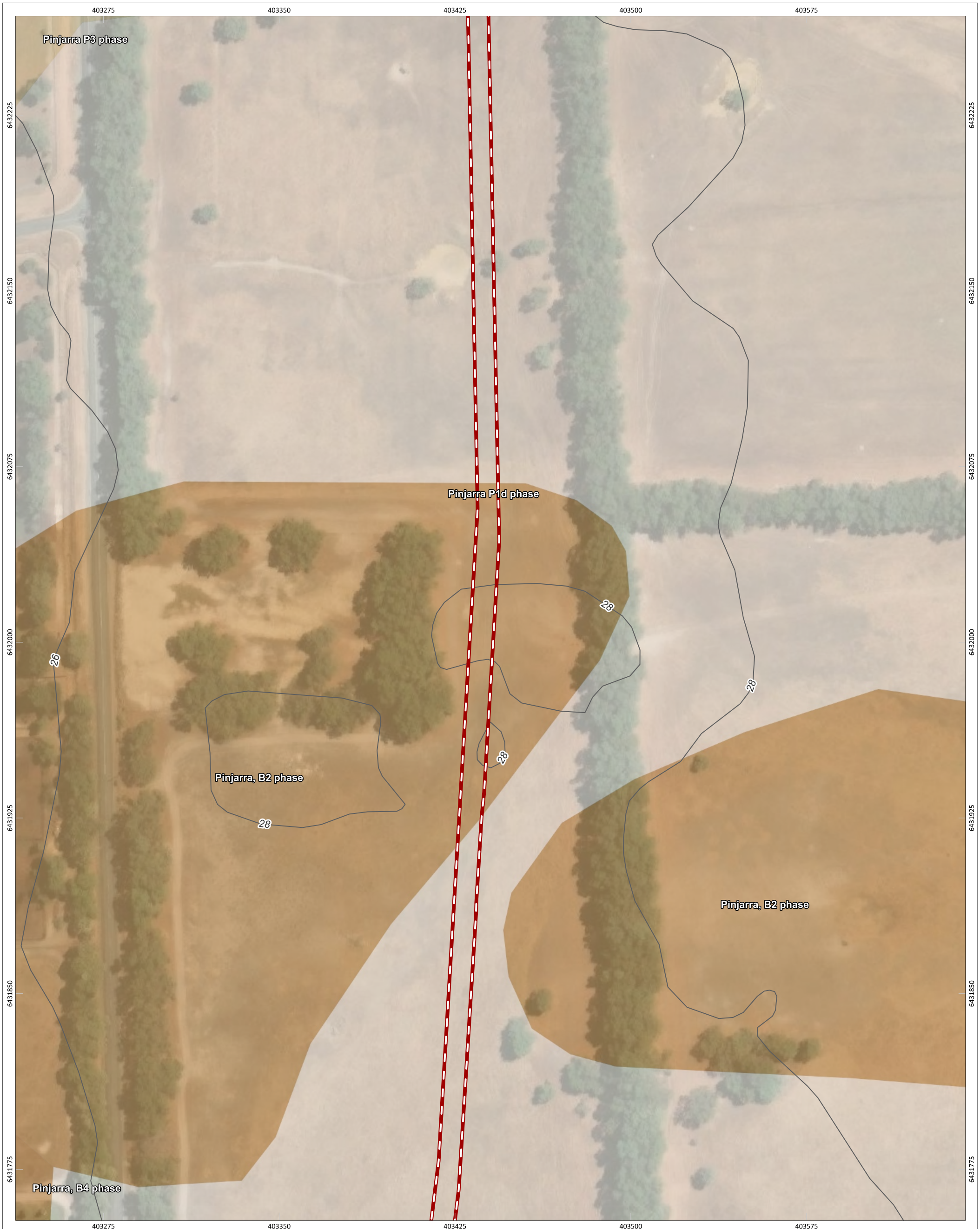


Figure 2 e: Soil Surface Geology and Topography

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- 2 Metre Contours (DPIRD-072)

Soil Landscape Mapping (DPIRD-027)

- Pinjarra P1d phase
- Pinjarra P3 phase
- Pinjarra, B2 phase
- Pinjarra, B4 phase

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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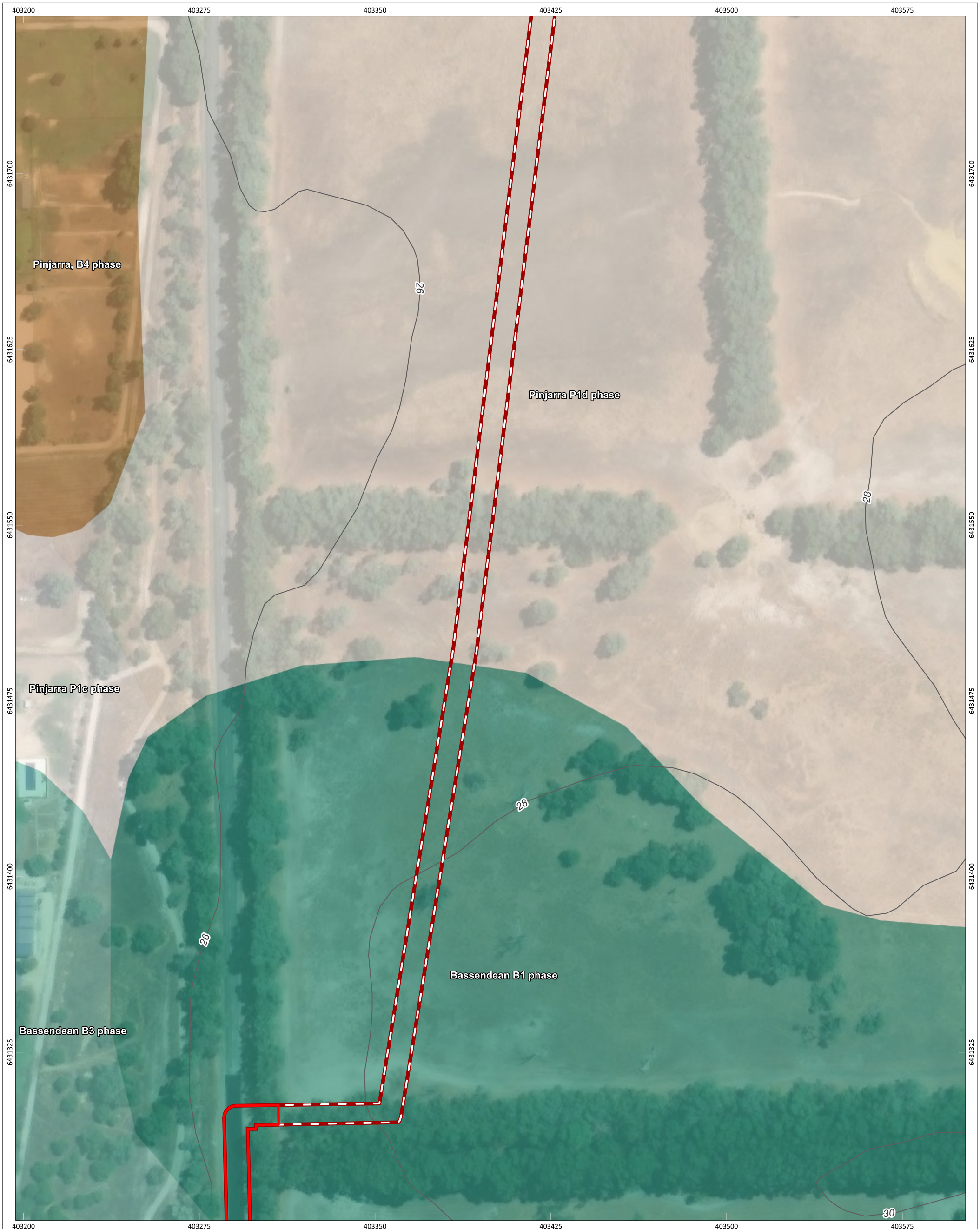


Figure 2f: Soil Surface Geology and Topography

N

0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA			
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- 2 Metre Contours (DPIRD-072)

Soil Landscape Mapping (DPIRD-027)

- Bassendean B1 phase
- Bassendean B3 phase
- Pinjarra P1c phase
- Pinjarra P1d phase
- Pinjarra, B4 phase

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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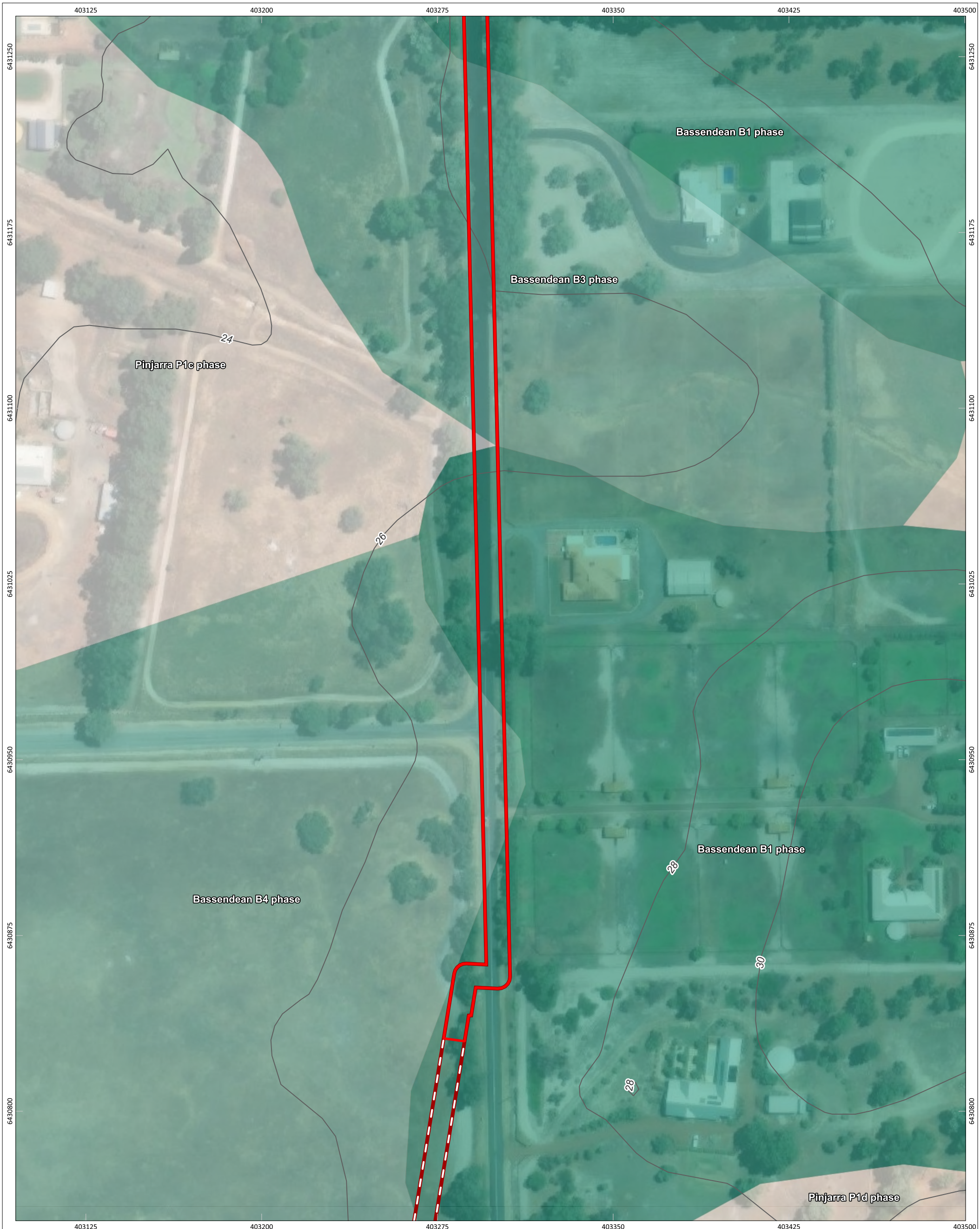


Figure 2 g: Soil Surface Geology and Topography

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- 2 Metre Contours (DPIRD-072)

Soil Landscape Mapping (DPIRD-027)

- Bassendean B1 phase
- Bassendean B3 phase
- Bassendean B4 phase
- Pinjarra P1c phase
- Pinjarra P1d phase

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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Figure 2h Soil Surface Geology and Topography

N

0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA			
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- 2 Metre Contours (DPIRD-072)

Soil Landscape Mapping (DPIRD-027)

- Bassendean B1 phase
- Bassendean B2 phase
- Bassendean B4 phase
- Pinjarra P1d phase
- Pinjarra, B1 phase

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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Figure 2i: Soil Surface Geology and Topography

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- 2 Metre Contours (DPIRD-072)

Soil Landscape Mapping (DPIRD-027)

- Bassendean B1 phase
- Pinjarra P1d phase
- Pinjarra, B1 phase

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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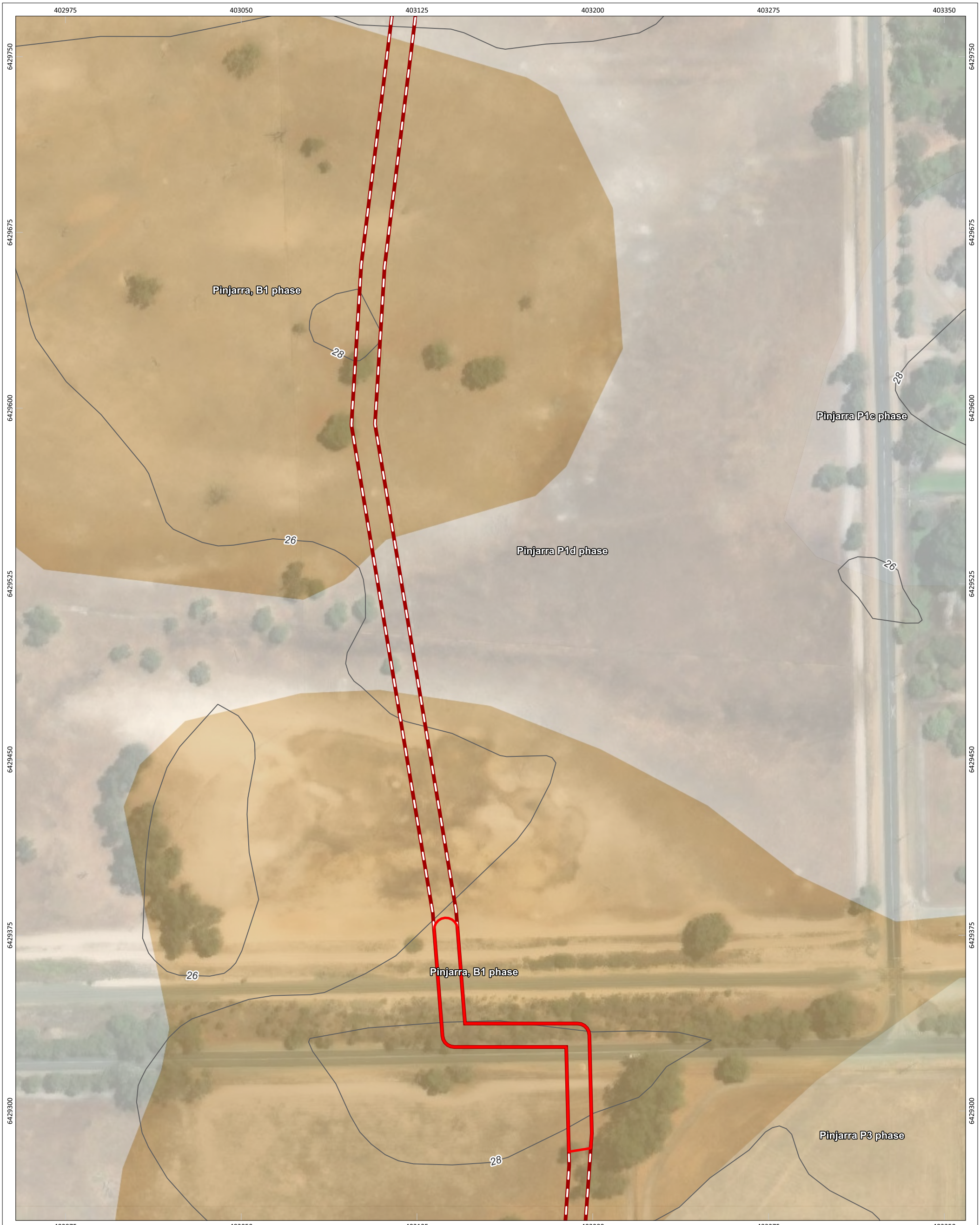


Figure 2j: Soil Surface Geology and Topography

N

0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA			
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- 2 Metre Contours (DPIRD-072)

Soil Landscape Mapping (DPIRD-027)

- Pinjarra P1c phase
- Pinjarra P1d phase
- Pinjarra P3 phase
- Pinjarra, B1 phase

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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Figure 2l: Soil Surface Geology and Topography

0 10 20 30 40 m

N

SCALE	1:1,500
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- 2 Metre Contours (DPIRD-072)

Soil Landscape Mapping (DPIRD-027)

- Pinjarra P1d phase
- Pinjarra P3 phase
- Pinjarra, B1 phase

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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Figure 2 m: Soil Surface Geology and Topography

N

0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA			
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- 2 Metre Contours (DPIRD-072)

Soil Landscape Mapping (DPIRD-027)

- Bassendean B1 phase
- Bassendean B6 phase
- Pinjarra P1d phase
- Pinjarra P3 phase

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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Figure 2n Soil Surface Geology and Topography

N

0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

Legend

- Project Area
- Proposed Underboring Areas
- 2 Metre Contours (DPIRD-072)

Soil Landscape Mapping (DPIRD-027)

- Bassendean B1 phase
- Bassendean B2 phase
- Bassendean B6 phase

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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5.3 Hydrology and Wetlands

5.3.1 Groundwater

Groundwater contour mapping was reviewed to provide information of the water table in and around the Project Area. The review found that publicly available data on Water Table Elevation (Contours) does not extend to the Project Area (DWER-099 and DWER-100). A review of the RiWi Act Groundwater Areas dataset (DWER-034) confirmed that the Project Area falls within a groundwater proclamation area being the Serpentine Groundwater Area.

While desktop information on water table contours is limited for the Project Area, a pre-development groundwater level and quality monitoring program was undertaken by Hy2do as part of the Lot 33 Hopkinson Road Cardup Structure Plan that intersects a central portion of the Project. This program utilised nine monitoring bores installed within the Structure Plan area and found that the groundwater levels range from approximately 25m AHD at the south-eastern corner to 32.5m AHD along the central northern boundary (Hyd2o, 2022). These levels corresponded to approximately 5.5m below the existing natural ground level. Douglas Partners have been commissioned to undertake a geotechnical investigation which will provide more accurate depths to groundwater within the Project Area.

The DWER Water Register (n.d) identified the following aquifers underlying the Site:

- Perth-Cattamarra Coal Measures Aquifer.
- Perth Leederville Aquifer.
- Perth Superficial Swan Aquifer.

The superficial and confirmed aquifers display available allocations in the Mundijong, Cardup, and Byford areas.

5.3.2 Surface water

According to mapping from the DWER (DWER-031), two naturally occurring drainage lines and watercourses intersect with the Project Area (Figure 3):

- Cardup Brook - Minor Tributary that is perennial and is associated with REW (UFID: 14,540).
- Manjedal Brook - Minor Tributary that is perennial and is associated with CCW (UFID: 14,945).

Both the Manjedal Brook and Cardup Brook are perennial groundwater-fed streams with baseflow that makes it more “perennial” than strictly seasonal or ephemeral that both tributaries to the Serpentine River (GHD, 2010 and DWER, 2019). However “perennial” in this context doesn’t guarantee a strong flowing channel year-round; flow volume and surface-water connectivity likely vary with season, rainfall and groundwater level.

The Project Area is situated in a 1 in 100 Annual Exceedance Probability (AEP) Floodplain Area (DWER-020). The mapped data shows the floodplain control area intersects most of the Project Area that occurs south of Cardup Siding Road (Figure 3).

The Project Area is located within the Upper Serpentine River Catchment which is a tributary to the Peel-Harvey estuary system. Upper Serpentine River has a catchment area of about 490 km2, just more than half of which has been cleared, mostly for beef and sheep grazing on the SCP.

The Project Area is not located within a surface water proclamation area.

5.3.3 Wetlands

Mapping undertaken by DBCA (DBCA-019) identifies the following geomorphic wetlands as partially mapped within the Project Area, as shown on Figure 3 and detailed in Table 5.

Table 5 Geomorphic Wetlands Mapped within the Project Area

UFID	Current Management Category (DBCA-019)	Wetland Type	Area od Wetland (DBCA-019)	Area within Project Area (ha)
14540	REW	Creek	7.64	0.02 ha
14945	CCW	Palusplain	8.24	0.02 ha
16021	MUW	Palusplain	27,602.08	2.39 ha
16189	MUW	Palusplain	7,263.09	1.96 ha

The Project Area does not intersect with any wetlands listed under the Directory of Important Wetlands in Australia (DBCA-045, EPA 2018).

The proposed design for the Project actively avoids direct impacts to Manjedal Brook CCW and Cardup Brook REW by adopting trenchless drilling and under boring construction techniques whereby the pressure main will be buried beneath these watercourses and wetland areas. The trenchless drilling and under boring will be installed 1 m below the surface of the riverbeds for Manjedal Brook and Cardup Brook. This avoidance measure is depicted within Plate 1 and Plate 2.

WEPL received formal correspondence from DWER on 11/09/2025 that due to construction methodologies adopted for the Project, direct impacts to the bed and banks of Manjedal Brook and Cardup Brook will be avoided, and there is no requirement for a Section 21A bed and banks permit under the RiWi Act.

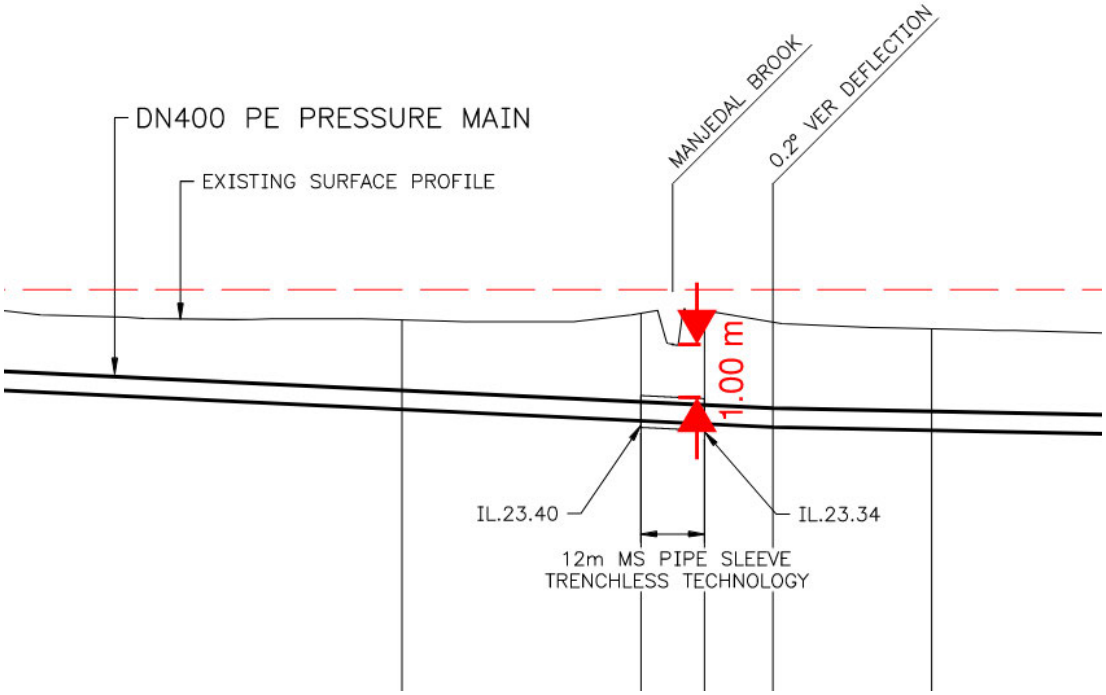


Plate 1: Cross section at Manjedal Brook

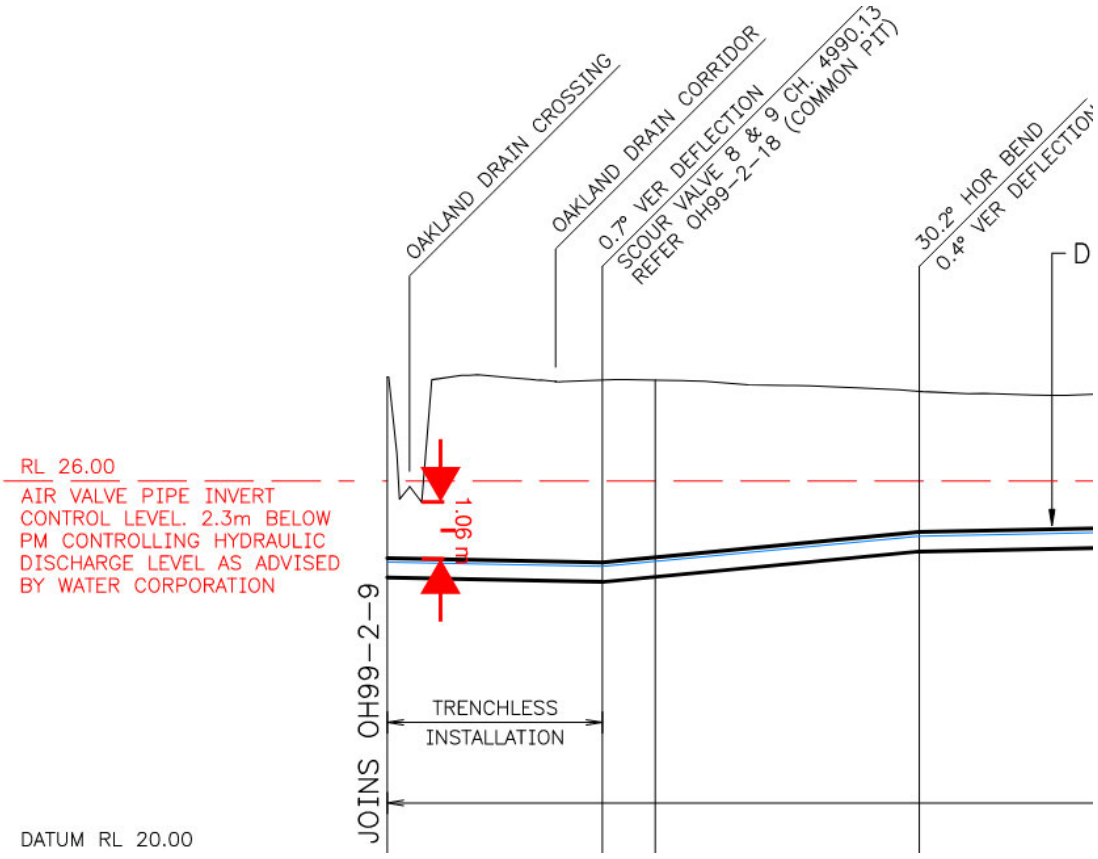


Plate 2: Cross section at Cardup Brook

5.3.4 Peel Inlet - Harvey Estuary Environmental Protection Policy

The Project Area is located within the Peel Inlet - Harvey Estuary Environmental Protection Policy (EPP) 1992.

The Peel Inlet-Harvey Estuarine System (the estuary) is located 75 km south of Perth in the South West of Western Australia. The system consists of two shallow lagoons, the Peel Inlet and the Harvey Estuary, into which three major rivers, the Murray, Serpentine and Harvey discharge (EPA, 2008).

The purpose of this EPP is:

- To set out environmental quality objectives for the Estuary which if achieved will rehabilitate the Estuary and protect the Estuary from further degradation.
- To outline the means by which the environmental quality objectives for the Estuary are to be achieved and maintained.

The following uses of the Estuary are declared to be beneficial uses to be protected under this policy:

- Use of the Estuary as a resource for studying the natural environment.
- Use of Estuary as a habitat for diverse and abundant native flora and fauna communities.
- Use of the Estuary to support commercial and amateur fisheries.
- Use of the Estuary for recreation, tourism and landscape amenity.
- Use of the Estuary as a focus for residential development.
- The relevant key basis for protection of the Estuary include that relates to this Project is:
- Nutrient enrichment of the Estuary has been caused by the clearing of native vegetation in the policy area and by land uses that result in nutrients, especially phosphorus, leaching into waterways in the policy area and then flowing into the Estuary.

The relevant environmental quality objectives to be achieved and maintained in respect of the Estuary are a median load (mass) of total phosphorus flowing into the Estuary of less than 75 tonnes with:

- The median load (mass) of total phosphorus flowing into the Estuary from Serpentine River being less than 21 tonnes. The Project Area is located within the Upper Serpentine River Catchment.
- The median land (mass) of total phosphorus flowing into the Estuary from the Murray River being less than 16 tonnes.
- The median land (mass) of total phosphorus flowing into the Estuary from the Harvey River and Drains being less than 38 tonnes.

The Water Quality Improvement Plan for the Rivers and Estuary of the Peel-Harvey System - Phosphorus Management aims to improve water quality by reducing phosphorus discharges from the catchment through changes to agricultural and urban practices and land use planning (EPA, 2008).

The SPP 2.9 further details for the protection of remnant vegetation and maintain or increase deep-rooted perennial vegetation coverage to improve water quality within the Peel Inlet - Harvey Estuary (WAPC, 2006). The purpose of this measure is to mitigate the impact that land clearing and the intensication of land uses have had on water quality within the catchment. Actions to comply with this measure will depend on the nature of the proposal and include:

a. minimising the clearing of remnant vegetation.
b. rehabilitation of remnant vegetation.
c. establishment of deep-rooted perennial vegetation. Preferably this would be undertaken with endemic plant species, however exotic species may be supported where they will improve water quality outcomes.

The key land uses that increase the levels of phosphorus flowing into waterways are associated to nutrient-exporting land uses such as agricultural land uses including beef and sheep farming, dairy, horticulture, poultry and equestrian land uses (DAF, 2012).

This Project is for the construction of a pressure main connecting to a WWPS for the growing expansion of residential development in the Shire of Serpentine Jarrahdale and Mundijong Area. The Project is being developed to service residential expansion and not for ongoing agricultural purposes in the region, so aligns with the objectives of reducing nutrient export and the release of phosphorus into the Estuary.

Another key objective of the EPP is for the protection of habitat for diverse and abundant native flora and fauna communities. The assessment provided in this NVCP details the required vegetation clearance for the Project is minor and is unlikely to significantly impact flora, vegetation or fauna values. The proposed clearing of a maximum of 0.58 ha of vegetation along the 6 km alignment is unlikely to cause nutrient enrichment of the Peel Inlet - Harvey Estuary EPP, or any other degradation and isn't at variance with the objectives of SPP 2.9.



Figure 3 a: Surface Water Features, Floodplains and Geomorphic Wetlands

N 0 10 20 30 40 m

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Pipeline

Geomorphic Wetlands (DBCA-019)

- Multiple Use

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403275 403350 403425 403500 403575 403650

6433725 6433650 6433575 6433500 6433425 6433350 6433275



403275 403350 403425 403500 403575 403650

Figure 3 b: Surface Water Features, Floodplains and Geomorphic Wetlands

N

0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	
		CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

Legend

- Project Area
- Proposed Pipeline
- FPM Floodplain Area (DWER-020)

Geomorphic Wetlands (DBCA-019)

- Multiple Use

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403350 403425 403500 403575 403650

6433200 6433125 6433050 6432975 6432900 6432825

0 10 20 30 40 m

N

Figure 3 c: Surface Water Features, Floodplains and Geomorphic Wetlands

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline
- Hydrography Linear Hierarchy (DWER-031)
- FPM Floodplain Area (DWER-020)

Geomorphic Wetlands (DBCA-019)

- Multiple Use
- Resource Enhancement

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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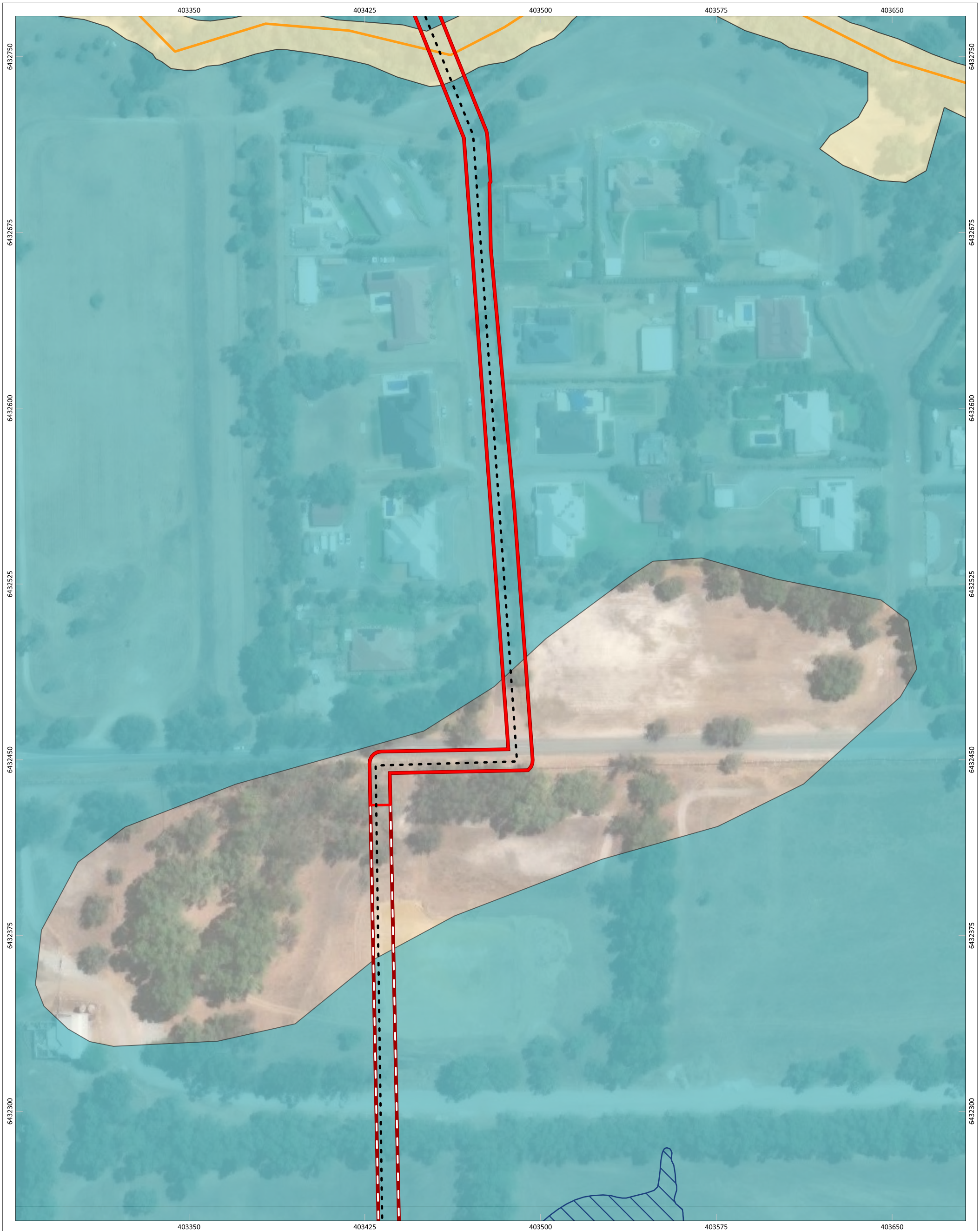


Figure 3 d: Surface Water Features, Floodplains and Geomorphic Wetlands

N

0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA			
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline
- Hydrography Linear Hierarchy (DWER-031)
- FPM Floodplain Area (DWER-020)

Geomorphic Wetlands (DBCA-019)

- Multiple Use
- Resource Enhancement

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403275 403350 403425 403500 403575

6432225 6432150 6432075 6432000 6431925 6431850 6431775

Figure 3 e: Surface Water Features, Floodplains and Geomorphic Wetlands

0 10 20 30 40 m

N

SCALE	1:1,500
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Pipeline
- FPM Floodplain Area (DWER-020)

Geomorphic Wetlands (DBCA-019)

- Multiple Use

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403200 403275 403350 403425 403500 403575

6431700 6431625 6431550 6431475 6431400 6431325

Figure 3 f: Surface Water Features, Floodplains and Geomorphic Wetlands

N

0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA			
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline
- FPM Floodplain Area (DWER-020)

Geomorphic Wetlands (DBCA-019)

- Multiple Use

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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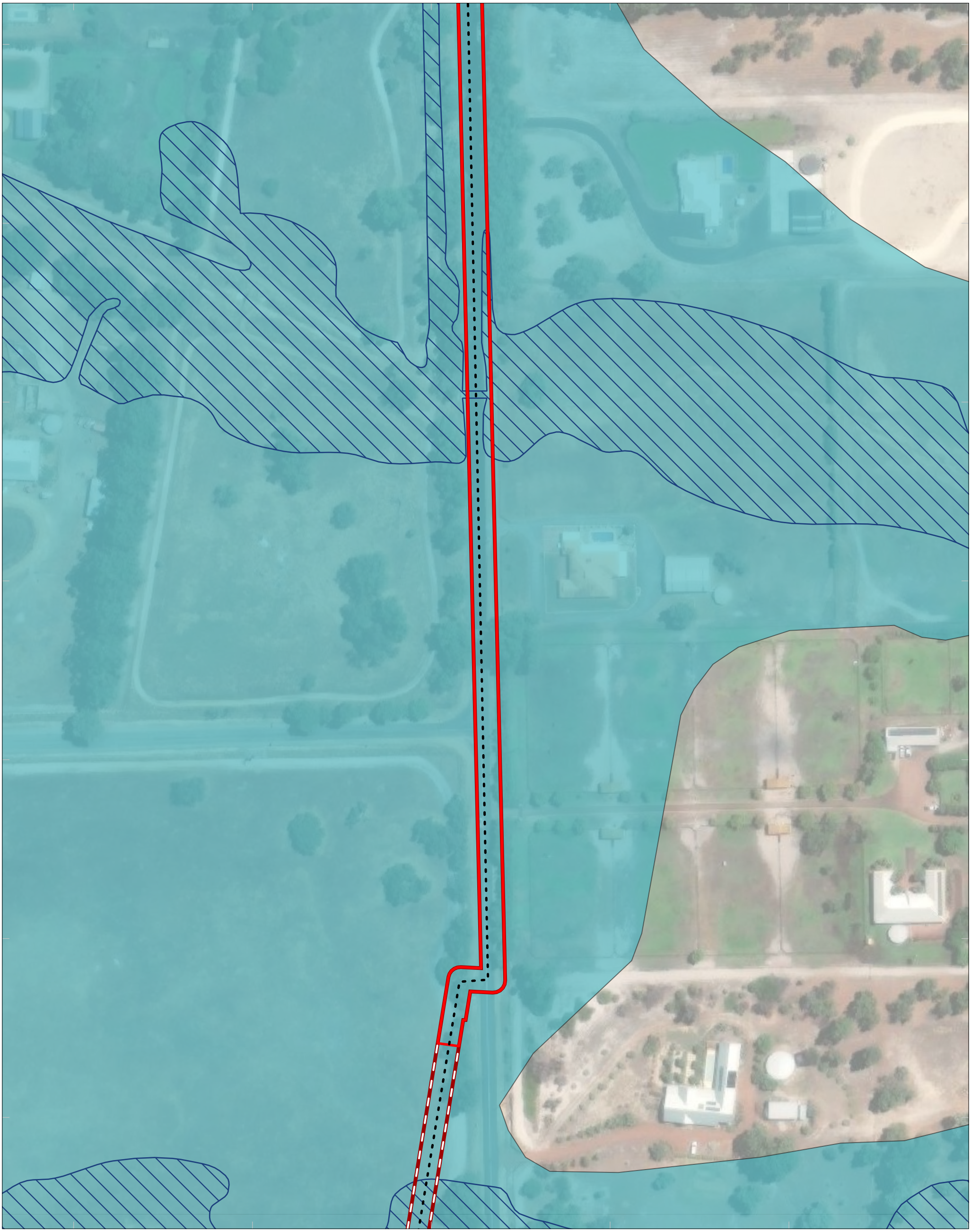
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403125 403200 403275 403350 403425 403500

6431250 6431175 6431100 6431025 6430950 6430875 6430800



403125 403200 403275 403350 403425 403500

Figure 3 g: Surface Water Features, Floodplains and Geomorphic Wetlands

N

0 10 20 30 40 m

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline
- FPM Floodplain Area (DWER-020)

Geomorphic Wetlands (DBCA-019)

- Multiple Use

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403050 403125 403200 403275 403350

6430725 6430650 6430575 6430500 6430425 6430350 6430275

Figure 3 h: Surface Water Features, Floodplains and Geomorphic Wetlands

N

0 10 20 30 40 m

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Pipeline
- FPM Floodplain Area (DWER-020)

Geomorphic Wetlands (DBCA-019)

- Multiple Use

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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Figure 3 i: Surface Water Features, Floodplains and Geomorphic Wetlands

N

0 10 20 30 40 m

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Pipeline
- FPM Floodplain Area (DWER-020)

Geomorphic Wetlands (DBCA-019)

- Multiple Use

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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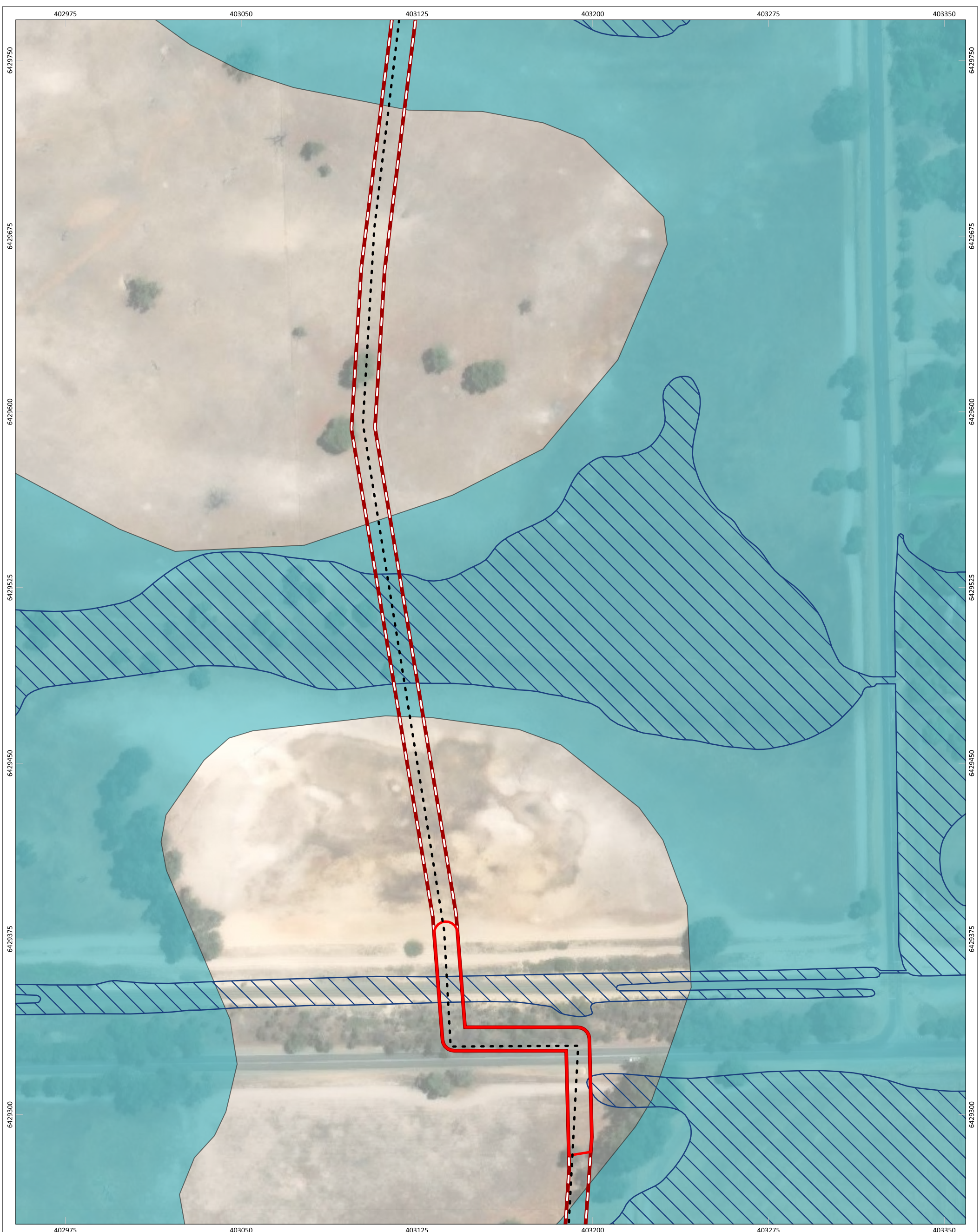


Figure 3 j: Surface Water Features, Floodplains and Geomorphic Wetlands

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline
- FPM Floodplain Area (DWER-020)

Geomorphic Wetlands (DBCA-019)

- Multiple Use

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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Figure 3 l: Surface Water Features, Floodplains and Geomorphic Wetlands

N

0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA			
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

Legend

- Project Area
- Proposed Pipeline
- FPM Floodplain Area (DWER-020)

Geomorphic Wetlands (DBCA-019)

- Multiple Use

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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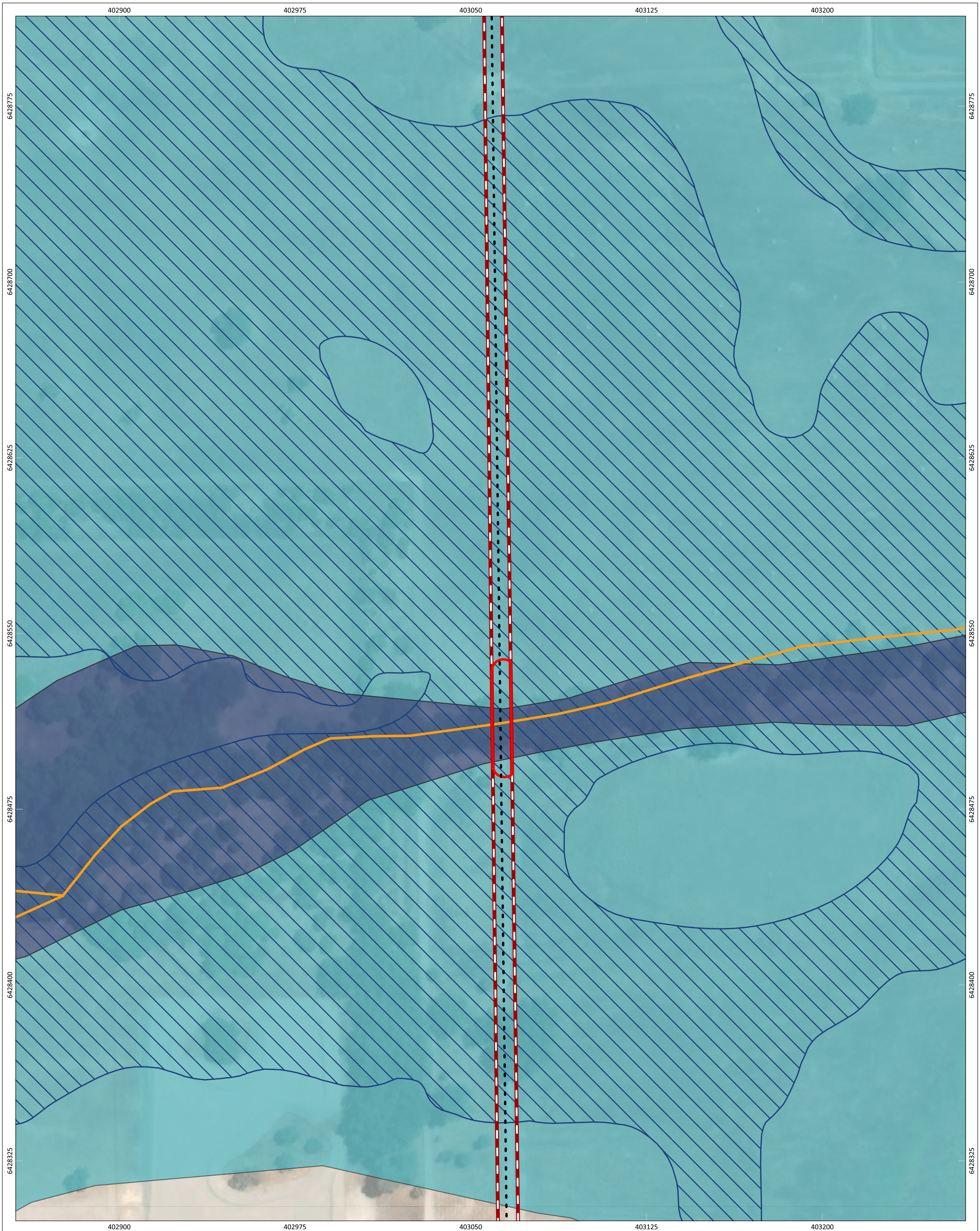


Figure 3 m: Surface Water Features, Floodplains and Geomorphic Wetlands

N

0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA			
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline
- Hydrography Linear Hierarchy (DWER-031)
- FPM Floodplain Area (DWER-020)

Geomorphic Wetlands (DBCA-019)

- Conservation
- Multiple Use

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

NOTES:

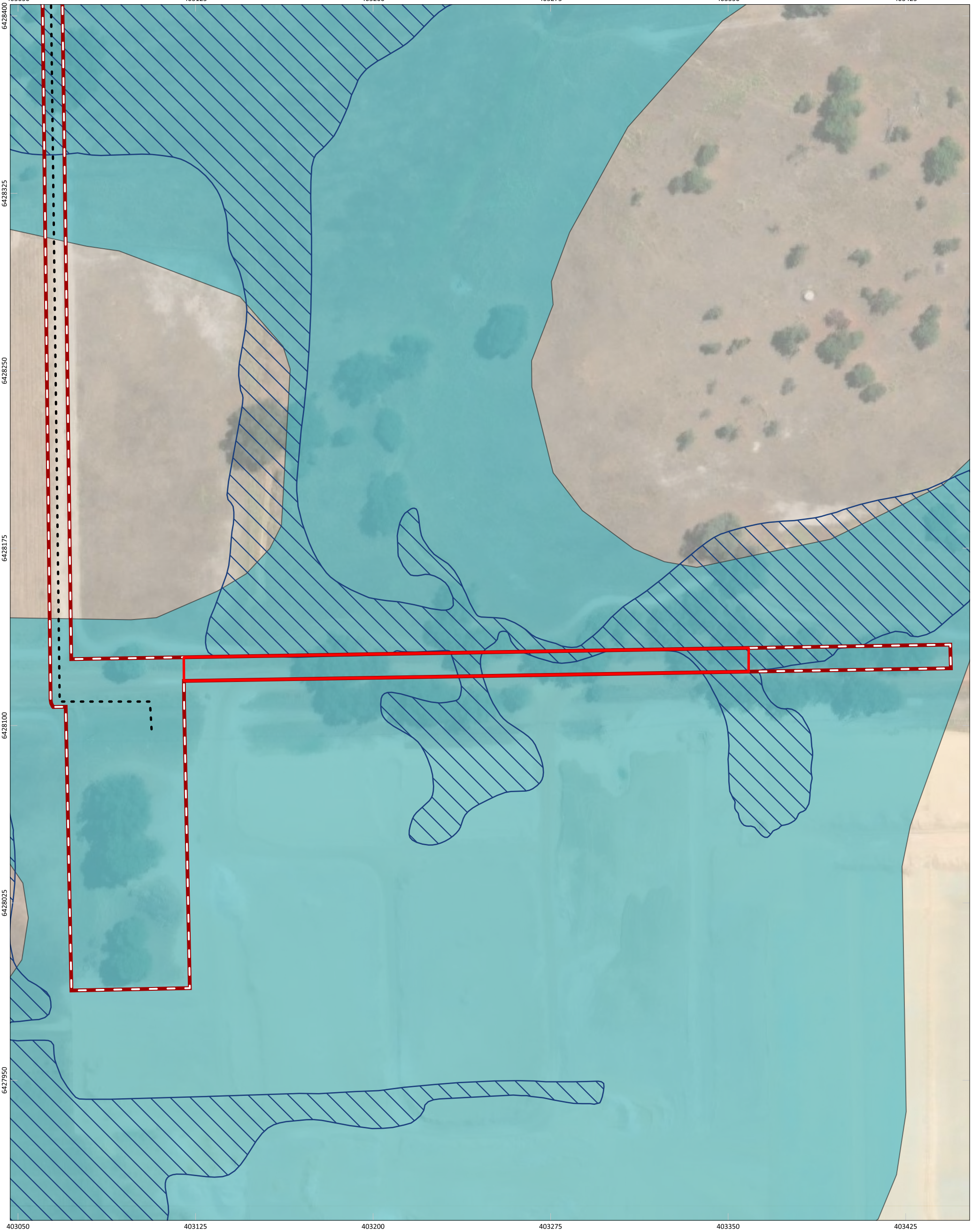
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403050 403125 403200 403275 403350 403425

6428400 6428325 6428250 6428175 6428100 6428025 6427950



403050 403125 403200 403275 403350 403425

Figure 3 n: Surface Water Features, Floodplains and Geomorphic Wetlands

N 0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline
- FPM Floodplain Area (DWER-020)

Geomorphic Wetlands (DBCA-019)

- Multiple Use

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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6. Biological Environment

6.1 Flora and Vegetation

A summary of flora and vegetation within the Project Area and Disturbance Footprint is detailed in the following sections, based on the surveys completed by WEPL (2025, Appendix A).

6.1.1 Pre-European Vegetation

During the 1970s, John Beard and associates conducted a systematic survey of native vegetation, describing the vegetation systems in WA. Beard (1981) mapped the vegetation of the SCP at 1:1,000,00 scale. This mapping described two broad vegetation units for the Survey Area.

Beard's mapping attempted to depict the native vegetation as it was presumed to be at the time of settlement and is known as the pre-European vegetation type and extent. Beard's vegetation maps are maintained in digital form by DPIRD (DPIRD, 2019) in dataset DPIRD-006. Extents are updated periodically by DBCA. One pre-European vegetation association is mapped within the Project Area as detailed in Table 7 and shown in Figure 4.

- Pinjarra_968 - Medium woodland; jarrah, marri & wandoo.

Table 7: Extent of the Mapped Vegetation Association in the Project Area (DPIRD-006)

Vegetation Association	Description	Original Extent (ha)	Current Extent (ha)	% Remaining	% Managed for Conservation
Pinjarra_968	Medium woodland; jarrah, marri & wandoo	135,999.02	8,996.33	6.61%	1.19%

6.1.2 Vegetation Complexes

Vegetation Complexes are a broad level of vegetation description which is based on the underlying geomorphology and rainfall (Heddle et al., 1980).

Regional vegetation for the SCP was mapped at vegetation complex level by Heddle et al. (1980) at a scale of 1:250,000 and are maintained in digital form by DBCA (DBCA-046). According to this data (DBCA-046), the majority of the Project Area is primarily representative of one vegetation complex being the Guildford Complex, with some sections of the Project Area comprising of the Beermullah Complex, as shown in Figure 4. The current extents of the Heddle (1980) vegetation complex are presented in Table 8.

Both the Beermullah Complex and Guildford Complex are below the target remaining of 30% for vegetation complexes and communities and below the target of 10% for constrained portions of the SCP (State Planning Policy 2.8: Bushland Policy for the Perth Metropolitan Region (WAPC, 2010)).

There is 0.20 ha of native vegetation mapped within the Beermullah Complex and 0.78 ha of Guildford Complex within the Project Area.

Table 8: Extent of the Mapped Vegetation Complexes in the Project Area

Vegetation Complex	Description	Original Extent (ha)	Current Extent (ha)	% Remaining	% Managed for Conservation
Beermullah Complex	Mixture of low open forest of *Casuarina obesa* (Swamp Sheoak) and open woodland of *Corymbia calophylla* (Marri) - *Eucalyptus wandoo* (Wandoo) - *Eucalyptus marginata* (Jarrah). Minor components include closed scrub of Melaleuca *species* and occurrence of *Actinostrobus pyramidalis* (Swamp Cypress).	6,707.27	447.21	6.67%	2.13%
Guildford Complex	A mixture of open forest to tall open forest of *Corymbia calophylla* (marri) - *Eucalyptus wandoo* (wandoo) - *Eucalyptus marginata* (jarrah) and woodland of *Eucalyptus wandoo* (wandoo) (with rare occurrences of *Eucalyptus lane-poolei* [salmon white gum]). Minor components include *Eucalyptus rudis* (flooded gum) - *Melaleuca rhaphiophylla* (swamp paperbark).	90,513.13	4,607.91	5.09%	0.33%

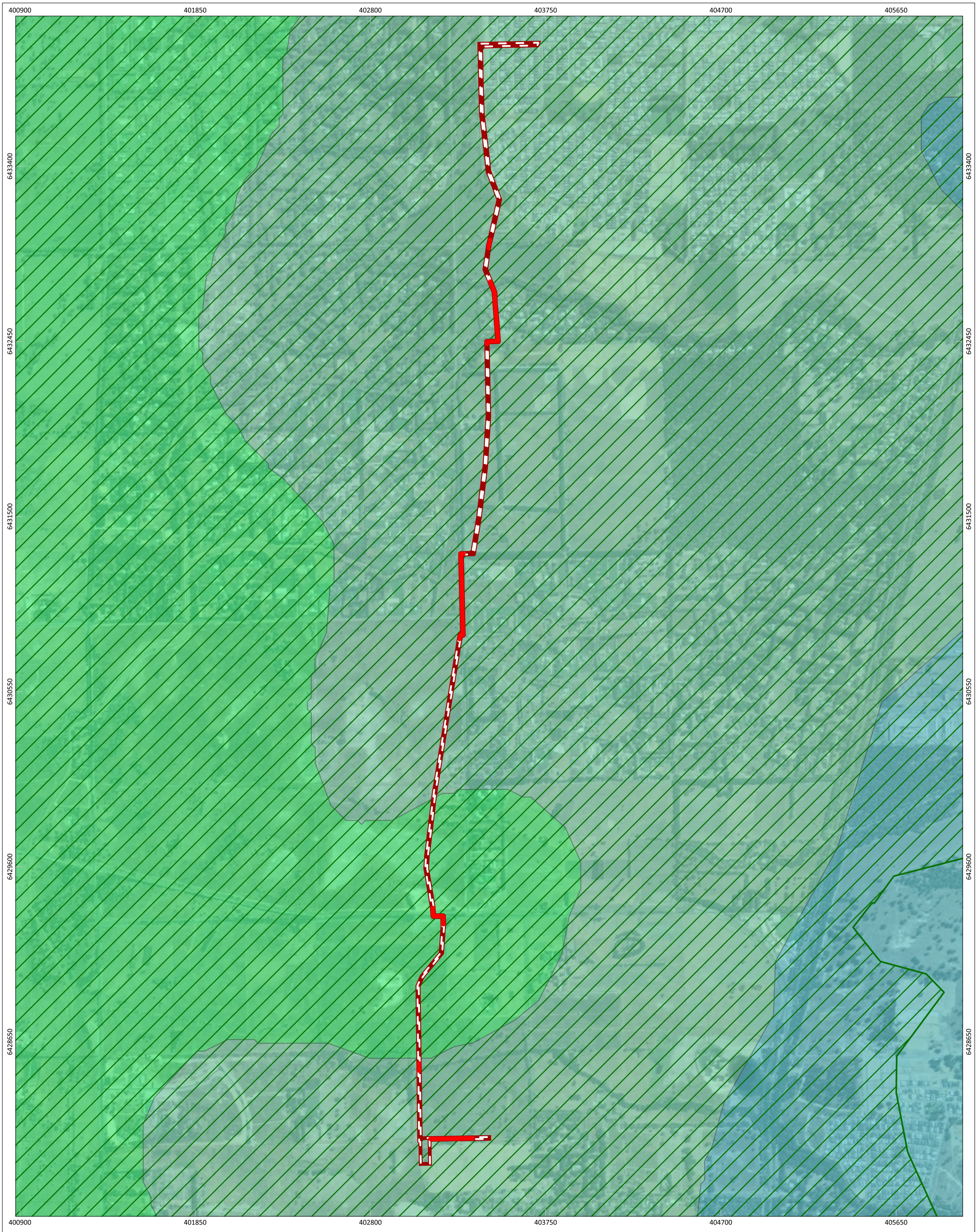


Figure 4: Pre-European Vegetation and Vegetation Complexes

N

0 125 250 375 500 625 m

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:19,000
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Proposed Underboring Areas
- Project Area

Pre-European Vegetation (DPIRD-006)

- PINJARRA_968

Vegetation Complexes Swan Coastal Plain (DBCA-046)

- Beermullah Complex
- Forrestfield Complex
- Guildford Complex

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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6.1.3 Survey effort

The field survey was conducted over two days during the Autumn flowering period for the region which was adequate for a Reconnaissance level flora survey (WEPL, 2025). Due to the size of the road reserves and condition of the vegetation present this was deemed adequate to define the presence of Threatened Flora and Communities in accordance with relevant Conservation Advice and Recovery Plans. Furthermore, this position is supported by the survey effort and outcomes undertaken for the Tonkin Highway Extension Thomas Road to South Western Highway Project which has both State and Commonwealth approval.

6.1.4 Vegetation Types

A total of five vegetation types (VT) were identified within the Project Area, as described in Table 9 and mapped in Figure 5. The majority of the mapped vegetation types were highly disturbed as a result of clearing and grazing and, overall, the majority of the Project Area did not contain native vegetation - these areas were considered Cleared and had no vegetation types assigned (WEPL, 2025).

There is a total of 0.98 ha of remnant native vegetation within the Project Area, excluding cleared areas and paddocks, and vegetation type VT04 which is defined as 'mixed non-native plantings' in Table 9.

The complete vegetation surveys are provided in Appendix A.

Table 9: Vegetation Types (WEPL, 2025)

Type Code	Description	Area (ha), % of Survey Area	Area (ha), % of Project Area	Strata details
VT01	Riparian Vegetation	5.36 ha 13.88 %	0.78 ha 10.84 %	*Eucalyptus rudis* and *Melaleuca preissiana* mid open woodland with scattered individuals of *Calothamnus quadrifidus* mid stratum in the creek lines over a weedy understorey of **Oxalis pes-caprae*, *Banksia dallanneyi* and **Hypochaeris glabra*
VT02	*Corymbia calophylla/Kingia australis* woodland on heavy soils	0.32 ha 0.84 %	0.02 ha 0.29 %	*Corymbia calophylla* mid open forest with scattered Kingia australis over *Banksia dallanneyi, Hibbertia hypericoides* and *Hypocalymma angustifolium.* Occurs in lower landscapes on margins of wetlands and atop of heavy soils of southern SCP. TECs/PECs: Yes the patch along Hopkinson Road qualifies as TEC. The patch along Orton Road is too Degraded and not representative of the TEC.
VT03	Banksia Woodland	0.68 ha 1.76 %	0.08 ha 1.08 %	A low, closed woodland of *Banksia menziesii, Banksia attenuata* over an open mid storey of *Jacksonia furcellata, Eremaea pauciflora* and *Kunzea glabrescens* over an open ground stratum of *Scholtzia involucrata, *Ursinia anthemoides* and *Conostylis juncea*.

Type Code	Description	Area (ha), % of Survey Area	Area (ha), % of Project Area	Strata details
				TECs/PECs: Does not qualify for TEC under Commonwealth guidelines
VT04	Mixed non-native planting	1.99 ha 5.14 %	0.44 ha 6.13 %	Mixed, low planted natives; Conostylis candicans, *Lomandra longifolia* and *Ficinia nodosa* with low, weedy invasive species of **Brassica tournefortii,* **Sonchus oleraceus* and **Cucumis myriocarpus*.
VT05	*Corymbia calophylla/Eucalyptus marginata* woodland	0.40 ha 1.05%	0.10 ha 1.39 %	Mixed mid, open, *Corymbia calophylla and Eucalyptus marginata* on the mid slopes with a weedy understory and Completely Degraded from grazing.
	Paddock/Cleared.	29.87 ha 77.33 %	5.79 ha 80.27 %	Scattered weeds and cleared for grazing.
Total	**-**	**38.63 ha**	**7.21 ha**	-

Vegetation Condition

The vegetation condition within the Project Area ranged from Good to Completely Degraded, with the majority being in Completely Degraded condition (Table 10, Figure 6). The Project Area has been affected by degrading factors including clearing, cattle and weed invasion. Vegetation condition is in better condition roadside and rail side in VT02 (*Corymbia calophylla/Kingia australis* woodland) and VT03 (Banksia woodland) and Degraded near the urbanisation and on the rural blocks.

Table 10: Vegetation Conditions (WEPL, 2025)

Vegetation Condition	Survey Area (ha)	Proportion of Survey Area (%)	Project Area (ha)	Proportion of Project Area (%)
Excellent	-	-	-	-
Very Good	0.16	0.42	-	-
Good	0.27	0.70	0.07	0.93
Degraded	2.48	6.43	0.26	3.61
Completely Degraded	5.84	15.12	1.09	15.18
Cleared	29.87	77.33	5.79	80.27
Total	**38.63**	**100.0**	**7.21**	**100.0**

403350 403425 403500 403575 403650

6434250 6434175 6434100 6434025 6433950 6433875 6433800



403350 403425 403500 403575 403650

Figure 5a: Site Survey: Vegetation Types

0 10 20 30 40 m

N

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR
PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	
CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032 / VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore / DATE: 5/12/2025

Legend

- Project Area
- Proposed Pipeline

Vegetation Types

- Cleared
- VT01 - Riparian vegetation

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

NOTES:

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403275 403350 403425 403500 403575 403650

6433725 6433650 6433575 6433500 6433425 6433350 6433275



403275 403350 403425 403500 403575 403650

Figure 5 b: Site Survey: Vegetation Types

0 10 20 30 40 m

N

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR
PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	
CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032 / VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore / DATE: 5/12/2025

Legend

- Project Area
- Proposed Pipeline

Vegetation Types

- Cleared
- VT01 - Riparian vegetation
- VT05 - Corymbia calophylla/Eucalyptus marginata woodland

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403350 403425 403500 403575 403650

6433200 6433125 6433050 6432975 6432900 6432825



403350 403425 403500 403575 403650

Figure 5c: Site Survey: Vegetation Types

N 0 10 20 30 40 m		PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Pipeline

Vegetation Types

- Cleared
- VT01 - Riparian vegetation
- VT02 - Corymbia calophylla/Kingia australis woodland on heavy soils

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403350 403425 403500 403575 403650

6432750 6432675 6432600 6432525 6432450 6432375 6432300

Figure 5 d: Site Survey: Vegetation Types

N 0 10 20 30 40 m		PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Pipeline

Vegetation Types

- Cleared
- VT01 - Riparian vegetation
- VT04 - Farmland planted

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403275 403350 403425 403500 403575

6432225 6432150 6432075 6432000 6431925 6431850 6431775



403275 403350 403425 403500 403575

Figure 5e: Site Survey: Vegetation Types

N 0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

Legend

- Project Area
- Proposed Pipeline

Vegetation Types

- Cleared
- VT01 - Riparian vegetation
- VT04 - Farmland planted

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403200 403275 403350 403425 403500 403575

6431700 6431625 6431550 6431475 6431400 6431325

Figure 5f: Site Survey: Vegetation Types

0 10 20 30 40 m

N

SCALE	1:1,500
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Pipeline

TECs and PECs

- Potentially SCP3a

Vegetation Types

- Cleared
- VT04 - Farmland planted

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

NOTES:

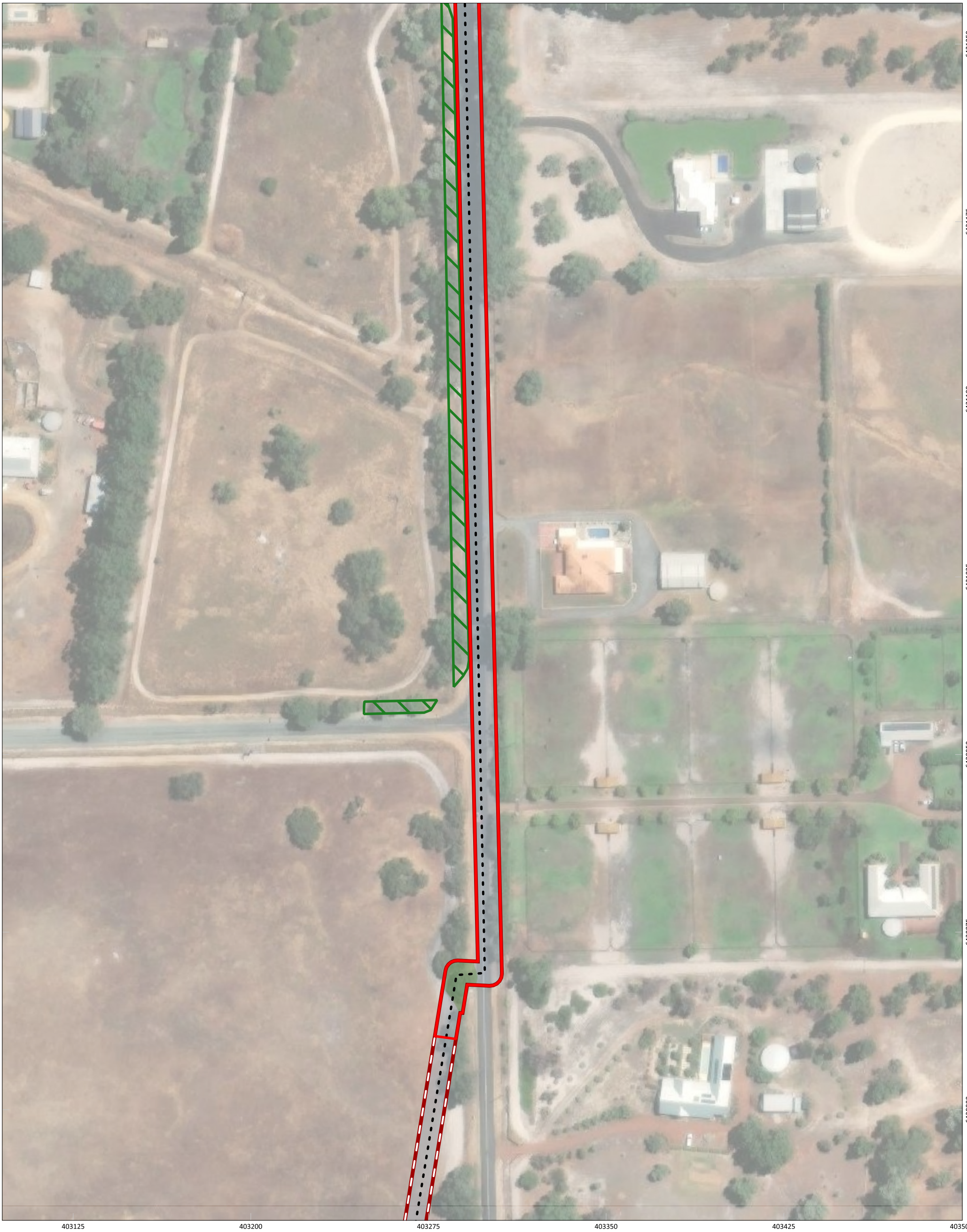
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403125 403200 403275 403350 403425 403500

6431250 6431175 6431100 6431025 6430950 6430875 6430800



403125 403200 403275 403350 403425 403500

Figure 5 g: Site Survey: Vegetation Types

0 10 20 30 40 m

N

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR
PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	
CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032 / VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore / DATE: 5/12/2025

Legend

- Project Area
- Proposed Pipeline

TECs and PECs

- Potentially SCP3a

Vegetation Types

- Cleared
- VT01 - Riparian vegetation

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403050 403125 403200 403275 403350

6430725 6430650 6430575 6430500 6430425 6430350 6430275

Figure 5 h: Site Survey: Vegetation Types

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Pipeline

Vegetation Types

- Cleared

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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402975 403050 403125 403200 403275 403350

6430200 6430125 6430050 6429975 6429900 6429825

Figure 5i: Site Survey: Vegetation Types

N 0 10 20 30 40 m

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Pipeline

Vegetation Types

- Cleared
- VT01 - Riparian vegetation

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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402975 403050 403125 403200 403275 403350

6429750 6429675 6429600 6429525 6429450 6429375 6429300

Figure 5 j: Site Survey: Vegetation Types

0 10 20 30 40 m

N

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA		
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Pipeline

TECs and PECs

- Likely SCP20b

Vegetation Types

- Cleared
- VT01 - Riparian vegetation
- VT03 - Banksia woodland
- VT05 - Corymbia calophylla/Eucalyptus marginata woodland

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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Figure 5 l: Site Survey: Vegetation Types

N

0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

Legend

- Project Area
- Proposed Pipeline

Vegetation Types

- Cleared
- VT05 - Corymbia calophylla/Eucalyptus marginata woodland

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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Figure 5 m: Site Survey: Vegetation Types

0 10 20 30 40 m
N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Pipeline

Vegetation Types

- Cleared
- VT01 - Riparian vegetation

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403050 403125 403200 403275 403350 403425

6428400 6428325 6428250 6428175 6428100 6428025 6427950



403050 403125 403200 403275 403350 403425

Figure 5 n: Site Survey: Vegetation Types

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Pipeline

TECs and PECs

- Likely SCP20b

Vegetation Types

- Cleared
- VT01 - Riparian vegetation
- VT04 - Farmland planted
- VT05 - Corymbia calophylla/Eucalyptus marginata woodland

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403350 403425 403500 403575 403650

6434250 6434175 6434100 6434025 6433950 6433875 6433800



403350 403425 403500 403575 403650

Figure 6 a: Site Survey: Vegetation Conditions

0 10 20 30 40 m

N

SCALE	1:1,500
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Vegetation Condition

- Cleared
- Completely Degraded
- Degraded
- Good

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403275 403350 403425 403500 403575 403650

6433725 6433650 6433575 6433500 6433425 6433350 6433275



403275 403350 403425 403500 403575 403650

Figure 6 b: Site Survey: Vegetation Conditions

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Vegetation Condition

- Cleared
- Completely Degraded
- Degraded
- Good

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403350 403425 403500 403575 403650

6433200 6433125 6433050 6432975 6432900 6432825



403350 403425 403500 403575 403650

Figure 6 c: Site Survey: Vegetation Conditions

N 0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Vegetation Condition

- Cleared
- Completely Degraded
- Degraded
- Good

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

NOTES:

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403350 403425 403500 403575 403650

6432750 6432675 6432600 6432525 6432450 6432375 6432300

Figure 6 d: Site Survey: Vegetation Conditions

N

0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Vegetation Condition

- Cleared
- Completely Degraded
- Degraded
- Good

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403275 403350 403425 403500 403575

6432225 6432150 6432075 6432000 6431925 6431850 6431775



403275 403350 403425 403500 403575

Figure 6 e: Site Survey: Vegetation Conditions

N 0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA		
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Vegetation Condition

- Cleared
- Completely Degraded
- Degraded
- Good

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

NOTES:

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403200 403275 403350 403425 403500 403575

6431700 6431625 6431550 6431475 6431400 6431325



403200 403275 403350 403425 403500 403575

Figure 6 f: Site Survey: Vegetation Conditions

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Vegetation Condition

- Cleared
- Completely Degraded
- Degraded
- Good

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

NOTES:

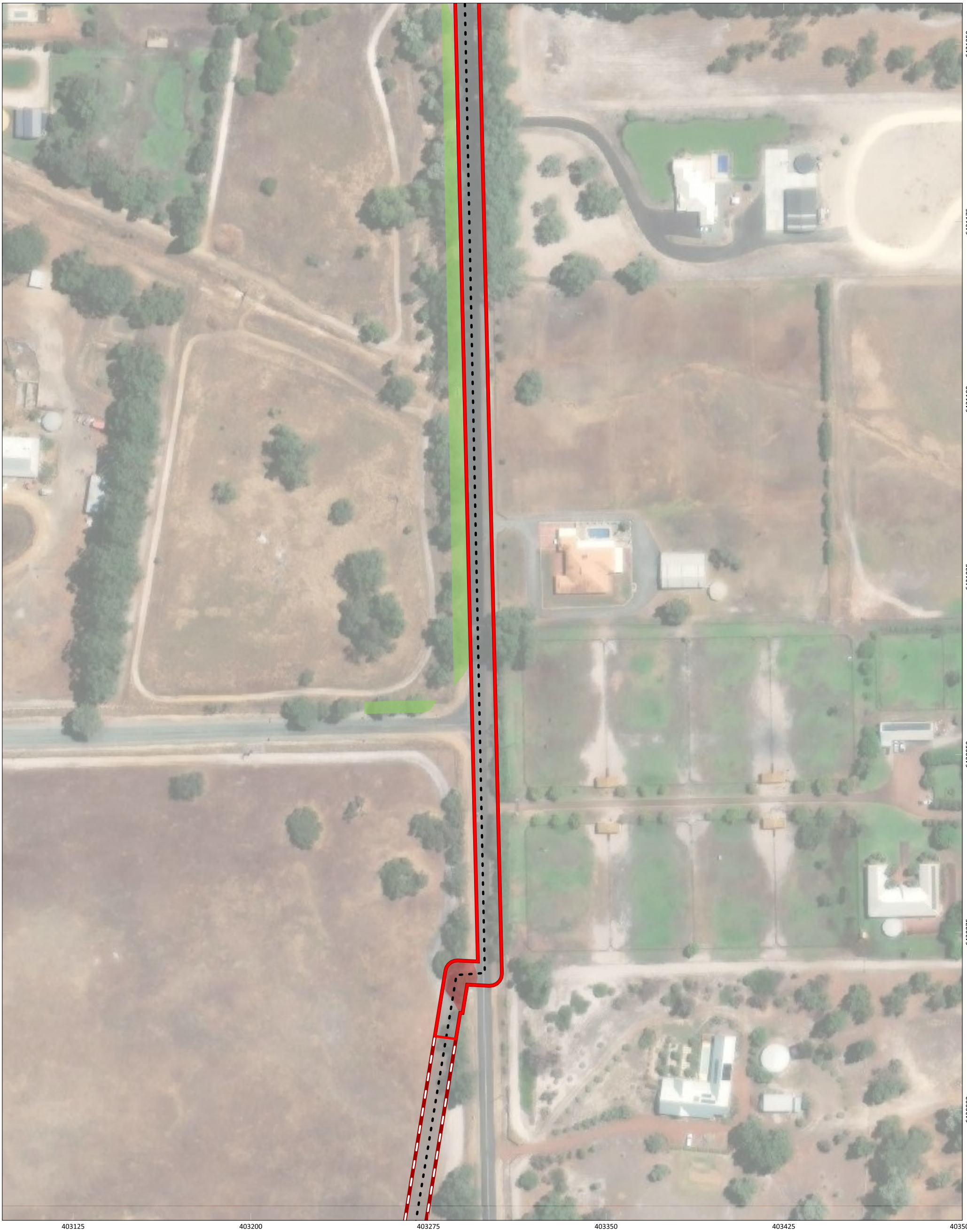
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403125 403200 403275 403350 403425 403500

6431250 6431175 6431100 6431025 6430950 6430875 6430800



403125 403200 403275 403350 403425 403500

Figure 6 g: Site Survey: Vegetation Conditions

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Vegetation Condition

- Cleared
- Completely Degraded
- Degraded
- Good

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

NOTES:

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403050 403125 403200 403275 403350

6430725 6430650 6430575 6430500 6430425 6430350 6430275



403050 403125 403200 403275 403350

Figure 6 h: Site Survey: Vegetation Conditions

N

0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Vegetation Condition

- Cleared
- Completely Degraded
- Degraded
- Good

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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402975 403050 403125 403200 403275 403350

6430200 6430125 6430050 6429975 6429900 6429825



402975 403050 403125 403200 403275 403350

Figure 6i: Site Survey: Vegetation Conditions

N 0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032 / VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore / DATE: 5/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

CLIENT: Cossil and Webley

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Vegetation Condition

- Cleared
- Completely Degraded
- Degraded
- Good

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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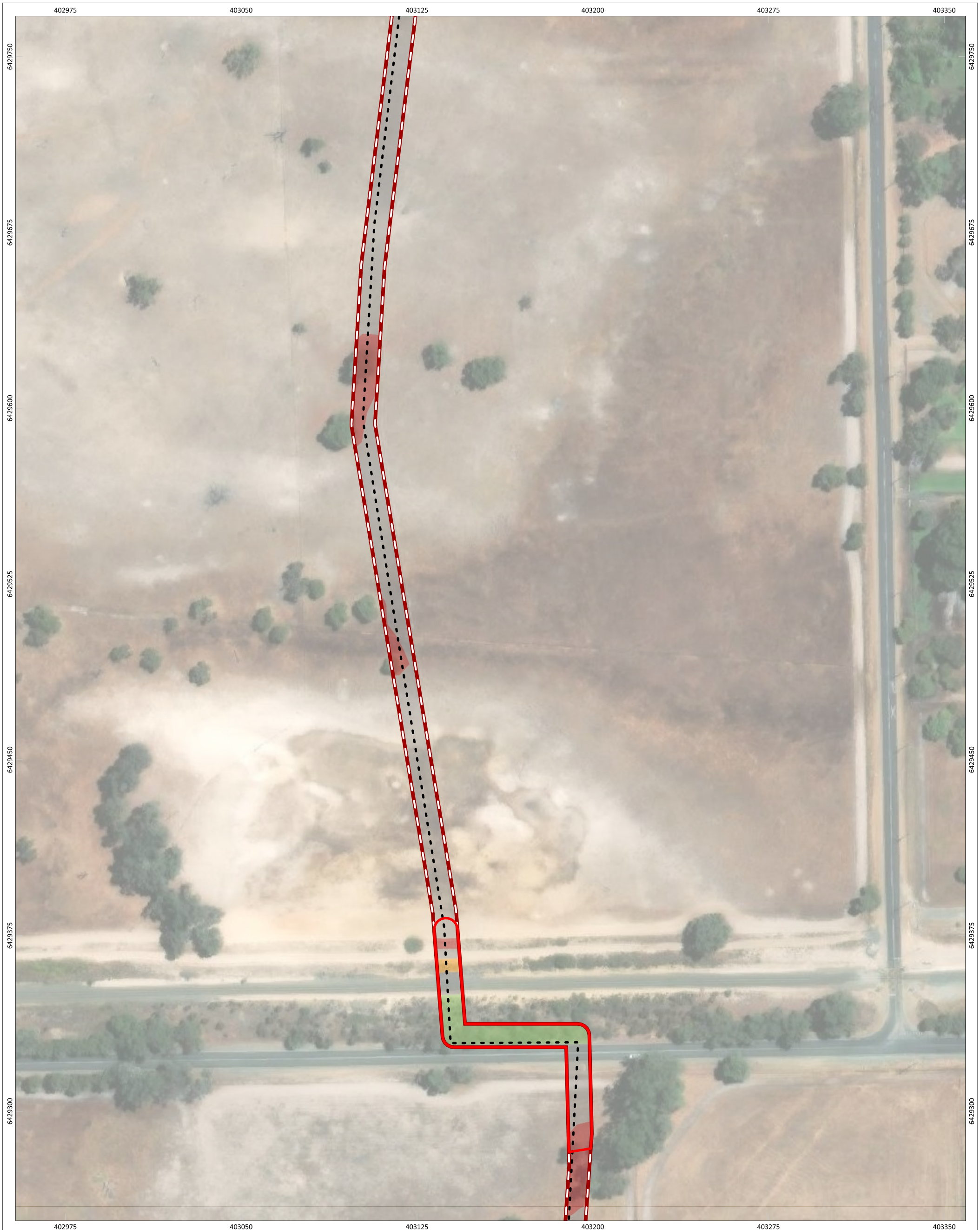


Figure 6 j: Site Survey: Vegetation Conditions

N

0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	
		CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Vegetation Condition

- Cleared
- Completely Degraded
- Degraded
- Good

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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Figure 6l: Site Survey: Vegetation Conditions

N 0 10 20 30 40 m		PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Vegetation Condition

- Cleared
- Completely Degraded
- Degraded
- Good

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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Figure 6 m: Site Survey: Vegetation Conditions

0 10 20 30 40 m
N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Vegetation Condition

- Cleared
- Completely Degraded
- Degraded
- Good

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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6428400 6428325 6428250 6428175 6428100 6428025 6427950



Figure 6 n: Site Survey: Vegetation Conditions

N

0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	
		CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Vegetation Condition

- Cleared
- Completely Degraded
- Degraded
- Good

No	Description	Drawn	Approved	Date
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6.1.5 Threatened and Priority Flora

A total of 92 vascular flora taxa, including 34 introduced species, were recorded from within the Survey Area of the biological surveys (WEPL, 2025).

The majority of the Project Area was highly disturbed due to the presence of cattle, and encroaching urbanisation. There were a few patches of remnant vegetation along the creek lines and roadside at two locations. Greater emphasis was placed on targeting flora in the VT02 community (*Corymbia calophylla/Kingia australis* woodland) and along the edge of the riparian vegetation VT01 (Riparian vegetation) and in the Banksia Woodland along the railway line in VT03.

No Threatened or Priority flora species pursuant to the BC Act or EPBC Act were identified during the survey. The post-survey LoO Assessment found that all threatened, or priority flora had a low likelihood of occurring within the Project Area due to much of the habitat being Degraded for agriculture and lack of understory vegetation to support the listed species (WEPL, 2025). As such, seasonal targeted surveys were considered unnecessary which is a position supported by the survey effort and outcomes undertaken for the Tonkin Highway Extension Thomas Road to South Western Highway Project by Woodman Environmental (2019) that has State and Commonwealth approval. Refer to Appendix A for LoO assessment.

6.1.6 Threatened Ecological Communities

Of the seven TECs and PECs identified by the desktop assessment as having a high or medium LoO, Two of these TECs, (the SCP20b Banksia *attenuata* and/or *Eucalyptus marginata* woodlands of the eastern side of the Swan Coastal Plain and SCP3a *Corymbia calophylla* - *Kingia australis* woodlands on heavy soils) have mapped occurrences or a buffer of mapped occurrences shown in DBCA database search results as intersecting the Survey Area. Refer to Appendix A for LoO assessment.

The post-survey presence/absence assessment identified that these two TECs are likely to be present within the Survey Area of the biological surveys undertaken by WEPL (WEPL, 2025).

The post biological survey presence/ absence assessment identified one commonwealth listed TEC and one State listed TEC are likely to be present within the Survey Area:

- SCP3a *Corymbia calophylla* - *Kingia australis* woodlands on heavy soils TEC, EN under the EPBC Act and CE under the BC Act.
- SCP20b *Banksia attenuata* and/or *Eucalyptus marginata* woodlands of the eastern side of the Swan Coastal Plain TEC, Endangered under the EPBC Act (if it meets the criteria of the Commonwealth listed Banksia Woodland of the Swan Coastal Plain TEC) and CE under the BC Act.

Given the level of degradation present within the Survey Area and survey timing, Floristic Community Type (FCT) analysis is not considered suitable for TEC/PEC determination.

SCP3a Corymbia calophylla - Kingia australis woodlands on heavy soils of the Swan Coastal Plain

There is one patch within the Survey Area within VT02 that is likely to be representative of SCP3a (Hopkinson's Road) that 0.20 ha in size and in Good Condition (Plate 3) (Figure 5) The patch is on a heavier clay/loam soil with the main overstory composed of *Corymbia calophylla* over a midstorey of *Kingia australis*. The relevé sampled at this location had eight species (66%) of the species present listed as "typical and common" species presented in Section 2 Description of the Ecological Community in the Approved Conservation Advice and is considered likely to be SCP3a (DoEE, 2017). None of the SCP3a patch along Hopkinson Road is located within the Project Area, it is located directly adjacent to the west. Refer to Appendix A for further information.

There was a second patch of vegetation within VT02 that may have been representative of the TEC that intersects the Project Area (along Oroton Road), (Plate 4). This patch has been cleared and is in Degraded to Completely Degraded condition. The relevé sampled at this location had four species (33%) of the species present listed as "typical and common" species presented in Section 2 Description of the Ecological Community in the Approved Conservation Advice. This is not considered to be a sufficient alignment with characteristic species to define it as an occurrence of the TEC (DoEE, 2017). Refer to Appendix A for further information.

Static groundwater data from Department of Water's Groundwater Information System indicates that where bores are located close to or within occurrences of the community, that groundwater was generally within 3 m of the natural ground surface when bores were drilled. Although the data are not comprehensive as they are static water levels, do not provide information about changes to groundwater levels over time, and were taken at different times of the year, the static water levels can provide a rough guide to the dependence of the community on groundwater, hence likely susceptibility to change.

While desktop information on water table contours is limited for the Project Area, a pre-development groundwater level and quality monitoring program was undertaken by Hy2do as part of the Lot 33 Hopkinson Road Cardup Structure Plan that intersects a central portion of the Project Area. This program utilised nine monitoring bores installed within the Structure Plan area and found that the groundwater levels range from approximately 25 m AHD at the south-eastern corner to 32.5 m AHD along the central northern boundary (Hy2do, 2022). These levels corresponded to approximately 5.5 m below the existing natural ground level at Lot 33 Hopkinson Road. This is located within a few hundred metres from the patch of SCP3a along patch along Hopkinson Road. Douglas Partners have been commissioned to undertake a geotechnical investigation which will provide more accurate depths to groundwater within the Project Area.

Whilst WEPL have identified the SCP3a along Hopkinson Road, this area was not identified as TEC by Woodman Environmental (2019) during the biological surveys for the Tonkin Highway Extension Thomas Road to South Western Highway Project that was accepted by both State and Commonwealth assessment and approval processes.



Plate 3: SCP3a located along western edge of Hopkinson Road



Plate 4: VT02 located along Orton Road where Project Area intersects

SCP20b Banksia attenuata and/or Eucalyptus marginata woodlands of the eastern side of the Swan Coastal Plain

The vegetation in VT03 had affinities and similarities in composition to SCP20b. The FCT SCP20b has been previously identified 0.6 km to the east of the Survey Area. As no FCT analysis has been undertaken the precautionary principle is applied and the vegetation is considered representative of SCP20b.

Relevé 7 was analysed in Good condition Banksia Woodland along Bishop Road that crossed through the Project Area (Plate 5; Figure 5). This patch of Good condition woodland has been affected by clearing for the adjacent railway and Bishop Road although held a moderate diversity and low weed ratio.

The patch of SCP20b does not meet the criteria of the Commonwealth listed Banksia Woodland of the Swan Coastal Plain TEC as detailed in sections further below.

There is a total of 0.68 ha of SCP20b mapped within the Survey Area. There is 0.08 ha of SCP20b mapped within the Project Area (0.07 ha in Good Condition and 0.01 ha in Degraded Condition). Through implementing trenchless drilling and under boring construction methodologies direct clearance of this TEC will be avoided.



Plate 5: SCP20b along Bishop Road within the Project Area

6.1.7 Banksia Woodland of the Swan Coastal Plain

The presence and distribution of the Banksia Woodland of the Swan Coastal Plain TEC ('Banksia Woodland TEC') was determined as per the diagnostics presented in Section 2 of the Department of the Environment and Energy (DotE; 2016).

The pre-survey desktop assessment identified that DBCA database mapping indicates the potential presence of the Banksia Woodland TEC. The field survey confirmed that two patches of vegetation within VT03 (Plate 6 and Plate 7) were consistent with the vegetation structure and composition of the community and that patches of the Banksia TEC were present.

The Conservation Advice defines a patch as "a discrete and mostly continuous area of the ecological community. A patch may include small-scale (<30 m) variations, gaps and disturbances, such as tracks, paths or breaks" (DotE, 2016). Where breaks are present (e.g. cleared gaps of >30 m or area of non-Banksia Woodland vegetation types) several patches within a Survey Area may be defined and assessed against the criteria separately. The assessment is also tenure blind and requires consideration of vegetation outside of the Survey Area. Within the Survey Area two separate patches of potential Banksia Woodland TEC were identified: one north, and one south, of the cleared pressure main corridor.

The assessment concluded that neither patch meets the TEC criteria within Commonwealth Guideline. Refer to Appendix A for more details.



Plate 6: Banksia woodland (VT03) Patch 1 on Bishop Road



Plate 7: Banksia woodland (VT03) Patch 2 on Scott Road

6.1.8 Invasive species

A total of 34 introduced taxa were recorded within the Survey Area of the biological surveys undertaken by WEPL (WEPL, 2025). These are listed in Appendix A along with their status under the Biosecurity and Agriculture Management Act 2007 (BAM Act) or Weeds of National Significance (WoNS) listing. A comprehensive weed inventory was not collected in cleared and Completely Degraded areas. Listed species are common/widespread.

Four of the species recorded: Narrowleaf Cottonbush (**Gomphocarpus fruticosus*), Arum lily (**Zantedeschia aethiopica*), Bridal creeper (**Asparagus asparagoides*) and Paterson's Curse (*Echium plantagineum*) are listed as a Declared Pest under the BAM Act in WA and one is also listed as a WonS, Bridal creeper. These species are discussed further below within Appendix A.

6.2 Fauna

A basic fauna survey was undertaken by WEPL in June 2025. This survey was completed in accordance with Terrestrial Fauna Technical Guidance (EPA, 2020). A basic survey is a low-intensity survey, conducted at the local scale to gather broad fauna and habitat information. The primary objectives are to verify the overall adequacy of the desktop study, and to map and describe habitats, with a focus on habitat for conservation listed fauna.

Fauna species were identified by active searches, secondary evidence such as scats, tracks, calls, remains, diggings and other signs. A fauna inventory was not compiled as part of this survey (not required under basic level survey) however observations were used to inform the fauna habitat type assessment.

Potential habitats for conservation listed species were identified and evaluated and the likelihood of occurrence assessed.

In addition to a basic fauna survey, a targeted black cockatoo assessment was also completed.

The full biological report is attached in Appendix A (WEPL, 2025).

6.2.1 Desktop Assessment

A search of DBCA's Threatened and Priority Fauna database and EPBC Act PMST was undertaken by WEPL (WEPL, 2025) to compile a list of conservation significant fauna previously recorded within or surrounding the Survey Area undertaken as part of the WEPL biological surveys (DBCA, 2025; DCCEEW, 2025b; WEPL, 2025).

Database searches identified 58 conservation listed fauna species that potentially occur, or habitat likely occurs within 10 km of the Survey Area, comprising:

- 35 bird species.
- 11 mammal species.
- Eight invertebrate species.
- Four reptile species.

A LoO assessment was undertaken to determine the likelihood of these species occurring within the Survey Area based on suitable habitat present and the species known distribution based on the following criteria.

- Recorded: Recorded in the Survey Area from database searches, previous survey by others or by current survey.
- High: Preferred habitat is present within the Project Area; the Project Area is in the species' known distribution and the species has been recorded on more than one occasion within the vicinity (<5 km of the Project Area).
- Medium: Limited or no suitable habitat occurs in the Project Area, but is nearby and the species has good dispersal abilities and is known from the general area or preferred habitat occurs.
- Low: No suitable habitat is present in the Project Area or the Project Area is outside the species known distribution or the species is known from the general area but has poor dispersal abilities.

This assessment was undertaken pre-survey and post-survey (as detailed in Appendix A).

6.2.2 Fauna Habitat Types

There are nine fauna habitat types within the Project Area. These broadly align with the mapped vegetation type boundaries. The fauna habitat types are described below in Table 11 and shown in Figure 7.

For possibly occurring conservation listed fauna species, habitat types are assessed as either core, supporting or non-significant habitat. In accordance with the MNES – Significant Impact Guidelines 1.1:

- Core habitat is defined as that critical to the survival of the species and considered to contain denning or breeding sites, primary foraging areas and refuge from drought, fire and other stresses (WEPL, 2025).
- Supporting habitat is defined as that which is likely used for foraging and dispersing or connective purposes but is not essential habitat for the continuation of a local population (WEPL, 2025).
- Non-significant habitat is that which would be used only very infrequently for foraging or dispersing (WEPL, 2025).

Table 11: Fauna Habitat Types Mapped within the Survey Area and Project Area (WEPL, 2025)

Fauna Habitat Type	Area (ha) Proportion of Survey Area (%)	Area (ha) Proportion Project Area (%)	Habitat Description	Species Suitability
FHT01 Scattered small-fruited Eucalyptus	2.56 ha 6.63%	0.52 ha 7.21 %	Planted rows and stands of small-fruited smooth bark Eucalyptus and *Eucalyptus rudis* (Flooded gum) over cleared/grazed paddock. Limited understory species due to agricultural grazing, dominated by paddock grasses. No evidence of foraging was observed. Soil substrate: Variable over Survey Area.	**No core habitat for all species.** **Supporting habitat for:** Forest red-tailed black cockatoos **Non-significant for:** Carnaby's black cockatoos; Baudin's black cockatoos; Peregrine falcon; Brush-tailed phascogale; Quenda; Rakali; Graceful sun-moth; Carter's freshwater mussel; Perth slider; Black-striped burrowing snake.
FHT02 Paddock and open grassland	30.20 78.16 %	4.82 ha 66.83%	Cleared pasture grassland, dominated by paddock grasses.	**Non-significant habitat for all species.**
FHT03 Scattered Marri	0.63 ha 1.64 %	0.12 ha 1.69 %	Rows and stands of *Corymbia calophylla* (marri) over cleared/grazed paddock. Degraded condition with some connective canopy. No understory species observed, minimal ground leaf cover, mostly dominated by paddock grasses. Scattered hollow fallen logs and branches on ground, with occasional old dead trees containing suitable hollows for black cockatoos (Class 3). Some foraging evidence was observed, no roosting evidence. Soil substrate: deep bleached grey sands/sandy loam over clay.	**No core habitat for all species.** **Supporting habitat for:** Forest red-tailed black cockatoos; Carnaby's black cockatoos; Baudin's black cockatoos **Non-significant for:** Peregrine falcon; Brush-tailed phascogale; Quenda; Rakali; Graceful sun-moth; Carter's freshwater mussel; Perth slider; Black-striped burrowing snake.
FHT04 Scattered paperbark	0.17 ha 0.45 %	0.02 ha 0.22%	Individual or small rows of *Melaleuca preissiana* (paperbark) along roadsides or over degraded grazed paddock.	**Non-significant for all species.**

Fauna Habitat Type	Area (ha) Proportion of Survey Area (%)	Area (ha) Proportion Project Area (%)	Habitat Description	Species Suitability
FHT05 **Banksia woodland and associated mixed shrubs**	0.21 ha 0.54 %	0.05 ha 0.70%	Scattered individual *Banksia attenuata* and *B. menziesii* over mixed native species. Single contiguous area along the railway in south of the Survey Area, scattered Banksia and other associated proteaceous species (*Xylomelum occidentale*.) occur sporadically elsewhere. Habitat value for fauna reduced due to small relative size and isolated nature of the patches. Soil substrate: Deep sandy loam soils.	**No core habitat for all species.** **Supporting habitat for:** Forest red-tailed black cockatoos ; Carnaby's black cockatoos; Baudin's black cockatoos; Quenda; Graceful sun-moth; Perth slider; black-striped burrowing snake. **Non-significant for:** Peregrine falcon; Brush-tailed phascogale; Rakali; Carter's freshwater mussel.
FHT06 **Wetland feature and associated vegetation**	0.8 ha 2.08 %	0.05 ha 0.69 %	Planted rows and stands of small-fruited smooth bark Eucalyptus and *Eucalyptus rudis* (Flooded gum) on banks of seasonal drainage lines (river streams, slow flowing dams) as the survey occurred during winter, all water courses were in active flow. Drainage lines may dry up during summer months.	**Core habitat for:** Carter's freshwater mussel **Supporting habitat for:** Brush-tailed phascogale; Rakali; Quenda **Non-significant for:** Forest red-tailed black cockatoos; Carnaby's black cockatoos; Baudin's black cockatoos; Peregrine falcon; Graceful sun-moth; Perth slider; black-striped burrowing snake.
FHT07 **Reedbed**	0.03 ha 0.09 %	0.004 ha 0.05 %	Reedbed of *Typha orientalis* on ephemeral creek line.	**No core habitat for all species.** **Supporting habitat for:** Quenda Non-significant for all other listed species
FHT08 **Planted garden**	0.13 ha 0.33 %	0.02 ha 0.23 %	Mix non-native and exotic eucalypt and garden species over cleared paddock. patch in the south along Scott rd appears to be dead *Tipuana tipu.*	Non-significant for all species.

Fauna Habitat Type	Area (ha) Proportion of Survey Area (%)	Area (ha) Proportion Project Area (%)	Habitat Description	Species Suitability
FHT09 Scattered Jarrah	0.04 0.1 %	0.02 ha 0.23 %	individual *Eucalyptus marginata* (jarrah) over cleared/grazed paddock. Degraded condition with no connected canopy. No understory species observed, minimal ground leaf cover, mostly dominated by paddock grasses. Scattered hollow fallen logs and branches on ground. Soil substrate: deep bleached grey sands/sandy loam over clay.	**No core habitat for all species.** **Supporting habitat for:** Forest red-tailed black cockatoos **Non-significant for:** Carnaby's black cockatoos; Baudin's black cockatoos; Peregrine falcon; Brush-tailed phascogale; Quenda; Rakali; Graceful sun-moth; Carter's freshwater mussel; Perth slider; Black-striped burrowing snake.
BG-Bare ground and built structure	3.86 ha 9.98%	1.60 ha 22.16 %	Road surface, driveways, built structure and completely degraded substrate (sand/gravel, no vegetation).	**Non-significant for all species.**
Total	**38.63 ha**	**7.21 ha**		

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403350 403425 403500 403575 403650

Figure 7 a: Fauna Habitats

0 10 20 30 40 m

N

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR
PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	
CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032 / VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore / DATE: 5/12/2025

Legend

- Project Area
- Proposed Pipeline

Fauna Habitats

- BG_01
- FHT_01
- FHT_02
- FHT_07

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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6433725 6433650 6433575 6433500 6433425 6433350 6433275



403275 403350 403425 403500 403575 403650

Figure 7 b: Fauna Habitats

0 10 20 30 40 m

N

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR
PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	
CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032 / VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore / DATE: 5/12/2025

Legend

- Project Area
- Proposed Pipeline

Fauna Observations

- Carnaby's Cockatoo
- Red-tailed Black Cockatoo
- Quenda

Fauna Habitats

- BG_01
- FHT_01
- FHT_02
- FHT_03

No	Description	Drawn	Approved	Date
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6433200 6433125 6433050 6432975 6432900 6432825



403350 403425 403500 403575 403650

Figure 7 c: Fauna Habitats

0 10 20 30 40 m N	PROJECT/REPORT NAME Scott Road Waste Water Pumping Station: EIA Report Byford WA		
SCALE 1:1,500	SHEET SIZE A3 COLOUR	CLIENT Cossil and Webley	
COORDINATE REFERENCE SYSTEM GDA2020 / MGA Zone 50		PROJECT NUMBER A24.032	VERSION 3
DATA SOURCE ESRI Imagery		DRAWN BY / REVIEWED BY West GIS Stephen Moore	DATE 5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Fauna Habitats

- BG_01
- FHT_02
- FHT_03
- FHT_06

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403350 403425 403500 403575 403650

6432750 6432675 6432600 6432525 6432450 6432375 6432300

Figure 7 d: Fauna Habitats

N 0 10 20 30 40 m		PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Fauna Habitats

- BG_01
- FHT_01
- FHT_02
- FHT_06
- FHT_08

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403275 403350 403425 403500 403575

6432225 6432150 6432075 6432000 6431925 6431850 6431775



403275 403350 403425 403500 403575

Figure 7 e: Fauna Habitats

N

0 10 20 30 40 m

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Pipeline

Fauna Habitats

- FHT_01
- FHT_02
- FHT_06

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403200 403275 403350 403425 403500 403575

6431700 6431625 6431550 6431475 6431400 6431325



403200 403275 403350 403425 403500 403575

Figure 7 f: Fauna Habitats

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Fauna Habitats

- BG_01
- FHT_01
- FHT_02
- FHT_09

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

NOTES:

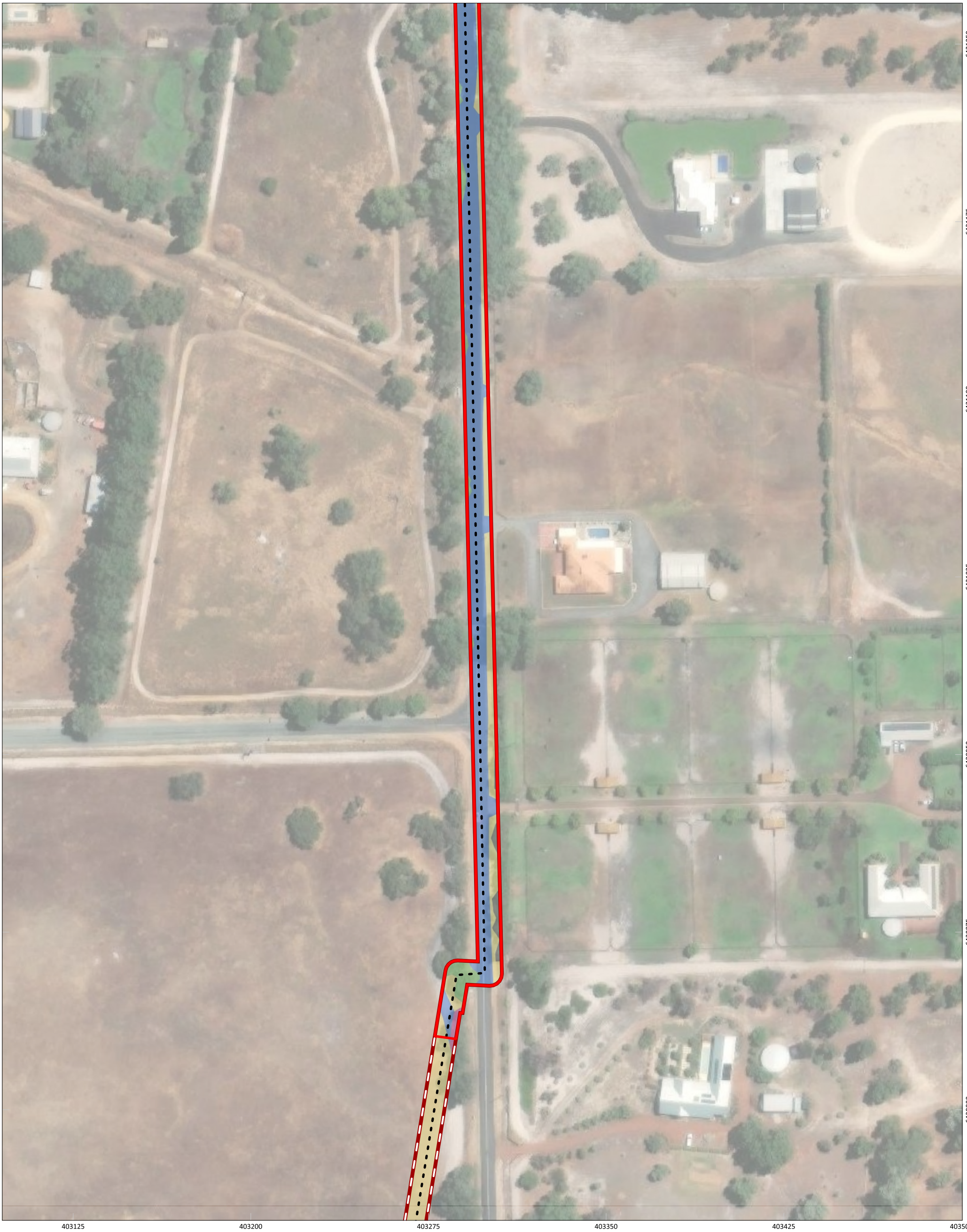
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403125 403200 403275 403350 403425 403500

6431250 6431175 6431100 6431025 6430950 6430875 6430800



403125 403200 403275 403350 403425 403500

Figure 7 g: Fauna Habitats

N

0 10 20 30 40 m

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Fauna Habitats

- BG_01
- FHT_01
- FHT_02
- FHT_03
- FHT_08

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403050 403125 403200 403275 403350

6430725 6430650 6430575 6430500 6430425 6430350 6430275



403050 403125 403200 403275 403350

Figure 7 h: Fauna Habitats

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Pipeline

Fauna Habitats

- FHT_02

No	Description	Drawn	Approved	Date
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402975 403050 403125 403200 403275 403350

6430200 6430125 6430050 6429975 6429900 6429825



402975 403050 403125 403200 403275 403350

Figure 7 i: Fauna Habitats

N 0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA		
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Pipeline

Fauna Habitats

- BG_01
- FHT_01
- FHT_02

No	Description	Drawn	Approved	Date
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6429750 6429675 6429600 6429525 6429450 6429375 6429300

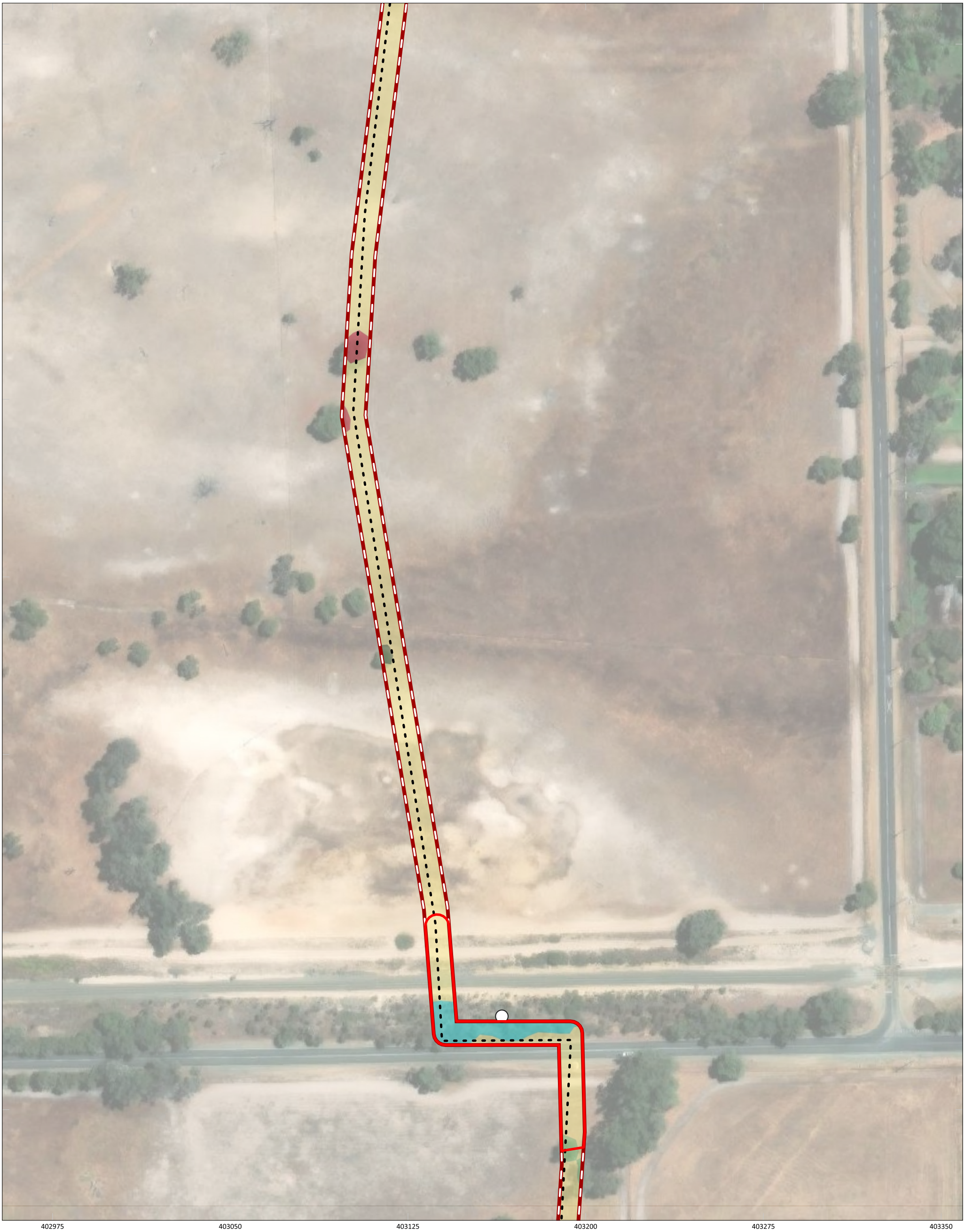


Figure 7 j: Fauna Habitats

N 0 10 20 30 40 m	PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA		
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 3	
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025	

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Fauna Observations

- Baudin's Cockatoo

Fauna Habitats

- FHT_02
- FHT_03
- FHT_04
- FHT_05
- FHT_09

No	Description	Drawn	Approved	Date
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402900 402975 403050 403125 403200 403275

6429225 6429150 6429075 6429000 6428925 6428850 6428775



402900 402975 403050 403125 403200 403275

Figure 7 l: Fauna Habitats

N

0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA			
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Pipeline

Fauna Habitats

- FHT_02
- FHT_04

No	Description	Drawn	Approved	Date
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Figure 7 m: Fauna Habitats

0 10 20 30 40 m
N

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA		
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Fauna Habitats

- FHT_01
- FHT_02
- FHT_04
- FHT_06

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403050 403125 403200 403275 403350 403425

6428400 6428325 6428250 6428175 6428100 6428025 6427950

Figure 7 n: Fauna Habitats

N

0 10 20 30 40 m

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Fauna Observations

- Red-tailed Black Cockatoo

Fauna Habitats

- BG_01
- FHT_01
- FHT_02
- FHT_03

No	Description	Drawn	Approved	Date
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6.2.3 Threatened and Priority Fauna

Four of the species identified as having a high LoO were observed within the Survey Area during the field Survey, they were:

- Baudin's black cockatoo (BBC)—EN.
- Carnaby's black cockatoo (CBC) —EN.
- Forest red-tailed black cockatoo (FRTBC)—VU.
- Quenda—P4.

Specific targeted assessments for black cockatoo species were undertaken and are presented in the following sections.

Black cockatoos

Observations

The Project Area falls within the modelled distribution range for BBC, CBC and the FRTBC (DAWE, 2022).

During the field survey, CBC and FRTBC were both observed within the Project Area. CBC were seen commuting over the northern section of the Project Area and did not stop to perch (WEPL, 2025). FRTBC were observed commuting over the Project Area but were also recorded actively foraging marri nuts within an immature marri along the heavily disturbed Scott Road. All observations were made in habitat consistent with known high-quality foraging habitat of the three black cockatoos.

Black Cockatoo Habitat Descriptions

The SCP is used by CBC for foraging, with some patches of breeding within the SCP from July to December (DAWE, 2022). Vegetation used by Carnaby's black cockatoo is dominated by Banksia spp. and tuart woodlands, as well as marri, with jarrah in the eastern SCP (DAWE, 2022).

Within the eastern and southern portion of the SCP, BBC can be observed foraging from March to September, with unlikely observations in the western and northern SCP. Vegetation used by BBC is dominated by marri and native proteaceous plant species including *Banksia ssp* and *Hakea spp*, but rarely jarrah (DAWE, 2022). Breeding for Baudin's black cockatoo typically occurs in the southern jarrah forest but may also occur in the southern SCP (DAWE, 2022).

Within the SCP, FRTBC can be flexibly observed year-round, most commonly present from January through to July, some individuals remain present all year round. Vegetation used by FRTBC are primarily the seeds of jarrah and marri woodlands and forests, *Allocasuarina* spp cones, fruits of *Persoonia longifolia* (snotty gobble), *Eucalyptus pilularis* (blackbutt), *Eucalyptus megacarpa* (bullich), *Hakea spp*., tuart and some introduced eucalypts such as Eucalyptus camaldulensis (river red gum) (DAWE, 2022). Breeding may occur in locations containing suitable breeding tree species, including the Perth Metropolitan Area (DAWE, 2022).

There were numerous observation records for BBC, CBC and the FRTBC identified in the DBCA database within a 10 km buffer of the Project Area.

Foraging Habitat

Habitats within the Project Area contain species which comprise suitable foraging habitat Fauna habitat types. FHT01, FHT03 and FHT05 all contain a proportion of foraging species for all three black cockatoo species including jarrah, marri, Banksia spp. and other Eucalyptus species.

The Commonwealth referral guidelines provide a foraging quality scoring tool to guide referral information (DAWE, 2022). The tool advises that if the Project Area contains native vegetation used for foraging at any time by a black cockatoo species and is >1 ha in size, that it is considered at face value to be of very high quality and assigned a starting score of 10. The tool then allows for subtractions if attributes are present which reduce the functionality of the foraging habitat (WEPL, 2025). The details regarding the application of this methodology to the project are described in the associated Flora and Vegetation, and Fauna Survey (Appendix A; WEPL, 2025).

WEPL undertook a foraging habitat assessment across the Project Area, which identified that quality of foraging habitat ranged from 1/10 to 10/10. Within the Project Area there was the same amount of foraging habitat recorded for the BBC and CBC at the same quality score (therefore have been detailed in Table 12), whereas the FRTBC had varying quality score and amount of habitat so has been detailed in Table 13).

For BBC and CBC the weighted average of the quality of foraging habitat within the Project Area has a score of 2/10 (described as low). This is due to the majority (7.04 ha, 98%) of foraging habitat having a score of 2/10 or lower (Low to negligible, and therefore considered unsuitable habitat) comprised of cleared or heavily disturbed land. Several tree species and vegetation types within the Project were identified as representative of suitable black cockatoo foraging habitat, with 0.17 ha suitable foraging habitat mapped across the Project Area (Figure 8 and Figure 9). Of the 0.17 ha of suitable habitat, the majority is in High to Very High quality.

The final foraging habitat quality score for the BBC and CBC, and the total area of that score present within the Survey Area and Project Area are listed in Table 12.

Table 12: Final Habitat Quality Score and Extent of Foraging Habitat for BBC and CBC

Final Habitat Quality Score (score out of 10)	Baudin's Black Cockatoo (ha)		Carnaby's Black Cockatoo (ha)		% of Project Area
	Survey Area	Project Area	Survey Area	Project Area	
10	0.63	0.12	0.63	0.12	1.69%
9	0.21	0.05	0.21	0.05	0.7%
8	-	-	-	-	
7	-	-	-	-	
6	-	-	-	-	

Final Habitat Quality Score (score out of 10)	Baudin's Black Cockatoo (ha)		Carnaby's Black Cockatoo (ha)		% of Project Area
	Survey Area	Project Area	Survey Area	Project Area	
5	-	-	-	-	
4	-	-	-	-	
3	-	-	-	-	
2	3.41	0.59	3.41	0.59	7.9%
1	30.53	4.85	30.53	4.85	67.32%
0	3.86	1.60	3.86	1.60	22.16%
Total	**38.63**	**7.21**	**38.63**	**7.21**	**100%**
Total Suitable habitat	**0.84**	**0.17**	**0.84**	**0.17**	**2.39%**

* Shaded cells are classified as not comprising suitable foraging habitat

For FRTBC the weighted average of the quality of foraging habitat within the Project Area has a score of 2/10 (described as low). This is due to the majority (7.07 ha, 97.08%) of foraging habitat having a score of 2/10 or lower (Low to negligible, and therefore considered unsuitable habitat) comprised of cleared or heavily disturbed land. Several tree species and vegetation types within the Project were identified as representative of suitable black cockatoo foraging habitat, with 0.14 ha suitable foraging habitat mapped across the Project Area (Figure 10). Of the 0.18 ha of suitable habitat, the majority is in Moderate - High to Very High quality.

The final foraging habitat quality score for the FRTBC, and the total area of that score present within the Survey Area and Project Area are listed in Table 13.

Table 13: Final Habitat Quality Score and Extent of Foraging Habitat for FRTBC

Final Habitat Quality Score (score out of 10)	Forest Red-tail Black Cockatoo (ha)		% of Project Area
	Survey Area	Project Area	
10	0.63	0.12	1.7%
9	0.02	-	
8	0.04	0.02	0.23%
7	-	-	
6	-	-	
5	-	-	
4	-	-	
3	-	-	
2	3.56	0.62	8.6%
1	30.53	4.85	67.32%
0	3.86	1.60	22.16%
Total	**38.63**	**7.21**	**100%**
Total Suitable habitat	**0.69**	**0.14**	**1.91%**

As per the Habitat Quality Scoring Tool areas with a site condition score of 2 or lower (shaded cells) are "extremely unlikely to be considered as suitable habitat". These areas are therefore classified as not comprising suitable foraging habitat in this assessment.

Within the Project Area there is 0.17 ha of suitable foraging habitat for BBC and CBC and 0.14 ha suitable foraging habitat for FRTBC scoring between 8 to 10 on the Habitat Quality Scoring Tool - Final Habitat Quality Score. This represents 0.001 % of the estimated regional habitat extent, refer to following sections (WEPL, 2025).

403350 403425 403500 403575 403650

6434250 6434175 6434100 6434025 6433950 6433875 6433800



403350 403425 403500 403575 403650

Figure 8a : Baudins Cockatoo Foraging Habitat

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Pipeline

Baudins Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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6433725 6433650 6433575 6433500 6433425 6433350 6433275



403275 403350 403425 403500 403575 403650

Figure 8 b: Baudins Cockatoo Foraging Habitat

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
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PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Pipeline

Baudins Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2
- 10

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403350 403425 403500 403575 403650

6433200 6433125 6433050 6432975 6432900 6432825



403350 403425 403500 403575 403650

Figure 8 c: Baudins Cockatoo Foraging Habitat

0 10 20 30 40 m

N

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032 / VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore / DATE: 5/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

CLIENT: Cossil and Webley

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Baudins Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2
- 10

No	Description	Drawn	Approved	Date
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403350 403425 403500 403575 403650

6432750 6432675 6432600 6432525 6432450 6432375 6432300

Figure 8 d: Baudins Cockatoo Foraging Habitat

0 10 20 30 40 m

N

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Baudins Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2

No	Description	Drawn	Approved	Date
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403275 403350 403425 403500 403575

6432225 6432150 6432075 6432000 6431925 6431850 6431775



403275 403350 403425 403500 403575

Figure 8 e: Baudins Cockatoo Foraging Habitat

N

0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

Legend

- Project Area
- Proposed Pipeline

Baudins Cockatoo Foraging Habitat Quality Score

- 1
- 2

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

NOTES:

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403200 403275 403350 403425 403500 403575

6431700 6431625 6431550 6431475 6431400 6431325



403200 403275 403350 403425 403500 403575

Figure 8 f: Baudins Cockatoo Foraging Habitat

N 0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Baudins Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

NOTES:

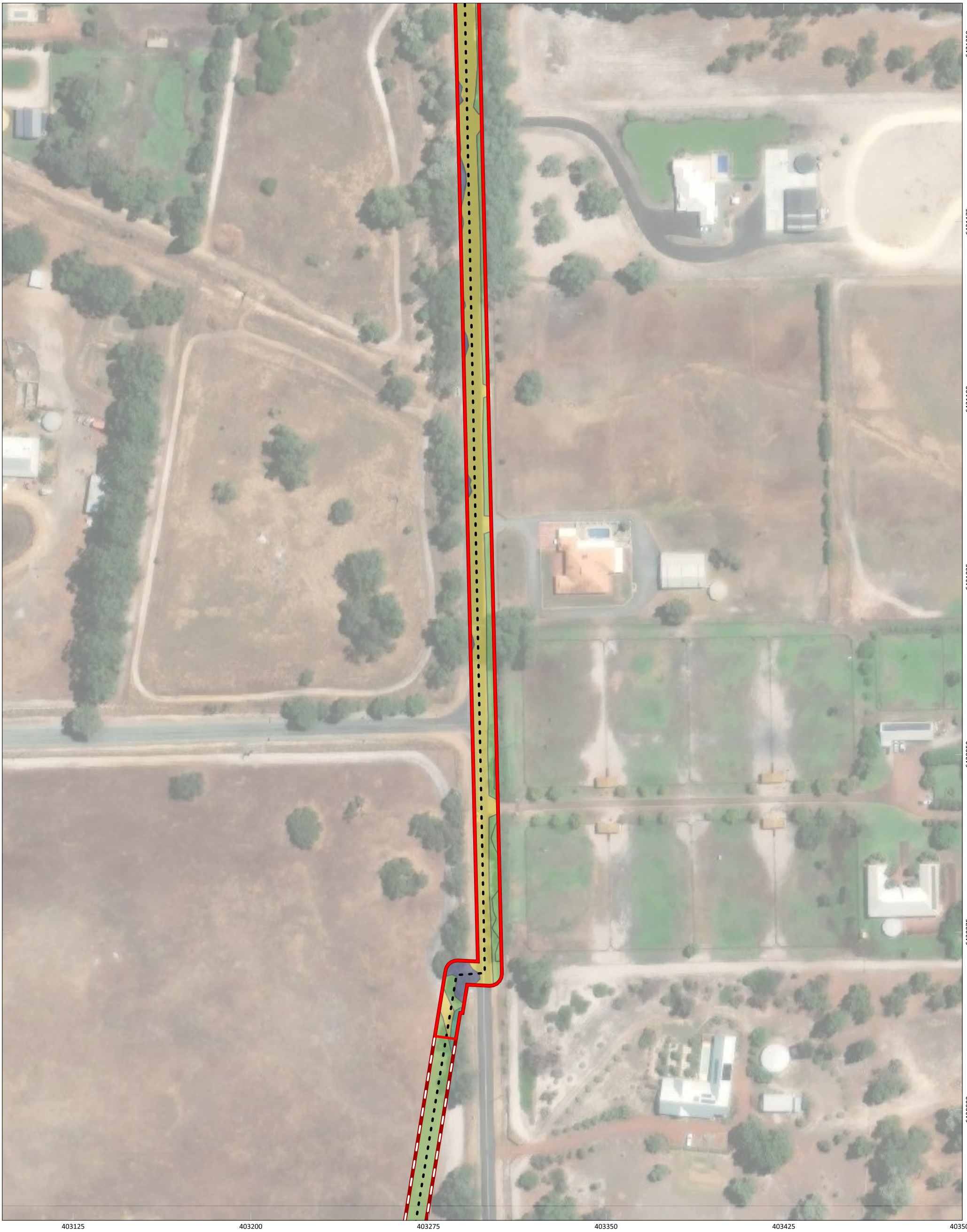
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403125 403200 403275 403350 403425 403500

6431250 6431175 6431100 6431025 6430950 6430875 6430800



403125 403200 403275 403350 403425 403500

Figure 8 g: Baudins Cockatoo Foraging Habitat

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Baudins Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2
- 10

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

NOTES:

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403050 403125 403200 403275 403350

6430725 6430650 6430575 6430500 6430425 6430350 6430275



403050 403125 403200 403275 403350

Figure 8h: Baudins Cockatoo Foraging Habitat

N 0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

Legend

- Project Area
- Proposed Pipeline

Baudins Cockatoo Foraging Habitat Quality Score

- 1

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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Figure 8i: Baudins Cockatoo Foraging Habitat

N 0 10 20 30 40 m	PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA		
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 3	
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025	

Legend

- Project Area
- Proposed Pipeline

Baudins Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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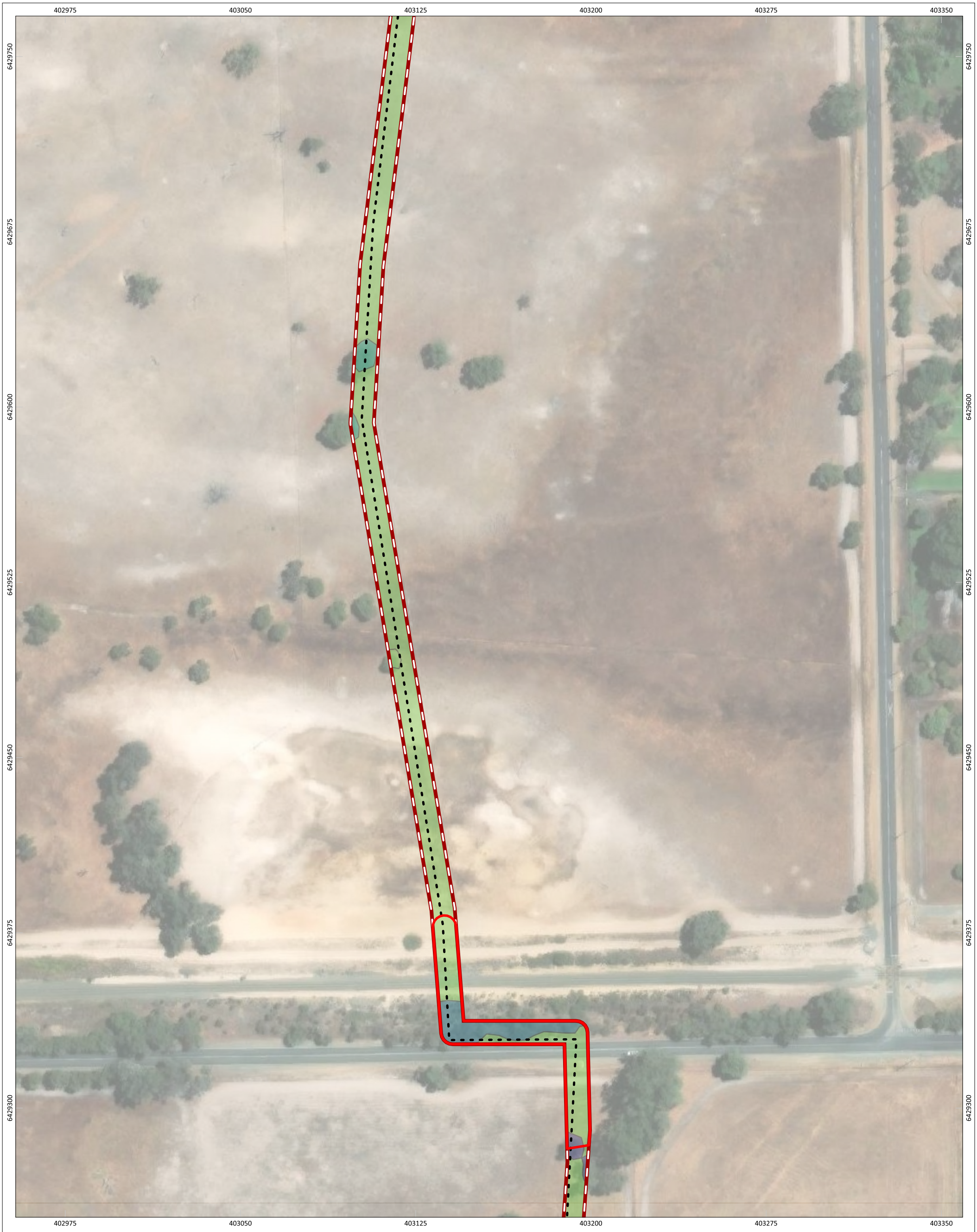


Figure 8 j: Baudins Cockatoo Foraging Habitat

0 10 20 30 40 m

N

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Baudins Cockatoo Foraging Habitat Quality Score

- 1
- 2
- 9
- 10

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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Figure 8l: Baudins Cockatoo Foraging Habitat

0 10 20 30 40 m
N

SCALE	1:1,500
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

Project Area

Proposed Pipeline

Baudins Cockatoo Foraging Habitat Quality Score

1

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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Figure 8 m: Baudins Cockatoo Foraging Habitat

0 10 20 30 40 m
N

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA		
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Baudins Cockatoo Foraging Habitat Quality Score

- 1
- 2

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403050 403125 403200 403275 403350 403425

6428400 6428325 6428250 6428175 6428100 6428025 6427950



403050 403125 403200 403275 403350 403425

Figure 8 n: Baudins Cockatoo Foraging Habitat

0 10 20 30 40 m

N

SCALE	1:1,500
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Baudins Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2
- 10

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403350 403425 403500 403575 403650

6434250 6434175 6434100 6434025 6433950 6433875 6433800



403350 403425 403500 403575 403650

Figure 9 a: Carnaby's Black Cockatoo Foraging Habitat

0 10 20 30 40 m

N

SCALE	1:1,500
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Pipeline

Carnaby's Black Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403275 403350 403425 403500 403575 403650

6433725 6433650 6433575 6433500 6433425 6433350 6433275

Figure 9 b: Carnaby's Black Cockatoo Foraging Habitat

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Pipeline

Carnaby's Black Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2
- 10

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

NOTES:

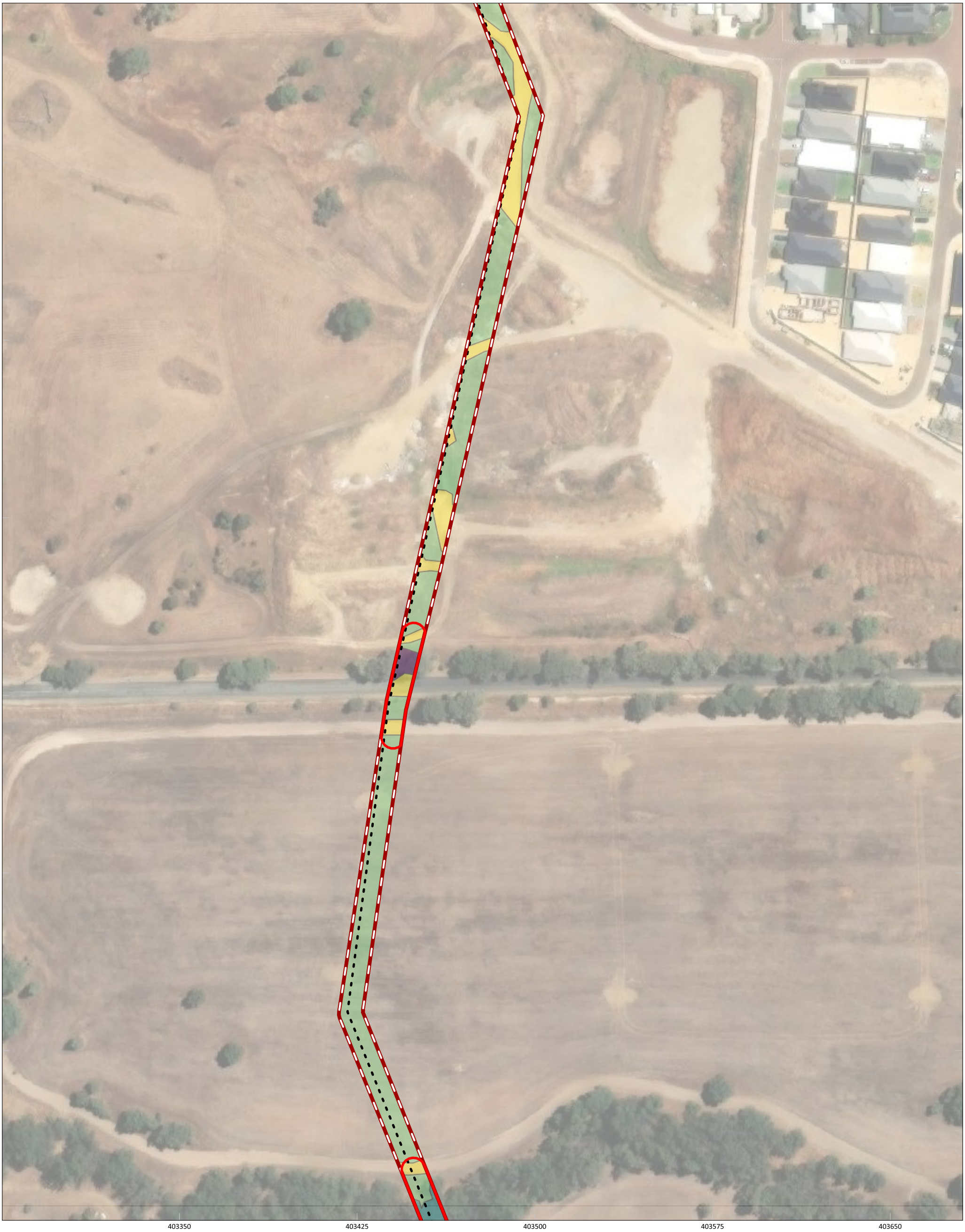
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403350 403425 403500 403575 403650

6433200 6433125 6433050 6432975 6432900 6432825



403350 403425 403500 403575 403650

Figure 9 c: Carnaby's Black Cockatoo Foraging Habitat

N 0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA		
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Carnaby's Black Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2
- 10

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403350 403425 403500 403575 403650

6432750 6432675 6432600 6432525 6432450 6432375 6432300

Figure 9 d: Carnaby's Black Cockatoo Foraging Habitat

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Carnaby's Black Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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Figure 9 e: Carnaby's Black Cockatoo Foraging Habitat

N

0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	
		CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Pipeline

Carnaby's Black Cockatoo Foraging Habitat Quality Score

- 1
- 2

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403200 403275 403350 403425 403500 403575

6431700 6431625 6431550 6431475 6431400 6431325



403200 403275 403350 403425 403500 403575

Figure 9 f: Carnaby's Black Cockatoo Foraging Habitat

N 0 10 20 30 40 m

SCALE	1:1,500
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Carnaby's Black Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

NOTES:

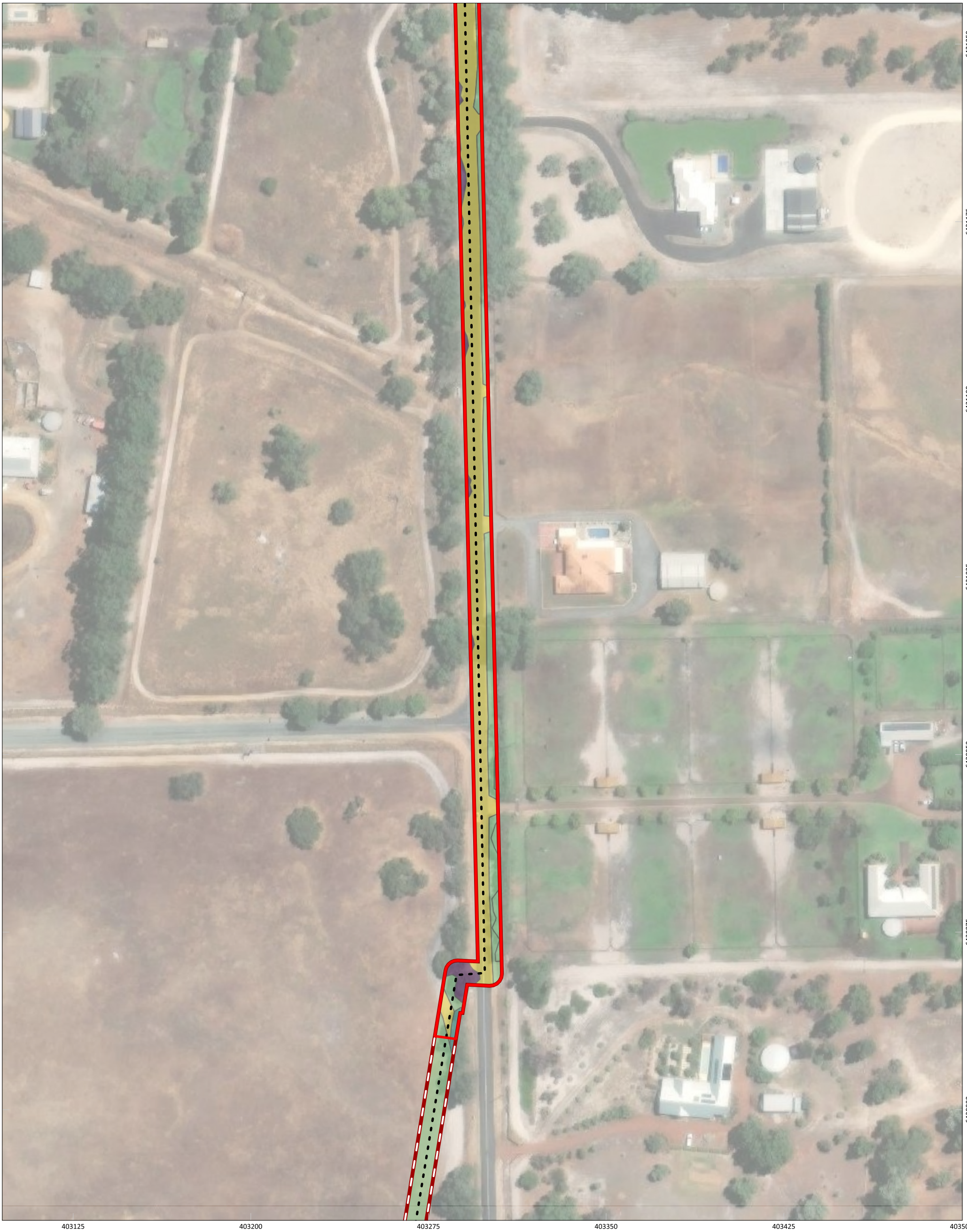
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403125 403200 403275 403350 403425 403500

6431250 6431175 6431100 6431025 6430950 6430875 6430800



403125 403200 403275 403350 403425 403500

Figure 9 g: Carnaby's Black Cockatoo Foraging Habitat

N 0 10 20 30 40 m

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Carnaby's Black Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2
- 10

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403050 403125 403200 403275 403350

6430725 6430650 6430575 6430500 6430425 6430350 6430275



403050 403125 403200 403275 403350

Figure 9 h: Carnaby's Black Cockatoo Foraging Habitat

0 10 20 30 40 m

N

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032 / VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore / DATE: 5/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

CLIENT: Cossil and Webley

Legend

- Project Area
- Proposed Pipeline

Carnaby's Black Cockatoo Foraging Habitat Quality Score

- 1

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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Figure 9 i: Carnaby's Black Cockatoo Foraging Habitat

0 10 20 30 40 m
N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Pipeline

Carnaby's Black Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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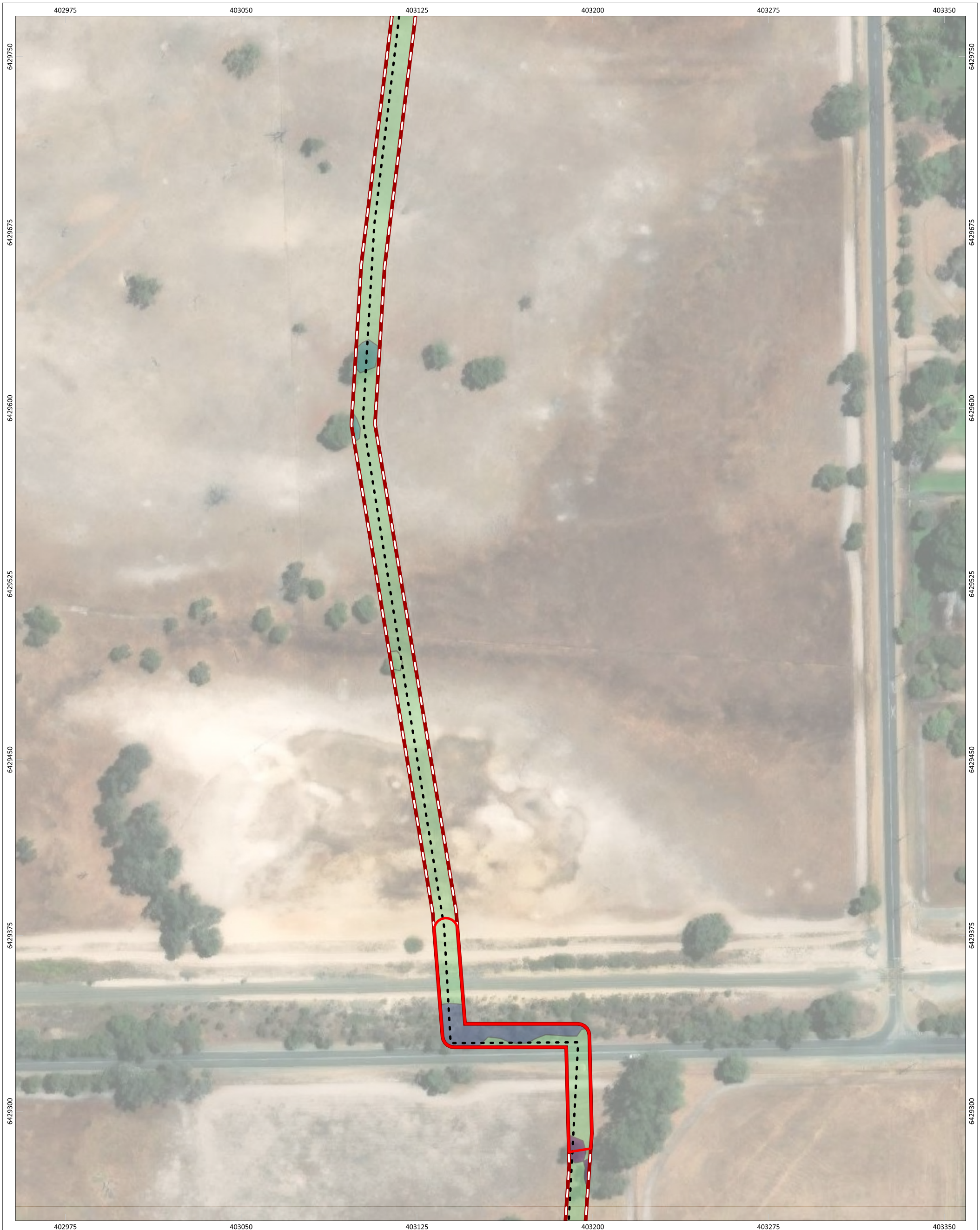


Figure 9 j: Carnaby's Black Cockatoo Foraging Habitat

0 10 20 30 40 m

N

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA		
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Carnaby's Black Cockatoo Foraging Habitat Quality Score

- 1
- 2
- 9
- 10

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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Figure 9 l: Carnaby's Black Cockatoo Foraging Habitat

0 10 20 30 40 m

N

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR
CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032 / VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore / DATE: 5/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

Legend

- Project Area
- Proposed Pipeline

Carnaby's Black Cockatoo Foraging Habitat Quality Score

- 1

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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Figure 9 m: Carnaby's Black Cockatoo Foraging Habitat

0 10 20 30 40 m
N

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA		
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Carnaby's Black Cockatoo Foraging Habitat Quality Score

- 1
- 2

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403050 403125 403200 403275 403350 403425

6428400 6428325 6428250 6428175 6428100 6428025 6427950



Figure 9 n: Carnaby's Black Cockatoo Foraging Habitat

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Carnaby's Black Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2
- 10

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403350 403425 403500 403575 403650

6434250 6434175 6434100 6434025 6433950 6433875 6433800



403350 403425 403500 403575 403650

Figure 10 a: Forest Red-Tailed Black Cockatoo Foraging Habitat

N 0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

Legend

- Project Area
- Proposed Pipeline

Forest Red-Tailed Black Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403275 403350 403425 403500 403575 403650

6433725 6433650 6433575 6433500 6433425 6433350 6433275



403275 403350 403425 403500 403575 403650

Figure 10 b: Forest Red-Tailed Black Cockatoo Foraging Habitat

N

0 10 20 30 40 m

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Pipeline

Forest Red-Tailed Black Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2
- 10

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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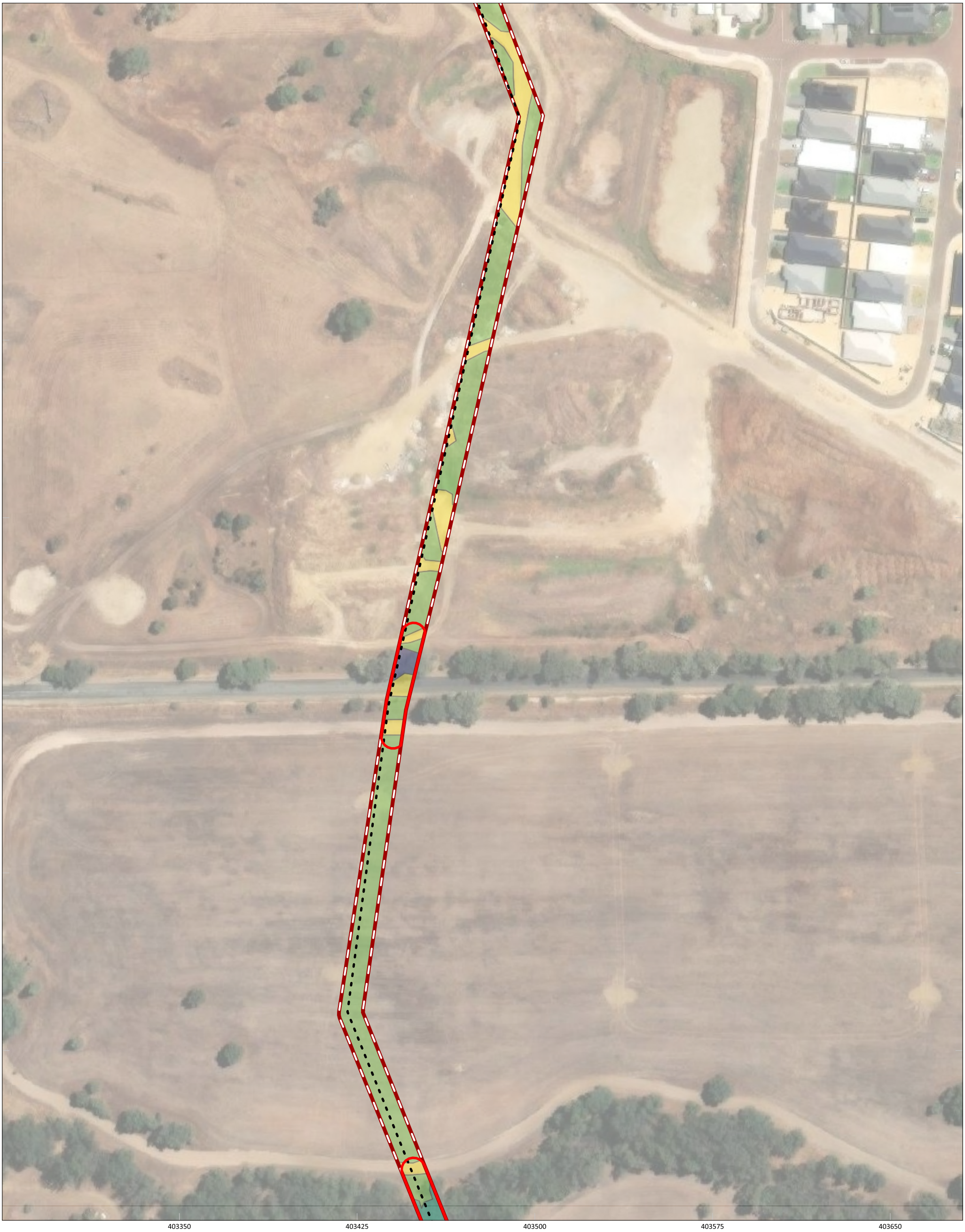
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403350 403425 403500 403575 403650

6433200 6433125 6433050 6432975 6432900 6432825



403350 403425 403500 403575 403650

Figure 10 c: Forest Red-Tailed Black Cockatoo Foraging Habitat

N 0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA		
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Forest Red-Tailed Black Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2
- 10

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403350 403425 403500 403575 403650

6432750 6432675 6432600 6432525 6432450 6432375 6432300

Figure 10 d: Forest Red-Tailed Black Cockatoo Foraging Habitat

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Forest Red-Tailed Black Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403275 403350 403425 403500 403575

6432225 6432150 6432075 6432000 6431925 6431850 6431775



403275 403350 403425 403500 403575

Figure 10 e: Forest Red-Tailed Black Cockatoo Foraging Habitat

N

0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	
		CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Pipeline

Forest Red-Tailed Black Cockatoo Foraging Habitat Quality Score

- 1
- 2

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403200 403275 403350 403425 403500 403575

6431700 6431625 6431550 6431475 6431400 6431325

Figure 10 f: Forest Red-Tailed Black Cockatoo Foraging Habitat

0 10 20 30 40 m

N

SCALE	1:1,500
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Forest Red-Tailed Black Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2
- 8

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

NOTES:

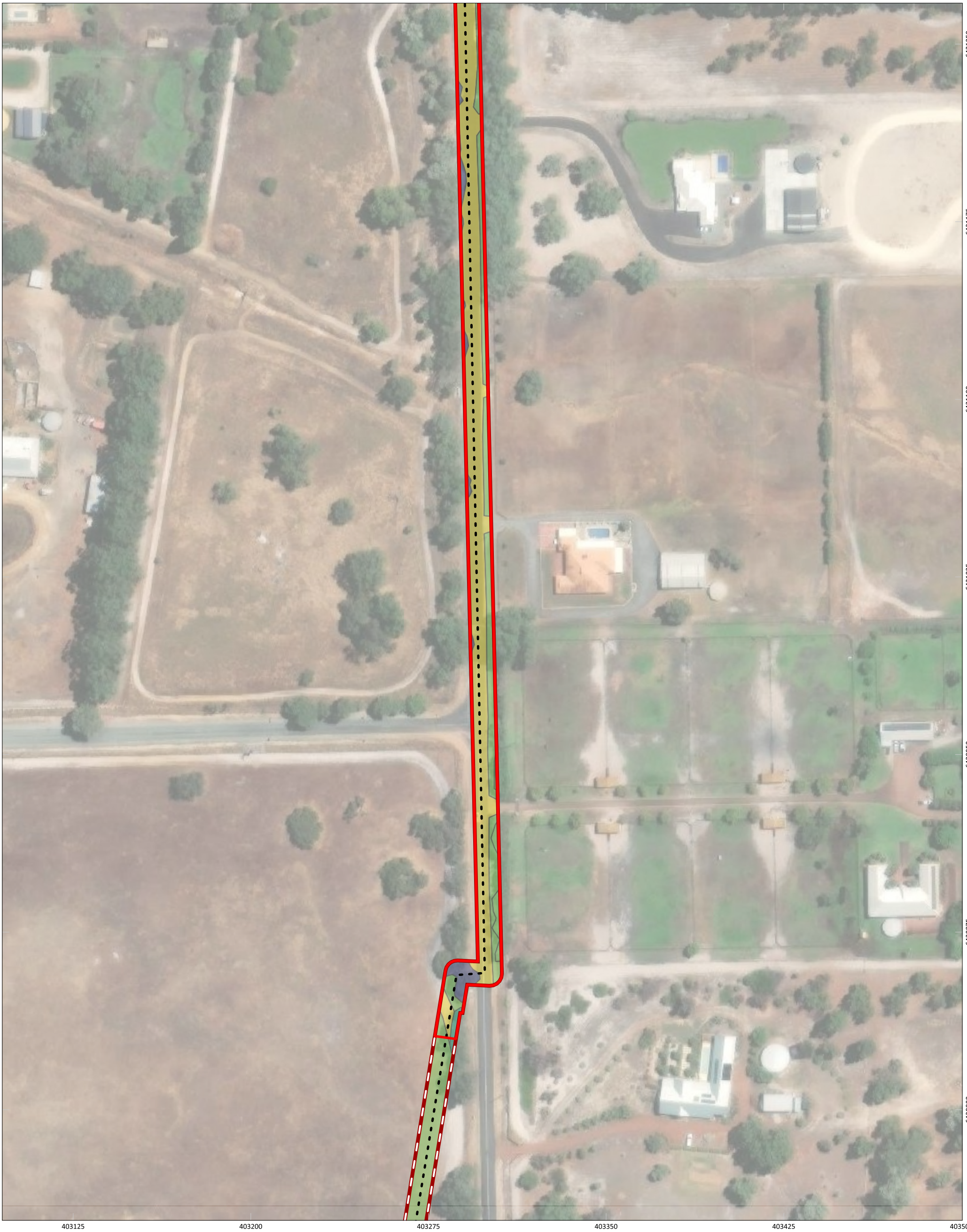
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403125 403200 403275 403350 403425 403500

6431250 6431175 6431100 6431025 6430950 6430875 6430800



403125 403200 403275 403350 403425 403500

Figure 10 g: Forest Red-Tailed Black Cockatoo Foraging Habitat

N 0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA		
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Forest Red-Tailed Black Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2
- 10

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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403050 403125 403200 403275 403350

6430725 6430650 6430575 6430500 6430425 6430350 6430275



403050 403125 403200 403275 403350

Figure 10 h: Forest Red-Tailed Black Cockatoo Foraging Habitat

N 0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	
		CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Pipeline

Forest Red-Tailed Black Cockatoo Foraging Habitat Quality Score

- 1

No	Description	Drawn	Approved	Date
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Figure 10 i: Forest Red-Tailed Black Cockatoo Foraging Habitat

N

0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA			
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Pipeline

Forest Red-Tailed Black Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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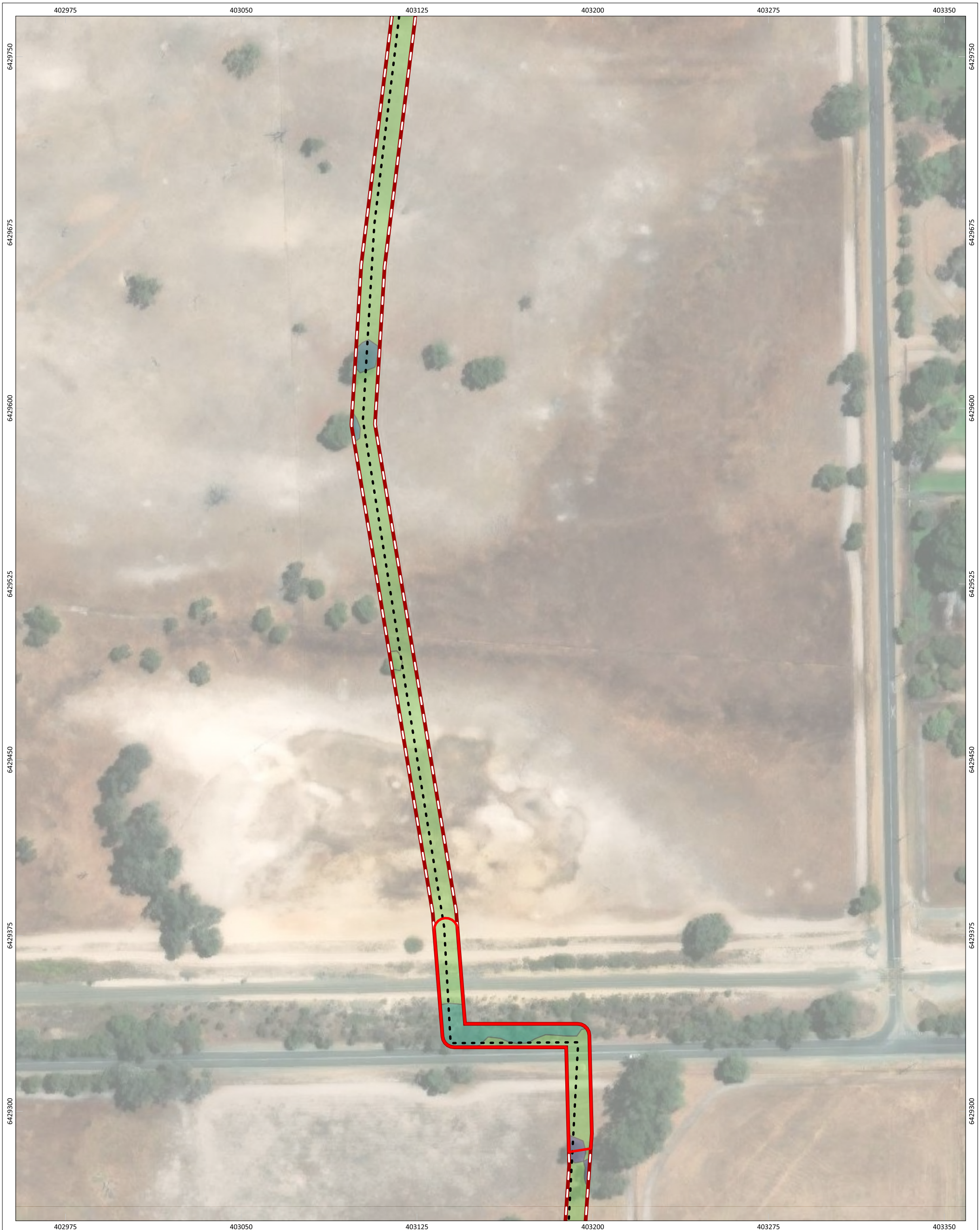


Figure 10 j: Forest Red-Tailed Black Cockatoo Foraging Habitat

N

0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA			
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Forest Red-Tailed Black Cockatoo Foraging Habitat Quality Score

- 1
- 2
- 8
- 10

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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402900 402975 403050 403125 403200 403275

6429225 6429150 6429075 6429000 6428925 6428850 6428775



402900 402975 403050 403125 403200 403275

Figure 10 l: Forest Red-Tailed Black Cockatoo Foraging Habitat

N

0 10 20 30 40 m

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

Project Area

Proposed Pipeline

Forest Red-Tailed Black Cockatoo Foraging Habitat Quality Score

1

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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Figure 10 m: Forest Red-Tailed Black Cockatoo Foraging Habitat

0 10 20 30 40 m
N

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR		
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 5/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report
Byford WA

CLIENT: Cossil and Webley

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Forest Red-Tailed Black Cockatoo Foraging Habitat Quality Score

- 1
- 2

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	5/12/2025

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Figure 10n: Forest Red-Tailed Black Cockatoo Foraging Habitat

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	5/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Forest Red-Tailed Black Cockatoo Foraging Habitat Quality Score

- 0
- 1
- 2
- 10

No	Description	Drawn	Approved	Date
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Breeding

All three black cockatoo species breed in deep hollows with a large entry diameter, within eucalypt species of a suitable size and species to form such hollows. Eucalypt trees with the capacity to develop suitable hollows are generally have a DBH of at least 50 cm.

The following methodology was adopted by WEPL for the Project Area.

All trees of species with the potential to form hollows (typically Jarrah, Marri and Tuart), and with a sufficient diameter (DBH > 500 mm) were assessed for their potential to provide suitable breeding habitat. The following criteria were used:

- Species.
- Diameter at breast height (DBH) (at approximately 1.3 m) ≥ 500 mm (≥ 300 mm for Wandoo and Salmon Gum) regardless of the presence or absence of hollows.
- All hollows observed within trees were recorded and categorised as follows:
    - Hollows = Total number of hollows observed within the tree, or 'no' if none were observed.
    - Hollows > 12 cm diameter = Number of hollows within the tree that are observed to contain an opening diameter > 12 cm, which has the potential of being used by black cockatoo species (DAWE, 2022). This also included recording any evidence of chewing around the hollow opening.
- Bamford Class.

In addition to Commonwealth guidelines for assessing breeding habitat trees, a scoring system based on that developed by Dr Mike Bamford (referred to as Bamford Class) was applied to class breeding habitat trees. WEPL categorised these trees according to the presence and suitability of hollows (if any) in accordance with Table 14.

Table 14: Black Cockatoo Potential Nesting Class Tree

Bamford Class	Description of Tree and Hollows/Activity	Alignment with DAWE (2022) Breeding Habitat Definitions
1	Active nest observed; adult (or immature) bird seen entering or emerging from hollow, eggs present.	Known Nesting Tree
2	Hollow of suitable size and angle visible with chew marks around entrance.	Known Nesting Tree
3	Potentially suitable hollow visible but no chew marks present; or potentially suitable hollow present (as suggested by structure of tree, such as large, vertical trunk broken off at a height of > 10m).	Suitable Nesting Tree (If confirmed hollow with suitable dimensions present in phase 2); Potential Nesting Tree (if confirmed hollow with suitable dimensions not

Bamford Class	Description of Tree and Hollows/Activity	Alignment with DAWE (2022) Breeding Habitat Definitions
		present or highly unlikely to be present in phase 2)
4	Tree with hollows or broken branches that might contain hollows, but hollows or potential hollows are not of a suitable size, or are aligned or obstructed so as to prevent access.	Potential Nesting Tree
5	Tree lacking large hollows or broken branches that might have large hollows; a tree with more or less intact branches and a spreading crown.	Potential Nesting Tree

A total of 249 potential nesting trees with a DBH ≥ 50 cm that are of a suitable size and species to develop hollows suitable for black cockatoo nesting were recorded within the Survey Area of the biological surveys undertaken by WEPL (WEPL, 2025). Refer to Figure 11 for tree locations and Appendix A for a summary of tree locations, species, DBH and tree health. No evidence of current or previous nesting behaviour, such as chew marks at hollow entrance attributed to black cockatoos, or individuals flying out of hollows were recorded.

The large majority of potential nesting trees (235 trees, 94 %) did not show signs of potential nesting hollow development (Class 5 trees). Twelve trees were assessed as possessing small hollows which are of an insufficient size to support nesting (<10 cm entrance); or which have an entrance of >10 cm but the internal dimensions are not suitable, or the hollow is not accessible (Class 4 trees). These Class 4 trees are however of sufficient age and growth form to be developing hollows. Two trees (Tree number 36 and 230) were confirmed to have hollows with suitable dimensions for use by black cockatoos (Class 3), however the trees were in poor condition.

Of the 249 potential nesting trees within the Survey Area a total of 69 potential nesting trees are located within the Project Area. A breakdown of all of tree species and class for all potential nesting trees within the Project Area, is provided in Table 15.

Table 15: Summary of Black Cockatoo Potential Nesting Trees Recorded within and Intersecting the Project Area

Bamford Class and DAWE (2022) Terminology	Class 1	Class 2	Class 3	Class 4	Class 5	Totals (Trees)
	Known Nesting Tree		Suitable Nesting Tree	Potential Nesting Tree	Potential nesting tree	
Tree Species						
Jarrah	-	-		1	1	2
Marri	-	-			18	18
Flooded Gum	-	-	-	2	23	25
Eucalyptus	-	-	-		24	24

Bamford Class and DAWE (2022) Terminology	Class 1	Class 2	Class 3	Class 4	Class 5	Totals (Trees)
	Known Nesting Tree		Suitable Nesting Tree	Potential Nesting Tree	Potential nesting tree	
Dead	-	-	-	-	-	-
Total (Bamford Class)	**0**	**0**		**3**	**66**	**69**

Through implementing trenchless drilling and under boring techniques this number has been reduced to 41 potential nesting trees that will be required to be cleared that is the suitable foraging habitat recorded in the Project Area, consisting of one Class 4 and 40 Class 5 trees with no suitable hollows present.

Roosting

No evidence of roosting within the Survey Area was recorded (WEPL, 2025).

Night roosting locations are typically in proximity to foraging habitat (black cockatoos mainly foraging within 20 km of night roosts) and with access to water points <2 km from roosting location (DAWE, 2022). Any groups of tall trees, particularly large native eucalypts in proximity to water sources may provide night roosting habitat (DAWE, 2022). Within the Project Area, fauna habitat types FHT-01 and FHT-03 provides the most suitable roosting habitat as they contain medium and large stands of eucalypts with medium canopies (WEPL, 2025). Access to permanent water is within the Project Area from farm dams and drainage lines (WEPL, 2025).

403350 403425 403500 403575 403650

6434250 6434175 6434100 6434025 6433950 6433875 6433800



403350 403425 403500 403575 403650

Figure 11 a: Potential Black Cockatoo Breeding Habitat

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

Project Area

Proposed Pipeline

Black Cockatoo Breeding Trees (Bamford Tree Classification)

5

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403275 403350 403425 403500 403575 403650

6433725 6433650 6433575 6433500 6433425 6433350 6433275

Figure 11 b: Potential Black Cockatoo Breeding Habitat

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Pipeline

Black Cockatoo Breeding Trees (Bamford Tree Classification)

- 3
- 4
- 5

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403350 403425 403500 403575 403650

6433200 6433125 6433050 6432975 6432900 6432825

0 10 20 30 40 m

N

Figure 11 c: Potential Black Cockatoo Breeding Habitat

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Black Cockatoo Breeding Trees (Bamford Tree Classification)

- 5

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403350 403425 403500 403575 403650

6432750 6432675 6432600 6432525 6432450 6432375 6432300

Figure 11 d: Potential Black Cockatoo Breeding Habitat

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Black Cockatoo Breeding Trees (Bamford Tree Classification)

- 4
- 5

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403275 403350 403425 403500 403575

6432225 6432150 6432075 6432000 6431925 6431850 6431775



403275 403350 403425 403500 403575

Figure 11 e: Potential Black Cockatoo Breeding Habitat

0 10 20 30 40 m

N

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA			
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

Legend

- Project Area
- Proposed Pipeline

Black Cockatoo Breeding Trees (Bamford Tree Classification)

- 5

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403200 403275 403350 403425 403500 403575

6431700 6431625 6431550 6431475 6431400 6431325

Figure 11 f: Potential Black Cockatoo Breeding Habitat

0 10 20 30 40 m

N

SCALE	1:1,500
SHEET SIZE	A3 COLOUR
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
DATA SOURCE	ESRI Imagery

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

CLIENT: Cossil and Webley

PROJECT NUMBER: A24.032

VERSION: 3

DRAWN BY / REVIEWED BY: West GIS, Stephen Moore

DATE: 4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Black Cockatoo Breeding Trees (Bamford Tree Classification)

- 4
- 5

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403125 403200 403275 403350 403425 403500

6431250 6431175 6431100 6431025 6430950 6430875 6430800

Figure 11 g: Potential Black Cockatoo Breeding Habitat

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Black Cockatoo Breeding Trees (Bamford Tree Classification)

- 5

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403050 403125 403200 403275 403350

6430725 6430650 6430575 6430500 6430425 6430350 6430275



403050 403125 403200 403275 403350

Figure 11 h: Potential Black Cockatoo Breeding Habitat

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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402975 403050 403125 403200 403275 403350

6430200 6430125 6430050 6429975 6429900 6429825



402975 403050 403125 403200 403275 403350

Figure 11 i: Potential Black Cockatoo Breeding Habitat

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Pipeline

Black Cockatoo Breeding Trees (Bamford Tree Classification)

- 4
- 5

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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402975 403050 403125 403200 403275 403350

6429750 6429675 6429600 6429525 6429450 6429375 6429300

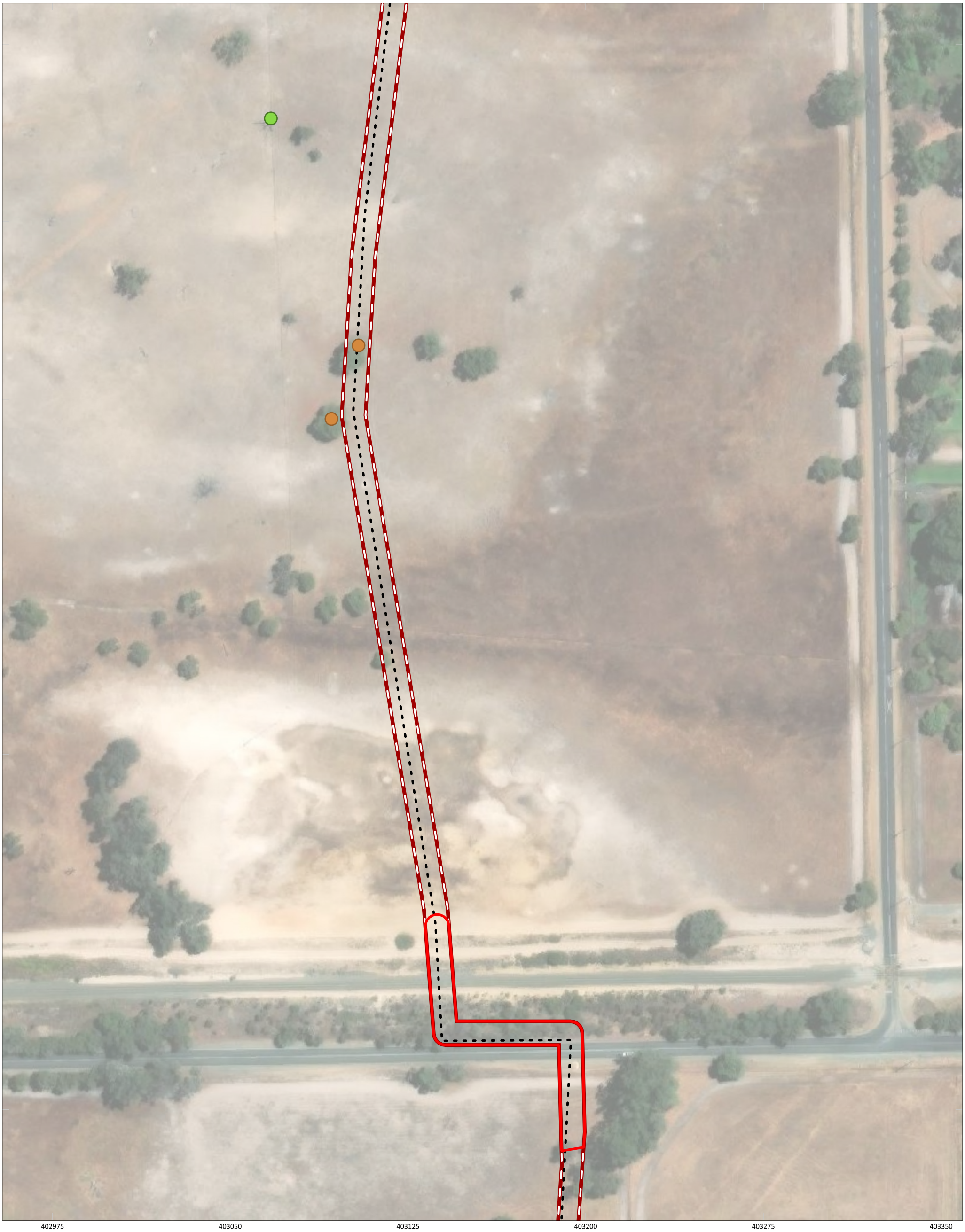


Figure 11 j: Potential Black Cockatoo Breeding Habitat

0 10 20 30 40 m

N

SCALE	1:1,500
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Black Cockatoo Breeding Trees (Bamford Tree Classification)

- 3
- 5

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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Figure 11 l: Potential Black Cockatoo Breeding Habitat

0 10 20 30 40 m N		PROJECT/REPORT NAME Scott Road Waste Water Pumping Station: EIA Report Byford WA	
SCALE 1:1,500	SHEET SIZE A3 COLOUR	CLIENT Cossil and Webley	
COORDINATE REFERENCE SYSTEM GDA2020 / MGA Zone 50		PROJECT NUMBER A24.032	VERSION 3
DATA SOURCE ESRI Imagery		DRAWN BY / REVIEWED BY West GIS Stephen Moore	DATE 4/12/2025

Legend

- Project Area
- Proposed Pipeline

Black Cockatoo Breeding Trees (Bamford Tree Classification)

- 4
- 5

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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Figure 11 m: Potential Black Cockatoo Breeding Habitat

0 10 20 30 40 m
N

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA		
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Black Cockatoo Breeding Trees (Bamford Tree Classification)

- 5

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403050 403125 403200 403275 403350 403425

6428400 6428325 6428250 6428175 6428100 6428025 6427950



403050 403125 403200 403275 403350 403425

Figure 11 n: Potential Black Cockatoo Breeding Habitat

N 0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Black Cockatoo Breeding Trees (Bamford Tree Classification)

- 4
- 5

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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Black Cockatoo Regional Context

Breeding

There is one confirmed Carnaby's black cockatoo breeding area within 12 km of the Project Area (DBCA-054) located approximately 5.7 km north east of the northern extent of the Project Area. The Project Area is located within an unconfirmed breeding site (DBCA-055).

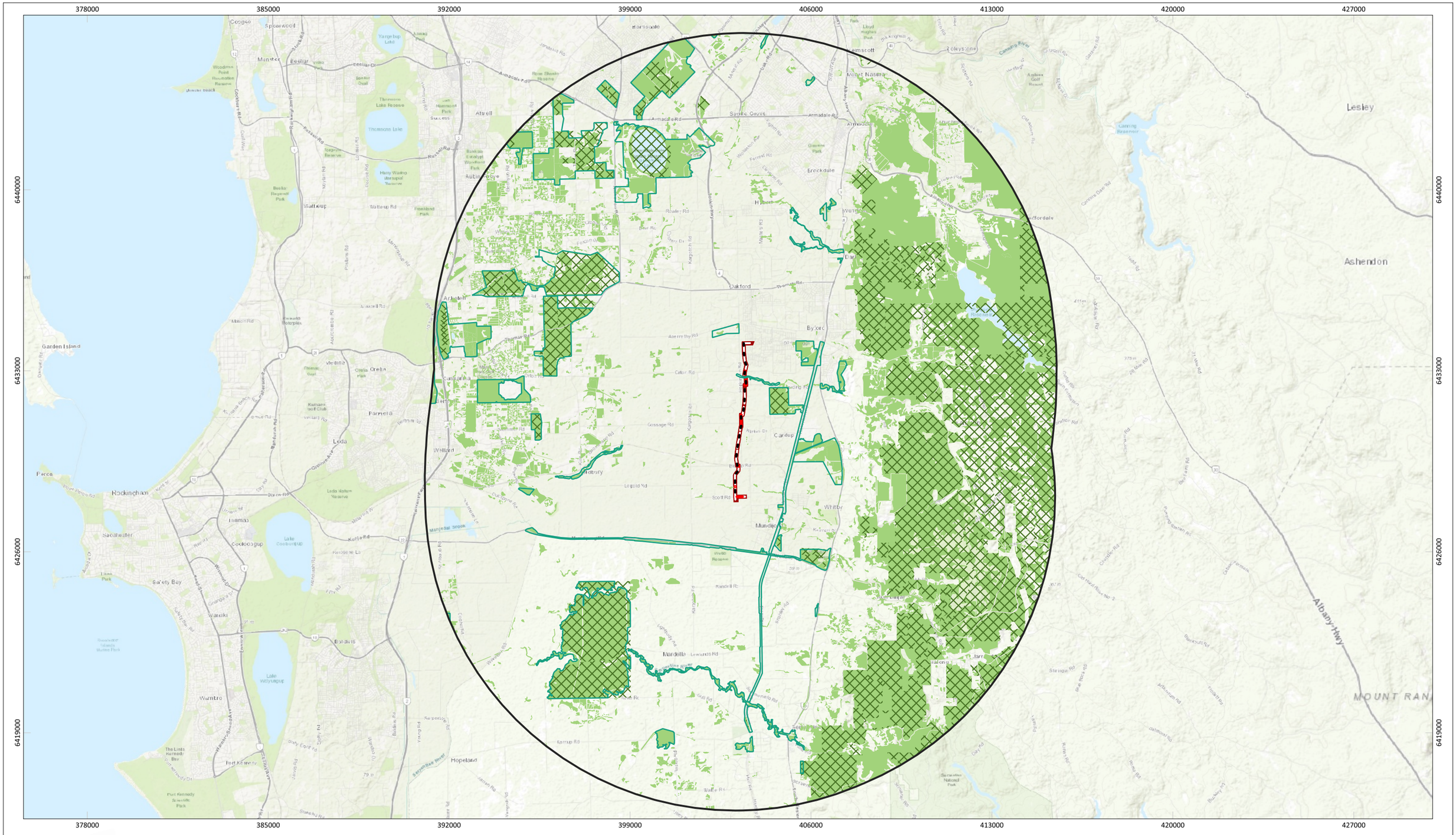
Foraging

An assessment of potentially suitable foraging habitat with the local area (12 km radius) was undertaken using publicly available datasets that show the current extent of native vegetation (DPIRD-005), and vegetation complexes (DBCA-046, DBCA-047). It is expected that the majority of remnant native vegetation within the local area would contain suitable foraging species at the same or greater rate than that present within the Project Area.

The regional context of Black Cockatoo foraging was assessed and calculated in the biological report (WEPL, 2025), and identified approximately 18,072.47 ha of remnant native vegetation mapped within 12 km of the Project Area. It is expected that the majority of this vegetation would contain suitable foraging species at the same or greater rate than that present within the Project Area as much of this regional remnant native vegetation is located to the east, within the jarrah forest (WEPL, 2025). The habitat quality within the Project Area is considered likely to be of lesser quality than much of the regional foraging habitat, which includes high quality marri-jarrah woodlands of the Jarrah Forest bioregion. Through applying the higher amount of 0.17 ha of suitable foraging habitat for BBC and CBC, this represents 0.001 % of the estimated regional habitat extent.

Roosting

Six mapped black cockatoo roosting sites are present within 12 km of the Project Area (DBCA-064). All are confirmed CBC roost sites, the nearest roost site is 1 km from the Project Area, see Figure 13. Isolated stands of tall trees are present throughout the Project Area, which may provide suitable roosting habitat. Access to permanent water from farm dams and wetlands is available within 2 km of the Project Area.


378000
385000
392000
399000
406000
413000
420000
427000
6440000
6433000
6426000
6419000
Cooloongup
Spearwood
Munster
Beeliar
Yangebup Lake
Thomsons Lake Reserve
Thomsons Lake
Success
Atwell
Harrisdale
Armadale
Roleystone
Mount Nasura
Armadale Rd
Brookdale
Wungong
Lesley
Ashendon
Canning Reservoir
Canning River
Watteup
Watteup Rd
Beeliar Regional Park
Banksia Eucalypt Woodland Park
Henry Waring Bushpool Reserve
Autumn Glory
Ardross
Oakford
Byford
Cardup
Gossage Rd
Cider Rd
Aberethy Rd
Thomas Rd
Welshpool Rd
Kardan Blvd
Hopkins Rd
Nicholls Rd
Kingsbury Dr
Forrest Rd
Wallsend Ave
Rowley Rd
Dixon Rd
Foxton Dr
Kingsbury Dr
Ardross Tennis Club
Ardross Motorplex
Mason Rd
Garden Island
Melville
Orelia
Orelia Park
Parmelia
Leda
Kwinana Golf Club
Thomas Road
Patterson Rd
Nairnbarup Rd
Peron
Rockingham
Dixon Rd
Leda Nature Reserve
Waikiki
Safety Bay
Baldivis
Warnbro
Port Kennedy
Lake Walyungup
Lake Coolongup
Kwinana Freeway
Kwinana Freeway
Welland
Hilbury
Leipold Rd
Scott Rd
Whitby
Mundijong
Manjedal Brook
Kerosene La
Kwinana Freeway
Kwinana Freeway
Mardella
Lewinds Rd
Kerosene La
Kwinana Freeway
Kwinana Freeway
Hopeland
Kargotich Rd
Kwinana Freeway
Kwinana Freeway
Albany Hwy
Albany Hwy
MOUNT RAN
Jarrahdale
Serpentine National Park
Serpentine Jarrahdale
Kwinana Freeway
Kwinana Freeway
Kwinana Freeway

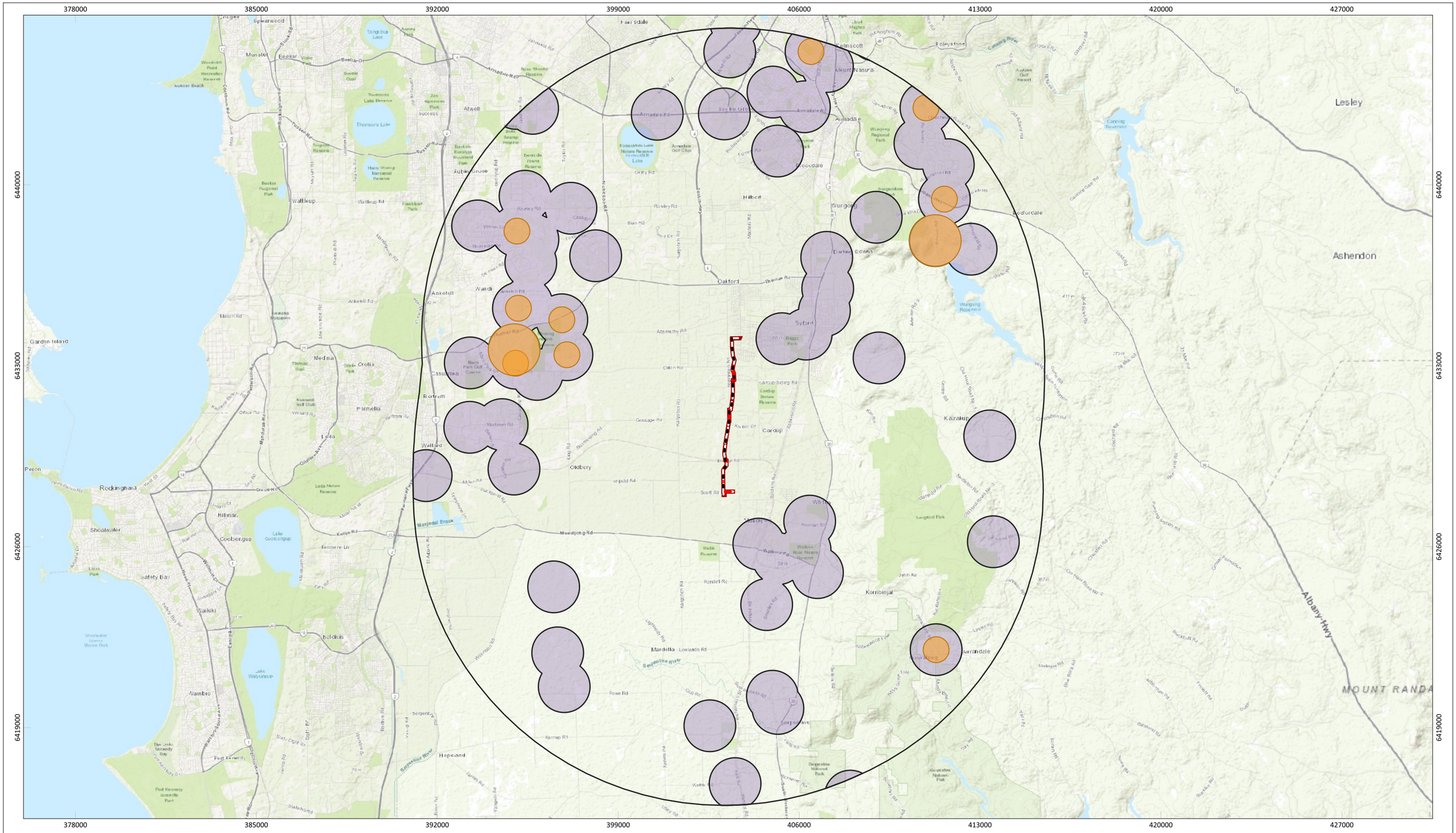


Figure 13 : Known Black Cockatoo Roosting and Breeding within 12km of the Site

N

0 1 2 3 4 5 km

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:140,000
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.230
VERSION	3
DATA SOURCE	ESRI Topographic Map
DRAWN BY / REVIEWED BY	West GIS / Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline
- Black Cockatoo Breeding Sites (DBCA-063) - None Visible
- Black Cockatoo Roosting Sites - Buffered (DBCA-064)
- Carnabys Cockatoo Confirmed Roost Sites (DBCA-050)

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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Other Fauna of Conservation Significance

WEPL undertook basic a basic fauna survey across the Survey Area. No previous DBCA fauna records have been reported within the Project Area. Other fauna species of conservation significance which were recorded or assessed as having a high or medium LoO within the Project Area are acknowledge below; further detail provided in the Flora and Vegetation and Fauna Survey Report (Appendix A; WEPL, 2025).

Carter's freshwater mussels (*Westralunio carteri*) - VU

This species has been recorded approximately 4 km northwest of the Project Area in an ephemeral drain of the Serpentine River in Oakford. All of the drainage lines within the Project Area serve as tributaries to the Serpentine River, as such FHT06 is considered core habitat for this species. FHT06 is associated with Manjedal Brook and Cardup Brook that are perennial rivers that are groundwater-fed stream with baseflow that makes it more "perennial" than strictly seasonal or ephemeral and is a tributary to the Serpentine River (GHD, 2010 and DWER, 2019). During the biological survey the Manjedal Brook and Cardup Brook were in active flow, however drainage lines may dry up during summer months.

The only other aquatic habitat within the Project Area was the small reed bed in the north (FHT08) but this habitat is considered too choked with vegetation to provide supporting habitat for Carter's fresh water mussel (WEPL, 2025). There is 0.05 ha of core habitat for the species within the Project Area.

Peregrine falcon (*Falco peregrinus*) - OS

There is no breeding habitat present within the Project Area for the Peregrine falcon. The species is likely to be only infrequently present or recorded as a flyover. None of the habitat within the Project Area would be considered core or supporting habitat for peregrine falcon, however tall trees in FHT01, FHT03, and FHT09 may provide occasional perching opportunities for the species (WEPL, 2025).

Quenda (*Isoodon fusciventer*) - P4

An individual deceased quenda was recorded along the border of the Project Area within an open paddock in FHT02. Quendas are commonly recorded in bushland <5 km from the Project Area. There is no core habitat for quenda within the Project Area. Fauna habitat type FHT05, FHT06 and FHT07 is considered to provide supporting habitat to this species due to presence of native understory that provides cover and foraging opportunities (WEPL, 2025). There is 0.104 ha of supporting habitat for the quenda within the Project Area.

Brush-tailed phascogale (*Phascogale tapoatafa*) - CD

The nearest records to the Project Area are 6 km southwest in the Lowlands Nature Reserve that borders the Serpentine river. Within the Project Area, FHT06 is considered suitable core habitats for the species as these habitats offer connective tree canopy over drainage lines and contains small tree hollows to support nesting (WEPL, 2025). There is 0.05 ha of core habitat for brush-tailed phascogale within the Project Area.

Rakali (*Hydromys chrysogaster*) – P4

There are 32 records of rakali within 20 km of the Project Area within the last 20 years, the majority of these records are along the Serpentine river which is a permanent water system that is located 6 km south of the Project Area, and the drainage lines within the Project Area have hydrological linkages to the Serpentine

River. FHT06 is considered supporting habitat for this species within the Project Area (WEPL, 2025). There is 0.05 ha of supporting habitat for rakali within the Project Area.

Graceful sun-moth (*Synemon gratiosa*) - P4

FHT05 provide supporting habitat for this species, graceful sun-moth require the host plant *Lomandra hermaphrodita* to complete their life cycle, *L. hermaphrodita* was recorded within the small patch of Banksia woodland in the south of the Project Area (FHT05) (WEPL, 2025). There is 0.05 ha of supporting habitat for the graceful sun-moth within the Project Area.

Black-striped snake (*Simoselaps calonotus*) - P3

This species is likely infrequently recorded due to its nocturnal and subterranean habit. The Banksia woodland of FHT05 is considered supporting habitat for this species, all other habitats within the Survey area are considered non-significant for this species (WEPL, 2025).

Perth slider (*Lerista lineata*) - P3

This species is likely infrequently recorded due to its nocturnal and subterranean habit. The Banksia woodland of FHT05 is considered supporting habitat for this species, all other habitats within the Survey area are considered non-significant for this species (WEPL, 2025).

7. Conservation Areas

The DPLH dataset SPP 2.8 Bushland Policy for the Perth Metropolitan Region (SPP 2.8 policy) (DPLH-054) identifies Bush Forever Site 351 - Cardup Brook Bushland, Cardup / Peel Estate as intersecting the Project Area in the north central section of the Project Area (Figure 14). Bush Forever Site 351 is associated to the Cardup Brook that is a REW (UID: 14,540) and is a representation of ecological communities, rarity, general criteria for the protection of wetland, streamline and estuarine fringing vegetation and coastal vegetation.

403350 403425 403500 403575 403650

6434250 6434175 6434100 6434025 6433950 6433875 6433800



403350 403425 403500 403575 403650

Figure 14a: Conservation Areas

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Pipeline
- Environmentally Sensitive Areas (DWER-046)

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403275 403350 403425 403500 403575 403650

6433725 6433650 6433575 6433500 6433425 6433350 6433275



403275 403350 403425 403500 403575 403650

Figure 14b: Conservation Areas

N 0 10 20 30 40 m	PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA		
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 3	
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025	

Legend

- Project Area
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403350 403425 403500 403575 403650

6433200 6433125 6433050 6432975 6432900 6432825



403350 403425 403500 403575 403650

Figure 14c: Conservation Areas

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline
- Bush Forever Area 351 Cardup Brook Bushland (DPLH-054)
- Bush Forever Areas 2000 (DPLH-019)
- Environmentally Sensitive Areas (DWER-046)

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403350 403425 403500 403575 403650

6432750 6432675 6432600 6432525 6432450 6432375 6432300

Figure 14d: Conservation Areas

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline
- Bush Forever Area 351 Cardup Brook Bushland (DPLH-054)
- Bush Forever Areas 2000 (DPLH-019)
- Environmentally Sensitive Areas (DWER-046)

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403275 403350 403425 403500 403575

6432225 6432150 6432075 6432000 6431925 6431850 6431775



403275 403350 403425 403500 403575

Figure 14e: Conservation Areas

N

0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA			
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

Legend

- Project Area
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403200 403275 403350 403425 403500 403575

6431700 6431625 6431550 6431475 6431400 6431325

Figure 14f: Conservation Areas

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

NOTES:

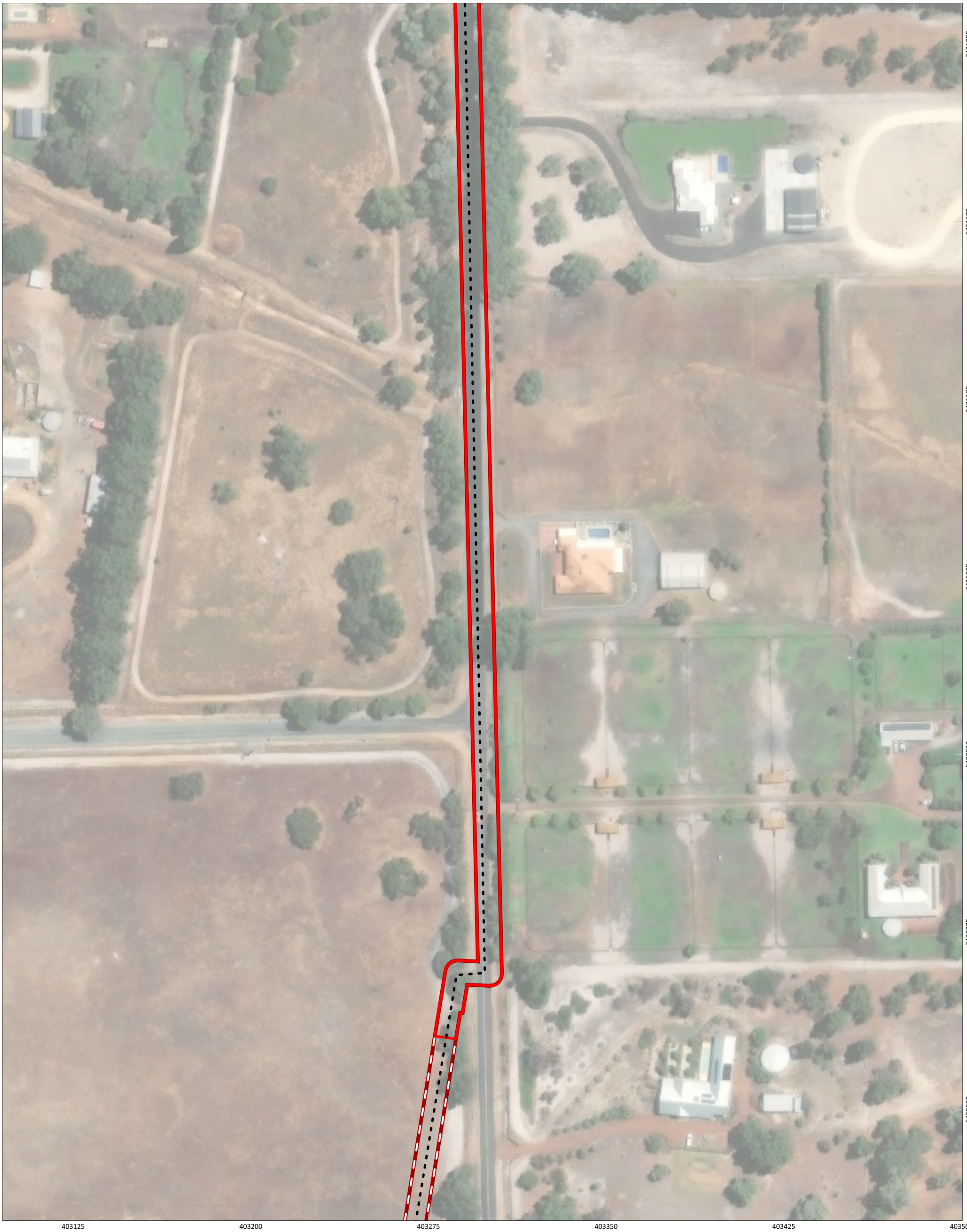
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403125 403200 403275 403350 403425 403500

6431250 6431175 6431100 6431025 6430950 6430875 6430800



403125 403200 403275 403350 403425 403500

Figure 14g: Conservation Areas

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403050 403125 403200 403275 403350

6430725 6430650 6430575 6430500 6430425 6430350 6430275



403050 403125 403200 403275 403350

Figure 14h: Conservation Areas

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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402975 403050 403125 403200 403275 403350

6430200 6430125 6430050 6429975 6429900 6429825



402975 403050 403125 403200 403275 403350

Figure 14i: Conservation Areas

N 0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA			
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

Legend

- Project Area
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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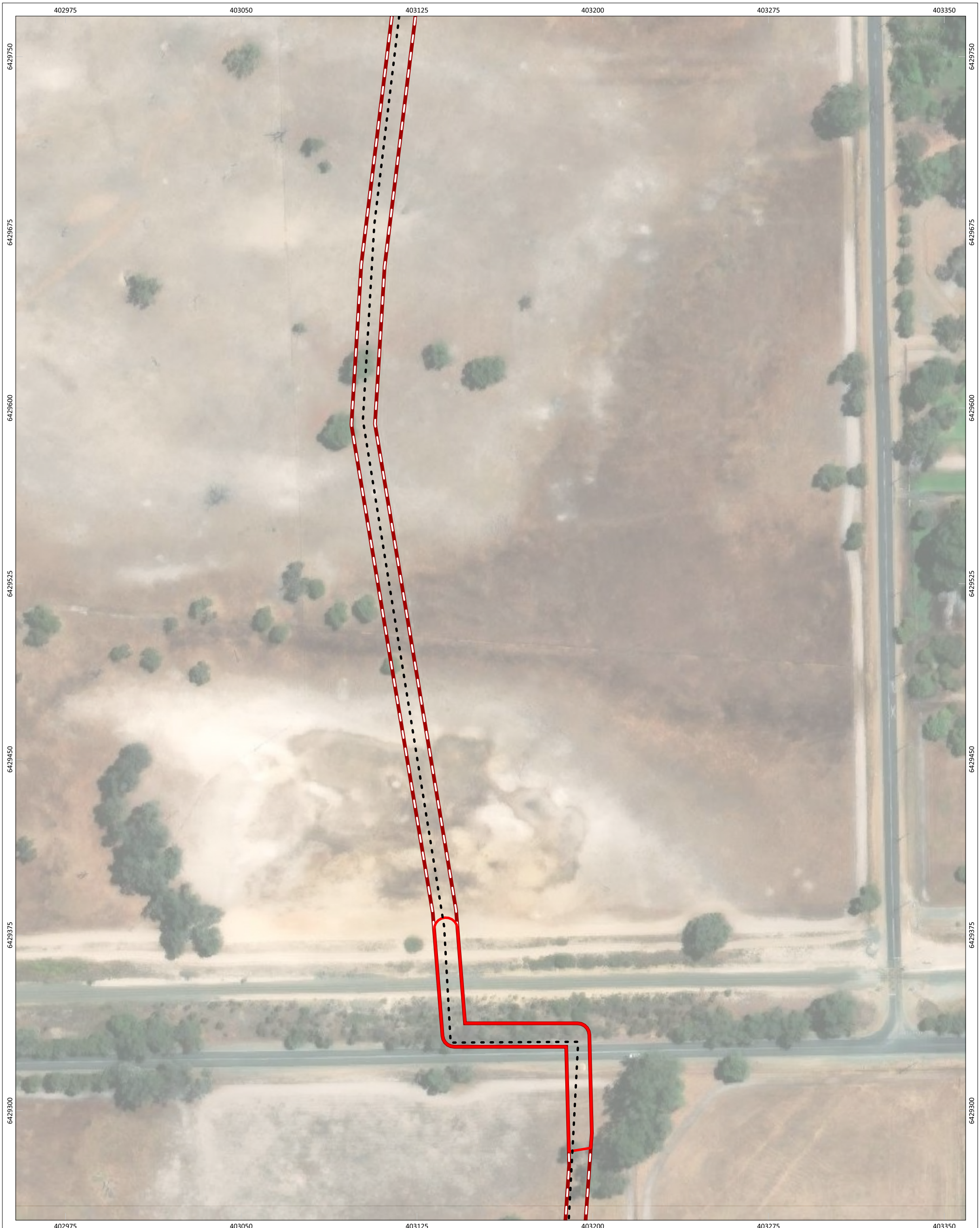


Figure 14j: Conservation Areas

0 10 20 30 40 m

N

SCALE	1:1,500
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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Figure 14l: Conservation Areas

N 0 10 20 30 40 m	PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA		
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 3	
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025	

Legend

- Project Area
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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Figure 14m: Conservation Areas

0 10 20 30 40 m
N

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA		
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

Legend
- Project Area
- Proposed Underboring Areas
- Proposed Pipeline
- Environmentally Sensitive Areas (DWER-046)

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403050 403125 403200 403275 403350 403425

6428400 6428325 6428250 6428175 6428100 6428025 6427950



403050 403125 403200 403275 403350 403425

Figure 14n: Conservation Areas

0 10 20 30 40 m

N

SCALE	1:1,500
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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8. Heritage

8.1.1 Aboriginal Heritage

A search of the ACHIS identified there is one registered Aboriginal Cultural Heritage (ACH) place which intersects the Project Area (DPLH-099) as shown on Figure 15.

Registered Aboriginal Site (ID 396): SOUTH-EAST CORRIDOR 07 / CARDUP SIDING (no restricted access) and is classified as Artefacts and Scatter. Registered Aboriginal Site (ID 396) is located in the northeast portion of the Project Area along Cardup Siding Road and Learmouth Turn. The boundary of the mapped site is listed as reliable under the ACHIS, last updated in 2002.

There are no 'lodged' aboriginal heritage places intersecting with the Project Area (DPLH-100), however there are two 'historic' aboriginal heritage places which intersect (DPLH-098).

Historical Aboriginal Heritage Site (ID: 16108) is named Cardup Brook and typed as Creation, Dreamtime Narrative. There are no restrictions on the site, and the boundary was last updated in 2007.

Historical Aboriginal Heritage Site (ID: 32616) is named MJ-03 and typed as Sub-surface cultural material - Artefacts and Scatter. There are no restrictions, and the site boundary was last updated in 2017.

WEPL have undertaken consultation with DPLH regarding the status of Registered Aboriginal Site (ID 396) and the proposed works for the Project. DPLH advised that there is existing underground infrastructure within the Learmouth Turn road reserve, and the area has been previously disturbed through land clearing and development. If the pressure main will be installed via an under bore method with the entry and exit points situated outside the site, approval under Regulation 7 and Regulation 10 (for minor impact activities) under AHR is likely to be appropriate for the Project. Consultation with WAC is recommended to provide them with the opportunity to respond to the proposal and the potential impact to Aboriginal heritage.

403350 403425 403500 403575 403650

6434250 6434175 6434100 6434025 6433950 6433875 6433800



403350 403425 403500 403575 403650

Figure 15 a: Aboriginal Cultural Heritage Sites

N

0 10 20 30 40 m

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403275 403350 403425 403500 403575 403650

6433725 6433650 6433575 6433500 6433425 6433350 6433275



403275 403350 403425 403500 403575 403650

Figure 15 b: Aboriginal Cultural Heritage Sites

0 10 20 30 40 m

N

SCALE	1:1,500
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Pipeline
- Aboriginal Cultural Heritage Historic (DPLH-098)

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

NOTES:

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403350 403425 403500 403575 403650

6433200 6433125 6433050 6432975 6432900 6432825

ACH-00016108

Figure 15 c: Aboriginal Cultural Heritage Sites

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline
- Aboriginal Cultural Heritage Historic (DPLH-098)

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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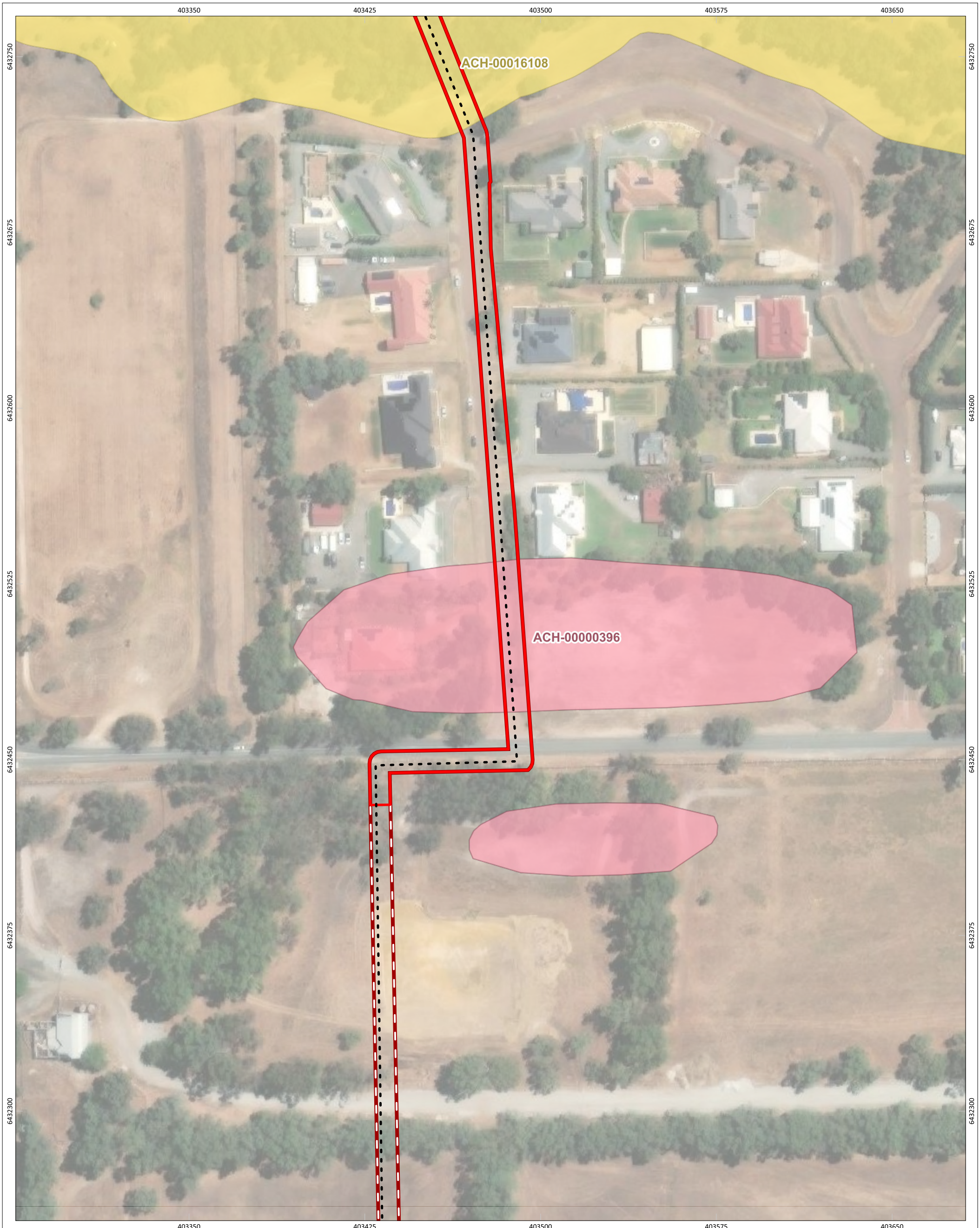


Figure 15 d: Aboriginal Cultural Heritage Sites

0 10 20 30 40 m
N

SCALE	1:1,500
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline
- Aboriginal Cultural Heritage Historic (DPLH-098)
- Aboriginal Cultural Heritage Registered (DPLH-099)

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403275 403350 403425 403500 403575

6432225 6432150 6432075 6432000 6431925 6431850 6431775

ACH-00000448

Figure 15 e: Aboriginal Cultural Heritage Sites

N 0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

Legend

- Project Area
- Proposed Pipeline
- Aboriginal Cultural Heritage Registered (DPLH-099)

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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6431700 6431625 6431550 6431475 6431400 6431325



403200 403275 403350 403425 403500 403575

Figure 15 f: Aboriginal Cultural Heritage Sites

0 10 20 30 40 m

N

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032 / VERSION: 3
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore / DATE: 4/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

CLIENT: Cossil and Webley

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

NOTES:

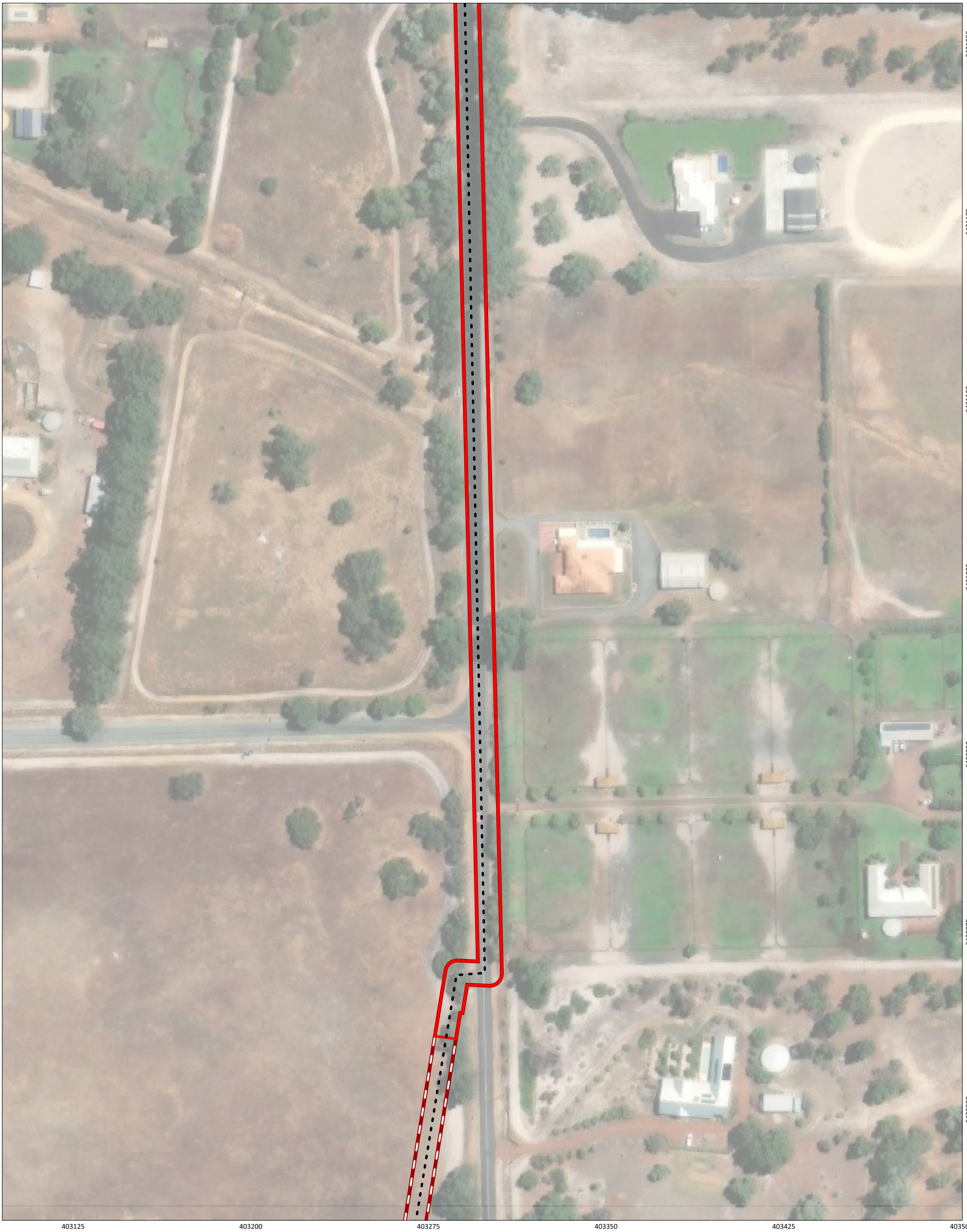
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403125 403200 403275 403350 403425 403500

6431250 6431175 6431100 6431025 6430950 6430875 6430800



403125 403200 403275 403350 403425 403500

Figure 15 g: Aboriginal Cultural Heritage Sites

N 0 10 20 30 40 m

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403050 403125 403200 403275 403350

6430725 6430650 6430575 6430500 6430425 6430350 6430275



403050 403125 403200 403275 403350

Figure 15 h: Aboriginal Cultural Heritage Sites

0 10 20 30 40 m

N

SCALE	1:1,500
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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402975 403050 403125 403200 403275 403350

6430200 6430125 6430050 6429975 6429900 6429825



402975 403050 403125 403200 403275 403350

Figure 15 i: Aboriginal Cultural Heritage Sites

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Pipeline

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

NOTES:

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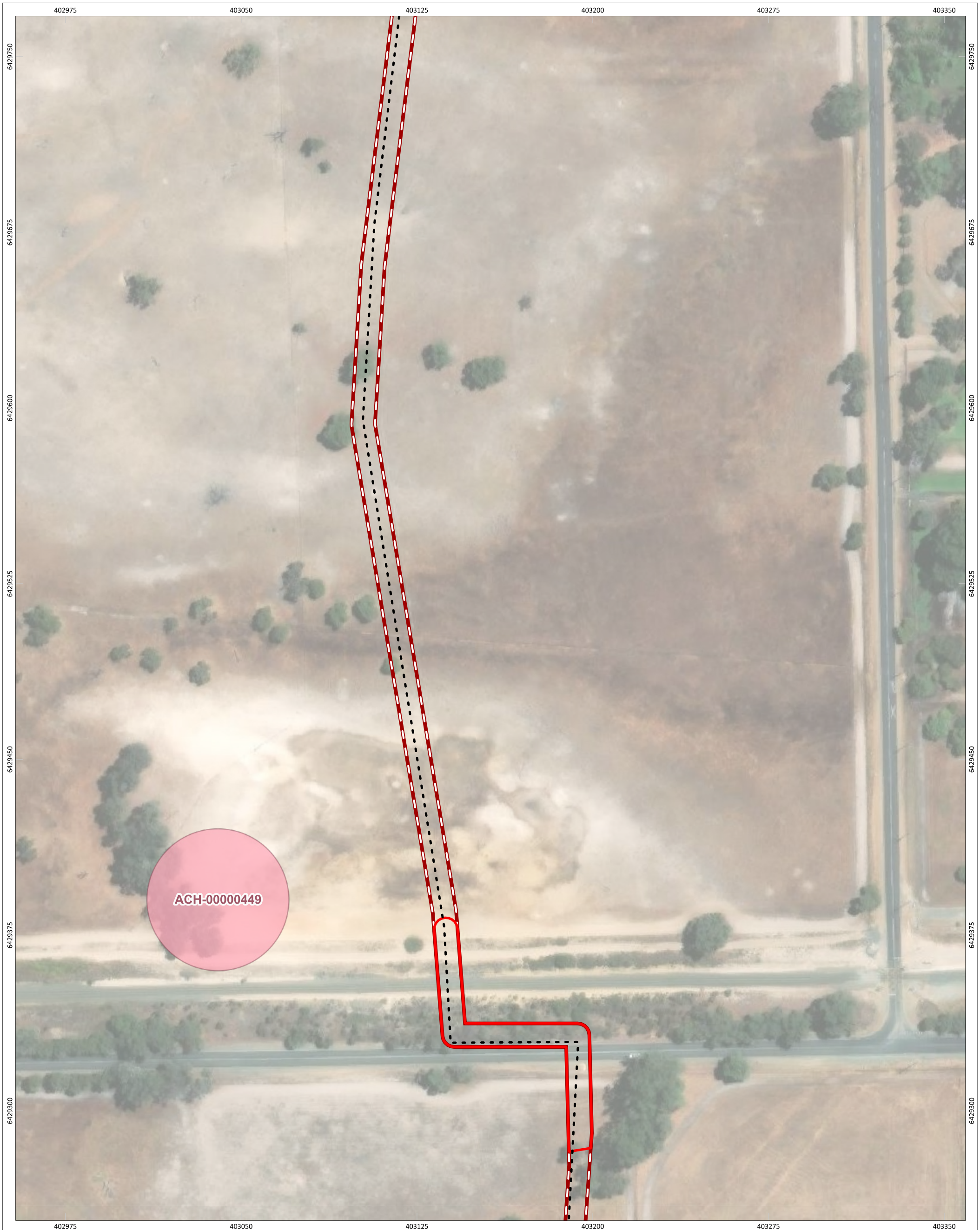


Figure 15 j: Aboriginal Cultural Heritage Sites

N

0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA			
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline
- Aboriginal Cultural Heritage Registered (DPLH-099)

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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Figure 15 l: Aboriginal Cultural Heritage Sites

0 10 20 30 40 m

N

SCALE	1:1,500
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Pipeline
- Aboriginal Cultural Heritage Registered (DPLH-099)

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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Figure 15 m: Aboriginal Cultural Heritage Sites

0 10 20 30 40 m
N

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR		
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 3
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

CLIENT: Cossil and Webley

Legend
- Project Area
- Proposed Underboring Areas
- Proposed Pipeline
- Aboriginal Cultural Heritage Historic (DPLH-098)

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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Figure 15 n: Aboriginal Cultural Heritage Sites

0 10 20 30 40 m

N

SCALE	1:1,500
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	3
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Project Area
- Proposed Underboring Areas
- Proposed Pipeline
- Aboriginal Cultural Heritage Historic (DPLH-098)
- Aboriginal Cultural Heritage Registered (DPLH-099)

No	Description	Drawn	Approved	Date
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9. Summary of Proposed Impacts

9.1 Direct Impacts

9.1.1 Flora and Vegetation

The development will require the clearing of up to a maximum of 0.58 ha of native vegetation pursuant to section V of the EP Act. This vegetation is comprised of:

- 0.58 ha of vegetation and trees; combination of riparian vegetation (VT01) and *Corymbia calophylla/Eucalyptus marginata* woodland (VT02). Of the 0.58 ha, 0.20 ha is Degraded and 0.38 ha is Completely Degraded.
- 0.13 ha of intact vegetation within the Beermullah Complex.
- 0.45 ha of intact vegetation within the Guildford Complex.

No priority flora species was observed within the Site; none will be impacted. Through implementing trenchless drilling and under boring construction methodologies direct clearance of SCP3a and SCP20b will be avoided.

This includes retention of all mapped native vegetation within the Bush Forever Sites, CCWs, REWs and watercourses.

9.1.2 Fauna

The Disturbance Footprint will necessitate the clearing of habitat for CBC, BBC and FRTBC, including:

- 0.08 ha of suitable foraging habitat for BBC and CBC that is High to Very High quality (final habitat quality score of 0.08 ha is 10/10).
- 0.08 ha of suitable foraging habitat for FRTBC that is Moderate - Very High quality (final habitat quality score of 0.08 ha is 10/10).
- 41 potential nesting trees with a DBH > 500 mm for black cockatoo species that is the suitable foraging habitat recorded in the Project Area, consisting of one Class 4 and 40 Class 5 trees with no suitable hollows present.
- 0.004 ha of supporting habitat for quenda.

The Disturbance Footprint has sought to retain vegetation adjacent outside of the Disturbance Footprint, to reduce fragmentation of habitat as a result of the proposed clearing. This includes retention of all mapped native vegetation within higher quality fauna habitat.

9.1.3 Conservation Areas

Through the design phase of the Project the construction methodology of trenchless drilling and under boring where the Project Area intersects Bush Forever Site 351 has been implemented to avoid all direct impacts of vegetation clearance associated to the Bush Forever Site.

9.2 Indirect and Consequential Impacts

Potential Indirect impacts to ecological values that may occur as a result of the Project include:

- Fragmentation of vegetation.
- Dust suppression on vegetation.
- Introduction of invasive species.
- Impacts to the health of SCP3a and SCP20b from the proposed trenchless drilling and under boring construction methodology.
- Direct impacts to conservation significant fauna, through traffic strikes and during clearing.
- Potential indirect impacts to fauna habitat, through dust emissions, habitat fragmentation, noise etc.
- Potential indirect impacts to Carter's freshwater mussel from dewatering activities required for the trenchless drilling and under boring construction methodology at the Manjedal Brook and Cardup Brook.
- Potential indirect impacts to vegetation and hydrological values associated to the Manjedal Brook and Cardup Brook from dewatering activities required for the trenchless drilling and under boring construction methodology at the Manjedal Brook and Cardup Brook.

There are a number of potential indirect impacts to the two identified TECs within the Project Area from trenchless drilling and under boring construction methodology including (indirect impacts could occur to the TECs within the broader Survey Area assessed in WEPL's biological surveys):

- Sediment runoff, chemical spills, or dust from boring can impact soil and water quality that can indirectly affect the health of the flora and vegetation associated to the TEC.
- Alteration of Groundwater Table (DER, 2015: Commonwealth of Australia, 2018):
    - Lower the water table, drying out ecosystems that rely on shallow groundwater (e.g. wetlands, riparian zones, or groundwater-dependent vegetation).
    - Formation of a cone of depression in the water table that forms around the pumping well, refer to Plate 9.

  - Raise the water table inappropriately, causing waterlogging, root rot, or changing plant species composition.

  - Redirect subsurface water flow paths, starving some areas of the moisture they naturally receive. This can particularly affect ecological communities dependent on specific moisture levels, like wetlands or groundwater-dependent ecosystems. This results in a loss of groundwater-dependent species (e.g., deep-rooted native trees like eucalypts), shift in vegetation structure — from wetland to dryland species, or vice versa, and dieback of trees and shrubs due to drought stress or waterlogging.

- Surface Water Diversion or Interceptions surface water runoff paths may be diverted or blocked, particularly if:

  - Access tracks or pads are built without proper drainage design.

  - Spoil or fill is left near drainage lines or wetlands.

  - Trenches or boreholes unintentionally channel water differently.

  - This can result in a change in plant community composition from wet to dry-adapted species.

- Contamination of Groundwater or Surface Water. Boring can introduce:

  - Drilling fluids, lubricants, or contaminated water into aquifers or nearby wetlands.

  - Saline groundwater into freshwater systems if not managed properly (e.g., upward leakage from deeper saline layers).

  - This can result in toxicity to sensitive flora and fauna, disruption of soil microbial communities critical for plant health, and long term salinisation of spoil, making it uninhabitable for native vegetation.

- Disruption of Natural Flood Regimes. Some TECs depend on seasonal flooding and are groundwater dependant such as the SCP3a and SCP20b that are located within the Project Area and the surrounding Survey Area. Under boring operations can:

  - Block or channelize water flow, reducing flood frequency or extent.

  - Cause unnatural prolonged inundation in some areas.

  - This can result in the disruption of seed germination cycles (some native plants require seasonal flooding to trigger germination), altered breeding cycles of amphibians or aquatic insects and increased invasive species pressure, as many are better adapted to altered hydrological conditions.

Information provided by CW to inform this NVCP indicates that pressure main depth varies from around 1.5 m to up to 4 m along the pressure main alignment. At the time of the preparation of this EIAR the depth to groundwater where the TECs are located is not quantified, however based on preliminary engineering and geotechnical results groundwater is likely to be intercepted at the locations of the TEC. Groundwater is generally within 3 m of the natural group surface in occurrences of the SCP3a TEC in particular, so there is the potential groundwater extraction required near this TEC could have an indirect impact to SCP3a.

The dewatering pumping rates are not known at this stage of design so the anticipated cone of depression that would be formed near the TECs is not able to be quantified (refer to Plate 8). The approximate timeframe for dewatering activities for the trenchless drilling will be a week maximum at each location where the TECs are located. The ASS and Dewatering Management Plan will need to quantify dewatering rates, extent and duration of the cone of depression.

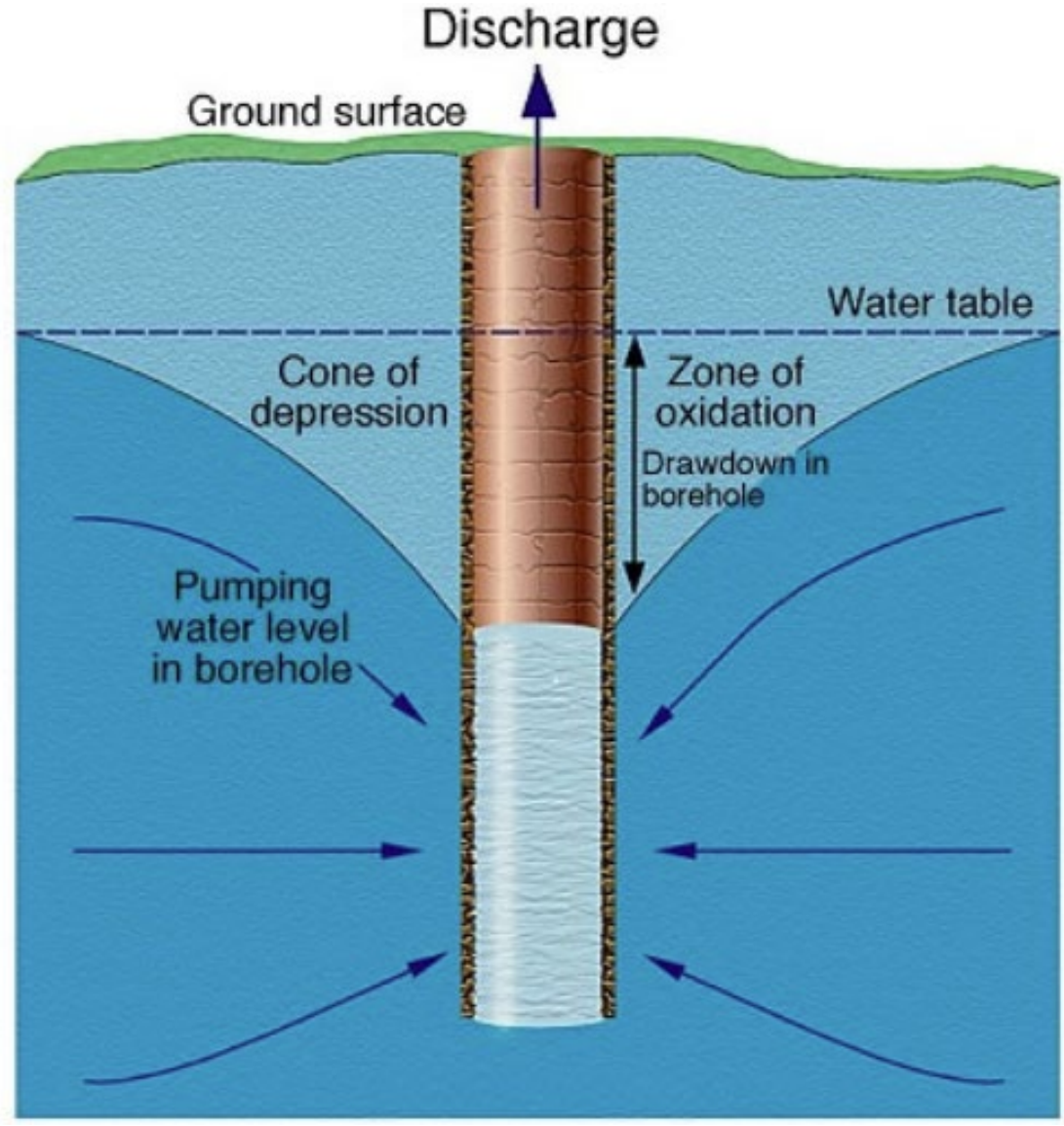


Plate 8: Cone of depression caused from dewatering (Source: Commonwealth of Australia, 2018)

There are the following indirect impacts to Bush Forever Site 351:

- Alteration of groundwater levels and hydrological regime potentially leading to further impacts on linked surface water features associated to the Bush Forever Site. This may result from surface water and groundwater infiltration caused from trenchless drilling, under boring, drainage design, trenches, and other construction works.

- Contamination of water quality and degradation of wetland features from under-boring approach through pollutant runoff such as chemical spills, and drilling fluids or lubricants. Impacts to water quality may include acidification, introduction of heavy metals, or increased salinity (e.g., upward leakage from deeper groundwater saline layers - if not managed adequately).

- Increased stormwater runoff and/or disruption of natural flood regimes in the surrounding area

10. Impact Mitigation and Avoidance

10.1.1 Flora and Vegetation

Impact Mitigation

To ensure that potential environmental impacts are appropriately managed, a range of mitigation measures have been considered in accordance with the EPA's impact mitigation hierarchy.

Avoid

Avoidance of direct significant impacts to flora and vegetation has been achieved by implementing trenchless drilling and under boring construction techniques to avoid the direct clearance of vegetation associated to the TECs recorded within the Project Area in particular. Through implementing trenchless drilling and under boring construction methodologies a total of 0.28 ha of native vegetation will be avoided from vegetation clearance. This reduces the native vegetation clearance required for the Project from 0.98 ha to 0.58 ha.

A total of 0.02 ha of SCP3a and 0.08 ha of SCP20b has been avoided through design considerations and no direct clearance of either TEC is required for the Project. The following residual impacts remain to vegetation values, refer to Table 16 for breakdown.

Table 16: Impact and Avoidance of Vegetation and Threatened Ecological Values within the Project Area

Vegetation Value	Extent within Project Area (ha)	Extent within Trenchless Drilling and Under Boring footprint (ha)	Remaining direct Impact (ha)
Vegetation Type (only includes native vegetation)			
VT01	0.78	0.18	Aa further 0.12 ha was removed from the Constellar Project). 0.48
Degraded	0.24	0.04	0.20
Completely Degraded	*0.54*	*0.14*	*0.*28
VT02	0.02	0.02	-
VT03	0.08	0.08	-
VT05	0.10	-	0.10
Completely Degraded	*0.10*	-	*0.10*
Total	**0.98**	**0.28**	**0.58**
Threatened Ecological Communities			
SCP3a	0.02	0.02	-

Vegetation Value	Extent within Project Area (ha)	Extent within Trenchless Drilling and Under Boring footprint (ha)	Remaining direct Impact (ha)
SCP20b	0.08	0.08	-
Total	**0.10**	**0.10**	-

Minimise

The Project is installing trenchless drilling along the entirety of Hopkinson Road that occurs within the Project Area on the eastern side of the road reserve. This will be located approximately 10 m from the known occurrence of the SCP3a that extends along the western side of Hopkinson Road for approximately 290 m and covers 0.20 ha (Figure 5). The dive location will be located approximately 100 m south from the Gossage Road and Hopkinson Road intersection, that is also 100 m south of the southern extent of the SCP3a mapping. There will be a requirement for three or four dive pits along trenchless drilling and under boring alignment to allow for dewatering requirements.

The entry / retrieval pits and the dive pits required for the trenchless drilling and under boring will be approximately 6 m x 8 m in size, with the 8 m length running parallel to the pressure main. This equates to an approximate size of 0.0048 ha per pit. There is proposed to be six pits based on the worst case scenario, comprising of one entry pit, one retrieval pit and four dive pits along the Hopkinson Road section, totally 0.03 ha in disturbance. There will therefore be a potential indirect impact to 0.03 ha of the 0.20 ha recorded TEC where dewatering will be required, totally 15% of the 0.20 ha of the TEC.

The pits on Hopkinson Road where the TEC is known to occur will be located within eastern side of the road reserve with the possibility of one lane of the road to be temporarily closed for the trenching activities.

To further minimise impacts to flora and vegetation values will need to consider the following mitigation measures prior to and during construction of the Project:

- To minimise indirect impacts to SCP20b, the entry and exit points for trenchless drilling and under boring is to be located outside of the edge of the TEC.
- During any dewatering works required for the trenchless drilling and under boring works near known TECs the following is required, as depicted in Plate 9:
    - The excess water is to be re-directed to temporary storage basins located upstream of the TECs, ideally within 100 m for storage and water quality testing purposes. This water is to be tested to ensure no contaminates are present.
    - The water is to be re-directed back into the cone of depression through the installation of infiltration basins. Redirecting water back into the cone of depression created by dewatering is a common engineering practice when you want to maintain groundwater balance, deduce

off-site impacts of pumping (i.e. indirect impacts to TECs) and control settlement or drawdown (DER, 2015: Commonwealth of Australia, 2018).

  - The re-direction of water into the cone of depression through an infiltration basin introduces water back into the ground and gravity causes recharge water to infiltrate and migrate downward and inward toward the pumping well (DER, 2015: Commonwealth of Australia, 2018). This partially fills the cone of depression, reducing its size and controlling drawdown impacts. The Infiltration basin is to be located upstream of the TECs.

  - The exact location of infiltration basins will need to be considered in the ASS and Dewatering Management Plan prior to construction works beginning, in particular near SCP3a located along Hopkinson Road and near SCP20b located along Bishop Road.

- The ASS and Dewatering Management Plan being prepared for the Project will need to quantify dewatering rates, extent and duration of the cone of depression, and clearly define the location of infiltration basins.

- Avoid boring during wet seasons or in flood-prone zones.

- Trenchless drilling and under boring will be temporary and to a maximum of one week at each location.

- Use sealed drilling techniques and drilling fluid containment.

- Design access and bore pads to maintain natural flow paths.

- Installation of appropriate infiltration basins and drainage infrastructure to ensure natural infiltration of water to TECs downstream of the infrastructure.

- Where impacts are considered to occur during construction, measures to avoid or mitigate the impact will be implemented through a detailed CEMP to be prepared. The CEMP at a minimum should include:

  - Provide measurements to minimise weed introduction and spread of weeds and diseases, unauthorised vehicle or pedestrian access as well as edge effects.

  - Erosion and sediment control measures near TECs where trenchless drilling and under boring is proposed.

  - Clearly demarcate native vegetation for retention, in particular known occurrences of TEC within the Project Area.

- Recommended monitoring the water table levels pre and post-activity to ensure no indirect impacts to hydrological processes associated to the TECs.

- Ensure contractors and staff are aware of native vegetation to be retained within the Project Area through the induction process.
- Where possible vegetation will be pruned as opposed to removed.

The Project Area represents the maximum extent of disturbance for the Project. Where possible, vegetation will be retained during detailed design and construction.

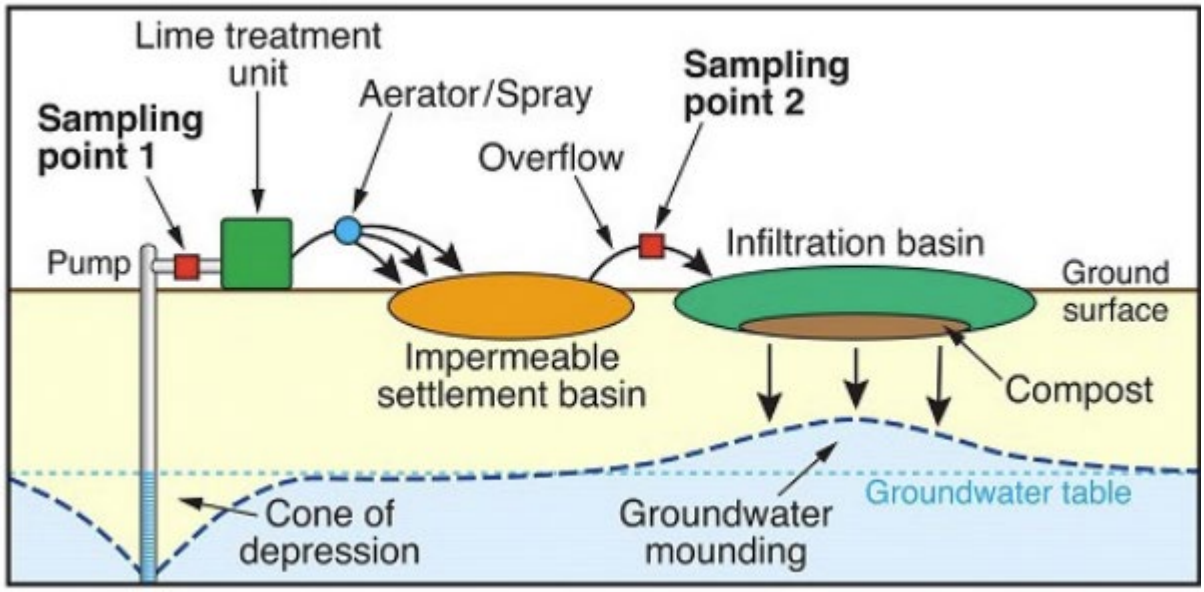


Plate 9: Schematic view of construction dewatering treatment scheme. Source: Commonwealth of Australia, 2018.

Rehabilitate

At this stage, no rehabilitation is deemed necessary as the potential impacts are unlikely to be significant.

Offset

Based on the assessment above the direct clearance of 0.58 ha of native vegetation not comprising of conservation significant flora or communities is not considered a significant impact. There are potential indirect impacts to 0.03 ha of the SCP3a and 0.68 ha of the SCP20b mapped within the Survey Area assessed during the WEPL biological survey from dewatering activities that may be required for the proposed trenchless drilling and under boring works. If mitigation measures are applied indirect impacts are manageable and no offsets are proposed for this factor.

10.1.2 Fauna

Impact Mitigation

To ensure that potential environmental impacts to fauna values are appropriately managed, a range of mitigation measures have been considered in accordance with the EPA's impact mitigation hierarchy, with

reference to the Australian Standard for Protection of Trees on Development Sites (AS 4970:2025) and the Significant Impact Guidelines 1.1 - Matters of Significance.

Avoid

The placement of the 10 m wide construction corridor (Project Area) has sought to retain black cockatoo foraging habitat, potential black cockatoo nesting trees, and other fauna values where possible. This has been achieved through refining the construction corridor to a 10 m width and the adoption of construction methodologies such as trenchless drilling and under-boring to avoid impacts to fauna values within the Project Area. Through these mitigation techniques, the following habitat values for the three black cockatoo species and other conservation significant species will be avoided within the Project Area:

- 0.09 ha of suitable foraging habitat for BBC and CBC that is High to Very High quality (final habitat quality score of 0.05 ha is 9/10 and 0.04 ha is 10/10).
- 0.04 ha of suitable foraging habitat for FRTBC that is Very High quality (final habitat quality score of 0.04 ha is 10/10).
- 28 potential nesting trees for black cockatoo species that is the foraging habitat.
- 0.05 ha of core habitat for the Carter's freshwater mussel.
- 0.10 ha of supporting habitat for quenda.
- 0.05 ha of core habitat for brush-tailed phascogale.
- 0.05 ha of supporting habitat for rakali, graceful sun-moth and perth slider.

Through applying the avoidance measures above the following residual direct impacts remain to fauna values within the Project Area, refer to Table 17 for breakdown.

Table 17: Impact and Avoidance of Terrestrial Fauna Values within the Project Area

Fauna Value	Extent within Project Area (ha)	Extent within Trenchless Drilling and Under Boring footprint (ha)	Remaining direct Impact (ha)
BBC and CBC suitable foraging habitat (ha)			
Final habitat quality score (10/10)	0.12	0.04	0.08
Final habitat quality score (9/10)	0.05	0.05	-
Total	**0.17**	**0.09**	**0.08**
FRTBC suitable foraging habitat (ha)			
Final habitat quality score (10/10)	0.12	0.04	0.08
Final habitat quality score (8/10)	0.02	-	The 0.02 ha removed within

Fauna Value	Extent within Project Area (ha)	Extent within Trenchless Drilling and Under Boring footprint (ha)	Remaining direct Impact (ha)
			the Constellar Cardup Junction Project footprint.
Total	**0.14**	**0.04**	**0.08**
Black cockatoo potential breeding trees	69	28	A further 8 potential nesting trees has been removed within the Constellar Cardup Junction Project footprint. Remaining amount of 33 potential nesting trees (all Class 5)
Carter's fresh water mussel	0.05	0.05	-
quenda	0.104	0.10	0.004
brush-tailed phascogale	0.05	0.05	-
rakali, graceful sun-moth and perth slider	0.05	0.05	-
Fauna Habitat			
FHT-01	0.52	0.10	0.42
FHT-02	4.82	0.37	4.45
FHT-03	0.12	0.04	0.08
FHT-04	0.02	-	0.02
FHT-05	0.05	0.05	-
FHT-06	0.05	0.05	-
FHT-07	0.004	-	0.004
FHT-08	0.02	0.004	0.016
FHT-09	0.02	-	0.02
BG	1.60	0.44	1.16
Total	**7.22**	**1.05**	**6.17**

Minimise

Further to avoidance measures detailed above a Preliminary Tree Survey and Arboricultural Impact Assessment (AIA) was undertaken by PaperBark Technologies (PaperBark, 2025). The proposed installation of the pressure main and associated trenching works will encroach upon the Tree Protection Zones (TPZ) and Structural Root Zones (SRZ) of several retained trees.

Where trenching must occur closer to these distances, alternative methods such as directional drilling to a minimum depth of 2.0 m beneath the SRZ are recommended.

Prior to construction there is an opportunity 12 trees (2 of the 14 trees were identified for removal due to health) to be further assessed by an Arborist to minimise the number of potential nesting trees to be removed for the Project, refer to Figure 16. If the intention is to minimise clearance of these trees the following mitigation measures will be required:

- Any open trenching or construction activity within the TPZ must be carried out under the supervision of a qualified Arborist, in accordance AS 4970:2025. Arborist supervision will:
    - Minimise root damage.
    - Allow for documentation of any significant roots encountered.
    - Provide immediate recommendations for root pruning and protection.
- Tree Protection Measures:
    - Tree Protection Fencing (TPF) must be installed around all retained trees prior to site work commencing, including any machinery or material delivery.
    - Fencing must be installed in accordance with AS 4970:2025 Section 4, clearly marked and maintained throughout the duration of works to establish a non-disturbance zone.

Further minimisation of impacts to terrestrial fauna values will be implemented through the following mitigation measures:

- Where impacts are considered to occur during construction, measures to avoid or mitigate the impact will be implemented through a detailed CEMP to be prepared. The CEMP at a minimum should include:
    - Provide measurements to minimise weed introduction and spread of weeds and diseases, unauthorised vehicle or pedestrian access as well as edge effects to fauna habitat.
    - Clearly demarcate fauna habitat for retention, in particular any potential nesting trees identified for retention within the Project Area or located adjacent to the Project Area.

- Ensure contractors and staff are aware of clearing extent for the Project to ensure no clearance of potential nesting trees and foraging habitat for the three black cockatoos and habitat for other species is cleared.

The Project Area represents the maximum extent of disturbance for the Project. Where possible, fauna habitat will be retained during detailed design and construction.

Rehabilitate

At this stage, no rehabilitation is deemed necessary as the potential impacts will not be significant.

Offset

The Project is unlikely to have a significant residual impact on terrestrial fauna. Consequently, no offsets are proposed for this environmental factor at this stage.

10.1.3 Conservation Areas

Impact Mitigation

Development Approval through the WAPC is required where any regionally significant vegetation associated to a Bush Forever Site will be impacted by the proposed works. The Project will avoid direct impacts to vegetation associated to Bush Forever Site 351, therefore a Development Approval is not deemed necessary for impacts to a Bush Forever Site.

Indirect impacts to the Bush Forever Site 351 such as sediment runoff and chemical spills during trenchless drilling and under boring works near the Bush Forever Site will be managed by erosion and sediment controls, contamination management, dewatering and ASS, and weed and disease management measures to be detailed and implemented in the ASS and Dewatering Management Plan, along with a CEMP..

Offset

No offsets for impacts to a Bush Forever Site are proposed in accordance with SPP 2.8 and 2.9 policies as no direct impacts are expected from the Project works. All potential indirect impacts can be adequately managed with a CEMP.

Development Approval through the WAPC is required where any regionally significant vegetation associated to a Bush Forever Site will be impacted by the proposed works. The Project will avoid direct impacts to vegetation associated to Bush Forever Site 351, therefore a Development Approval is not deemed necessary for impacts to a Bush Forever Site.



Figure 16 a: Potential Nesting Trees to be Retained and Removed

N 0 10 20 30 40 m

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SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 4
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

Legend

- Survey Area
- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Alternative Action for Retention

- Underbore Drilling
- Direct Drill (2m radius)
- Maximum Trenching Encroachment (6m radius)
- Maximum Trenching Encroachment (8m radius)

Bamford Tree Class

- 3
- 4
- 5
- Assessed for Retention
- Trees for Retention
- Trees for Removal

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403275 403350 403425 403500 403575 403650

6433725 6433650 6433575 6433500 6433425 6433350 6433275

49 50 51 52 56 57 60

Figure 16 b: Potential Nesting Trees to be Retained and Removed

N

0 10 20 30 40 m

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Alternative Action for Retention

- Underbore Drilling
- Direct Drill (2m radius)
- Maximum Trenching Encroachment (6m radius)
- Maximum Trenching Encroachment (8m radius)

Bamford Tree Class

- 3
- 4
- 5
- Assessed for Retention
- Trees for Retention
- Trees for Removal

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A	Original issue	WG	SM	4/12/2025

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403350 403425 403500 403575 403650

6433200 6433125 6433050 6432975 6432900 6432825

70 74 73

Figure 16 c: Potential Nesting Trees to be Retained and Removed

N 0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA			
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 4
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025	

Legend

- Survey Area
- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Alternative Action for Retention

- Underbore Drilling
- Direct Drill (2m radius)
- Maximum Trenching Encroachment (6m radius)
- Maximum Trenching Encroachment (8m radius)

Bamford Tree Class

- 3
- 4
- 5
- Assessed for Retention
- Trees for Retention
- Trees for Removal

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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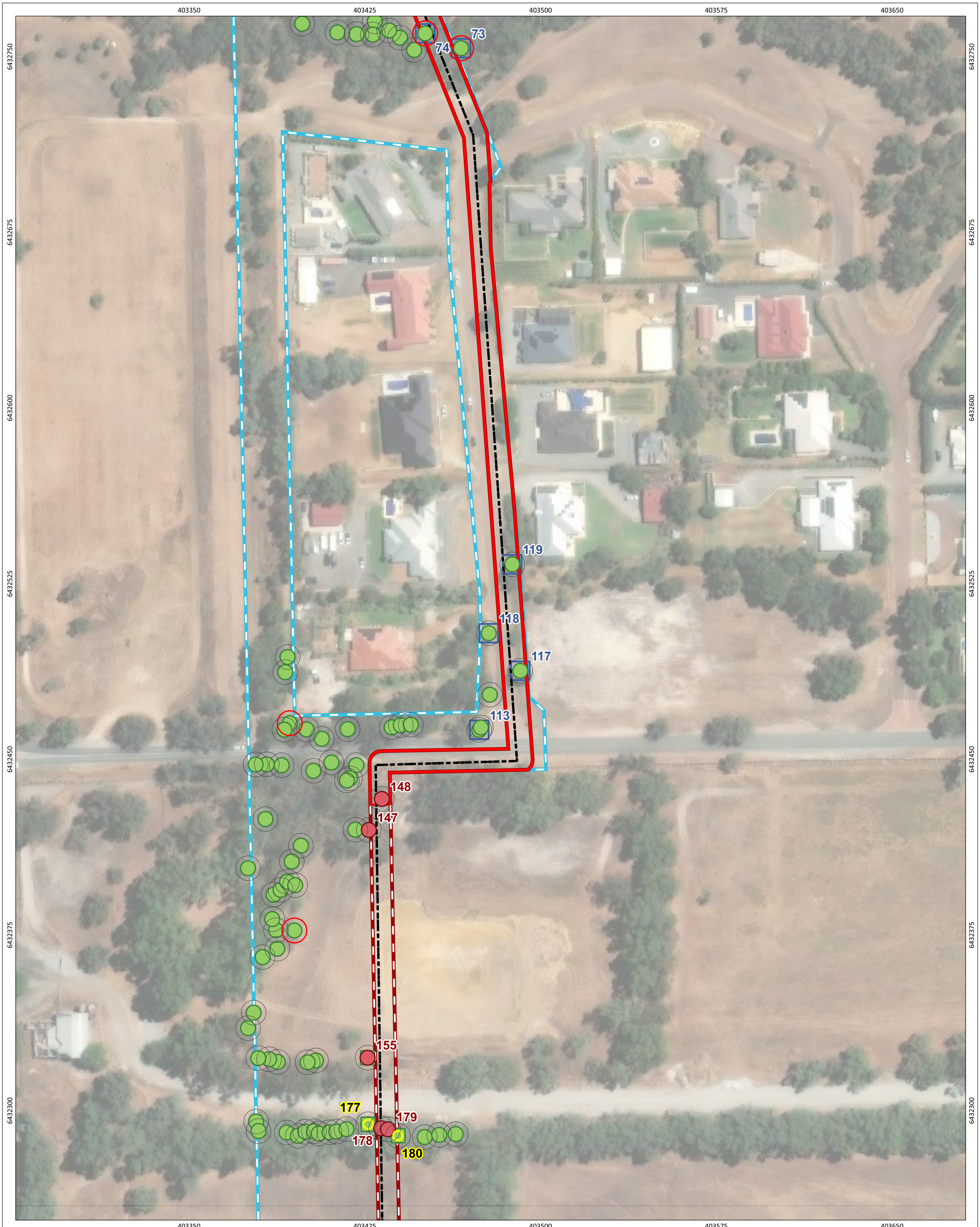


Figure 16 d: Potential Nesting Trees to be Retained and Removed

N 0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA			
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 4
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

Legend

- Survey Area
- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Alternative Action for Retention

- Underbore Drilling
- Direct Drill (2m radius)
- Maximum Trenching Encroachment (6m radius)
- Maximum Trenching Encroachment (8m radius)

Bamford Tree Class

- 3
- 4
- 5
- Assessed for Retention
- Trees for Retention
- Trees for Removal

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403275 403350 403425 403500 403575

6432225 6432150 6432075 6432000 6431925 6431850 6431775



403275 403350 403425 403500 403575

Figure 16 e: Potential Nesting Trees to be Retained and Removed

N 0 10 20 30 40 m

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA		
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 4
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

Legend

- Survey Area
- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Alternative Action for Retention

- Underbore Drilling
- Direct Drill (2m radius)
- Maximum Trenching Encroachment (6m radius)
- Maximum Trenching Encroachment (8m radius)

Bamford Tree Class

- 3
- 4
- 5
- Assessed for Retention
- Trees for Retention
- Trees for Removal

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403200 403275 403350 403425 403500 403575

6431700 6431625 6431550 6431475 6431400 6431325

277 286 279 300 309 304 301 303 336

Figure 16 f: Potential Nesting Trees to be Retained and Removed

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	4
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Survey Area
- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Alternative Action for Retention

- Underbore Drilling
- Direct Drill (2m radius)
- Maximum Trenching Encroachment (6m radius)
- Maximum Trenching Encroachment (8m radius)

Bamford Tree Class

- 3
- 4
- 5
- Assessed for Retention
- Trees for Retention
- Trees for Removal

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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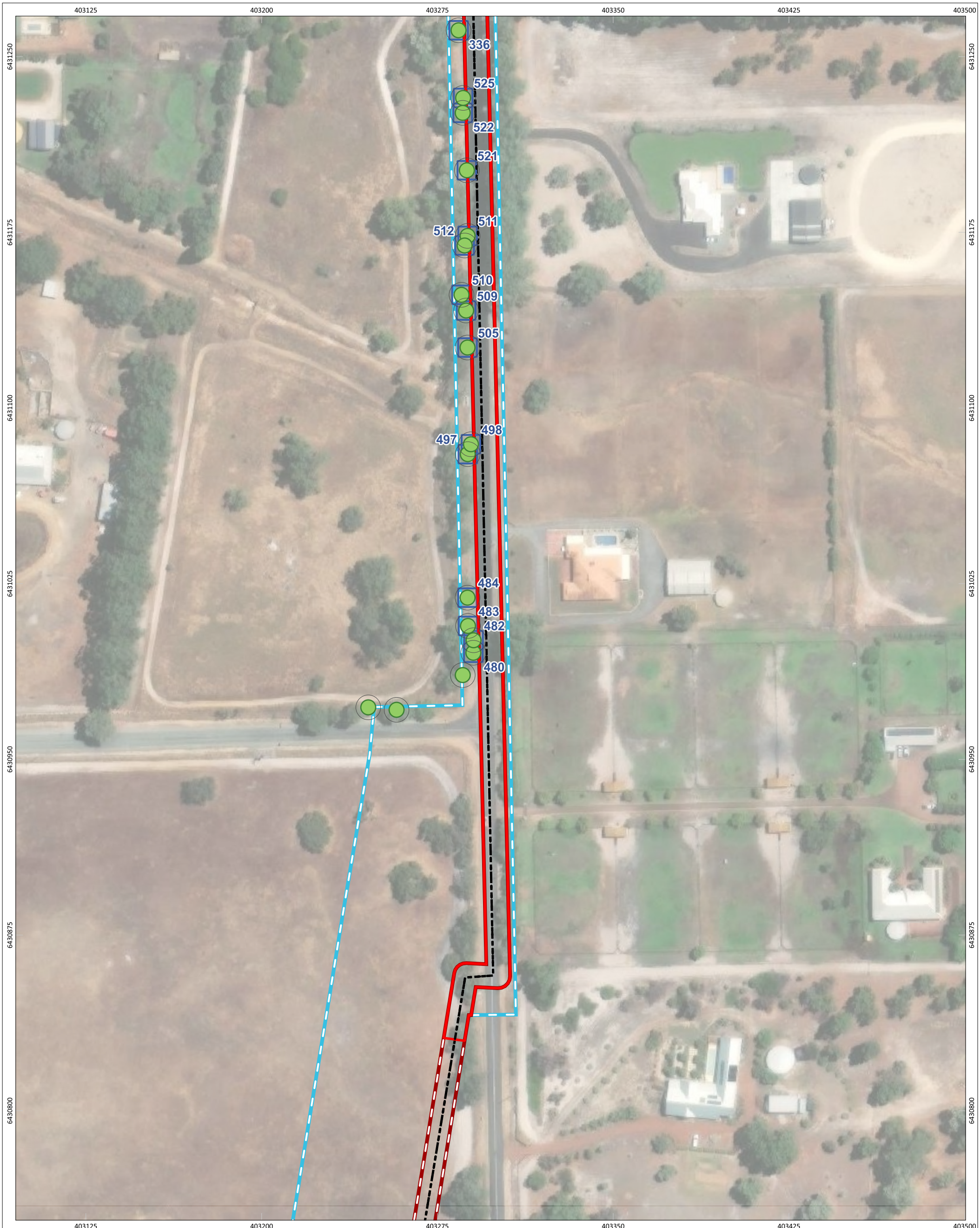


Figure 16 g: Potential Nesting Trees to be Retained and Removed

0 10 20 30 40 m

N

PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
SCALE	1:1,500
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	4
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Survey Area
- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Alternative Action for Retention

- Underbore Drilling
- Direct Drill (2m radius)
- Maximum Trenching Encroachment (6m radius)
- Maximum Trenching Encroachment (8m radius)

Bamford Tree Class

- 3
- 4
- 5
- Assessed for Retention
- Trees for Retention
- Trees for Removal

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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403050 403125 403200 403275 403350

6430725 6430650 6430575 6430500 6430425 6430350 6430275



403050 403125 403200 403275 403350

Figure 16 h: Potential Nesting Trees to be Retained and Removed

N 0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 4
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

Legend

- Survey Area
- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Alternative Action for Retention

- Underbore Drilling
- Direct Drill (2m radius)
- Maximum Trenching Encroachment (6m radius)
- Maximum Trenching Encroachment (8m radius)

Bamford Tree Class

- 3
- 4
- 5
- Assessed for Retention
- Trees for Retention
- Trees for Removal

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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Figure 16 i: Potential Nesting Trees to be Retained and Removed

N 0 10 20 30 40 m	PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA		
SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 4	
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025	

Legend

- Survey Area
- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Alternative Action for Retention

- Underbore Drilling
- Direct Drill (2m radius)
- Maximum Trenching Encroachment (6m radius)
- Maximum Trenching Encroachment (8m radius)

Bamford Tree Class

- 3
- 4
- 5
- Assessed for Retention
- Trees for Retention
- Trees for Removal

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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402975 403050 403125 403200 403275 403350

6429750 6429675 6429600 6429525 6429450 6429375 6429300

453

Figure 16 j: Potential Nesting Trees to be Retained and Removed

0 10 20 30 40 m

N

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR
PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032 / VERSION: 4
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore / DATE: 4/12/2025

Legend

- Survey Area
- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Alternative Action for Retention

- Underbore Drilling
- Direct Drill (2m radius)
- Maximum Trenching Encroachment (6m radius)
- Maximum Trenching Encroachment (8m radius)

Bamford Tree Class

- 3
- 4
- 5
- Assessed for Retention
- Trees for Retention
- Trees for Removal

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	4/12/2025

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402900 402975 403050 403125 403200 403275

6429225 6429150 6429075 6429000 6428925 6428850 6428775

Figure 16 l: Potential Nesting Trees to be Retained and Removed

0 10 20 30 40 m

N

SCALE	1:1,500
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Scott Road Waste Water Pumping Station: EIA Report Byford WA
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A24.032
VERSION	4
DATA SOURCE	ESRI Imagery
DRAWN BY / REVIEWED BY	West GIS Stephen Moore
DATE	4/12/2025

Legend

- Survey Area
- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Alternative Action for Retention

- Underbore Drilling
- Direct Drill (2m radius)
- Maximum Trenching Encroachment (6m radius)
- Maximum Trenching Encroachment (8m radius)

Bamford Tree Class

- 3
- 4
- 5
- Assessed for Retention
- Trees for Retention
- Trees for Removal

No	Description	Drawn	Approved	Date
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Figure 16 m: Potential Nesting Trees to be Retained and Removed

N

0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A24.032	VERSION: 4
DATA SOURCE: ESRI Imagery	DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA

Legend

- Survey Area
- Project Area
- Proposed Underboring Areas
- Proposed Pipeline

Alternative Action for Retention

- Underbore Drilling
- Direct Drill (2m radius)
- Maximum Trenching Encroachment (6m radius)
- Maximum Trenching Encroachment (8m radius)

Bamford Tree Class

- 3
- 4
- 5
- Assessed for Retention
- Trees for Retention
- Trees for Removal

No	Description	Drawn	Approved	Date
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Figure 16 n: Potential Nesting Trees to be Retained and Removed

N 0 10 20 30 40 m

SCALE: 1:1,500	SHEET SIZE: A3 COLOUR	PROJECT/REPORT NAME: Scott Road Waste Water Pumping Station: EIA Report Byford WA	
		CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A24.032	VERSION: 4
DATA SOURCE: ESRI Imagery		DRAWN BY / REVIEWED BY: West GIS, Stephen Moore	DATE: 4/12/2025

Legend

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- Underbore Drilling
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Bamford Tree Class

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11. Assessment Against the Ten Clearing Principles

An assessment of the 0.58 ha of native vegetation clearing against the Ten Clearing Principles contained in Schedule 5 of the EP Act is provided in Table 18.

Table 18: Assessment Against Ten Clearing Principles

Principle (Schedule 5 of the EP Act)	Assessment	Data Source/Tools for Assessment	Outcome
(a) Native vegetation should not be cleared if it comprises a high level of biological diversity	The Disturbance Footprint occurs within the SCP bioregion. A Reconnaissance Flora, Vegetation and Targeted Fauna Survey was undertaken within the Site in June of 2025 by Western Environmental Approvals (WEPL, 2025) (see Appendix A for full report). The desktop assessment included a search of the DBCA databases and Commonwealth PMST search tool. A total of 92 vascular flora taxa, including 34 introduced species, were recorded from within the Survey Area of the biological surveys (WEPL, 2025). No Threatened or Priority flora species pursuant to the BC Act or EPBC Act were identified during the biological survey. The post-survey LoO Assessment found that all threatened, or priority flora had a low likelihood of occurring within the Project Area due to much of the habitat being Degraded for agriculture and lack of understory vegetation to support the listed species (WEPL, 2025). Two TECs were recorded within the Disturbance Footprint during the biological survey, SCP3a and SCP20b. Through construction methodologies the direct clearance of these TECs have been avoided. The Disturbance Footprint was reported to have lower diversity than the broader Survey Area, given the presence of only two vegetation types opposed to four in the broader Survey Area. The majority of land within the Project Area has been historically cleared, with current vegetation condition varying between degraded to completely degraded. Areas of native vegetation which require clearing were assessed to be of degraded to completely degraded condition: • VT01 (0.48 ha) comprising of 0.20 ha degraded and 0.28 completely degraded. • VT05 (0.10 ha) completely degraded. Based on the degraded vegetation condition of vegetation within the disturbance footprint, the vegetation does not represent a high level of biological biodiversity, thus the proposed clearing is unlikely to be at variance.	Australia's Bioregions (DCCEEW, 2021) Reconnaissance Flora, Vegetation and Targeted Fauna Report (WEPL, 2025) Protected Matter Search Tool (DCCEEW, 2025) Western Australia Herbarium (WAH, 1998) records Priority ecological communities List for WA (2023)	Proposed clearing is unlikely to be at variance to this Principle.

Principle (Schedule 5 of the EP Act)	Assessment	Data Source/Tools for Assessment	Outcome
(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.	A basic fauna and targeted searches for the three species of black cockatoos was undertaken by WEPL in July of 2025 (WEPL, 2025). Four of the species identified as having a high LoO were observed within the Survey Area during the field Survey, they were: • BBC—EN. • CBC —EN. • FRTBC—VU. • Quenda—P4. Other fauna species of conservation significance which were recorded or assessed as having a high or medium LoO within the Project Area are acknowledge below: • Carter's freshwater mussels - VU • Peregrine falcon - OS • Brush-tailed phascogale - CD • Rakali – P4 • Graceful sun-moth - P4 • Black-striped snake - P3 • Perth slider - P3 The terrestrial fauna values recorded within the Project Area are not considered unique to the area and are known to be widespread in the region. Overall, the assemblage of vertebrate fauna expected to occur within the Project Area post survey, is typical of degraded and fragmented vegetation that occurs on agricultural land. The Disturbance Footprint consists primarily of scattered trees over paddock that lacks the required habitat to support majority of the species listed. As a result, the Project Area is considered overall as unlikely to be of significant value to fauna. Apart from a small area of core habitat mapped within the Project Area (FHT06) for Carter's freshwater mussel which will be retained, only supporting habitat and non-significant for conservation significant species is present within the Disturbance Footprint. This includes supporting for BBC, CBC, FRTBC, peregrine falcon, south-western brush-tailed phascogale, quenda, rakali, graceful sun-moth, black-striped snake and perth slider. The disturbance footprint includes only non-significant habitat for other species. The proposed clearing within the disturbance footprint will include impacts to **0.58 ha of native vegetation**, of which:	Protected Matter Search Tool (DCCEEW, 2025) Reconnaissance Flora, Vegetation and Targeted Fauna Report (WEPL, 2025)	Proposed clearing is unlikely to be at variance to this Principle.

Principle (Schedule 5 of the EP Act)	Assessment	Data Source/Tools for Assessment	Outcome
	• **0.08 ha of suitable foraging habitat for BBC and CBC that is High to Very High quality.** • **0.08 ha of suitable foraging habitat for FRTBC that is Very High quality.** • **33 black cockatoo breeding trees (all Class 5), included within the above foraging habitat, none of which include suitable nesting hollows.** There was no black cockatoo roosting evidence within the Survey Area. Given the proposed clearing of the above detailed foraging habitat and potential nesting trees over a 6 km linear alignment, it is highly unlikely that the black cockatoos are dependent on the Disturbance Footprint. Whilst the proposed clearing will cause temporary localised disturbance it is unlikely to impact significant foraging habitat for black cockatoo. The placement of the 10 m wide construction corridor (Project Area) has sought to retain black cockatoo foraging habitat, potential black cockatoo nesting trees, and other fauna values where possible. This has been achieved through refining the construction corridor to a 10 m width and the adoption of construction methodologies such as trenchless drilling and under-boring to avoid impacts to fauna values within the Project Area. Based on the assessment provided, if avoidance and mitigation measures are implemented for the protection of indirect impacts to terrestrial fauna. Due to the small extent of the proposed clearing (0.58 ha total) and the fragmented nature of habitat within the Disturbance Footprint, this removal of supporting habitat is unlikely to represent a significant habitat for the black cockatoos. Therefore, the proposed clearing is unlikely to have the potential to be at variance with this principle the Project is unlikely to have a significant impact on terrestrial fauna values.		
(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.	The pre-survey likelihood of occurrence assessment identified that of the 66 conservation listed flora species identified: • Fourteen were considered to have a high likelihood of occurrence. • Twenty were considered to have a medium likelihood of occurrence. • Thirty-two were considered to have a low likelihood of occurrence. Following the survey, the likelihood of occurrence was re-evaluated and identified that all 66 conservation listed flora species had a low likelihood of occurrence. Due to much of the habitat being Degraded for agriculture and lack of understory vegetation to support the listed species, no conservation significant flora was recorded during the reconnaissance field survey, or were identified as representing range extensions or flora of other significance (WEPL, 2025).	Protected Matter Search Tool (DCCEEW, 2025) Reconnaissance Flora, Vegetation and Targeted Fauna Report (WEPL, 2025)	Proposed clearing is unlikely to be at variance to this Principle.

Principle (Schedule 5 of the EP Act)	Assessment	Data Source/Tools for Assessment	Outcome
	The native vegetation proposed to be cleared within the Disturbance Footprint does not contain any Threatened or Priority species and is unlikely to be at variance with this principle.		
(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.	Of the seven TECs and PECs identified by the desktop assessment as having a high or medium LoO, Two of these TECs, (the SCP20b and SCP3a) have mapped occurrences or a buffer of mapped occurrences shown in DBCA database search results as intersecting the Survey Area. The post-survey presence/absence assessment identified that these two TECs are likely to be present within the Survey Area of the biological surveys undertaken by WEPL (WEPL, 2025). **SCP3a** There is one patch within the Survey Area within VT02 that is likely to be representative of SCP3a (Hopkinson's Road) that 0.20 ha in size and in Good Condition. There is no SCP3a within the Disturbance Footprint or a requirement for clearing the TEC as it has been avoided through trenchless drilling and under boring that avoids any clearance of the TEC. Within the local area (Shire of Serpentine Jarrahdale) there was approximately 47.8 ha of the TEC present, including 43.3 ha contained within the Brickwood Reserve and managed for conservation (DEC, 2011). The 0.20 ha of the TEC within the Survey Area is less than 0.2% of the known extent and 0.4% of the local extent of the population within the Shire of Serpentine Jarrahdale. There will be a potential indirect impact to 0.03 ha of the 0.20 ha recorded TEC where dewatering will be required, totally 15% of the 0.20 ha of the TEC. **SCP20b** There is a total of 0.68 ha of SCP20b mapped within the Survey Area. There is 0.08 ha of SCP20b mapped within the Project Area (0.07 ha in Good Condition and 0.01 ha in Degraded Condition). There is no SCP20b within the Disturbance Footprint or a requirement for clearing the TEC as it has been avoided through trenchless drilling and under boring that avoids any clearance of the TEC. Through implementing specific mitigation measures below any indirect impacts to the TECs will be managed: • During any dewatering works required for the trenchless drilling and under boring works near known TECs the following is required, as depicted in Plate 9:	Reconnaissance Flora, Vegetation and Targeted Fauna Report (WEPL, 2025)	Unlikely to be at variance

<table>
<tr><th>Principle (Schedule 5 of the EP Act)</th><th>Assessment</th><th>Data Source/Tools for Assessment</th><th>Outcome</th></tr>
<tr><td></td><td>

The excess water is to be re-directed to temporary storage basins located upstream of the TECs, ideally within 100 m for storage and water quality testing purposes. This water is to be tested to ensure no contaminates are present.
The water is to be re-directed back into the cone of depression through the installation of infiltration basins. Redirecting water back into the cone of depression created by dewatering is a common engineering practice when you want to maintain groundwater balance, deduce off-site impacts of pumping (i.e. indirect impacts to TECs) and control settlement or drawdown (DER, 2015: Commonwealth of Australia, 2018).
The re-direction of water into the cone of depression through an infiltration basin introduces water back into the ground and gravity causes recharge water to infiltrate and migrate downward and inward toward the pumping well (DER, 2015: Commonwealth of Australia, 2018). This partially fills the cone of depression, reducing its size and controlling drawdown impacts. The Infiltration basin is to be located upstream of the TECs.
The exact location of infiltration basins will need to be considered in the ASS and Dewatering Management Plan prior to construction works beginning, in particular near SCP3a located along Hopkinson Road and near SCP20b located along Bishop Road.
Temporary trenchless drilling up to a week maximum at each location.

The native vegetation present within the disturbance footprint does not comprise whole or part of, nor is it likely to be necessary for the maintenance of a TEC. Therefore, the proposed clearing is not likely to be at variance with this principle.
</td><td></td><td></td></tr>
<tr><td>(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.</td><td>
The Disturbance Footprint is within a highly constrained area within the Swan Coastal Plain of the Greater Bunbury Region Scheme. The high-level vegetation association in the Project Area has been mapped by Beard (1990) as Vegetation Complexes Beermullah Complex and the Guilford Complex. The status of the remaining pre-European vegetation and description is shown in the table below.
<table>
<tr><th>Vegetation Complex</th><th>Description</th><th>Original Extent (ha)</th><th>Current Extent (ha)</th><th>% Remaining</th><th>% Managed for Conservation</th></tr>
<tr><td>Beermullah Complex</td><td>Mixture of low open forest of Casuarina obesa (Swamp Sheoak) and open woodland of Corymbia calophylla (Marri) - Eucalyptus</td><td>6,707.27</td><td>447.21</td><td>6.67%</td><td>2.13%</td></tr>
</table>
</td><td>Beard (1990)

Reconnaissance Flora, Vegetation and Targeted Fauna Report (WEPL, 2025)

EPA Guidance No.10 (2006)</td><td>Proposed clearing is unlikely to be at variance to this Principle.</td></tr>
</table>

Principle (Schedule 5 of the EP Act)	Assessment						Data Source/Tools for Assessment	Outcome
		wandoo (Wandoo) - *Eucalyptus marginata* (Jarrah). Minor components include closed scrub of Melaleuca species and occurrence of *Actinostrobus pyramidalis* (Swamp Cypress).						
	Guildford Complex	A mixture of open forest to tall open forest of *Corymbia calophylla* (marri) - *Eucalyptus wandoo* (wandoo) - *Eucalyptus marginata* (jarrah) and woodland of Eucalyptus wandoo (wandoo) (with rare occurrences of Eucalyptus lane-poolei [salmon white gum]). Minor components include Eucalyptus rudis (flooded gum) - Melaleuca rhaphiophylla (swamp paperbark).	90,513.13	4,607.91	5.09%	0.33%		
	The National Objectives and Targets for Biodiversity Conservation 2001-2005 (Commonwealth of Australia, 2001) recognises that the retention of 30% or more of the pre-clearing extent of each ecological community is necessary if Australia's biodiversity is to be protected. Below this level, species loss appears to accelerate exponentially (EPA, 2000). State Planning Policy 2.8: Bushland Policy for the Perth Metropolitan Region recognises a target of at least 10 per cent of the original extent of each vegetation complex (as representative of ecological communities at the regional scale) for the Swan Coastal Plain portion of the Perth Metropolitan Region, which is recognised as a constrained area. The EPA Position Statement No.9 identifies vegetation with a 30 % or less or their pre-clearing extent remaining in the SCP bioregion, or 10 % or less of their pre-clearing extent remaining in constrained areas on the SCP to be critical assets. Clearing of critical assets would generally be at variance to this principle.							

Principle (Schedule 5 of the EP Act)	Assessment	Data Source/Tools for Assessment	Outcome
	There is 0.20 ha of native vegetation mapped within the Beermullah Complex and 0.78 ha of Guildford Complex within the Project Area. The proposed clearing of 0.58 ha of native vegetation in degraded to completely degraded condition, comprises of: • Beermullah Complex - 0.13 ha • Gilford Complex - 0.45 ha Based on the proposed clearing, this would equate to a further impact of 0.03% of the remaining extent of the Beermullah complex and 0.01% of the remaining extent of the Gilford Complex. Considering the vegetation to be cleared is a degraded to a completely degraded condition it is not very representative of either vegetation complex, and the proposed clearing will not drastically reduce the remaining extent of either vegetation complex. Based on the above, the proposed clearing is unlikely to be at variance to this principle.		
(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.	The Project Area intersects the Cardup Brook - Minor Tributary that is perennial and is associated with REW (UFID: 14,540) and Manjedal Brook - Minor Tributary that is perennial and is associated with CCW (UFID: 14,945). The proposed design for the Project actively avoids direct impacts to these two wetlands by adopting trenchless drilling and under boring construction techniques whereby the pressure main will be buried beneath these watercourses and wetland areas. There are potential indirect impacts to the Cardup Brook and Manjedal Brook from dewatering activities required for the trenchless drilling and under boring required to avoid impacting vegetation associated to these watercourses. All potential indirect impacts will be managed through the ASS and Dewatering Management Plan for the Project. The proposed clearing within the disturbance footprint is not at variance with this principle.		Proposed clearing is not at variance to this Principle.
(g) Native vegetation should not be cleared if the clearing of the vegetation is	DWER has defined land degradation as including the following: • The clearing of vegetation that cause land degradation • Soil erosion and soil acidity caused by wind and water erosion due to vegetation clearing • Soil salinity • Waterlogging/flooding	DPIRD-064 Australian Soil Resource Information System (ASRIS, 2014).	Proposed clearing is unlikely to be at variance to this Principle

Principle (Schedule 5 of the EP Act)	Assessment	Data Source/Tools for Assessment	Outcome
likely to cause appreciable land degradation.	The Disturbance Footprint shows a relatively flat topography with distant undulation throughout the boundary ranging between 24 m AHD and 30 m AHD. Soil landscapes within the Project Area comprise 2 soil systems: the Pinjarra System, characterised by clayey to sandy alluvial soils with seasonal wet areas, and the Bassendean System, consisting of sand dunes and sandplains with deep pale sands and semi-wet to wet soils. ASS mapping by DWER shows the entirety of the Project Area is in Class 2 for ASS risk. Class 2 indicates the area has a low to moderate risk of ASS occurring within 3 m of the natural soil surface and a high risk occurring beyond 3 m. A Geotechnical Investigation and ASS risk assessment is being undertaken, the results of those investigations will be incorporated into the ASS and Dewatering Management plan required for the Project. The Project Area intersects the Cardup Brook - Minor Tributary that is perennial and is associated with REW (UFID: 14,540) and Manjedal Brook - Minor Tributary that is perennial and is associated with CCW (UFID: 14,945). There will be no clearance of vegetation associated to either of these watercourses/wetlands due to trenchless drilling and under boring underneath them. The proposed clearing of a maximum of 0.58 ha of vegetation along the 6 km alignment is unlikely to cause nutrient enrichment of the Peel Inlet - Harvey Estuary EPP, or any other degradation and isn't at variance with the objectives of SPP 2.9. This Project is for the construction of a pressure main connecting to a WWPS for the growing expansion of residential development in the Shire of Serpentine Jarrahdale and Mundijong Area. The Project is being developed to service residential expansion and not for ongoing agricultural purposes in the region, so aligns with the objectives of reducing nutrient export and the release of phosphorus into the Estuary. Due to the disturbance footprint having been historically cleared and currently comprised of degraded and completely degraded vegetation and non-native vegetation, additional clearing of scattered paddock trees and non-native vegetation along a 6 km alignment is unlikely to result in appreciable land degradation or expose large amounts of land to erosion considering its current condition Therefore, the proposed clearing within the disturbance footprint is unlikely to be at variance with this principle.	DWER-031 SPP 2.9	

Principle (Schedule 5 of the EP Act)	Assessment	Data Source/Tools for Assessment	Outcome
(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area	The DPLH dataset SPP 2.8 Bushland Policy for the Perth Metropolitan Region (SPP 2.8 policy) (DPLH-054) identifies Bush Forever Site 351 - Cardup Brook Bushland, Cardup / Peel Estate as intersecting the Project Area in the north central section of the Project Area. Bush Forever Site 351 is associated to the Cardup Brook that is a REW (UID: 14,540) and is a representation of ecological communities, rarity, general criteria for the protection of wetland, streamline and estuarine fringing vegetation and coastal vegetation. The Bush Forever Site 351 covers a total area of 10.75 ha, with approximately 0.05 ha located within the Project Area. Construction methodology of trenchless drilling and under boring where the Project Area intersects Bush Forever Site 351 has been implemented to avoid all direct impacts of vegetation clearance associated to the Bush Forever Site. Therefore, only potential indirect impacts remain including: • Alteration of groundwater levels and hydrological regime potentially leading to further impacts on linked surface water features associated to the Bush Forever Site. This may result from surface water and groundwater infiltration caused from trenchless drilling, under boring, drainage design, trenches, and other construction works. • Contamination of water quality and degradation of wetland features from under-boring approach through pollutant runoff such as chemical spills, and drilling fluids or lubricants. Impacts to water quality may include acidification, introduction of heavy metals, or increased salinity (e.g., upward leakage from deeper groundwater saline layers - if not managed adequately). • Increased stormwater runoff and/or disruption of natural flood regimes in the surrounding area Indirect impacts to the Bush Forever Site 351 such as sediment runoff and chemical spills during trenchless drilling and under boring works near the Bush Forever Site will be managed by erosion and sediment controls, contamination management, dewatering and ASS, and weed and disease management measures to be detailed and implemented in the ASS and Dewatering Management Plan, along with a CEMP. Therefore, the proposed clearing within the disturbance footprint is unlikely to be at variance with this principle.	DPLH-054 SPP 2.8	Proposed clearing is unlikely to be at variance to this Principle.

Principle (Schedule 5 of the EP Act)	Assessment	Data Source/Tools for Assessment	Outcome
(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.	The Project Area does not intersect any mapped protection Public Drinking Water Source Areas. The Project Area intersects the Cardup Brook - Minor Tributary that is perennial and is associated with REW (UFID: 14,540) and Manjedal Brook - Minor Tributary that is perennial and is associated with CCW (UFID: 14,945). The proposed design for the Project actively avoids direct impacts to these two wetlands by adopting trenchless drilling and under boring construction techniques whereby the pressure main will be buried beneath these watercourses and wetland areas. There are potential indirect impacts to the Cardup Brook and Manjedal Brook from dewatering activities required for the trenchless drilling and under boring required to avoid impacting vegetation associated to these watercourses. These construction activities do not require the clearance of any native vegetation. All potential indirect impacts associated to dewatering activities will be managed through the ASS and Dewatering Management Plan for the Project. Considering the extensive clearing and historical grazing that has occurred across the Project Area, it is likely that ground water recharge and surface hydrology has already been altered. The additional clearing of a small extent of native vegetation (0.58 ha) mainly comprised of scattered paddock trees along with temporary trenchless drilling up to a week maximum is considered unlikely to result in material changes to ground water levels and surface water features. Therefore, the proposed clearing is unlikely to be at variance with this principle.	Reconnaissance Flora, Vegetation and Targeted Fauna Report (WEPL, 2025) Public Drinking Water Source Area Map DWER-041	Proposed clearing is not at variance to this Principle.
(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.	The Project Area is mapped as intersecting a CCW and REW, and large proportion of the Project Area is mapped as two MUW's, underlined by soils with high waterlogging potentials. Seasonal inundation across the Project Area is evident given the low topography and nature of the wetlands. Given the Project Area has been historically cleared and extensively grazed, the hydrological regime has likely already been somewhat modified. The Disturbance Footprint primarily includes scattered trees across the Project Area, of all of which are outside of the mapped CCW and REW. Given vegetation condition across the Site is completely degraded to degraded, and is limited to scattered trees, the limited clearing of 0.58 ha is considered unlikely to increase waterlogging or cause localised flooding.		Proposed clearing is unlikely to be a variance to this Principle

Principle (Schedule 5 of the EP Act)	Assessment	Data Source/Tools for Assessment	Outcome
	The Department of Environment and Regulations document "a guide to the assessment of applications to clear native vegetation" states the following for Principle (j): "Consideration of this principle may require extensive modelling of the whole catchment and should only be considered for large clearing projects. For smaller applications, clearing should not cause waterlogging (localised flooding)." Clearing of 0.58 ha of vegetation within the Disturbance Footprint is considered a smaller clearing project, and is therefore unlikely to cause localised flooding. As a result, the proposed clearing is unlikely to be at variance with this principle.		

12. Conclusions

This supporting document has identified that the Project requires an NVCP under Part V of the EP Act for the clearing of 0.58 ha of native vegetation. This vegetation is comprised of:

- 0.58 ha of vegetation and trees; combination of riparian vegetation (VT01) and *Corymbia calophylla/Eucalyptus marginata* woodland (VT02). Of the 0.58 ha, 0.20 ha is Degraded and 0.50 ha is Completely Degraded.

- This vegetation type is considered to provide high to very high foraging value for all three black cockatoo species, and includes 41 potential nesting trees, none of which contain suitable nesting hollows. This vegetation type also provides 0.004 ha of supporting habitat for quenda.

The proposed clearing is not considered at variance with any of the Ten Clearing Principles, due to:

- Having a low level of biological diversity in the context of the surrounding area (with particular reference to values mapped within the Project Area).

- Having avoided any direct impacts to SCP3a and SCP20b present within the Project Area through trenchless drilling and under boring.

- No material impact to the maintenance of a vegetation complex.

- No impact to Threatened flora species.

- Having limited habitat values for black cockatoos:

    - 0.08 ha of suitable foraging habitat for BBC and CBC that is High to Very High quality (final habitat quality score of 0.08 ha is 10/10).

    - 0.10 ha of suitable foraging habitat for FRTBC that is Moderate - High to Very High quality (final habitat quality score of 0.02 ha is 8/10 and 0.08 ha is 10/10).

- No impact to mapped native wetland vegetation. Avoided direct impacts through trenchless drilling and under boring.

- No direct impacts to conservation areas. Avoided direct impacts to Bush Forever Site 351 through trenchless drilling and under boring.

- No long-term land degradation being expected.

- No expected impacts to groundwater quality or hydrological regime.

There are a number of potential indirect impacts to the two identified TECs within the Project Area, the CCW, REW and Bush Forever Site 351 due to dewatering requirements for trenchless drilling and under boring

construction methodologies being implemented at these locations. Trenchless drilling and under boring will be temporary and to a maximum of one week at each location. All potential indirect impacts will be managed through an ASS and Dewatering Management plan, and a CEMP.

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Appendix A - Reconnaissance Flora and Vegetation and Targeted Fauna Survey (WEPL, 2025)

Scott Road, Byford Flora and Fauna Survey

Flora, Vegetation, Fauna and Black Cockatoo Survey 2025

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Scott Road, Byford Flora and Fauna Survey

Flora, Vegetation, Fauna and Black Cockatoo Survey 2025

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Environmental Conclusions

In accordance with the scope of services, WEPL has conducted environmental field monitoring and/or testing in the preparation of this report. The nature and extent of monitoring and/or testing conducted is described in this report.

On all sites, varying degrees of non-uniformity of vertical and horizontal conditions in media (soil, water, air, waste or other media as described in the report) are encountered. Hence no monitoring, common testing or sampling technique can eliminate the possibility that monitoring or testing results/samples are not totally representative of media conditions encountered. The conclusions are based on the data and the environmental field monitoring and/or testing actually undertaken and are therefore merely indicative of the environmental condition of the site at the time of preparing this report, including the presence or otherwise of contaminants or emissions. It should be recognised that site conditions, including the extent and concentration of contaminants, can change.

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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.

Executive Summary

Cossil and Webley commissioned Western Environmental Approvals Pty. Ltd. (WEPL) to undertake biological surveys to support environmental approvals associated with a pipeline from Scott Road to Copper Road, Byford. This section of pipeline infrastructure is 7.4 km and runs from north to south along Hopkinson's and Taylor Road from Mundijong to Byford in the Perth metropolitan area. The Survey Area is located 44.7 km south of Perth, Western Australia. The Survey Area comprised a 30 m buffer each side of the pipeline infrastructure and covers 38.65 ha.

The scope of works included:

- A desktop assessment of relevant databases and previous surveys.
- A likelihood of occurrence (LoO) assessment for Threatened and Priority Flora, Communities and Fauna.
- A reconnaissance level flora and vegetation survey.
- Targeted surveys for Threatened and Priority flora.
- Targeted surveys for Threatened Ecological Communities (TECs) and Priority Ecological Communities (PECs).
- A basic fauna survey for Threatened or Priority fauna.
- A targeted black cockatoo habitat assessment.

Biological surveys were undertaken across six person days sampling flora, fauna and vegetation on 15 and 16 of July 2025.

Flora and Vegetation

Flora of Conservation Significance

No conservation significant flora were recorded or have previously been recorded within the Survey Area.

- Post-survey for all other species identified by the desktop assessment it was determined that the likelihood of these species being present within the Survey Area was low due to no suitable habitat being present within the Survey Area.

Threatened and Priority Ecological Communities

The pre-survey LoO assessment identified six TEC/PECs as having a high likelihood of occurrence and one as having a medium likelihood of occurrence. Two of these TECs, (the SCP20b *Banksia attenuata* and/or *Eucalyptus marginata* woodlands of the eastern side of the Swan Coastal Plain and SCP3a *Corymbia calophylla - Kingia australis* woodlands on heavy soils) have mapped occurrences or a buffer of mapped occurrences shown in DBCA database search results as intersecting the Survey Area.

The post-survey presence/absence assessment identified that two TECs are likely to be present within the Survey Area:

- SCP3a *Corymbia calophylla - Kingia australis* woodlands on heavy soils TEC.
- SCP20b *Banksia attenuata* and/or *Eucalyptus marginata* woodlands of the eastern side of the Swan Coastal Plain TEC.

SCP20b Banksia attenuata and/or Eucalyptus marginata woodlands of the eastern side of the Swan Coastal Plain

Patch 1 of banksia woodland (Bishop Road within VT03) has similarities in species composition to SCP20b. If FCT analysis was undertaken this patch of banksia woodland has potential to align with SCP20b. The FCT SCP20b has been previously identified 0.6 km to the east of the Survey Area.

SCP3a Corymbia calophylla - Kingia australis woodlands on heavy soils of the Swan Coastal Plain

There is one patch within the Survey Area within VT02 that is likely to be representative of SCP3a (Hopkinson's Road). The patch along Hopkinson Road, Byford is in Good condition and covers 0.2 ha. The patch along Hopkinson Road appears likely to be consistent with SCP3a with a 66% correlation to key indicator species. There is a patch along Orton Road that is Degraded and is not determined an occurrence of the TEC due to only 33% of the species listed as "typical and common" presented in Section 2 of the description of the ecological community in approved conservation advice within the relevé.

Banksia WL SCP Banksia Woodlands of the Swan Coastal Plain ecological community (EN)

Within the Survey Area two separate patches of potential Banksia Woodlands of the Swan Coastal Plain TEC (The Banksia Woodland TEC) were identified: one north, and one south. The assessment of these patches against the Conservation Advice for the Banksia Woodland TEC confirmed both patches do not meet TEC criteria within Commonwealth guidelines.

Vegetation of Other Significance

The remaining areas of vegetation for both the Pinjarra 968 vegetation association of Beard, and the Beermullah and Guildford Complexes are below the 30 % targets set by the Commonwealth government (DEH, 2001). As such, these are considered to be Endangered under the criteria outlined in Commonwealth of Australia (1997).

Fauna Habitat Significance

Nine habitat types were described within the Survey Area. The habitat comprises of a mixture of intact native woodland/wetlands and areas of planted trees and cleared paddocks.

The five species that are identified as having a high likelihood of occurrence were:

- *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo)—VU.
- *Zanda baudinii* (Baudin's black cockatoo)—EN.

- *Zanda latirostris* (Carnaby's black cockatoo)—EN.
- *Isoodon fusciventer* (quenda)—P4.
- *Falco peregrinus* (peregrine falcon) - OS

The Six species that had a medium likelihood of occurrence were:

- *Hydromys chrysogaster* (water-rat, rakali) - P4.
- *Phascogale tapoatafa wambenger* (south-western brush-tailed phascogale) - CD.
- *Synemon gratiosa* (Graceful sun moth) - P4
- *Westralunio carteri* (Carter's freshwater mussel) - VU
- *Lerista lineata* (Perth slider, lined skink) - P3
- *Neelaps calonotos* (Black-striped snake, black-striped burrowing snake) - P3

Black Cockatoo Habitat

The Survey Area falls within the Swan Coastal Plain which is within the modelled distribution range of all three species of black cockatoos: Baudin's black cockatoo (*Zanda baudinii*), Carnaby's black cockatoo *(Zanda latirostris*), forest red-tailed (*Calyptorhynchus banksii naso*) (DAWE, 2022). No known breeding sites are present within or immediately adjacent to the Survey Area. The nearest roost site is 1 km east of the Survey Areas (DBCA-064). No evidence of roosting was observed within the Survey Area.

Two potential nest tree was recorded within the Survey Area, both were checked with a drone

Two hundred and forty-seven potential nesting trees were recorded within the Survey Area.

Habitats within the Survey Area that contain suitable foraging habitat are scattered marri (FHT-03) and Banksia woodland (FHT-05). These habitats are characterised by foraging species for Baudin's, Carnaby's and forest red-tailed black cockatoo species including marri, jarrah, *Banksia attenuata*, *Banksia ilicifolia* and *Allocasuarina spp*. The remainder of the Survey Area comprised cleared areas with scattered individual flooded gums and non-native eucalypt species. which have a comparative low foraging habitat value.

Foraging habitat quality was rated using the Commonwealth Habitat Quality Scoring Tool (DCCEEW, n.d.). As per the Habitat Quality Scoring Tool areas with a site condition score of 2 or lower (low, negligible or none value) are "extremely unlikely to be considered as suitable habitat". These areas are therefore classified as not comprising suitable foraging habitat in this assessment. Foraging habitat quality extents within the Survey Area out of ten are:

- Baudin's black cockatoo: 0.63 ha (10/10), 0.21 ha (9/10), and 37.79 ha (Low 2 to None 0). Total of 0.83 ha of suitable foraging habitat and 37.79 ha of unsuitable foraging habitat.

- Carnaby's black cockatoo: 0.63 ha (10/10), 0.21 ha (9/10), and 37.79 ha (Low 2 to None 0). Total of 0.83 ha of suitable foraging habitat and 37.79 ha of unsuitable foraging habitat.
- Forest red-tailed black cockatoo: 0.63 ha (10/10), 0.02 ha (9/10), 0.04 ha (8/10), and 35.94 ha (Low 2 to None 0). Total of 0.69 ha of suitable foraging habitat and 35.94 ha of unsuitable foraging habitat.

No evidence of roosting was recorded. Within the Survey Area, fauna habitat types FHT-01 and FHT-03 provides the most suitable roosting habitat as they contain medium and large stands of eucalypts with medium canopies. Access to permanent water is within the Survey Area from the farm dams and drainage lines.

Acronyms and Abbreviations

Abbreviation	Full Title
BAM Act	*Biosecurity and Agriculture Management Act 2007*
BC Act	*Biodiversity Conservation Act 2016*
°C	Degree Celsius
CR	Critically Endangered
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEWHA	Department of the Environment Water Heritage and the Arts
DPIRD	Department of Primary Industries and Regional Development
DRF	Declared Rare Flora
DWER	Department of Water and Environmental Regulation
DWER	Department of Water and Environmental Regulation
EIA	Environmental Impact Assessment
EN	Endangered
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ESA	Environmentally Sensitive Area
FCT	Floristic Community Type
GDE	Groundwater Dependent Ecosystem
GIS	Geographic Information System
GPS	Global Positioning System
ha	Hectare
IBRA	Interim Biogeographic Regionalisation for Australia
IBSA	Index of Biodiversity Surveys for Assessments
km	Kilometres
m	Metres
MA	Marine
MI	Migratory
MNES	Matters of National Environmental Significance
NVIS	National Vegetation Information System
OS	Other Specially Protected
P	Priority
PEC	Priority Ecological Community

Abbreviation	Full Title
PF	Priority Flora
PMST	Protected Matters Search Tool
T	Threatened
TEC	Threatened Ecological Community
TPFL	Threatened and Priority Flora Database
TPFRF	Threatened and Priority Flora Report Forms
VU	Vulnerable
WA	Western Australia
WAH	Western Australian Herbarium
WC Act	*Wildlife Conservation Act 1950*
WEPL	Western Environmental Approvals Pty Ltd
WoNS	Weeds of National Significance

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1. Introduction

1.1 Project Background

Western Environmental Approvals Pty Ltd (WEPL) was commissioned by Cossil & Webley to undertake biological surveys to define environmental values present at Scott Road (the Survey Area) and collect baseline data that will support an Environmental Assessment Report (EAR).

A preliminary site walkover and high-level environmental constraints analysis was conducted by WEPL on April 26, 2024. Based on the findings of this exercise, WEPL concluded that a detailed flora and vegetation survey was not required. Instead, a reconnaissance-level survey was recommended, with the provision for a targeted spring survey if any threatened flora were identified as potentially occurring within the Survey Area.

1.2 Location

The Survey Area follows the route of the proposed pipeline from Scott Road to Copper Road, Byford. This section of pipeline infrastructure is 6.25 km and runs from north to south along Hopkinson's and Taylor Road from Mundijong to Byford in the Perth metropolitan area. The Survey Area is located 44.7 km south of Perth, Western Australia (WA). The Survey Area comprised a 30 m buffer each side of the pipeline infrastructure and covers 38.65 ha (Figure 1).

1.3 Objective and Scope of Work

The objective of the survey was to define key flora, vegetation, fauna, and black cockatoo habitat values within the Survey Area.

The scope of work included:

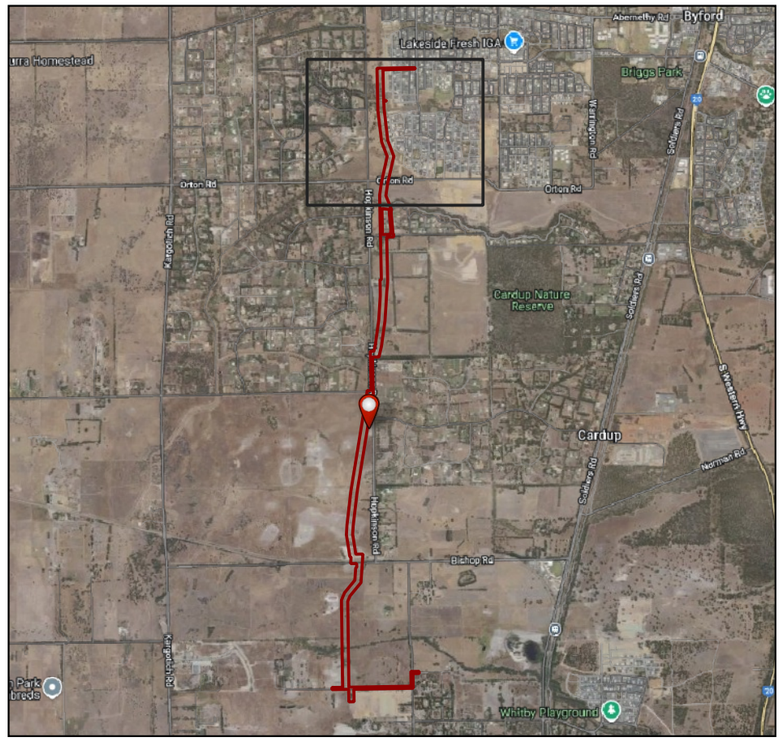
- A desktop assessment to consider abiotic and biotic values of the Site, including potentially significant environmental values. This included a review of publicly available data, published information, and searches of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) Protected Matters Search Tool (PMST), and database records held by the Department of Biodiversity, Conservation and Attractions (DBCA).

- Field surveys to comprise the following:

    - Reconnaissance level vegetation unit delineation and mapping: National Vegetation Information System (NVIS) Level V will be utilised for structural description of vegetation units and mapping (NVIS Technical Working Group 2017). Vegetation units will be interpreted and delineated in the field using structural and composition types, with boundaries drawn on aerial imagery.

  - Vegetation condition mapping and delineation: Vegetation condition will be determined according to the condition rating scale as per the EPA's Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016).
  - Establishment of relevés in each vegetation unit to sample and describe structure and key/dominant species present.
  - Preparation of a flora inventory of common and key/dominant species.
  - Plants will be collected for expert identification if they are unknown to the field botanist or have potential to be of conservation significance and will be processed according to Western Australian Herbarium protocols.
  - Weeds of National Significance (WoNS) and declared pests will be recorded.
  - Basic Fauna Survey.
  - Black Cockatoo Habitat Assessment.
- Preparation of a technical report detailing the findings of the desktop assessment and field surveys.
- Preparation of a geospatial data package prepared in accordance with Index of Biodiversity Surveys for Assessments (IBSA) requirements.





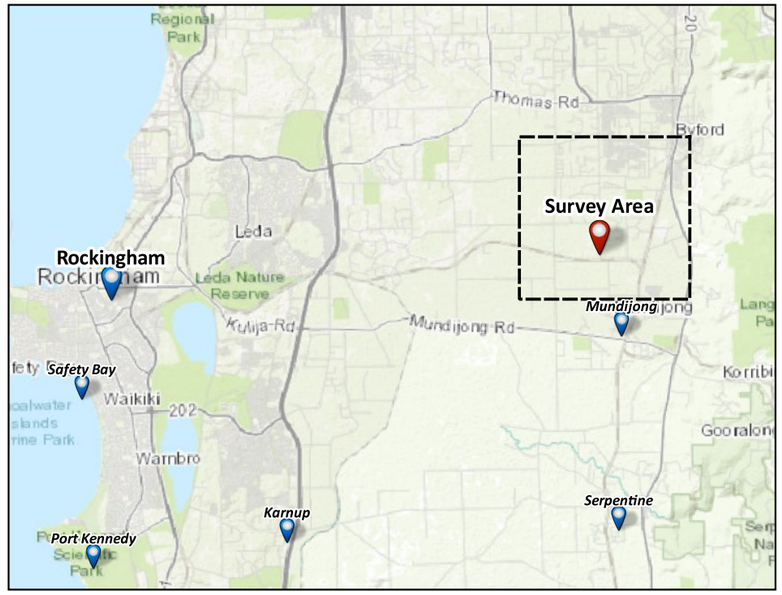


Figure 1a: Survey Area

N

0 90 180 270 360 m

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NOTES:

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

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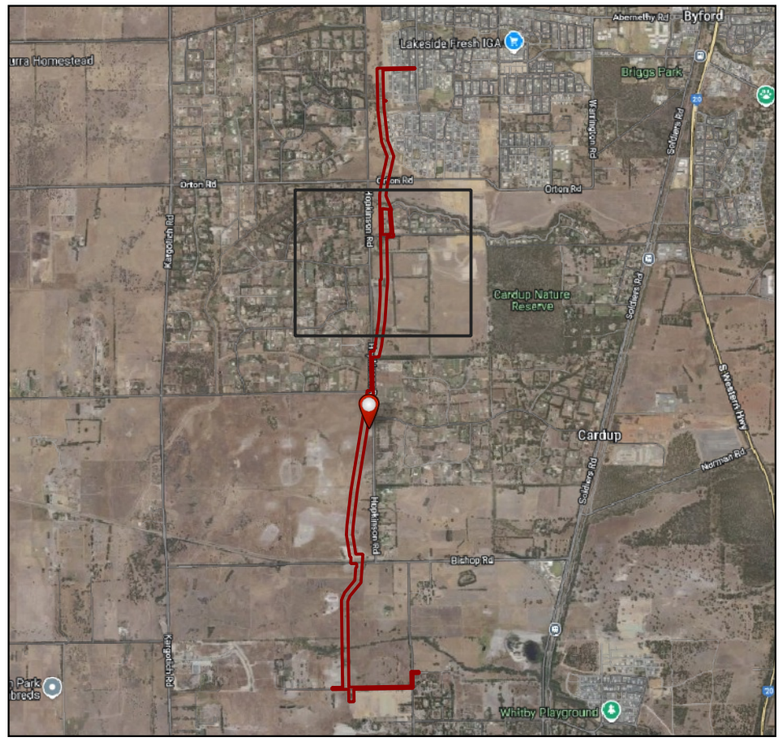
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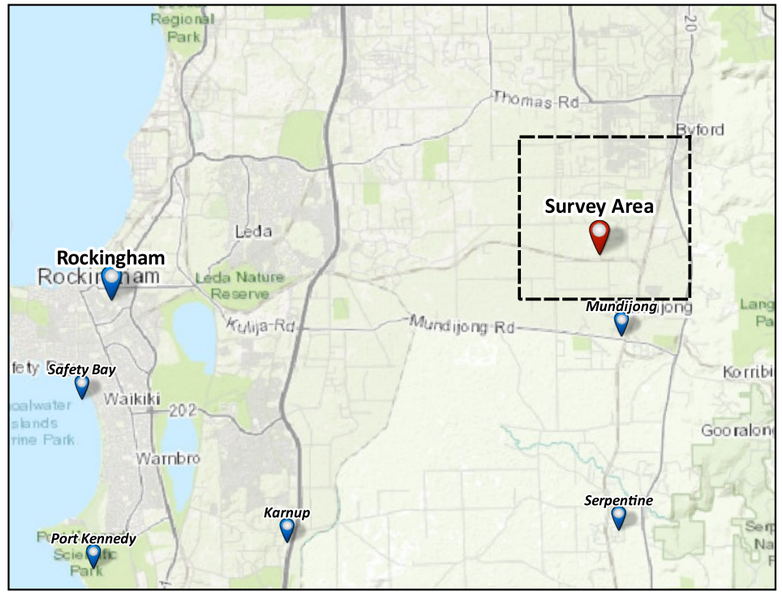


Figure 1b: Survey Area

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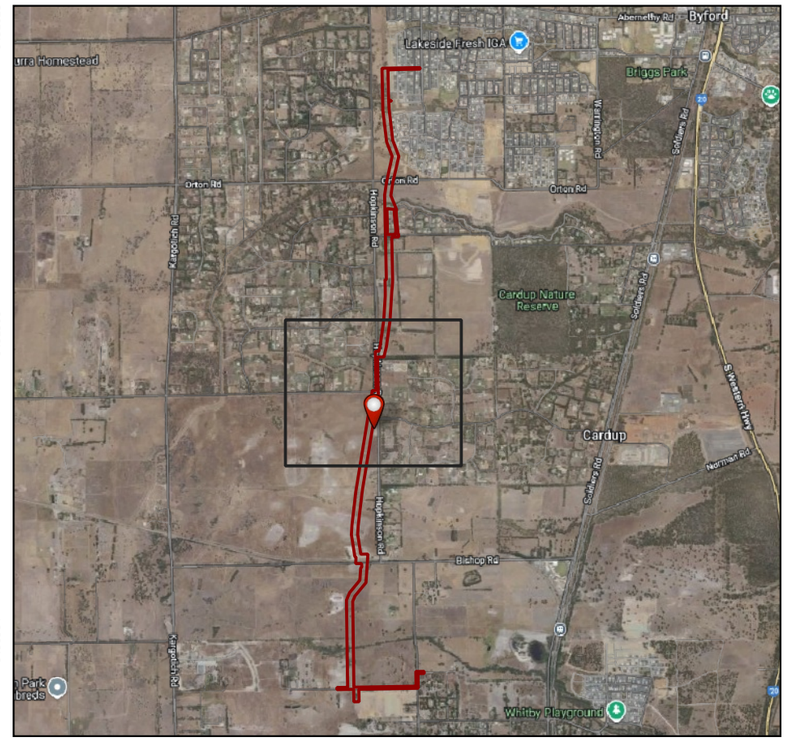
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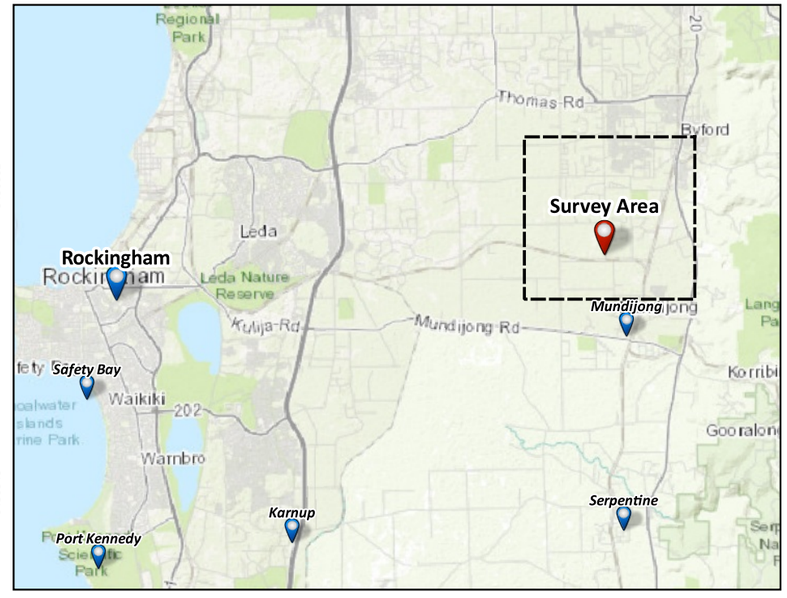


Figure 1c: Survey Area

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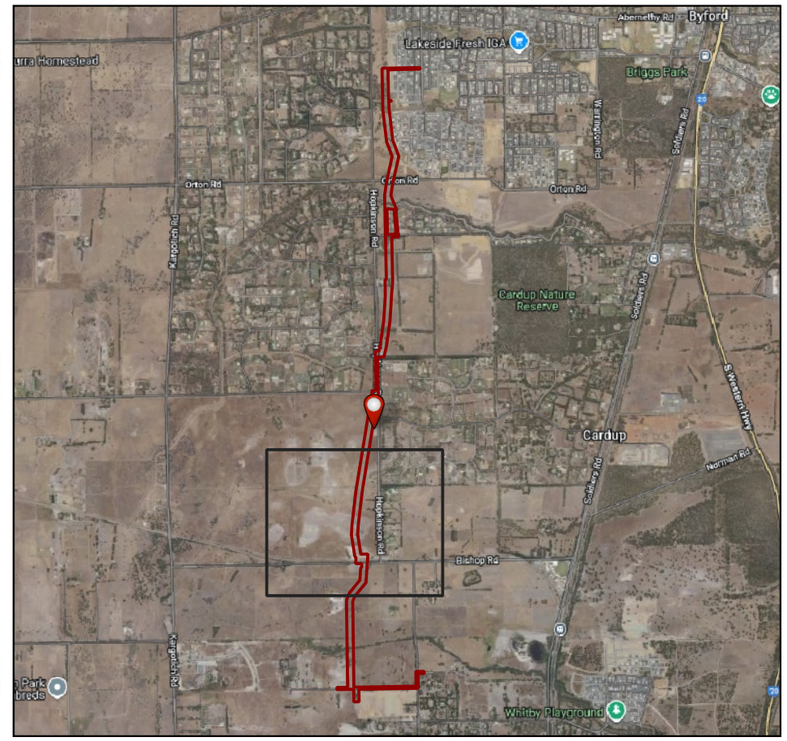
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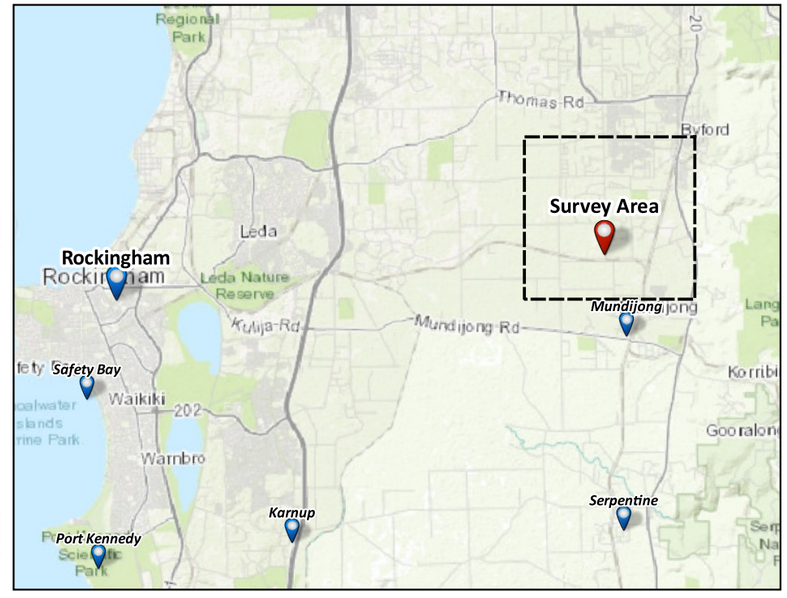


Figure 1d: Survey Area

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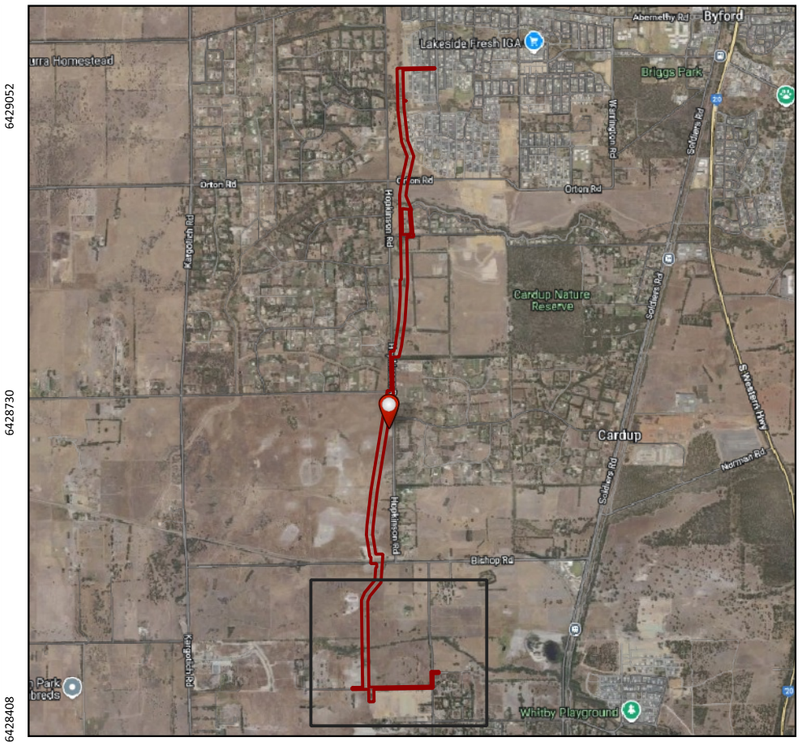
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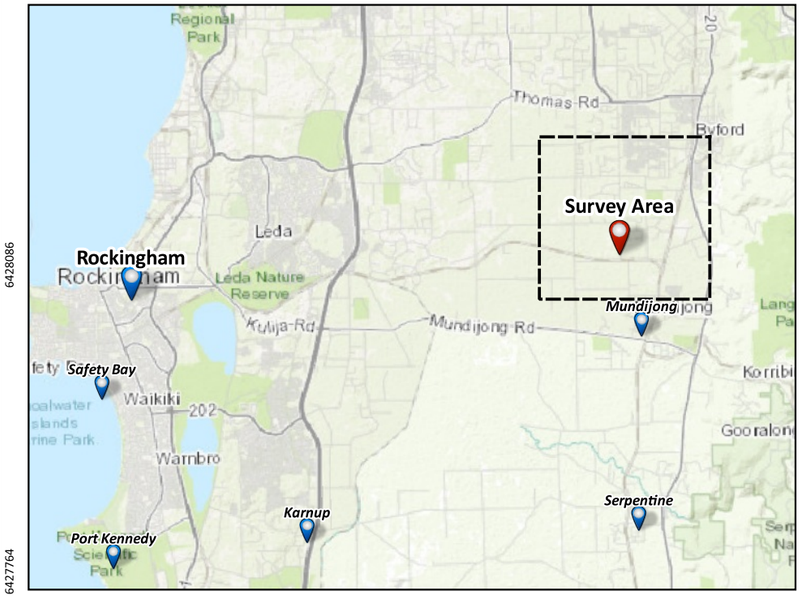


Figure 1e: Survey Area

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VERSION	0
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1.4 Relevant Legislation and Guidance

This environmental assessment was conducted in accordance with Commonwealth and State legislation and guidelines:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- Western Australian *Environmental Protection Act 1986* (EP Act).
- Western Australian *Biodiversity Conservation Act 2016* (BC Act).
- Western Australian *Biodiversity Conservation Regulations 2018*.
- Department of the Environment (DotE). (2013). *Matters of National Environmental Significance - Significant Impact Guidelines 1.1 - EPBC Act.*
- Department of the Environment Water Heritage and the Arts (DEWHA). (2010). *Survey Guidelines for Australia's Threatened Birds.*
- WA EPA. (2016). *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment.* Known herein as the 'Flora and Vegetation Technical Guidance.'
- WA EPA. (2020*). Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment.* Known herein as the 'Fauna Technical Guidance'.
- Department of Climate Change, Energy, Environment and Water (DCCEEW) (2022). *Referral Guidelines for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed black cockatoo*.
- Department of Biodiversity Conservation and Attractions (DBCA). (2023*). Draft: Methods for survey and identification of Western Australian Threatened Ecological Communities.* Communities and Communities Program, DBCA.
- Department of Agriculture, Water and the Environment (was DAWE, now DCCEEW). (2022*). Referral Guideline for 3 WA Threatened Black Cockatoo Species.*
- Department of Climate Change Energy, the Environment and Water (DCCEEW, see above) (2023-unpublished resource). *Habitat Scoring System for WA black cockatoo foraging habitat'* (the Habitat Quality Scoring Tool)

A short description of key legislation is provided in Appendix A. Other definitions, including species and ecological community conservation categories, are provided in Appendix B.

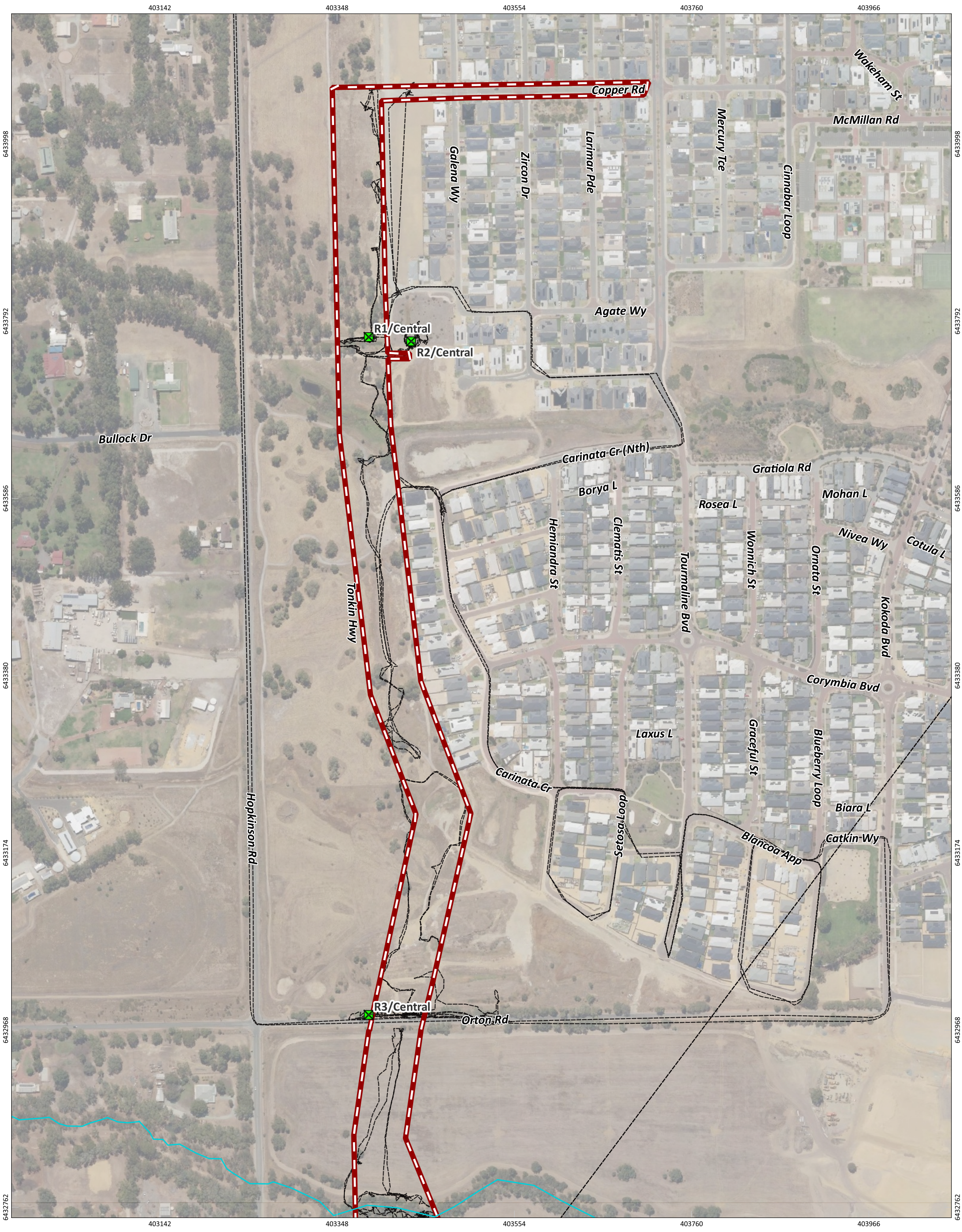
1.5 Survey Limitations and Constraints

Limitations and constraints of the fauna, flora and vegetation survey as outlined in the Flora and Vegetation Technical Guidance and Fauna Survey Technical Guidance (EPA, 2016) are detailed in Table 1.

Table 1: Limitations and Constraints of the Flora, Vegetation and Fauna Survey

Possible Limitation	Degree of Limitation (Significant, Moderate or Negligible)	Potential Constraints on Survey Outcomes
Survey Level/ Scope	Negligible	The Reconnaissance flora and vegetation survey was undertaken outside of the optimal survey season, with aim to assess habitat suitability for Threatened and Priority flora and ecological communities. The scope was deemed appropriate given the degraded condition of the Survey Area and the level of investigation for the project. The basic fauna survey and targeted assessment of black cockatoo habitat was considered suitable based on species expected to be present and the extent and condition of the vegetation/habitat present within the Survey Area. The level of information collected during the surveys were suitable to provide information required to inform and support approvals and referrals.
Availability of contextual information at a regional and local scale	Negligible	All data required to complete the scope of works including regional and local contextual information was available. DBCA data was requested as part of the desktop assessment.
Site Access	Negligible	The entirety of the Survey Area was readily accessed by vehicle and on foot
Survey Intensity and Extent	Negligible	Suitable survey effort by experienced ecologists was applied within the proposed survey level/scope. Survey effort included: • Two (2) two-person days sampling for flora and vegetation assessment • Eight relevés were sampled • Two (1) one-person days sampling of basic fauna survey and black cockatoo assessment See Figure 2 for botanical survey effort, tracklogs and sampling locations. Survey effort for the Black Cockatoo Habitat Survey included an assessment of every tree with a suitable diameter at breast height (DBH) to support black cockatoo breeding, as well as an assessment of all areas of potential foraging and roosting habitat within and immediately adjacent to the Survey Area boundary. All planned Survey Areas were adequately sampled in line with the project scope of works.
Experience	Negligible	The ecologist leading the flora and vegetation field survey (Daniel Rubick) has been conducting flora and vegetation surveys in WA for over four years, with over four years' experience in the Swan Coastal Plain bioregion. The ecologist leading the fauna field survey (Jack Rogers) has been conducting cockatoo targeted assessments in WA as well as Targeted Ornithological Surveys in the UK, with over four years' experience. Back-office support was

Possible Limitation	Degree of Limitation (Significant, Moderate or Negligible)	Potential Constraints on Survey Outcomes
		provided by senior ecologists who have worked in the region for over ten years.
Timing, weather, season	Not significant	The out of season Reconnaissance flora and vegetation survey was completed in July and aimed to assess habitat suitability for Threatened and Priority Flora and Ecological Communities. The timing and weather experienced during Reconnaissance survey present a limitation as most Threatened and Priority Flora species identified within the desktop assessment were not flowering at the time of survey. Given the degraded condition of the Survey Area and the high level of disturbance, the likelihood of occurrence of these species was found to be low due to a lack of habitat being present. Timing of the survey is therefore not considered a significant limitation. The Targeted black cockatoo survey was undertaken in July which is within the recommended timing for both foraging and breeding habitat for Baudin's black cockatoos (March to April, August to January breeding), Carnaby's black cockatoo (year-round foraging, July to December breeding) and Forest red-tailed black cockatoo (year-round) (DCCEEW, 2022a). Targeted searches were undertaken for secondary evidence of the species presence (i.e. foraging evidence which can be done at any time of year) and to evaluate the potential suitability of the habitat. The temperatures and weather experienced during the fauna field surveys were not considered a limitation and did not affect the ability to record fauna or habitats.
Proportion of the flora and fauna recorded and/or collected, and any identification issues	Negligible	A total of 92 vascular flora species were recorded, including 34 introduced species. The number of species recorded was low to moderate relative to the extent of the area surveyed. This is attributed to the historic clearing and current agricultural grazing in the Survey Area, resulting in limited remnant vegetation. These factors were not considered a limitation to the survey as they reflect the existing condition of the Survey Area. Species sampling was in line with the Flora and Vegetation Technical Guidance for a reconnaissance level flora and vegetation, and the Fauna Technical Guidance for basic fauna and targeted black cockatoo habitat assessment. Surveyors were able to accurately identify all vertebrate fauna species observed during the survey. Invertebrate species were not identified to species and are not included in the species inventory in Appendix F
Mapping Reliability	Negligible	The majority of the Survey Area was traversed by foot and mapping reliability is considered high. Mapping accuracy and reliability was not considered a limitation.
Disturbances (fire, flood etc.)	Negligible	Areas of disturbance associated with historic clearing for agricultural and weeds were recorded but were not a constraint on the results of the survey.



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Figure 2a: Flora and Vegetation Survey Effort and Sampling Locations

N

0 30 60 90 120 m

PROJECT/REPORT NAME: Biological Survey Report Scott Road WWPS to Byford		
SCALE: 1:4,112	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A24.032	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW	DRAWN BY / REVIEWED BY: MD/JR	DATE: 26/9/2025

Legend

- Survey Area
- Tracks
- Quadrat Releve

Hydrography Linear (Hierarchy) (DWER-031)

- Minor Tributary

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	26/9/2025

NOTES:

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

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Figure 2b: Flora and Vegetation Survey Effort and Sampling Locations

N

0 30 60 90 120 m

SCALE: 1:4,112	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A24.032	VERSION: 0
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PROJECT/REPORT NAME: Biological Survey Report
Scott Road WWPS to Byford

Legend

- Survey Area
- Tracks
- Quadrat Releve

Hydrography Linear (Hierarchy) (DWER-031)

- Minor Tributary

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	26/9/2025

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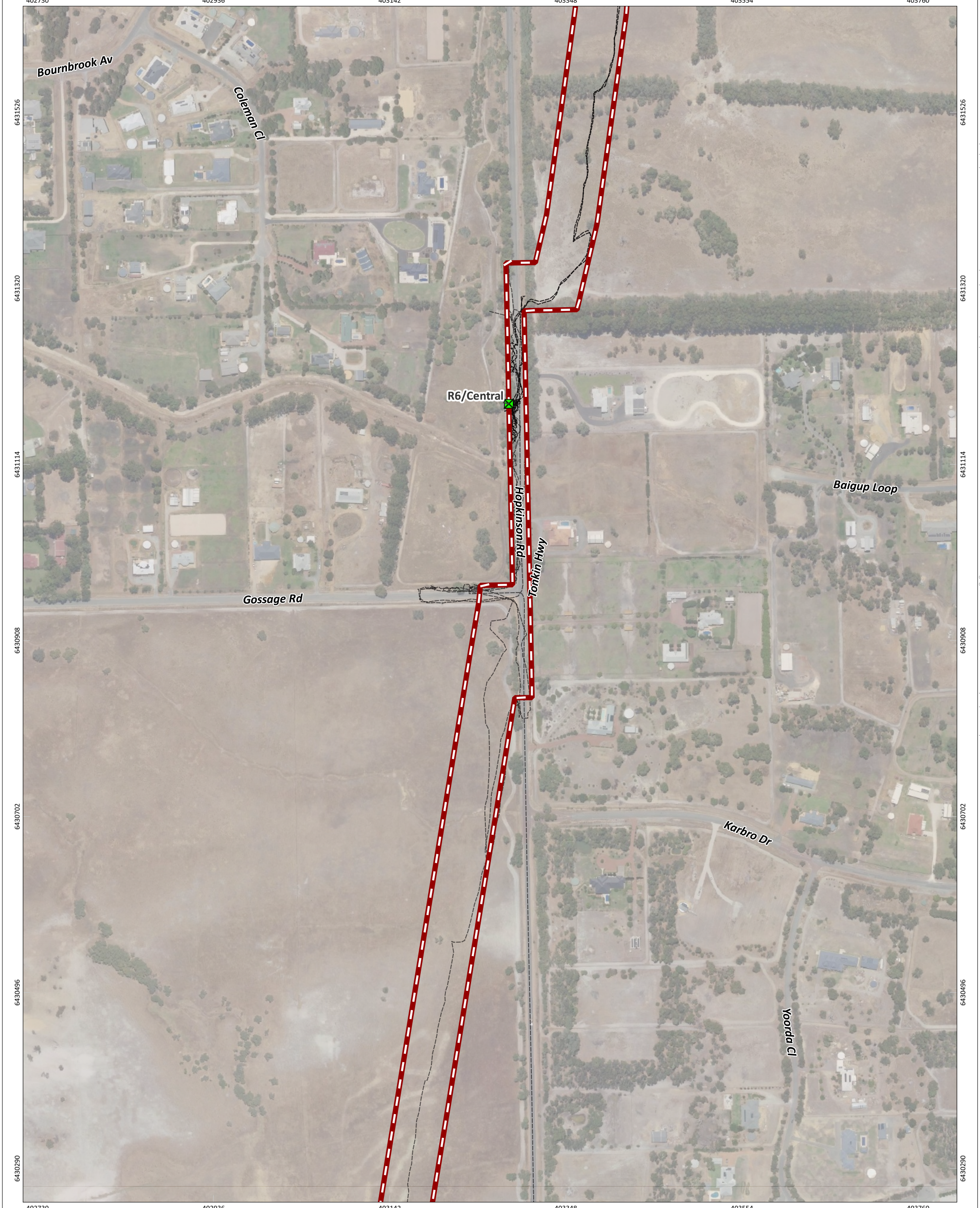


Figure 2c: Flora and Vegetation Survey Effort and Sampling Locations

0 30 60 90 120 m

N

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	26/9/2025

Legend

- Survey Area
- Tracks
- Quadrat Releve

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	26/9/2025

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Figure 2d: Flora and Vegetation Survey Effort and Sampling Locations

N

0 30 60 90 120 m

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SCALE: 1:4,112	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A24.032	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW	DRAWN BY / REVIEWED BY: MD/JR	DATE: 26/9/2025

Legend

- Survey Area
- Tracks
- Quadrat Releve

No	Description	Drawn	Approved	Date
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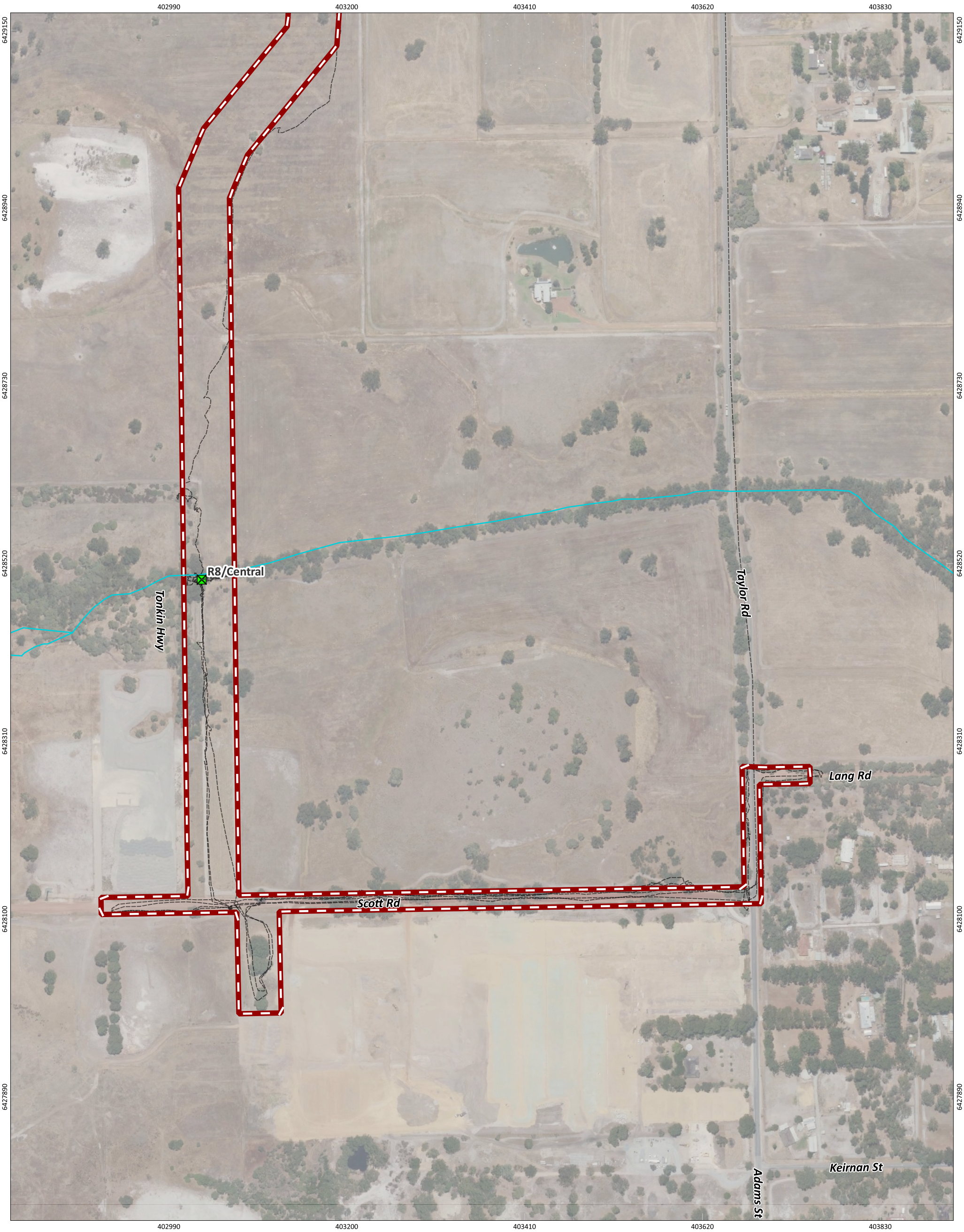


Figure 2e: Flora and Vegetation Survey Effort and Sampling Locations

N

0 30 60 90 120 m

PROJECT/REPORT NAME: Biological Survey Report Scott Road WWPS to Byford			
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COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A24.032	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW		DRAWN BY / REVIEWED BY: MD/JR	DATE: 26/9/2025

Legend

- Survey Area
- Tracks
- Quadrat Releve

Hydrography Linear (Hierarchy) (DWER-031)

- Minor Tributary

No	Description	Drawn	Approved	Date
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2. Existing Environment

2.1 Climate and Rainfall

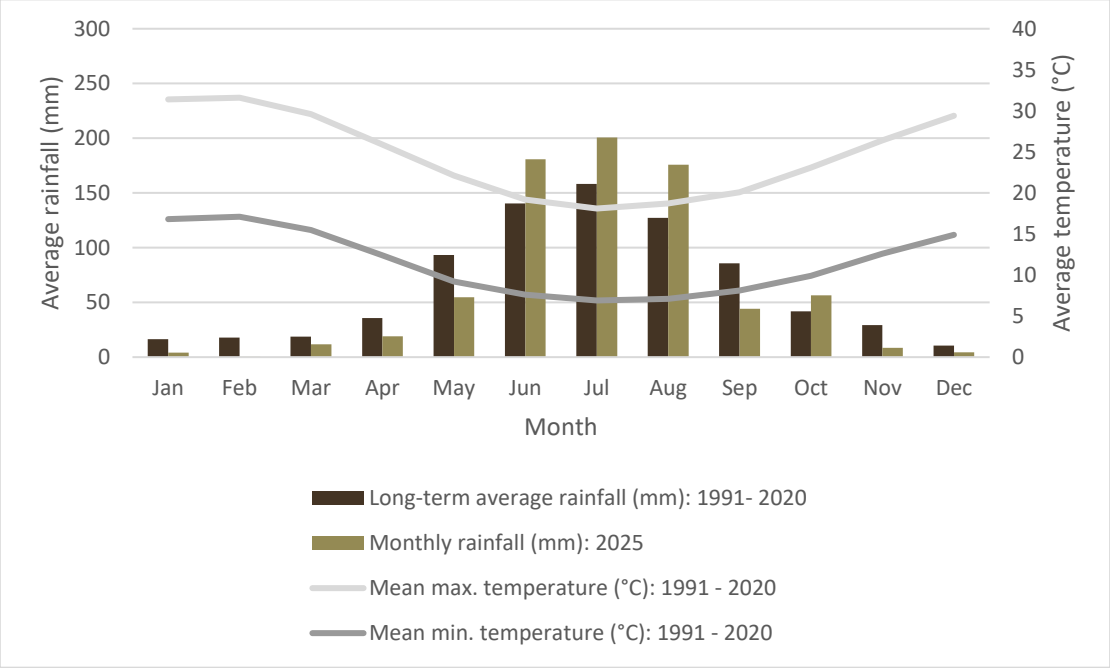
The Survey Area is located within the Swan Coastal Plain (SCP). J. S. Beard (1990) described the climate of the area as warm Mediterranean, with cool wet winters (May to September) and warm dry summers.

Climate results are presented using the closest long-term Bureau of Meteorology (BoM, 2025) weather station with a complete dataset. The station utilised for the Survey Area was Jandakot Aero (Station 009172). The data was sourced on the 15th of July 2025.

Climate statistics were calculated utilising data from the most current climate normal, which is defined as a 30-year interval (BoM, 2007), where possible. A climate normal is a period long enough to include year-to-year variations while avoiding the influence of longer-term changes in climate.

The long-term mean minimum temperature for Jandakot Aero ranges from 6.9 C (July) to 17.1 C (February) (1991-2020) and the long-term mean maximum temperature ranges from 18.1 C (July) to 31.6 C (February).

The Jandakot Aero WA weather station recorded 760.2 mm of rainfall in the 12 months prior to the flora survey (July 2024 to June 2025), which is 15.2 mm below the long-term average of 775.4 mm (BoM 2025). In the three months prior to the survey (April to June 2025), 254.4 mm of rainfall was recorded, which is 15.2 mm below the long-term average of 269.6 mm for the same time period (BoM, 2025).



Graph 1: Long-term and Monthly Total Rainfall, Maximum and Minimum Temperature for Jandakot Aero (Station 009172) (BoM, 2025)

2.2 Interim Biogeographic Regionalisation for Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (Commonwealth of Australia, 2012). The Survey Area occurs within the Swan Coastal Plain Biogeographic Region, Perth subregion (SWA02).

2.3 Geology and Soils

The soil landscape mapping units (DPIRD-027) intersecting the Survey Areas are listed below in Table 2 shown in Figure 3.

Table 2: Geology Systems Intersecting the Survey Area (DPIRD-027)

Mapping Unit Symbol	Map Unit Name	Description
212Bs__B1	Bassendean B1 phase	Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands sometimes with a pale-yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2 m, banksia dominant
212Bs_B2	Bassendean B2 phase	Flat to very gently undulating sandplain with well to moderately well drained deep bleached grey sands with a pale-yellow B horizon or a weak iron-organic hardpan 1-2 m.
212Bs__B3	Bassendean B3 phase	Closed depressions and poorly defined stream channels with moderately deep, poorly to very poorly drained bleached sands with an iron-organic pan, or clay subsoil. Surfaces are dark grey sand or sandy loam.
212Bs__B4	Bassendean B4 phase	Broad poorly drained sandplain with deep grey siliceous sands or bleached sands, underlain at depths generally greater than 1.5 m by clay or less frequently a strong iron-organic hardpan.
212Bs__B6	Bassendean B6 phase	Sandplain and broad extremely low rises with imperfectly drained deep or very deep grey siliceous sands.
213Pj__B1	Pinjarra, B1 phase	Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands sometimes with a pale-yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2 m; banksia dominant.
213Pj__B2	Pinjarra, B2 phase	Flat to very gently undulating sandplain with well to moderately well drained deep bleached grey sands with a pale-yellow B horizon or a weak iron-organic hardpan 1-2 m.
213Pj_P1b	Pinjarra P1b phase	Flat to very gently undulating plain with deep acidic mottled yellow duplex (or effective duplex) soils. Moderately deep pale sand to loamy sand over clay: imperfectly drained and moderately susceptible to salinity in limited areas.
213Pj__P1c	Pinjarra P1c phase	Flat to very gently undulating plain with deep acidic mottled yellow duplex (or "effective duplex") soils. Deep pale brown to yellowish sand to sandy loam over clay; imperfectly drained and moderately susceptible to salinity in limited are.
213Pj__P1d	Pinjarra P1d phase	Flat to very gently undulating plain with deep acidic mottled yellow duplex (or effective duplex) soils. Shallow pale sand to sandy loam over clay; imperfect to poorly drained and moderately susceptible to salinity.

Mapping Unit Symbol	Map Unit Name	Description
213Pj__P1e	Pinjarra P1e phase	Flat to very gently undulating plain with deep acidic mottled yellow duplex (or effective duplex) soils. Shallow pale sand to sandy loam over very gravelly clay; moderately well drained.
213Pj__P3	Pinjarra P3 phase	Flat to very gently undulating plain with deep, imperfect to poorly drained acidic gradational yellow or grey-brown earths and mottled yellow duplex soils, with loam to clay loam surface horizons.
213Pj_P9	Pinjarra P9 phase	Shallowly incised stream channels of minor creeks and rivers with deep acidic mottled yellow duplex soils.

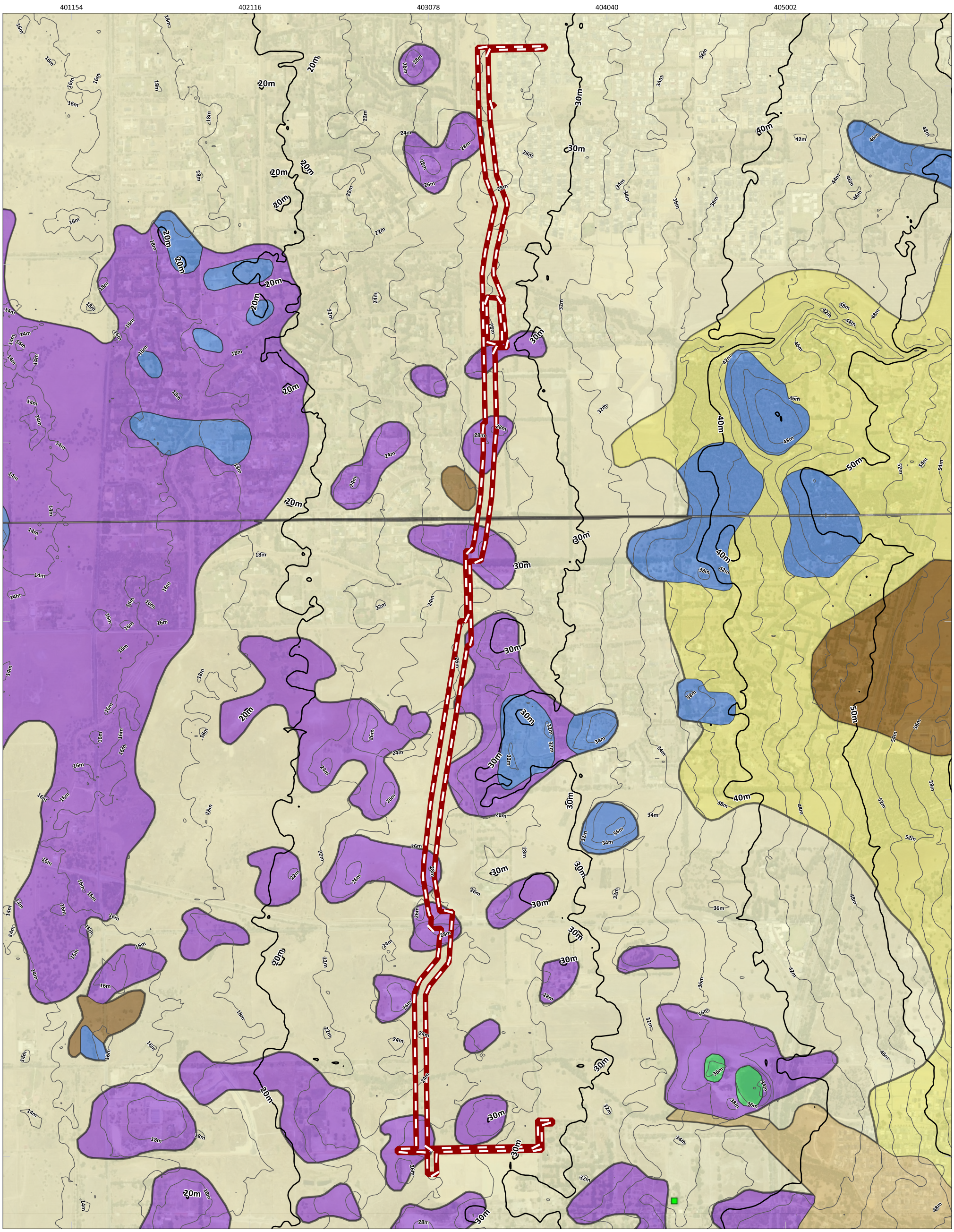


Figure 3: Surface Geology (Soils) and Topography

0 200 400 600 m

N

PROJECT/REPORT NAME: Biological Survey Report Scott Road WWPS to Byford		
SCALE: 1:19,250	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A24.032	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW	DRAWN BY / REVIEWED BY: MD/JR	DATE: 7/11/2025

Legend

SurveyArea

2 metre contours (DPIRD-072)
- 2m Contour
- 10m Contour

Minedex (DMIRS-001)
- SPECIALITY METAL

GSWA - Code
- Cs
- Csg
- FS1
- FS2
- Msc1
- S10
- S8
- Sp1

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	7/11/2025

NOTES:

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2.4 Pre-European Vegetation

2.4.1 Vegetation Association Mapping

During the 1970s, John Beard and associates conducted a systematic survey of native vegetation, describing the vegetation systems in WA. Beard (1981) mapped the vegetation of the Swan Coastal Plain at 1:1,000,00 scale. This mapping described two broad vegetation units for the Survey Area.

Beard's mapping attempted to depict the native vegetation as it was presumed to be at the time of settlement and is known as the pre-European vegetation type and extent. Beard's vegetation maps are maintained in digital form by the Department of Primary Industries and Regional Development (DPIRD, 2019) in dataset DPIRD-006. Extents are updated periodically by DBCA. The representative vegetation associations within the Survey Area is the Pinjarra association. (Table 3 and Figure 4).

Table 3: Pre-European Vegetation Intersecting the Survey Area (DPIRD-006)

Vegetation Association	Description	Original Extent (ha)	Current Extent (ha)	% Remaining	% Managed for Conservation
Pinjarra_968	Medium woodland; jarrah, marri & wandoo	135,999.02	8,996.33	6.61%	1.19%

2.4.2 Vegetation Complex Mapping

Regional vegetation for the Swan Coastal Plain was mapped at vegetation complex level by Heddle *et al*. (1980) at a scale of 1:250,000 and are maintained in digital form by DBCA (DBCA-046, 2019). According to this data (DBCA-046), the Survey Area is primarily representative of the Guildford vegetation complex (Figure 4). The current extents of the Heddle (1980) vegetation complex are presented in Table 4(DBCA 2019).

Table 4: Pre-European Vegetation Complex Representation (DBCA-046, 2019)

Vegetation Complex	Description	Original Extent (ha)	Current Extent (ha)	% Remaining	% Managed for Conservation
Beermullah Complex	Mixture of low open forest of *Casuarina obesa* (Swamp Sheoak) and open woodland of *Corymbia calophylla* (Marri) - *Eucalyptus wandoo* (Wandoo) - *Eucalyptus marginata* (Jarrah). Minor components include closed scrub of *Melaleuca* species and occurrence of *Actinostrobus pyramidalis* (Swamp Cypress).	6,707.27	447.21	6.67%	2.13%

Vegetation Complex	Description	Original Extent (ha)	Current Extent (ha)	% Remaining	% Managed for Conservation
Guildford Complex	A mixture of open forest to tall open forest of *Corymbia calophylla* (marri) - *Eucalyptus wandoo* (wandoo) - *Eucalyptus marginata* (jarrah) and woodland of *Eucalyptus wandoo* (wandoo) (with rare occurrences of *Eucalyptus lane-poolei* [salmon white gum]). Minor components include *Eucalyptus rudis* (flooded gum) - *Melaleuca rhaphiophylla* (swamp paperbark).	90,513.13	4,607.91	5.09%	0.33%

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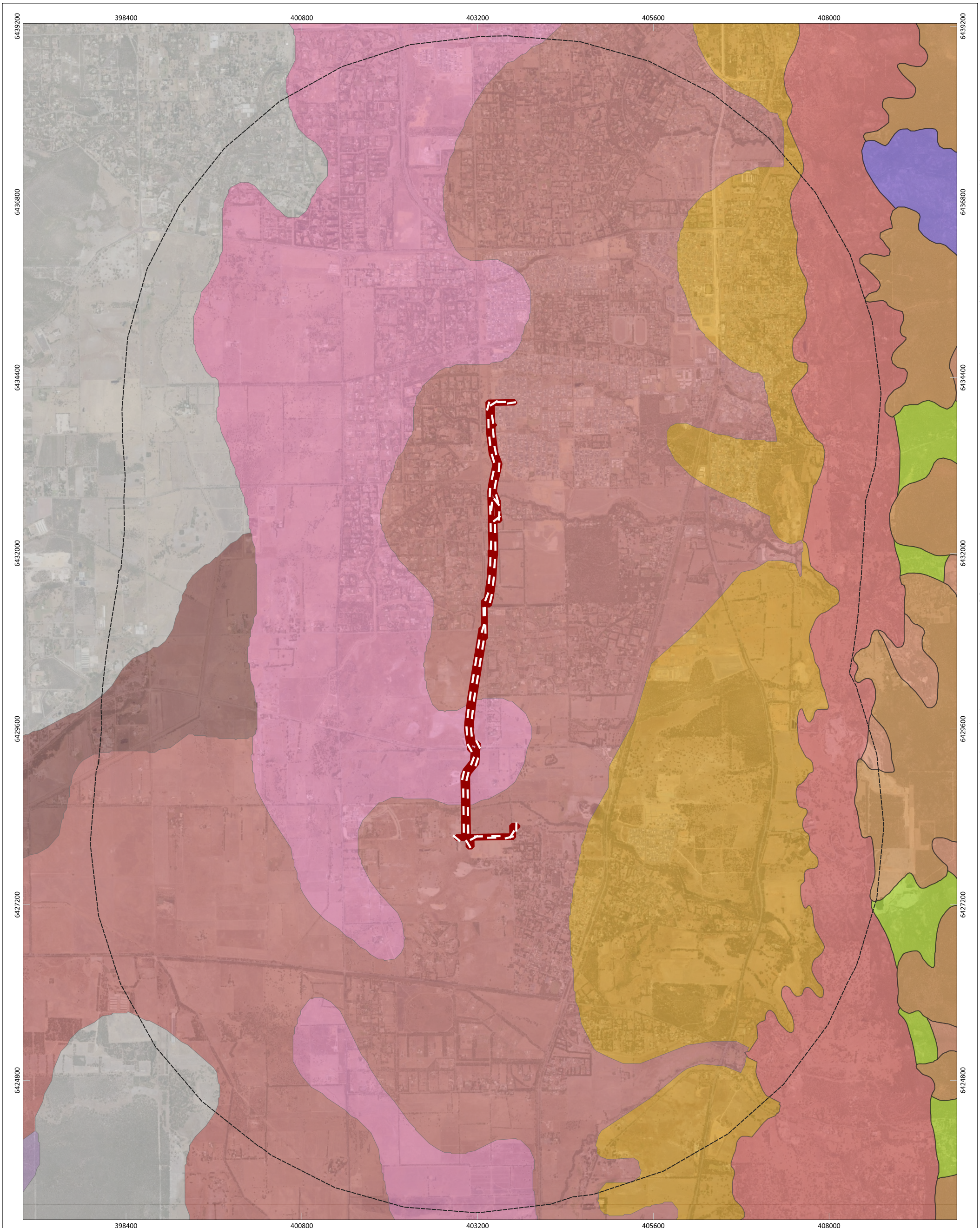


Figure 4: Vegetation Complexes

0 400 800 1,200 1,600 m

N

SCALE: 1:48,000	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A24.032	VERSION: 0
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PROJECT/REPORT NAME: Biological Survey Report
Scott Road WWPS to Byford

Legend

- Survey Area
- 5km Buffer

Vegetation Complexes - Swan Coastal Plain (DBCA-046)

- Bassendean Complex-Central and South
- Guildford Complex
- Dardanup Complex
- Serpentine River Complex
- Beermullah Complex
- Forrestfield Complex

Vegetation Complexes - South West forest region of Western Australia (DBCA-047)

- Darling Scarp, DS2
- Dwellingup, D2
- Helena 1, He1
- Murray 1, My1
- Yarragil 1, Yg1

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	22/9/2025

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2.5 Environmentally Sensitive Areas

Two Environmentally Sensitive Areas (ESAs), as defined under Clearing Regulations - Environmentally Sensitive Areas (DWER-046) (Accessed on 15th July 2025), intersect the Survey Area, shown in Figure 5:

- The northern portion of the Survey Area overlaps an ESA that is classified an ESA due to the values associated with Bush Forever Site 351 (Cardup Brook), as per Bush Forever Sites (DPLH-019, 2019).
- The southern portion of the Survey Area overlaps and ESA that is classified an ESA due to the values associated with Conservation Category Wetland (CCW) (UID 14,945).

2.6 Wetlands and Hydrology

The Survey Area is traversed by two drainage lines identified under *Geomorphic Wetlands, Swan Coastal Plain (*DBCA -019, 2025) which run east to west through the northern and southern sections:

- Cardup Brook - Minor Tributary.
- Manjedal Brook - Minor, Non-perennial.

Wetlands associated with these features include:

- UID 14,540 - categorised as a creek and mapped as an Resource Enhancement Wetland (REW).
- UID 14,945 categorised as palusplain and mapped as a CCW.

The remainder and majority of the Survey Area, not classified as a drainage line, REW or CCW is comprised of Multiple Use Wetlands (MUWs) split into two features:

The remainder—and majority—of the Survey Area is mapped as MUWs, comprising:

- UID 16,021 – palusplain.
- UID 16,189 – palusplain.

Locations of wetlands and hydrological features within and adjacent to the Survey Area are shown Figure 6. The Survey Area does not intersect with any wetlands listed under the *Directory of Important Wetlands in Australia* (DBCA-045, 2018).

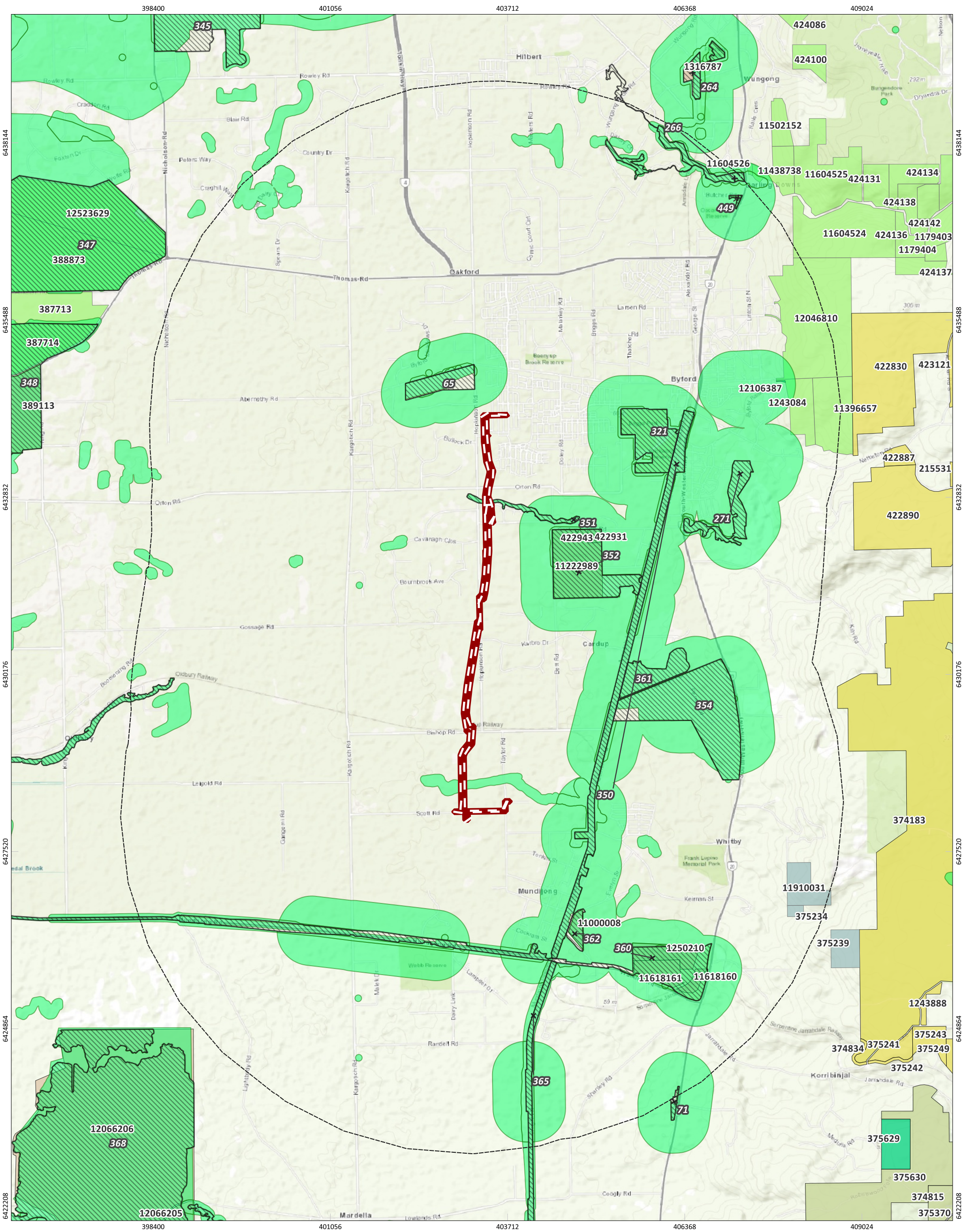


Figure 5: Environmentally Sensitive Areas, Conservation Estate and Bush Forever

N

0 400 800 1,200 1,600 m

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:53,117
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	ESRI Topographic Map
DRAWN BY / REVIEWED BY	MD/JR
DATE	22/9/2025

Legend

- Survey Area
- 5km Buffer
- Bush Forever Areas - 2000 (DPLH-019)
- Clearing Regulations - Environmentally Sensitive Areas (DWER-046)

DBCA - Legislated Lands and Waters (DBCA-011)

- National Park
- Nature Reserve
- Conservation Park
- Section 5(1)(h) Reserve
- State Forest
- Crown Freehold - Dept Managed

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	22/9/2025

NOTES:

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

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Environmentally Sensitive Areas, Wetlands and Conservation Estate

DBCA - Legislated Lands and Waters (DBCA-011) within map extent

Pin	Reserve Class	Reserve Name	Name Status	Tenure Classification
387714				Crown Freehold - Dept Managed
424144				Crown Freehold - Dept Managed
424131				Crown Freehold - Dept Managed
424086				Crown Freehold - Dept Managed
424141				Crown Freehold - Dept Managed
424138				Crown Freehold - Dept Managed
424142				Crown Freehold - Dept Managed
387713				Crown Freehold - Dept Managed
424100				Crown Freehold - Dept Managed
388873				Crown Freehold - Dept Managed
1179403				Crown Freehold - Dept Managed

References
Department of Biodiversity, Conservation and Attractions, (2022a). Legislated Lands and Waters (DBCA-011) - Accessed on 22/9/2025 from https://services.slip.wa.gov.au/public/rest/services/SLIP_Public_Services/Property_and_Planning/MapServer
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Department of Water and Environmental Regulation, (2022). Clearing Regulations - Environmentally Sensitive Areas (DWER-046). Accessed on 22/9/2025 from https://catalogue.data.wa.gov.au/dataset/clearing-regulations-environmentally-sensitive-areas-dwer-046

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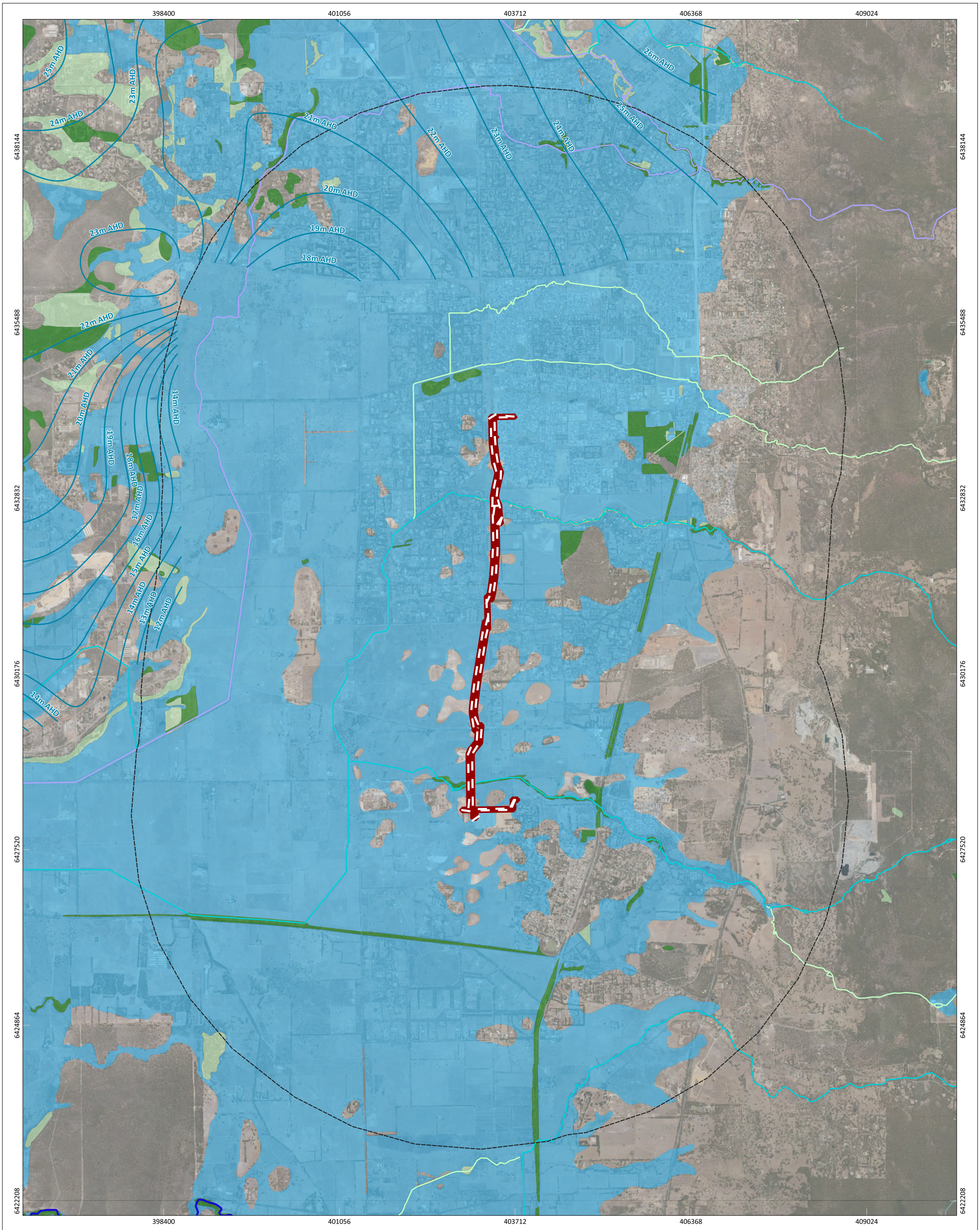


Figure 6: Surface Water Features and Geomorphic Wetlands

N 0 400 800 1,200 1,600 m		PROJECT/REPORT NAME: Biological Survey Report Scott Road WWPS to Byford	
SCALE: 1:53,117	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A24.032	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW		DRAWN BY / REVIEWED BY: MD/JR	DATE: 23/9/2025

Legend

- Survey Area
- 5km Buffer

Geomorphic Wetlands, Swan Coastal Plain (DBCA-019)

- Conservation
- Multiple Use
- Not Applicable
- Resource Enhancement

Hydrography Linear (Hierarchy) (DWER-031)

- Mainstream
- Minor River
- Significant Stream
- Major Tributary
- Minor Tributary
- Insignificant Tributary
- Infrastructure

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	23/9/2025

NOTES:

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

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3. Methodology

3.1 Desktop Assessment

3.1.1 Database Searches

A search of database records held by DBCA was undertaken to compile a list of conservation significant flora, fauna, and ecological communities previously recorded within or surrounding the Survey Areas (Table 5). In addition, a search of the EPBC Act Protected Matters Search Tool (PMST) was undertaken to identify potential Matters of National Environmental Significance (MNES) within or surrounding the Survey Areas (DCCEEW, 2024).

Table 5: Database Searches

Database Name	Date Received and Reference Number	Search Type	Search Area
DBCA Threatened and Priority Fauna database search	16/05/2025 24-0524FA	Threatened and Priority Fauna	10 km buffer around the Survey Areas
DBCA Threatened and Priority Flora database search	16/05/2025 31-0524FL	Threatened and Priority Flora	10 km buffer around the Survey Areas
DBCA Threatened and Priority Ecological Communities database search	16/05/2025 15.0524EC	Threatened and Priority Ecological Communities	10 km buffer around the Survey Areas
Protected Matters Search Tool (DCCEEW, 2025)	16/05/2025	Commonwealth listed Threatened flora, fauna and Threatened Ecological Communities	10 km buffer around the Survey Areas

3.1.2 Likelihood of Occurrence

Conservation significant flora, fauna and ecological communities identified from the desktop assessment were assessed to determine their likelihood of occurrence within the Survey Area, both before and after the field survey. The assessment was completed based on the likelihood of occurrence criteria presented in Table 6.

Only species that were either recorded within the Survey Area or considered to have a high or medium likelihood of occurrence during the post field survey assessment will be discussed in detail. Species that were classified as having a low likelihood of occurrence will not be discussed unless a justification for this classification is required.

Species listed as marine only under the EPBC Act (e.g. sharks, whales, turtles), and pelagic seabirds, have been excluded from the likelihood of occurrence list as there is no marine habitat present within or near the Survey Area. The likelihood of occurrence assessment is contained within Appendix C.

Table 6: Likelihood of Occurrence Criteria

Likelihood	Criteria
Recorded	Recorded in the Survey Area from database searches, previous survey by others or by current survey.
High	**Flora and Communities** Suitable habitat for flora or communities occurs within the Survey Area; and • Records of flora or community <2 km from the Survey Area, with record <30 years old. **Fauna** Records of fauna species <10 km from the Survey Area. With record <20 years old; or • For species with well understood and specific habitat preference/ requirements, when specific habitat is present in the Survey Area, and records present <10 km from the Survey Area. • Species with general habitat preference, which is present in the Survey Area, and records present <5 km from the Survey Area.
Medium	**Flora and Communities** Suitable or marginally suitable habitat occurs within the Survey Area; and • Records of flora or community <5 km from the Survey Area. • Species or community is strongly linked to a specific habitat, which occurs within the Survey Area and records are present <10 km from the Survey Area. **Fauna** There are records <10 km from the Survey Area, however: • The species is strongly linked to a specific habitat, which is marginally suitable or small in extent in the Survey Area; or • Species has a general habitat preference, but small extent of suitable habitat is present. There is suitable habitat in the Survey Area, but records are >10 km from Survey Area.
Low	• Records are historical only or are pre mapping procedures (e.g. records assigned to towns or place names). • The species has a well understood and specific habitat preference/ requirements, which is absent from the Survey Area; or • Suitable habitat is present, however there are no existing records of the species from the region despite reasonable previous search effort; or • There is some suitable habitat in the Survey Area, however the species is very infrequently recorded in the locality (e.g. migratory bird species).

3.2 Flora and Vegetation Survey

3.2.1 Field Survey and Timing

The field survey was conducted over two days by the survey team listed in Table 7. The survey was conducted during the Autumn flowering period for the region which was adequate for a Reconnaissance level flora survey (EPA, 2016).

Table 7: Survey Team and Timing

Name	Position and years of Experience	DBCA Licence No.	Survey Dates
Dan Rubick	Senior Botanist, 4 years	FB62000688	15th and 16th of July, 2025
Jayga Littlefair	Graduate Botanist	FB62000863	15th and 16th of July, 2025

3.2.2 Floristic Sampling

A Reconnaissance level survey was undertaken to describe the values within the Survey Area. This included several sampling techniques as described below. All sampling methodologies were undertaken as per the Flora and Vegetation Technical Guidance (EPA, 2016). Data was collected on a Samsung Galaxy Active 5 tablet using QField software with proprietary layers.

Relevé Sampling

A total of eight non-permanent flora relevés were established within the Survey Area. A relevé is an unbounded sample of varying size generally focussed on a discrete stand of vegetation.

The following information was collected from within each relevé:

- Observer.
- Date.
- Relevé/site number.
- Global Position System (GPS) location (GDA2020; accuracy +/- 0.5 m) at the centre of the relevés.
- Digital photograph (spatially referenced with a reference number), taken from the north-west, looking diagonally across the relevés.
- Broad soil type and colour.
- Topography.
- List of flora species recorded with height and total foliar cover within the relevés for each species.

- National Vegetation Information System (NVIS) Vegetation description (NVIS Technical Working Group, 2017).
- Vegetation condition (using scale of Keighery, 1994, as reproduced in EPA, 2016)

The data collected in the relevés are provided in Appendix D. Survey effort, including sampling locations and track logs, is presented in Figure 2.

Opportunistic Sampling

Species that were not captured in the relevés were recorded and collected opportunistically to ensure all species within the Survey Area were captured. The full flora inventory is provided in Appendix E as a Site by Species Matrix.

3.2.3 Flora Taxonomy and Lodgement of Specimens

Where plant taxa could not be identified in the field, specimens were collected for identification using resources of the Western Australian Herbarium (WAH). Identification of flora collections were completed by Daniel Rubick and non-typical specimens were submitted to the WAH and confirmed by WAH taxonomist (M. Hislop).

The finalised species list was checked against FloraBase (Western Australian Herbarium, 2025) to determine the conservation status and known distribution of each taxon. Introduced species were compared against the current Biosecurity and Agriculture Management Act 2007 (BAM Act) Declared Pest list (DPIRD, 2022) and the list of Weeds of National Significance (WoNS) (DCCEEW, 2022a) to determine their control status.

3.2.4 Vegetation Description and Classification

Vegetation was described from relevés, using the height and estimated cover of dominant and characteristic species of each stratum based on NVIS, recorded at Level V (NVIS Technical Working Group, 2017). Up to three species per stratum (upper, mid and ground) were used to formulate vegetation descriptions for each relevé and each vegetation type. Vegetation types were defined by observation of species dominance and structural composition by the field survey team.

3.2.5 Vegetation Condition Assessment

Vegetation condition mapping was undertaken as per the requirements of the Flora and Vegetation Technical Guidance (EPA, 2016). The delineation and mapping of vegetation condition within the Survey Area included critical review of sampling data (relevés and mapping notes), vegetation mapping, and aerial photography (i.e. delineation of tracks and cleared areas). Polygon boundaries for vegetation condition were digitised using QGIS.

3.3 Identification and Assessment of Significant Vegetation

3.3.1 Identification of Threatened and Priority Ecological Communities

The presence of Threatened and Priority ecological communities was assessed in accordance with the following:

- *Methods for survey and identification of Western Australian threatened ecological communities* (DBCA, 2023a).
- Comparison of species to the Gibson *et al.* (1994) report and Keighery *et al.* (2012) reports, particularly the list of taxa presented in Appendix 1 of Gibson *et al.* (1994).
- Priority Ecological Communities for Western Australia version 35. (DBCA, 2023b).
- Where applicable, Commonwealth Approved Conservation Advice including Listing Advice was also applied for EPBC Act listed communities.

3.3.2 Banksia Woodland of the Swan Coastal Plain TEC

The presence and distribution of the Banksia Woodland of the Swan Coastal Plain TEC ('Banksia Woodland TEC') was determined as per the diagnostics presented in Section 2 of the Department of the Environment and Energy (DotE; 2016). This process includes:

- Determining if the key diagnostic characteristics are present.
- Determining the condition of the patch/es.
- Determining if the patch/es size meets the minimum size (ha) requirements.
- Review of patch/es in surrounding context to determine if patch meets condition thresholds.

3.4 Basic Fauna Survey

The basic fauna survey incorporated a number of survey techniques as per the Fauna Technical Guidance (EPA, 2020). A basic survey is a low-intensity survey, conducted at the local scale to gather broad fauna and habitat information. The primary objectives are to verify the overall adequacy of the desktop study, and to map and describe habitats, with a focus on habitat for conservation listed fauna.

Fauna species were identified by active searches, secondary evidence such as scats, tracks, calls, remains, diggings and other signs. A fauna inventory was not compiled as part of this survey (not required under basic level survey protocol), however observations are used to inform the fauna habitat type assessment.

Potential habitats for conservation listed species were identified and evaluated and the likelihood of occurrence of the taxa assessed. See Table 8 below for survey team and timing.

Table 8: Fauna Survey Team and Timing

Name	Position and years of Experience	Survey Dates
Jack Rogers	Environmental Scientist, 4 years	15th and 16th of July, 2025

3.4.1 Fauna Habitat Type Assessment

The fauna habitat types present within the Survey Area were defined considering landform, vegetation, structure such as rockpiles and logs, and fauna assemblage occupying the area.

The following information was used to define and map all fauna habitat types within the Survey Area at specific fauna habitat assessment points and during traverses of the Survey Area:

- Land systems and landform.
- Vegetation type and condition mapping.
- Soil characteristics.
- Structure such as rockpiles and logs.
- Fauna assemblage information from desktop assessment and field observations.
- Aerial imagery and historic imagery.
- Each fauna habitat type was described considering suitability for various fauna species groups or conservation listed species. In addition, the fauna habitat type's likelihood to harbour specialised fauna species which are not found in adjacent areas was taken into consideration. Habitat types were delineated in the field and digitised upon return from the field survey.

3.4.2 Fauna Taxonomy

Terrestrial vertebrate fauna taxa were identified in the field by an experienced ecologist.

Taxonomy and nomenclature follow the WA Museum checklist 2024 (Western Australian Museum [WAM], 2024). Conservation status follows the DBCA Threatened and Priority fauna list (DBCA, 2025a). Where required verification of identification of secondary evidence (tracks, scats, diggings) may be undertaken by a relevant species group expert.

An inventory of all vertebrate species identified by the field team within the Survey Area is presented in Appendix F.

3.5 Targeted Black Cockatoo Survey

3.5.1 Black cockatoo Habitat Assessment

The Survey Area falls within the Swan Coastal Plain which is within the modelled distribution range of Baudin's black cockatoo (*Zanda baudinii*), Carnaby's black cockatoo (*Zanda latirostris*) and forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) (DCCEEW, 2022a).

The Swan Coastal Plain is used by Carnaby's black cockatoos for foraging, with some patches of breeding within the Swan Coastal Plain from July to December (DCCEEW, 2022a). Vegetation used by Carnaby's black cockatoo is dominated by *Banksia* spp. and Tuart (*Eucalyptus gomphocephala*) woodlands, as well as marri (*Corymbia calophylla*), with jarrah (*E. marginata*) in the east Swan Coastal Plain. (DCCEEW, 2022a).

Within the eastern and southern portion of the Swan Coastal Plain, Baudin's black cockatoos can be observed foraging from March to September. Vegetation used by Baudin's black cockatoo is dominated by marri and native proteaceous plant species (*Banksia* ssp.) including hakea species, but rarely jarrah (DCCEEW, 2022a). Breeding for Baudin's black cockatoo typically occurs in the southern jarrah forest but may also occur in the southern Swan Coastal Plain (DCCEEW, 2022a).

Within the Swan Coastal Plain, forest red-tailed black cockatoo can be flexibly observed year-round, most commonly present from January through to July, some individuals remain present all year round. Vegetation used by forest red-tails are primarily the seeds of jarrah and marri woodlands and forests, *Allocasuarina* cones, fruits of snotty-gobble (*Persoonia longifolia*), blackbutt, bullich, *Hakea* spp., tuart and some introduced eucalyptus such as river red gum (DCCEEW, 2022a). Breeding may occur in locations containing suitable breeding tree species, including the Perth Metropolitan area (DCCEEW, 2022a).

The timing of the survey in July 2025 provided good opportunity to record foraging individuals and early nesting for all three species of black cockatoos. If no individuals are present, searching for foraging evidence is a reliable alternative as it will generally persist in the landscape (particularly marri nut chews) for up to two years (DCCEEW, 2022a).

The Black cockatoo habitat field survey followed the Commonwealth *Referral Guideline for 3 WA Threatened Black Cockatoo Species* (DCCEEW, 2022a) for identifying breeding, foraging and roosting habitat.

Breeding Habitat Assessment

DCCEEW (2022) defines breeding habitat as that which contains known, suitable or potential nesting trees, and which occurs within the range of the species. Terminology used in this report for breeding habitat trees follows that defined in the glossary of DCCEEW (2022) as shown in Table 9.

Table 9: Breeding Habitat Terminology

Breeding Habitat Term	Definition (DCCEEW, 2022a)
Known nesting trees	Trees (live or dead but still standing) which contains a hollow where black cockatoo breeding has been recorded or which demonstrates evidence of breeding (i.e. showing evidence of use through scratches, chew marks or feathers).
Suitable nesting trees	Trees with suitable nesting hollows present, although no evidence of use.
Suitable nesting hollows	Any hollow with dimensions suitable for use for nesting by black cockatoos. See Table 10 for further discussion on nesting hollow characteristics.
Potential nesting trees	Trees that have a suitable Diameter at Brest Height (DBH) to develop a nest hollow, but do not currently have hollows. For most species of trees, suitable nest hollows are only found in live trees with a DBH of at least 500 mm.

In addition to the Commonwealth's guideline for assessing breeding habitat trees, a scoring system based on that developed by Dr Mike Bamford (referred to as Bamford Class) was applied to class breeding habitat trees. The alignment of the Bamford Class with the DCCEEW (2022a) breeding habitat terminology is detailed in Table 10.

Table 10: Black Cockatoo Potential Breeding Tree Class

Bamford Class	Description of Tree and Hollows/Activity	Alignment with DCCEEW (2022a) Breeding Habitat Terminology
1	Active nest observed; adult (or immature) bird seen entering or emerging from hollow, eggs present.	Known nesting tree
2	Hollow of suitable size and angle visible with chew marks attributed to Black Cockatoo nesting activity around entrance.	Known nesting tree
3	Potentially suitable hollow visible but no chew marks present; or potentially suitable hollow present if from ground-based assessment only (as suggested by structure of tree, such as large, vertical trunk broken off at a height of >10 m with thin rim).	Suitable nesting tree
4	Tree with hollows or broken branches that might or do contain hollows, but hollows or potential hollows are not of a suitable size, or are aligned or obstructed so as to prevent access	Potential nesting tree
5	Tree lacking large hollows or broken branches that might have large hollows; a tree with more or less intact branches and a spreading crown.	Potential nesting tree

Trees that were identified to contain potentially suitable hollows present were inspected using a pole camera or small drone to inspect hollow internal dimensions. Hollow information that was recorded included:

- Size of entry.
- Estimated depth.
- Hollow type (knot, fissure, spout, vertical/chimney.
- Suitability for use.
- Evidence of use.
- Presence of other birds or bees.

Foraging Habitat Assessment

DCCEEW (2022) defines foraging habitat as areas including plants of species known to support foraging within the range of each black cockatoo species. Marri (*Corymbia calophylla*) and jarrah (*Eucalyptus marginata*) woodlands are particularly important to Baudin's and Forest red-tailed black cockatoos, while proteaceous heaths (shrublands dominated by banksia, hakea and grevillea species) are also utilised by Carnaby's black cockatoo (DCCEEW, 2022a).

The potential of the habitat within the Survey Area to support foraging was described, and any evidence was recorded, along with opportunistic sightings of any black cockatoo individuals.

Habitat mapping of the Survey Area was used in conjunction with the site assessment to determine the foraging quality using the Foraging Habitat Scoring Tool (DCCEEW, 2022a).

The Foraging Habitat Scoring Tool (DCCEEW, 2022a) is applied once only for an entire site. A secondary assessment was undertaken using the 'Habitat Scoring System for WA black cockatoo foraging habitat' (the Habitat Quality Scoring Tool) provided by DCCEEW in 2023 as an unpublished source. The Habitat Quality Scoring Tool produces a score of 0-7 for site condition and may be applied to each identified fauna habitat type. An overall site context score of 0-3 is then added. See Appendix G for detailed scoring tool methodologies.

As per the Habitat Quality Scoring Tool areas with a site condition score of 2 or lower (foraging condition low, negligible or none) are "extremely unlikely to be considered as suitable habitat". These areas are therefore classified as not comprising suitable foraging habitat in this assessment.

Roosting Habitat Assessment

Roosting habitat was assessed based on the observation of roosting or roosting evidence recorded during survey and based on habitat suitability (generally tall trees in the landscape in proximity to a water source). During the field survey, searches were conducted for evidence of roosting (e.g. piles of scats, feeding debris or chewed trees).

4. Results

4.1 Desktop Assessment

4.1.1 Flora Desktop Assessment

The DBCA database and EPBC Act PMST searches identified 66 conservation listed flora species as occurring within 10 km of the Survey Area. These species are either found within 10 km of the Survey Area or have the potential to occur in the region as identified by PMST searches. See Figure 7.

There are no significant flora points that have been identified previously within the Survey Area. See Appendix C for full database search results and likelihood of occurrence assessment.

Pre-Survey Likelihood of Occurrence

The pre-survey likelihood of occurrence assessment identified that of the 66 conservation listed flora species identified:

- Fourteen were considered to have a high likelihood of occurrence.
- Twenty were considered to have a medium likelihood of occurrence.
- Thirty-two were considered to have a low likelihood of occurrence.

Species with a high or medium likelihood of occurrence are discussed below in Table 11.

Table 11: Pre-Survey Desktop Assessment of Threatened and Priority Flora Species with High or Medium Likelihood of Occurrence

Species	Conservation Status		Source		Flowering Period	Preferred habitat	Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA				
Caladenia huegelii	CR	CR	x	x	Sep to Oct	Grey or brown sand, clay loam.	Yes	Medium - Multiple records 7.5 km north-west and 7.7 km south-west of Survey Area, <30 years old. Survey Area is 1 km outside of known distribution.
Drakaea elastica	CR	CR	x	x	Oct to Nov.	White or grey sand. Low-lying situations adjoining winter-wet swamps.	Yes	High - One record 3.3km east of Survey Area and clusters of records 7 km north-west and 9 km south-west of Survey Area, all records <20 years old.
Drosera oreopodion	CR	CR	-	x	Sep to Oct	Clayey sand sometimes mixed with lateritic pebbles.	Yes	Medium - One record 6.7 km south of Survey Area, and records 9.8 km towards south-west of Survey Area, <20 years old.
***Synaphea* sp. Serpentine (G.R. Brand 103)**	CR	CR	x	x	Unknown	Narrow band from the northernmost point west of Byford (38 km SSE of Perth) to south of Serpentine (54 km SSE of Perth), over a range of 18 km.	Yes	High - Closest record 2 km east and 1.9 km south of Survey Area, <30 years old.
Lepidosperma rostratum	CR	EN	x	x	Jun to Aug	Sandy soil among low heath in a winter wet swamp	Yes	Medium - Records 2.2 km south of Survey Area within creek line and clustering 7.6 km north-west of Survey Area, <30 years old.
Diuris purdiei	EN	EN	x	x	Sep to Oct	Grey-black sand, moist. Winter-wet swamps.	Yes	Medium - One record 6.7 km south of Survey Area, and records 9.8 km towards south-west of Survey Area, <20 years old.

Species	Conservation Status		Source		Flowering Period	Preferred habitat	Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA				
Grevillea curviloba	EN	EN	-	x	Aug to Oct	Grey sand, sandy loam. Winter-wet heath.	Yes	High - one record 2.6 km south-east of Survey Area, <20 years old.
Grevillea curviloba* subsp. *incurva	EN	EN	x	-	Sept to Oct	Open heath in winter-wet areas on sand over limestone, or over ironstone at sites with a high-water table. Associated tec 'shrublands and woodlands on Perth to Gingin grevillea curviloba subsp. Incurva.	Yes	Medium - No known records within 10 km buffer. Survey Area is within known distribution.
***Synaphea* sp. Pinjarra Plain (A.S. George 17182)**	EN	EN	x	x	Sep to Nov	Grey sandy loam or clay, grey-brown clayey sand, brown clayey loam, laterite. Flats, seasonally wet areas, railroad reserves often with wet depressions or drains.	Yes	High - Closest record 0.5 km south and 1.3 km south-east of Survey Area, <30 years old. Multiple records <5 km north-east of Survey Area
Drakaea micrantha	EN	VU	x	x	Sep to Oct	White-grey sand.	Yes	Medium - One record 9.5 km south-west of Survey Area, <30 years old. One historical record in the same area, >30 years old. Survey Area is within known distribution.
Diuris micrantha	VU	VU	x	-	Sep to Oct	Brown loamy clay. Winter-wet swamps, in shallow water.	Yes	Medium - No known records within 10 km buffer. Survey Area is within known distribution.
Eleocharis keigheryi	VU	VU	x	-	Aug to Nov	Clay, sandy loam. Emergent in freshwater: creeks, claypans.	Yes	Medium - No known records within 10 km buffer. Survey Area is within known distribution.

Species	Conservation Status		Source		Flowering Period	Preferred habitat	Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA				
Morelotia australiensis	VU	VU	x	x	Dec to Nov	Grey sand over clay, winter-wet, swampy depressions, drainage lines or rises surrounding swamps. Open forest or Marri (*Corymbia calophylla*) woodland	Yes	High - Closest record is 2.2 km south of Survey Area with several recorded <5 km along creek line. Other records are 3.8 km east of Survey Area, all records <30 years old.
***Acacia lasiocarpa* var. *bracteolata* long peduncle variant (G.J. Keighery 5026)**	P1	-	-	x	May or Aug	Grey or black sand over clay. Swampy areas, winter wet lowlands.	Yes	High- One record 0.3 km west of Survey Area, <5 years old.
Boronia juncea* subsp. *juncea	P1	-	-	x	Apr	Sand. Low scrub.	Yes	Medium - one record 9 km west of Survey Area, <30 years old
Calectasia grandiflora	P2	-	-	x	Jun to Nov	White, grey or yellow sand, sandy clay, gravel, laterite, granite. Swampy areas, rock outcrops, flats, slopes, ridges.	Yes	High - Three record 2 km south of Survey Area, <30 years old.
Johnsonia pubescens* subsp. *cygnorum	P2	-	-	x	Sept	Grey-white-yellow sand. Flats, seasonally wet sites.	Yes	Medium - One record 5.9 km north-east of Survey Area, <20 years old. Historical records show clustering 1.9 km east of Survey Area.
***Leucopogon* sp. Busselton (D. Cooper 243)**	P2	-	-	x	Unknown	Unknown	Yes	High -records 2.1 km south of Survey Area within creek line, <20 years old.
Angianthus drummondii	P3	-	-	x	Oct to Dec	Grey or brown clay soils, ironstone. Seasonally wet flats.	Yes	High - One record 2.7 km south-west of Survey Area, 12 years old.

Species	Conservation Status		Source		Flowering Period	Preferred habitat	Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA				
Babingtonia urbana	P3	-	-	x	Jan to March	Associated with wetlands on the Swan Coastal Plain. In the Perth area the species occurs on the eastern side of the plain.	Yes	High - One record 1.5 km west of Survey Area, one record 2.5 km to the east and three records 2.4 km south of Survey Area, records <10 years old.
Cyathochaeta teretifolia	P3	-	-	x		Grey sand, sandy clay. Swamps, creek edges.	Yes	Medium - Two records 9 km south of Survey Area, <20 years old.
Dampiera triloba	P3	-	-	x	Aug to Dec.	Loamy sand, lower lying area.	Yes	Medium - One record 9 km west of Survey Area, <10 years old.
Dillwynia dillwynioides	P3	-	-	x	Aug to Dec	Sandy soils. Winter-wet depressions.	Yes	Medium - One record 6.7 km south-west of Survey Area, 30 years old. Two other historical records in the same area.
***Eryngium pinnatifidum* subsp. Palustre**	P3	-	-	x	Unknown	Clay, sandy clay. Claypans, seasonally wet flats.	Yes	Medium - One record 9.3 km south of Survey Area, 29 years old.
Isopogon autumnalis	P3	-	-	x	Feb to may	Sandy soils, often in Banksia woodlands.	Yes	Medium - one record 9.7 km south of Survey Area, <30 years old.
Jacksonia gracillima	P3	-	-	x	Oct to Nov	Grey sand, well drained flats, seasonally wet	Yes	Medium - One record 6.8 km north-west and one record 6 km south-west of Survey Area, <20 years old.
Meionectes tenuifolia	P3	-	-	x	Unknown	Unknown		Low- one record 7.4 km north-west of Survey Area, <30 years old.
Stylidium aceratum	P3	-	-	x	Oct to Nov	Sandy soils. Swamp heathland.	Yes	High - One record 2.7 km south-west of Survey Area, <30 years old.
Stylidium paludicola	P3	-	-	x	Oct to Dec	Peaty sand over clay. Winter wet habitats. Marri and	Yes	Medium - Two records, 8.8 km south and 8.6 km north-west of Survey Area, <30 years old.

Species	Conservation Status		Source		Flowering Period	Preferred habitat	Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA				
						Melaleuca woodland, Melaleuca shrubland.		
***Schoenus* sp. Waroona (G.J. Keighery 12235)**	P3	-	-	x	Oct to Nov	Clay or sandy clay. Winter-wet flats.	Yes	High - One record 2.6 km north-east of Survey Area, <30 years old.
Eucalyptus rudis* subsp. *cratyantha	P4	-	-	x	Jul to Sep	Loam. Flats, hillsides.	Yes	Medium - One record 9.5 km south of Survey Area, 29 years old.
Parsonsia diaphanophleba	P4	-	-	x	Jan to Feb or Apr to Jun or Sep	Alluvial soils. Along rivers.	Yes	Medium - most recent record is 7.4 km south-west of Survey Area, <30 years old.
Stylidium longitubum	P4	-	-	x	Oct to Dec	Sandy clay, clay. Seasonal wetlands.	Yes	Medium - Two records, 8.3 km north-west and 8.8 km west of Survey Area, <30 years old.
Verticordia lindleyi* subsp. *lindleyi	P4	-	-	x	May or Nov to Dec or Jan to Feb.	White/grey sand, gravelly sand, sandy loam. Seasonal swamps, sandplains.	Yes	High - Closest record is 0.75 km north of Survey Area, <20 years old.

4.1.2 Threatened and Priority Ecological Communities

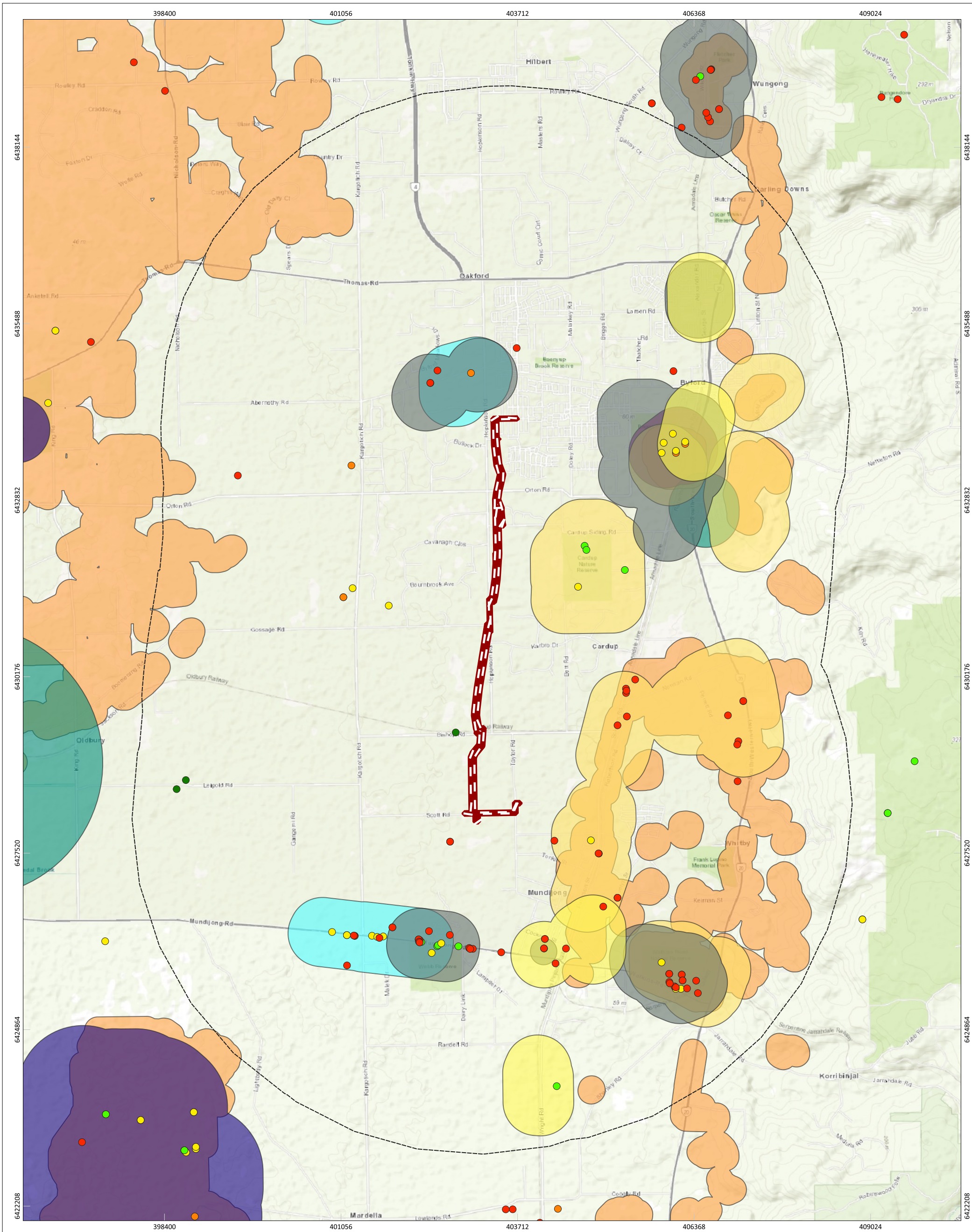
The desktop assessment identified that records of 19 Threatened Ecological Communities (TECs) and Priority Ecological Communities (PECs) occur within 10 km of the Survey Area (see Figure 7). The occurrences shown are buffered. The pre survey assessment identified that of the 19 communities:

- Six TECs are indicated by a DBCA buffered occurrence mapping as within 2 km of the Survey Area and are assessed as having a high likelihood of occurrence.
- One TEC has a buffered occurrence indicated by DBCA <5 km of the Survey Area and is assessed as having a medium likelihood of occurrence.
- Twelve have a low likelihood of occurrence.

Communities with a high or medium likelihood of occurrence are discussed below in Table 12. See Appendix I for full database search results and likelihood of occurrence assessment.

Table 12: Pre-Survey Assessment of Threatened or Priority Ecological Communities with High or Medium Likelihood of Occurrence

Floristic Community Type	Community name	Conservation Status		Database		Likelihood of Occurrence	Justification
		State	Federal	PMST	DBCA		
SCP 7, SCP 8, SCP 9 and SCP 10a	Clay Pans of the Swan Coastal Plain	CR	CR	x	-	High	Community likely to occur within feature area
SCP20b	*Banksia attenuata* and/or *Eucalyptus marginata* woodlands of the eastern side of the Swan Coastal Plain (floristic community type (FCT) 20b as originally described in Gibson et al. 1994)	CR	EN	-	x	High	Closest record is 0.6 km east of Survey Area
SCP3c	*Corymbia calophylla - Xanthorrhoea preissii* woodlands and shrublands of the Swan Coastal Plain	EN	EN	x	x	Medium	Closest record is 2 km south of Survey Area, community known to occur in buffer of Survey Area.
SCP 20a, SCP 20b, SCP 21a, SCP 21b, SCP 21c, SCP 22, SCP 23a and SCP 23b	Banksia Woodlands of the Swan Coastal Plain ecological community	P3	EN	x	x	High	Numerous records towards the east and west of Survey Area, closest record is 1.4 km east.
SCP3a	*Corymbia calophylla - Kingia australis* woodlands on heavy soils of the Swan Coastal Plain (FCT 3a as originally described in Gibson et al. 1994)	CR	EN	x	x	High	Closest record is 0.2 km north of Survey Area. Community known to occur within area.
SCP3b	*Corymbia calophylla - Eucalyptus marginata* woodlands on sandy clay soils of the southern Swan Coastal Plain (FTC 3b as originally described in Gibson et al. 1994)	EN	VU	-	x	High	Closest record is 0.5 km east of Survey Area.
***Casuarina obesa* association**	*Casuarina obesa* Association	P1	-	-	x	High	Closest record is 0.5 km north-west of Survey Area



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Figure 7: DBCA Database Search Results Flora and Communities

N

0 400 800 1,200 1,600 m

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford		
SCALE	1:53,117	SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley		
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50	PROJECT NUMBER	A24.032
VERSION	0		
DATA SOURCE	ESRI Topographic Map	DRAWN BY / REVIEWED BY	MD/JR
DATE	25/9/2025		

Legend

Survey Area
5km Buffer

DBCA Flora Data Search
- Threatened (DBCA)
- Priority 1 (DBCA)
- Priority 2 (DBCA)
- Priority 3 (DBCA)
- Priority 4 (DBCA)
- Presumed Extinct (DBCA)

DBCA TEC PEC
- Banksia WL SCP (Endangered, Priority 3)
- Mound Springs SCP (Endangered, BCA Critically Endangered)
- SCP08 (Critically Endangered, BCA Endangered)
- SCP10a (Critically Endangered, BCA Endangered)
- SCP20b (Endangered, BCA Critically Endangered)
- SCP3a (Endangered, BCA Critically Endangered)
- SCP3c (Endangered, BCA Endangered)
- SCP21c (Endangered, Priority 3)

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	25/9/2025

NOTES:

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

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4.2 Flora Survey

4.2.1 Flora

A total of 92 vascular flora taxa, including 34 introduced species, were recorded from within the Survey Area from eight relevés and opportunistic observations.

The families with the highest number of taxa were Myrtaceae (15 taxa), Fabaceae (9 taxa) and Cyperaceae (7 taxa) The most recorded genera were *Melaleuca* and *Lomandra* (4 taxa each). These families and genera are typical and common for the locality.

A site by species matrix and inventory of flora recorded is provided in Appendix E.

Post-Survey Likelihood of Occurrence

An assessment of habitat suitability for each listed species was undertaken post survey (Appendix C). The likelihood of occurrence was produced on the suitability and distribution of nearby threatened and priority flora in similar vegetation communities.

4.2.2 Threatened and Priority Flora

No Threatened or Priority flora species were identified during the survey. The post-survey likelihood of occurrence found that all threatened, or priority flora had a low likelihood of occurring due to much of the habitat being Degraded for agriculture and lack of understory vegetation to support the listed species, refer to Appendix C for details.

The majority of the Survey Area was highly disturbed due to the presence of cattle, and encroaching urbanisation. There were a few patches of remnant vegetation along the creek lines and roadside at two locations. Greater emphasis was placed on targeting flora in the VT02 community (*Corymbia calophylla*/*Kingia australis* woodland) and along the edge of the riparian vegetation VT01 (Riparian vegetation) and in the banksia woodland along the railway line in VT03.

4.2.3 Flora of Other Significance

Flora may be considered of other conservation significance if it is a novel taxon or represents a range extension.

No species were identified as representing range extensions or flora of other significance.

4.2.4 Introduced Species

A total of 34 introduced taxa were recorded within the Survey Area. These are listed in Table 13 along with their status under the BAM Act or WoNS listing. A comprehensive weed inventory was not collected in cleared and Completely Degraded areas. Listed species are common/widespread.

Four of the species recorded: Narrowleaf Cottonbush (**Gomphocarpus fruticosus*), Arum lily (**Zantedeschia aethiopica*), Bridal creeper *(*Asparagus asparagoides*) and Paterson's Curse (*Echium plantagineum*) are listed as a Declared Pest under the BAM Act in WA and one is also listed as a Weed of National Significance (**Asparagus asparagoides*). These species are discussed further below (Table 13).

Table 13: Introduced Species recorded in the Survey Area

Family	Taxon	Status Under BAM Act/WoNS
Apocynaceae	**Gomphocarpus fruticosus*	Declared Pest
Araceae	**Zantedeschia aethiopica*	Declared Pest
Arecaceae	**Washingtonia filifera*	-
Asparagaceae	**Asparagus asparagoides*	Declared Pest, WoNS
Asparagaceae	**Lomandra longifolia*	-
Asteraceae	**Arctotheca calendula*	-
Asteraceae	**Conyza bonariensis*	-
Asteraceae	**Helianthus annuus*	-
Asteraceae	**Sonchus oleraceus*	-
Asteraceae	**Ursinia anthemoides*	-
Boraginaceae	**Echium plantagineum*	Declared Pest
Brassicaceae	**Brassica tournefortii*	-
Caryophyllaceae	**Spergula arvensis*	-
Casuarinaceae	**Casuarina obesa*	-
Cucurbitaceae	**Cucumis myriocarpus*	-
Cyperaceae	**Cyperus tenuiflorus*	-
Euphorbiaceae	**Euphorbia maculata*	-
Euphorbiaceae	**Ricinus communis*	-

Family	Taxon	Status Under BAM Act/WoNS
Fabaceae	**Lupinus cosentinii*	-
Fabaceae	**Ornithopus compressus*	-
Fabaceae	**Vicia sativa*	-
Geraniaceae	**Pelargonium capitatum*	-
Iridaceae	**Watsonia meriana*	-
Juncaceae	**Juncus articulatus*	-
Moraceae	**Ficus carica*	-
Oleaceae	**Olea europaea*	-
Oxalidaceae	**Oxalis pes-caprae*	-
Papaveraceae	**Fumaria muralis*	-
Poaceae	**Briza maxima*	-
Poaceae	**Briza minor*	-
Poaceae	**Cenchrus clandestinus*	-
Poaceae	**Cynodon dactylon*	-
Poaceae	**Eragrostis curvula*	-
Solanaceae	**Solanum nigrum*	-

*Narrowleaf Cottonbush (*Gomphocarpus fruticosus)-Declared Pest*

The Narrowleaf cottonbush is an erect perennial, herb or shrub that grows between 0.5 m to1.5 m high. It Flowers in white or cream from February to July in disturbed sites commonly in the Swan Coastal Plain (WAH, 1998). There were 45 individuals within the Survey Area (Table 14 and Figure 9).



Plate 1: Narrowleaf Cottonbush (Gomphocarpus fruticosus*) near Copper Road**

*Arum lily (*Zantedeschia aethiopica) Declared Pest*

The Arum lily is a rhizomatous (tuber-like) perennial herb that grows to 1 m high. It flowers white from July to November on loam or sand in swamps, rarely uplands (WAH, 1998). There were 22 individuals recorded during the survey (Table 14 and Figure 9).



Plate 2: Arum lily (Zantedeschia aethiopica*) near Scott Road**

*Bridal creeper (*Asparagus asparagoides) Declared Pest/WoNS*

The Bridal creeper is a rhizomatous and tuberous perennial herb and climber that grows between 1 m to 5 m high. The bridal creeper flowers white from august to September on sand, loam, clay and granite (WAH, 1998). There were 26 individuals recorded during the survey (Table 14 and Figure 9).



Plate 3: Bridal creeper (Asparagus asparagoides*) on Scott Road, Mundijong**

*Paterson's Curse (*Echium plantagineum) Declared Pest*

The Paterson's curse is an erect annual or biennial, herb that grows between 0.1 m to 0.6 m high. The Paterson's curse flowers blue/blue purple/pink/white, mainly September to December or in January on roadsides, on vacant lands & disturbed grounds (WAH, 1998). There were six individuals recorded during the survey (Table 14 and Figure 9).



Plate 4: Paterson's Curse (Echium plantagineum*) near the Cardup Siding Creek**



Plate 5: Paterson's Curse (Echium plantagineum*) near the Cardup Siding Creek**

Table 14: Declared Weed Abundance and Location

Taxon Name	Common Name	Status under the BAM Act/WoNS	Abundance	Easting	Northing
Gomphocarpus fruticosus	Narrowleaf Cottonbush	DP	3	-32.2259877,	115.9749964
Gomphocarpus fruticosus	Narrowleaf Cottonbush	DP	2	-32.2263281,	115.9746360
Gomphocarpus fruticosus	Narrowleaf Cottonbush	DP	3	-32.2294270,	115.9747785
Gomphocarpus fruticosus	Narrowleaf Cottonbush	DP	2	-32.2309728,	115.9747198
Gomphocarpus fruticosus	Narrowleaf Cottonbush	DP	4	-32.2336177,	115.9756083
Gomphocarpus fruticosus	Narrowleaf Cottonbush	DP	2	-32.2357237,	115.9749461
Asparagus asparagoides	Bridal creeper	DP, WoNS	2	-32.2374254,	115.9749880
Echium plantagineum	Paterson's curse	DP	3	-32.2375388,	115.9746443
Gomphocarpus fruticosus	Narrowleaf Cottonbush	DP	4	-32.2377941,	115.9752898
Echium plantagineum	Paterson's curse	DP	3	-32.2360002,	115.9748623
Gomphocarpus fruticosus	Narrowleaf Cottonbush	DP	2	-32.2380706,	115.9745773
Zantedeschia aethiopica	Arum lily	DP	2	-32.2504497,	115.9732780
Gomphocarpus fruticosus	Narrowleaf Cottonbush	DP	3	-32.2752275,	115.9701931
Zantedeschia aethiopica	Arum lily	DP	2	-32.2761489,	115.9702350
Zantedeschia aethiopica	Arum lily	DP	2	-32.2762906,	115.9701931
Asparagus asparagoides	Bridal creeper	DP, WoNS	2	-32.2762977,	115.9702602
Zantedeschia aethiopica	Arum lily	DP	3	-32.2769427,	115.9702602
Gomphocarpus fruticosus	Narrowleaf Cottonbush	DP	2	-32.2773679,	115.9701261
Zantedeschia aethiopica	Arum lily	DP	4	-32.2774033,	115.9703105
Zantedeschia aethiopica	Arum lily	DP	4	-32.2770773,	115.9701261

Taxon Name	Common Name	Status under the BAM Act/WoNS	Abundance	Easting	Northing
Gomphocarpus fruticosus	Narrowleaf Cottonbush	DP	2	-32.2794232,	115.9703692
Gomphocarpus fruticosus	Narrowleaf Cottonbush	DP	3	-32.2794232,	115.9723810
Zantedeschia aethiopica	Arum lily	DP	2	-32.2795437,	115.9723810
Gomphocarpus fruticosus	Narrowleaf Cottonbush	DP	3	-32.2794020,	115.9749964
Asparagus asparagoides	Bridal creeper	DP, WoNS	2	-32.2795224,	115.9760107
Zantedeschia aethiopica	Arum lily	DP	3	-32.2795720,	115.9741162
Gomphocarpus fruticosus	Narrowleaf Cottonbush	DP	2	-32.2794179,	115.9745521
Asparagus asparagoides	Bridal creeper	DP, WoNS	2	-32.2793665,	115.9764340
Asparagus asparagoides	Bridal creeper	DP, WoNS	2	-32.2795331,	115.9758053
Asparagus asparagoides	Bridal creeper	DP, WoNS	3	-32.2795508,	115.9771089
Asparagus asparagoides	Bridal creeper	DP, WoNS	2	-32.2793382,	115.9769999
Asparagus asparagoides	Bridal creeper	DP, WoNS	2	-32.2790618,	115.9770669
Asparagus asparagoides	Bridal creeper	DP, WoNS	3	-32.2789342,	115.9772388
Gomphocarpus fruticosus	Narrowleaf Cottonbush	DP	3	-32.2781227,	115.9770753
Asparagus asparagoides	Bridal creeper	DP, WoNS	2	-32.2781546,	115.9770669
Asparagus asparagoides	Bridal creeper	DP, WoNS	2	-32.2782503,	115.9778591
Gomphocarpus fruticosus	Narrowleaf Cottonbush	DP	2	-32.2784593,	115.9772514
Asparagus asparagoides	Bridal creeper	DP, WoNS	2	-32.2782822,	115.9770774
Gomphocarpus fruticosus	Narrowleaf Cottonbush	DP	3	-32.2793329,	115.9770544

4.3 Vegetation Mapping

4.3.1 Vegetation Types

A total of five vegetation types were identified within the Survey Area, as described in Table 15and mapped in Figure 8. The majority of the mapped vegetation types were highly disturbed as a result of clearing and grazing and, overall, the majority of the Survey Area did not contain native vegetation - these areas were considered Cleared and had no vegetation types assigned.

Table 15 Vegetation Types

Vegetation Unit Description	Vegetation Condition	Sampling Sites	Area (ha) % of Survey Area	Representative Photo
Veg Code: VT01 Description: Riparian Vegetation *Eucalyptus rudis* and M*elaleuca preissiana* mid open woodland with scattered individuals of *Calothamnus quadrifidus* mid stratum in the creek lines over a weedy understorey of **Oxalis pes-caprae, Banksia dallanneyi* and **Hypochaeris glabra* TECs/PECs: None identified. Historical clearing and grazing have resulted in the loss of all potentially occurring communities.	Degraded to Completely Degraded	R01 R04 R05 R08	5.38 ha 13.91 %	 

Vegetation Unit Description	Vegetation Condition	Sampling Sites	Area (ha) % of Survey Area	Representative Photo
Veg Code: VT02 Description: *Corymbia calophylla/Kingia australis* woodland on heavy soils *Corymbia calophylla* mid open forest with scattered *Kingia australis* over *Banksia dallanneyi, Hibbertia hypericoides* and *Hypocalymma angustifolium*. Occurs in lower landscapes on margins of wetlands and atop of heavy soils of southern Swan Coastal Plain. Degraded on the edge of the road. TECs/PECs: Yes, the patch along Hopkinson Road aligns with SCP3a. The patch along Orton Road is Degraded, and not representative of SCP3a.	Very Good to Completely Degraded	R03 R06	0.32 ha 0.08 %	 

Vegetation Unit Description	Vegetation Condition	Sampling Sites	Area (ha) % of Survey Area	Representative Photo
Veg Code: VT03 Description: Banksia Woodland A low, closed woodland of *Banksia menziesii, Banksia attenuata* over an open mid storey of *Jacksonia furcellata, Eremaea pauciflora* and *Kunzea glabrescens* over an open ground stratum of *Scholtzia involucrata, *Ursinia anthemoides* and *Conostylis juncea*. Degraded near the railway and on the roadside. TECs/PECs: Has affinities to state listed SCP20b and could qualify for TEC under Commonwealth guidelines.	Good to Completely Degraded	R07	0.67 ha 1.73 %	

Vegetation Unit Description	Vegetation Condition	Sampling Sites	Area (ha) % of Survey Area	Representative Photo
Veg Code: VT04 Description: Mixed non-native planting Mixed, low planted natives; *Conostylis candicans, Lomandra longifolia* and *Ficinia nodosa* with low, weedy invasive species of **Brassica tournefortii, *Sonchus oleraceus* and **Cucumis myriocarpus*. Highly degraded due to cattle presence and grazing. TECs/PECs: None	Completely Degraded	R02	1.99 ha 0.51 %	

Vegetation Unit Description	Vegetation Condition	Sampling Sites	Area (ha) % of Survey Area	Representative Photo
VT05: *Corymbia calophylla/Eucalyptus marginata* woodland Mixed mid, open, *Corymbia calophylla* and *Eucalyptus marginata* on the mid slopes with a weedy understory and Completely Degraded from grazing. TECs/PECs: None	Completely Degraded	N/A No native mid or understorey	0.40 ha 0.10 %	

Vegetation Unit Description	Vegetation Condition	Sampling Sites	Area (ha) % of Survey Area	Representative Photo
Paddock/Cleared. Scattered weeds and cleared for grazing.	Cleared	N/A	29.85 ha 77.23 %	
Total	-	-	38.65 ha	

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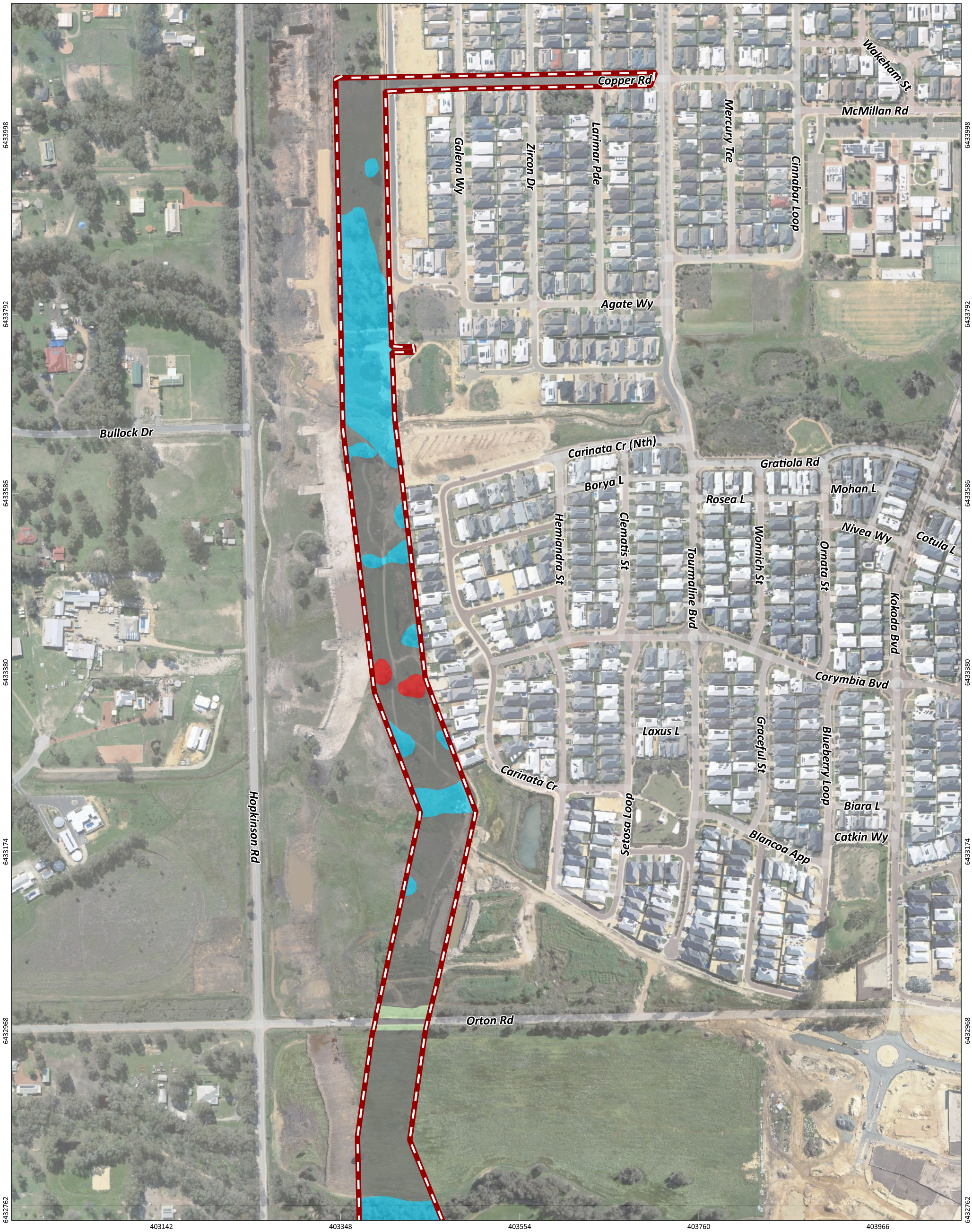


Figure 8a: Vegetation Types

0 30 60 90 120 m

N

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	14/11/2025

Legend

- Survey Area
- VT01 - Riparian vegetation
- VT02 - Corymbia calophylla/Kingia australis woodland on heavy soils
- VT05 - Corymbia calophylla/Eucalyptus marginata woodland
- Cleared

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	14/11/2025

NOTES:

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

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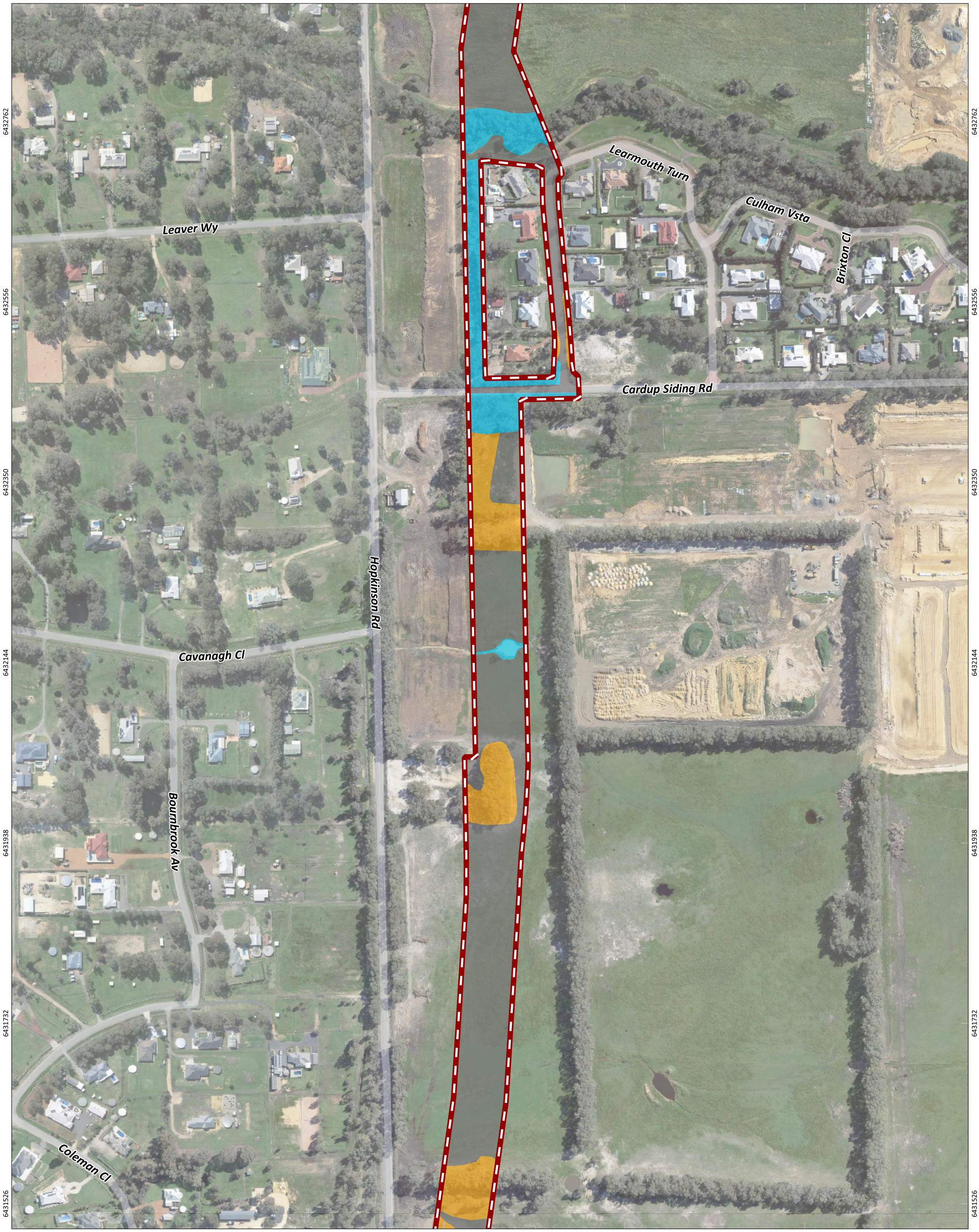


Figure 8b: Vegetation Types

0 30 60 90 120 m

N

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	14/11/2025

Legend

- Survey Area
- VT01 - Riparian vegetation
- VT04 - Farmland planted
- Cleared

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	14/11/2025

NOTES:

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

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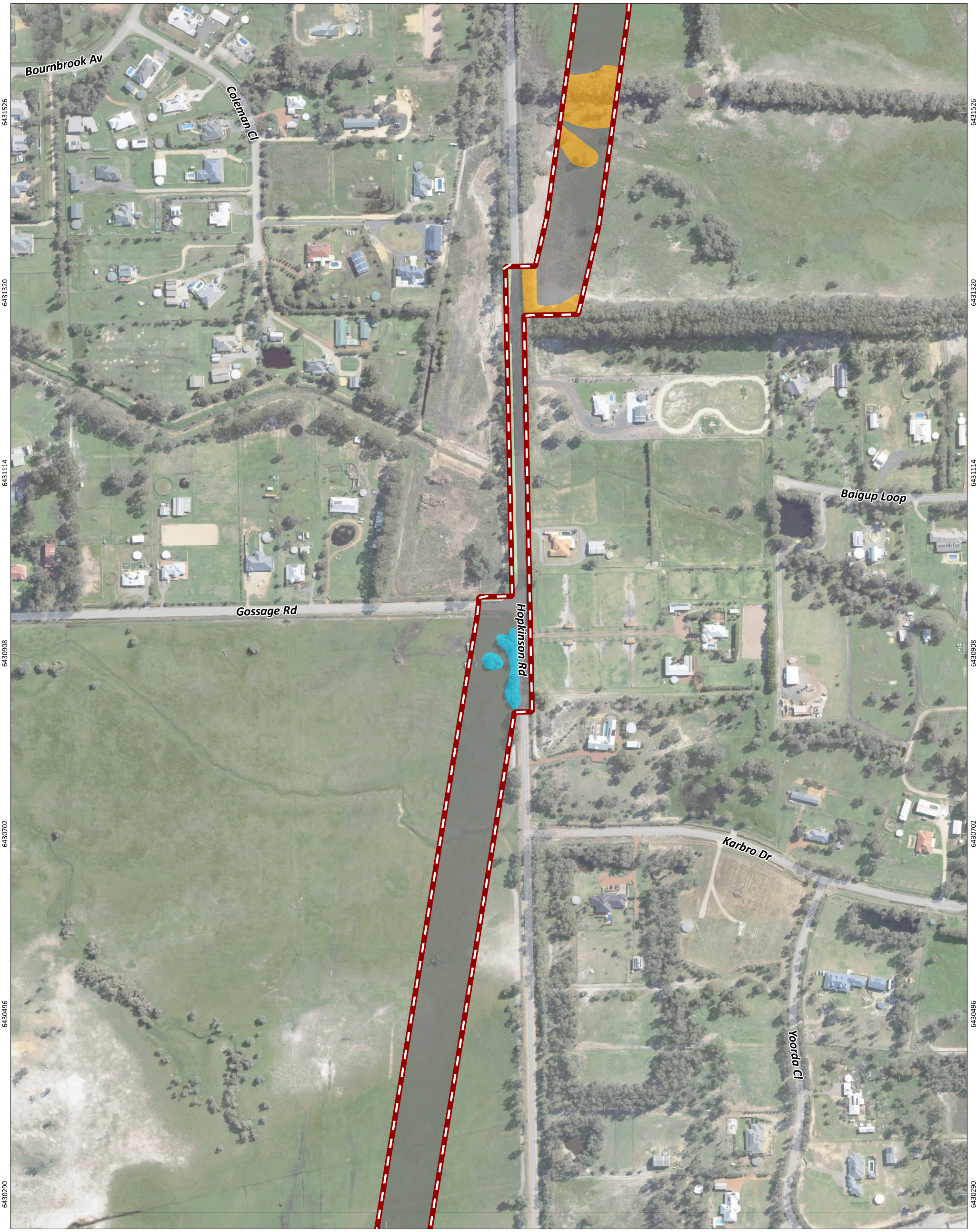


Figure 8c: Vegetation Types

0 30 60 90 120 m

N

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	14/11/2025

Legend

- Survey Area
- VT01 - Riparian vegetation
- VT02 - Corymbia calophylla/Kingia australis woodland on heavy soils
- VT04 - Farmland planted
- Cleared

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	14/11/2025

NOTES:

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

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Figure 8d: Vegetation Types

0 30 60 90 120 m

N

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	14/11/2025

Legend

- Survey Area
- VT01 - Riparian vegetation
- VT03 - Banksia woodland
- VT05 - Corymbia calophylla/Eucalyptus marginata woodland
- Cleared

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	14/11/2025

NOTES:

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

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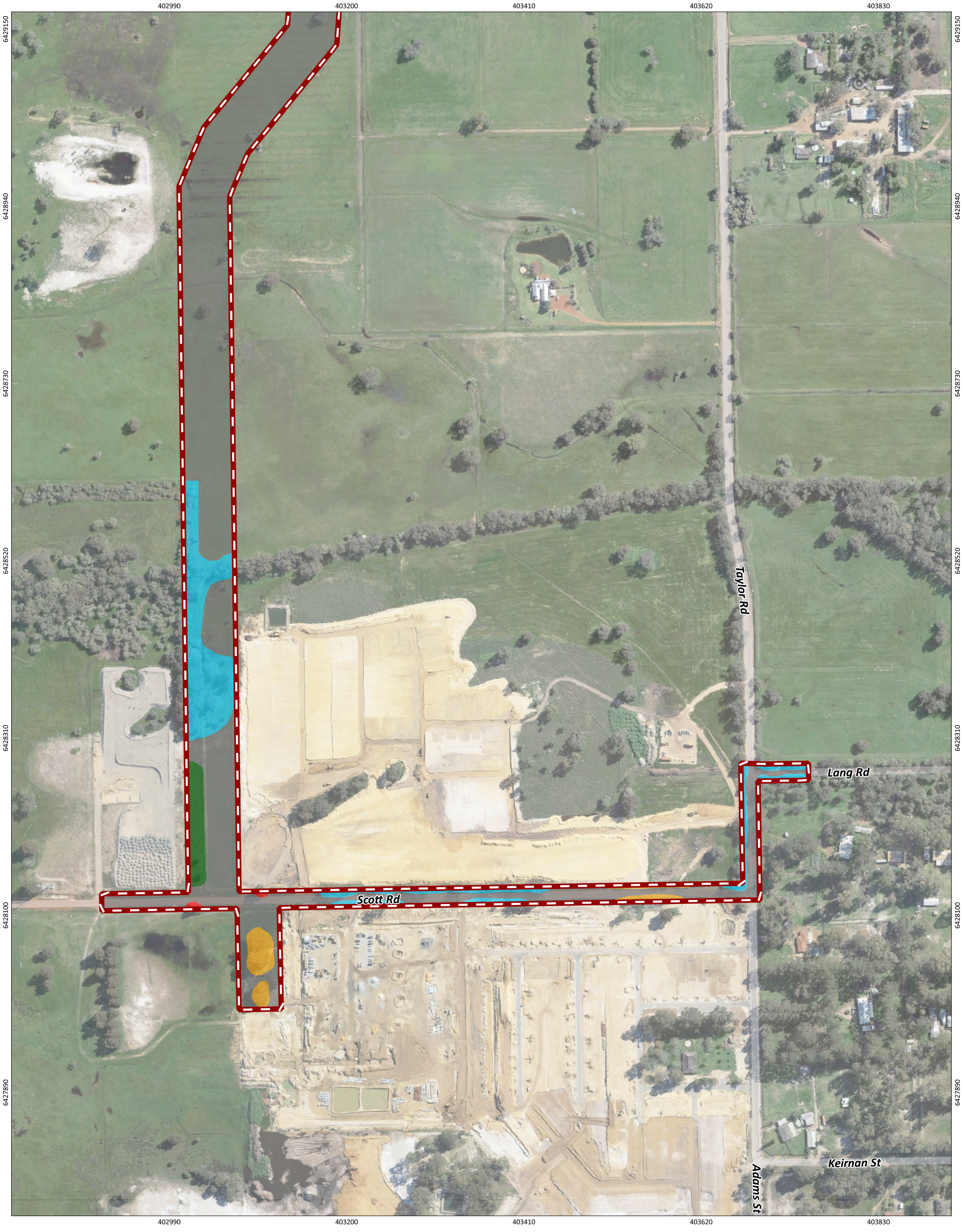


Figure 8e: Vegetation Types

N

0 30 60 90 120 m

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,190
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	14/11/2025

Legend

- Survey Area
- VT01 - Riparian vegetation
- VT03 - Banksia woodland
- VT04 - Farmland planted
- VT05 - Corymbia calophylla/Eucalyptus marginata woodland
- Cleared

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	14/11/2025

NOTES:

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

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4.3.2 Vegetation Condition

The vegetation of the Survey Area ranged from Very Good to Completely Degraded, with the majority being in Completely Degraded condition (Table 16; Figure 9). The Survey Area has been affected by degrading factors including clearing, cattle and weed invasion. Vegetation condition is in better condition roadside and rail side in VT02 (*Corymbia calophylla/Kingia australis* woodland) and VT03 (Banksia woodland) and Degraded near the urbanisation and on the rural blocks.

Table 16: Vegetation Condition of the Survey Area (as per EPA, 2016 condition scale)

Vegetation Condition	Area (ha)	Proportion of Survey Area (%)
Excellent	-	-
Very Good	0.17	0.45
Good	0.27	0.70
Degraded	2.49	6.44
Completely Degraded	5.87	15.18
Cleared	29.85	77.23
Total	38.65	100.0

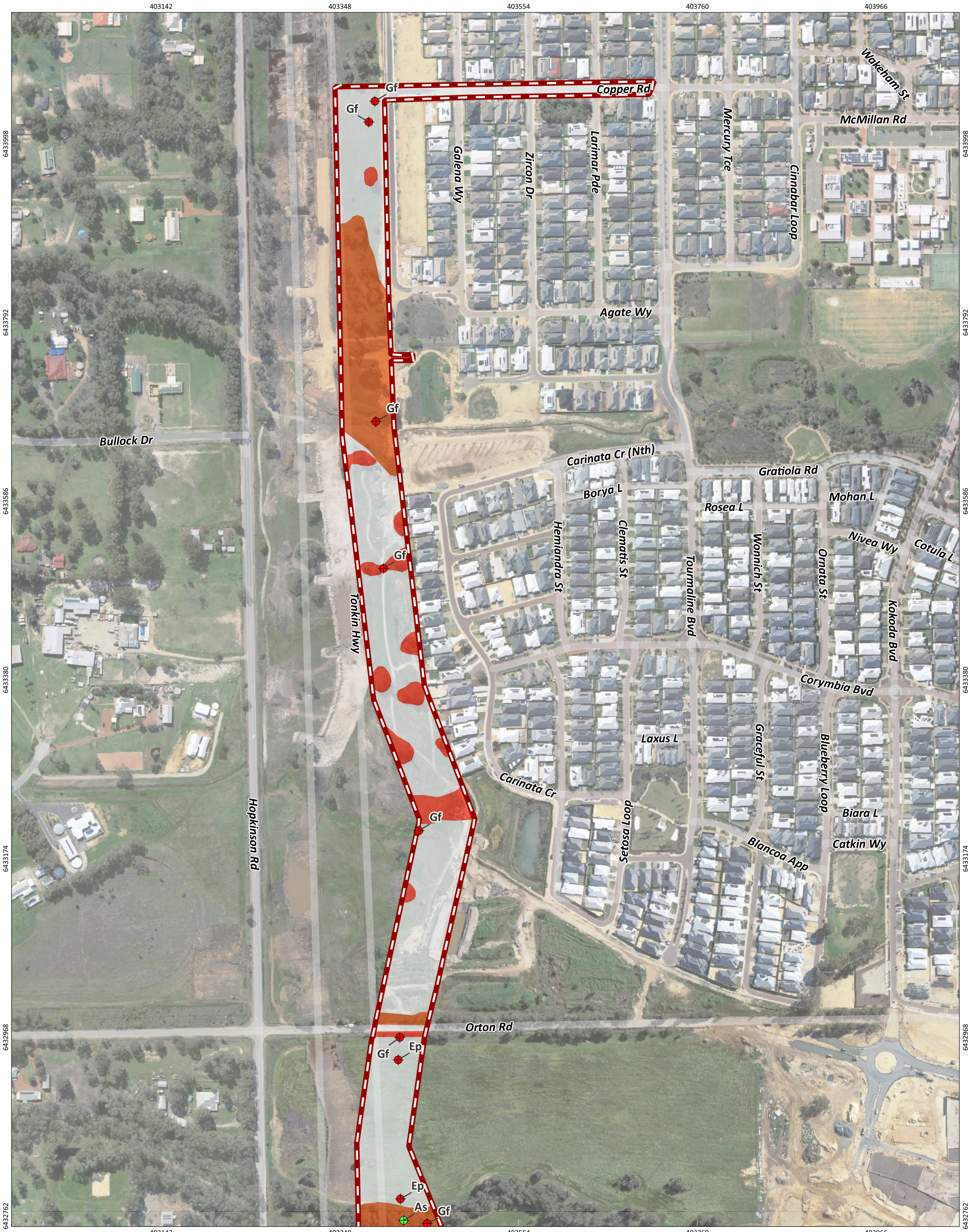


Figure 9a: Vegetation Condition and Significant Weeds

N

0 30 60 90 120 m

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	5/12/2025

Legend

- Survey Area
- Cleared
- Completely degraded
- Degraded

WeedObs

- Declared Pest
- WONS

WeedObs

As - Asparagus sparagoides
Ep - Echium plantagineum
Gf - Gomphocarpus fruticosus

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	5/12/2025

NOTES:

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

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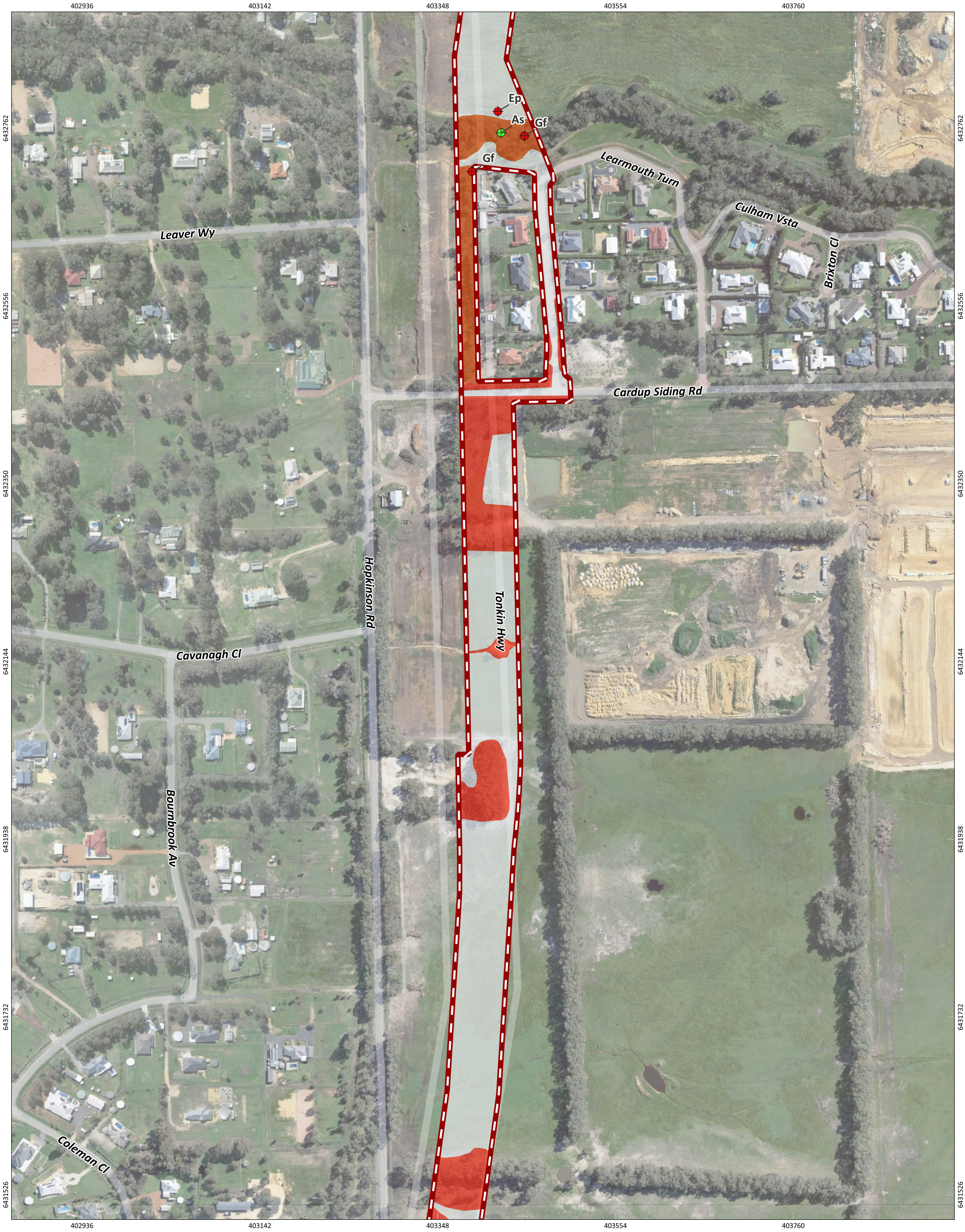


Figure 9b: Vegetation Condition and Significant Weeds

0 30 60 90 120 m

N

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	5/12/2025

Legend

- Survey Area
- Cleared
- Completely degraded
- Degraded

WeedObs

- Declared Pest
- WONS

WeedObs

- As - Asparagus sparagoides
- Ep - Echium plantagineum
- Gf - Gomphocarpus fruticosus

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	5/12/2025

NOTES:

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

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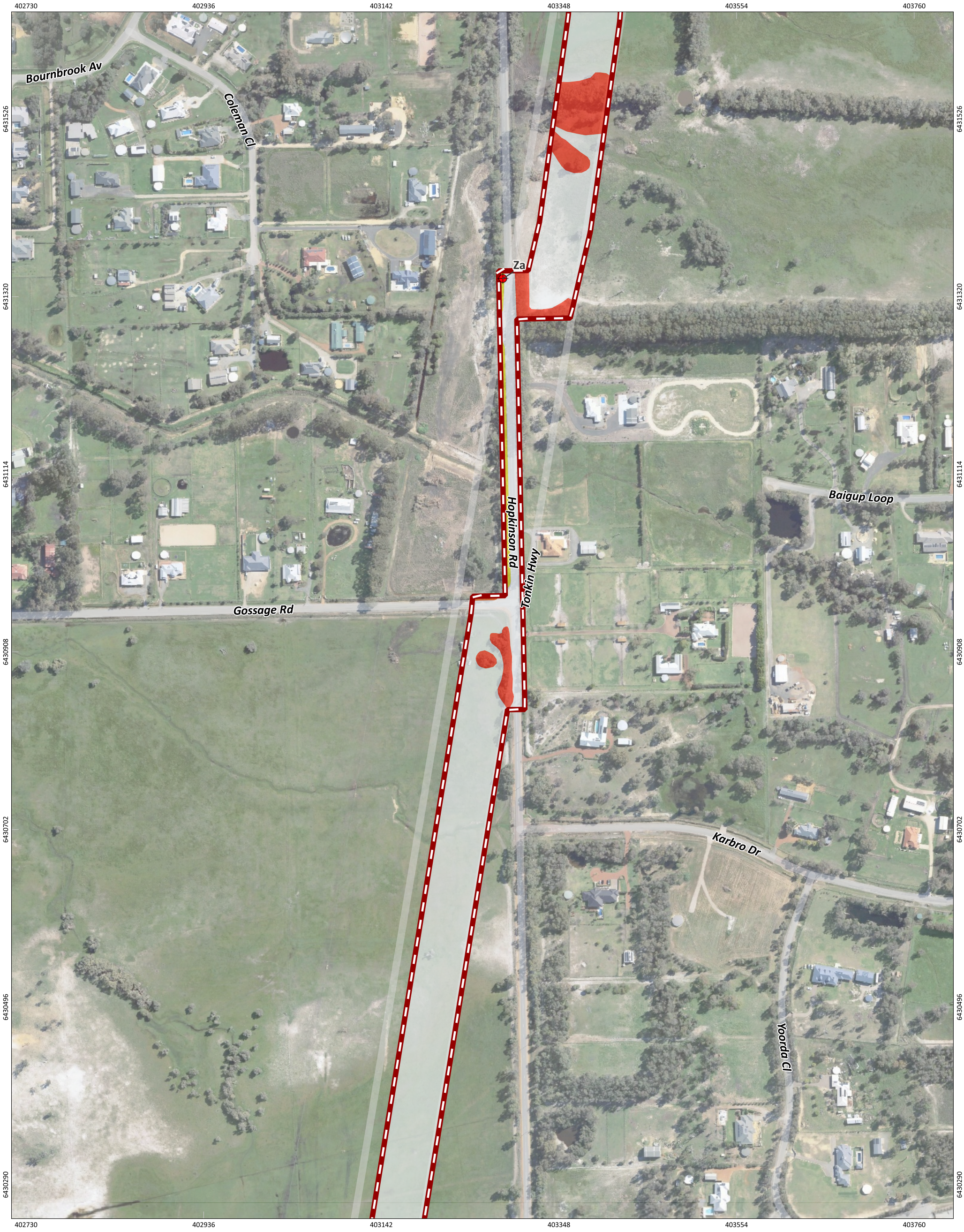


Figure 9c: Vegetation Condition and Significant Weeds

N

0 30 60 90 120 m

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	5/12/2025

Legend

- Survey Area
- Cleared
- Completely degraded
- Degraded
- Good

WeedObs

- Declared Pest

WeedObs

Za - Zantedeschia aethiopica

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	5/12/2025

NOTES:

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

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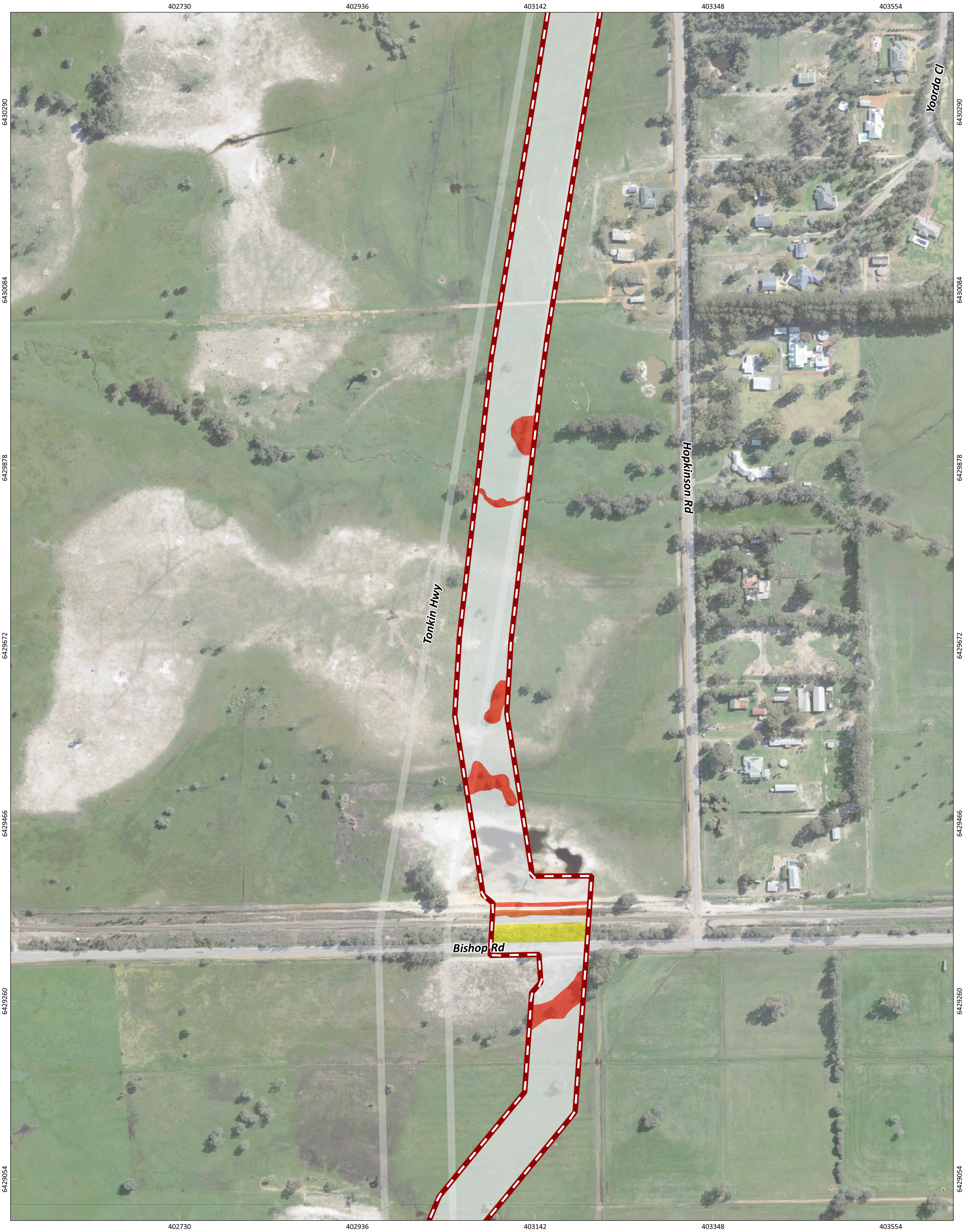


Figure 9d: Vegetation Condition and Significant Weeds

N

0 30 60 90 120 m

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	5/12/2025

Legend

- Survey Area
- Cleared
- Completely degraded
- Degraded
- Good

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	5/12/2025

NOTES:

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

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402990 403200 403410 403620 403830

6429150 6428940 6428730 6428520 6428310 6428100 6427890

Tonkin Hwy
Taylor Rd
Scott Rd
Lang Rd
Keirnan St
Adams St

Gf Za Za Aa Gf Za Za Za Gf

Gf Za Gf Aa Za Gf Aa Aa Aa Aa

Gf Aa Aa Gf Aa Aa Aa Aa

Figure 9e: Vegetation Condition and Significant Weeds

0 30 60 90 120 m

N

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,190
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	5/12/2025

Legend

- Survey Area
- Cleared
- Completely degraded

WeedObs

- Declared Pest
- WONS

WeedObs

- Aa - Asparagus asparagoides
- Gf - Gomphocarpus fruticosus
- Za - Zantedeschia aethiopica

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	5/12/2025

NOTES:

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

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4.3.3 Threatened and Priority Ecological Communities

The presence or absence of TECs and PECs was determined as per the following guidance:

- Methods for survey and identification of Western Australian threatened ecological communities (DBCA, 2023a).
- Comparison of species to the Gibson *et al.* (1994) report and Keighery *et al*. (2012) reports, particularly the list of taxa presented in Appendix 1 of Gibson *et al*. (1994).
- Listing in the Priority Ecological Communities for Western Australia version 35 (DBCA, 2023b).
- Where applicable, Commonwealth Approved Conservation Advice including Listing Advice was also applied for EPBC Act listed communities.

TECs and PECs with a medium or high likelihood of occurrence, as identified in the desktop assessment, are discussed in Table 17 below. No extant occurrence of TECs or PECs were identified as likely to occur within the Survey Area.

Given the level of degradation present within the Survey Area and survey timing, FCT analysis is not considered suitable for TEC/PEC determination.

As per methodology presented in Appendix 01 of *Methods for survey and identification of Western Australian threatened ecological communities* (DBCA, 2023a) vegetation was surveyed across a series of relevés, due to the primarily Degraded-Completely Degraded condition. For each TEC or PEC identified as potentially occurring by the desktop assessment, an assessment of presence or absence was undertaken based on species composition, soil and landform characteristics. The combined species list from all relevés for each identified vegetation unit/type were compared against the list of typical and common species presented in Appendix 1 of Gibson *et. al*. (1994) to infer likely FCT associations on the basis of species composition, with consideration of other typical habitat features such as soil and landform, and hydrological status.

Table 17: Assessment of TEC and PEC Presence or Absence

Floristic Community Type/ Comm ID	Community Name	Conservation Status		Presence/ Absence	Justification
		State (BC Act)	Federal (EPBC Act)		
SCP3c	*Corymbia calophylla - Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain (FCT 3c as originally described in Gibson et al. 1994)	CR	EN	Absent	Suitable soil and landform characteristics, comprising a heavy sandy loam to clayey loam with waterlogging are present within the central portion of the Survey Area, intersecting with the mapped extents of VT01 and VT02. Soils intersecting the southern portion of the Survey Area within mapped extent of VT03, VT04 and VT05 are not suitable and comprise of deep sandy soil with low nutrients. VT01, VT03, VT04 and VT05 did not contain characteristic native species associated with FCT SCP3c and were excluded from consideration on this basis. VT05 is comprised of *Corymbia calophylla* open woodland with over grazed paddock in Completely Degraded condition. The vegetation has been subjected to prolonged agricultural grazing, resulting in very low native species diversity in the lower stratum, which is now dominated by introduced grass species. Both releve 3 and 6 were analysed against SCP3c data. Comparison against typical and common species listed in Appendix 1 of Gibson *et al*. (1994) identified three of the 23 (13.04 %) listed species occur comprising: • *Corymbia calophylla* (syn. *Eucalyptus calophylla*) • *Banksia dallanneyi* • *Hypocalymma angustifolium* Note that with the exception of *Corymbia calophylla*, native species listed above are occurring as singular plants or scattered groups within VT05. The mid and ground strata

<table>
<tr><th rowspan="2">Floristic Community Type/ Comm ID</th><th rowspan="2">Community Name</th><th colspan="2">Conservation Status</th><th rowspan="2">Presence/ Absence</th><th rowspan="2">Justification</th></tr>
<tr><th>State (BC Act)</th><th>Federal (EPBC Act)</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>are dominated by weeds primarily *Bromus diandrus, *Vulpia myuros and *Ehrharta longiflora.

While comparison demonstrates some similarities to Gibson et al. (1994) typical and common species for SCP 3c, the percentage similarities are low, being 15% or less. It is considered logical to conclude based on location, soil association and the presence of some typical and common species that VT02 may have previously represented an occurrence of SCP 3c. However, due to the low percentage similarities to FCT description, the Completely Degraded condition and ongoing degradation from weeds and disturbance, it was concluded that the vegetation no longer represents an extant occurrence of SCP 3c.

<table>
<tr><th>Releve 3</th><th>Releve 6</th></tr>
<tr><td>Banksia attenuata</td><td>Corymbia calophylla</td></tr>
<tr><td>Corymbia calophylla</td><td>Xanthorrhoea preissii</td></tr>
<tr><td>Xanthorrhoea preissii</td><td>Hypocalymma angustifolia</td></tr>
<tr><td colspan="2">Percentage match against typical and common species listed in Appendix 1 of Gibson et al, (1994).</td></tr>
<tr><td>13 %</td><td>13 %</td></tr>
</table></td></tr>
<tr><td>SCP3b</td><td>Corymbia calophylla - Eucalyptus marginata woodlands on sandy clay soils of the southern Swan Coastal Plain (FCT 3b</td><td>EN</td><td>EN</td><td>Absent</td><td>Suitable soil and landform characteristics, comprising a moderately well drained deep loam within the northern portion of the Survey Area, intersecting with the mapped extents of VT01 and VT02.

VT01 comprises Eucalyptus rudis open woodland and VT02 comprises Corymbia calophylla open woodland, both which are in Good to Completely Degraded Condition.</td></tr>
</table>

<table>
<tr><th rowspan="2">Floristic Community Type/ Comm ID</th><th rowspan="2">Community Name</th><th colspan="2">Conservation Status</th><th rowspan="2">Presence/ Absence</th><th rowspan="2">Justification</th></tr>
<tr><th>State (BC Act)</th><th>Federal (EPBC Act)</th></tr>
<tr><td></td><td>as originally described in Gibson et al. 1994)</td><td></td><td></td><td></td><td>The vegetation was previously cleared for agricultural purposes and now has very low native species diversity and is dominated by weeds.

Comparison against typical and common species listed in Appendix 1 of Gibson et al. (1994) identified that three of the 39 (7.69%) listed species occur comprising:

• Corymbia calophylla (syn. Eucalyptus calophylla)
• Xanthorrhoea preissii
• *Briza maxima

Note that with the exception of Corymbia calophylla native species listed above are occurring as singular plants or scattered groups. The mid and ground strata are dominated by weeds.

While comparison demonstrates some similarities to Gibson et al. (1994) typical and common species for SCP 3b, the percentage similarities are low, being 15% or less. It is considered logical to conclude based on location, soil association and the presence of some typical and common species that VT01 and VT02 may have previously represented an occurrence of SCP 3b (notwithstanding the possibility of VT02 representing SCP3c). However, due to the low percentage similarities to FCT description, the Completely Degraded condition and ongoing degradation from weeds and disturbance, it was concluded that the vegetation no longer represents an extant occurrence of SCP 3b.
<table>
<tr><th>Releve 3</th><th>Releve 6</th></tr>
<tr><td>Corymbia calophylla</td><td>Corymbia calophylla</td></tr>
<tr><td>Xanthorrhoea preissi</td><td>*Briza maxima</td></tr>
<tr><td></td><td>Xanthorrhoea preissii</td></tr>
</table>
</td></tr>
</table>

Floristic Community Type/ Comm ID	Community Name	Conservation Status		Presence/ Absence	Justification
		State (BC Act)	Federal (EPBC Act)		
					Percentage match against typical and common species listed in Appendix 1 of Gibson et al, (1994).
					5 % **7.6 %**
Banksia WL SCP	Banksia Woodlands of the Swan Coastal Plain ecological community	P3	EN	Absent (See Table 18)	Soils intersecting the Survey Area within the mapped extent of VT03, occurs in the on Bassendean and Pinjarra phase soils, characterised by well-draining, low nutrient soils. These landform and soil characteristics are considered suitable for potentially supporting banksia woodland. Patch 1 was in Good condition and did contain many of the indicator species with >2% banksia species cover. Patch 2 was Completely Degraded and did not contain native species characteristics of banksia woodland, with <2% banksia species cover recorded. As such, these vegetation types were excluded from consideration on this basis. Patch 1 in vegetation type VT03 contained two Banksia species (*Banksia attenuata* and *Banksia menziesii*) which covers greater than 2% foliage cover of the vegetation type. Patch 2 had a lower stratum that was in Completely Degraded condition due to agricultural grazing. Patch 1 did not meet the size condition threshold of 2 ha of Good condition to be classified as Banksia WL SCP TEC. Patch 2 was too Degraded to meet criteria.
121	Clay Pans of the Swan Coastal Plain	CR	CR	Absent	There were no geographical features that represented a clay pan in the Survey Area.
SCP20b	*Banksia attenuata* and/or *Eucalyptus*	CR	EN	Likely Present	The vegetation in VT03 had affinities and similarities in composition to SCP20b. Releve 7 was analysed in Good condition banksia woodland along Bishop Road that crossed

Floristic Community Type/ Comm ID	Community Name	Conservation Status		Presence/ Absence	Justification
		State (BC Act)	Federal (EPBC Act)		
	marginata woodlands of the eastern side of the Swan Coastal Plain (FCT 20b as originally described in Gibson *et al*. 1994)				through the Survey Area. This patch of Good condition woodland has been affected by clearing for the adjacent railway and Bishop Road although held a moderate diversity and low weed ratio. **Releve 7** ***Banksia attenuata*** ***Conostylis juncea*** ***Dasypogon bromeliifolius*** ****Ursinia anthemoides*** ***Gompholobium tomentosum*** ***Stirlingia latifolia*** ***Conostephium pendulum*** ***Hypocalymma robustum*** ***Lomandra hermaphrodita*** **Percentage match against typical and common species listed in Appendix 1 of Gibson et al, (1994).** **19.14%**
SCP3a	*Corymbia calophylla - Kingia australis* woodlands on heavy soils of the Swan Coastal Plain (FCT 3a	CR	EN	Likely Present	The vegetation in VT02 had similarities in species composition to the *Corymbia calophylla - Kingia australis* woodlands on heavy soils of the Swan Coastal Plain TEC.

<table>
<tr><th rowspan="2">Floristic Community Type/ Comm ID</th><th rowspan="2">Community Name</th><th colspan="2">Conservation Status</th><th rowspan="2">Presence/ Absence</th><th rowspan="2">Justification</th></tr>
<tr><th>State (BC Act)</th><th>Federal (EPBC Act)</th></tr>
<tr><td></td><td>as originally described in Gibson et al. 1994)</td><td></td><td></td><td></td><td>The Soil was a heavy clay/loam and its position along the base of the Darling Scarp is consistent with other known communities. Releve 6 along Hopkinson’s Road was 66 % similar to SCP3a.

Orton Road is not considered SCP 3a - Is not an occurrence of the TEC. Only 33% of the species listed as "typical and common" species presented in Section 2 DESCRIPTION OF THE ECOLOGICAL COMMUNITY in Approved Conservation Advice are in the releve. This is not considered to be a sufficient alignment with characteristic species to define it as an occurrence.

<table>
<tr><th>Species</th><th>Releve 3</th><th>Releve 6</th></tr>
<tr><td>Banksia dallanneyi</td><td>Y</td><td>Y</td></tr>
<tr><td>Briza maxima</td><td></td><td>Y</td></tr>
<tr><td>Corymbia calophylla</td><td>Y</td><td>Y</td></tr>
<tr><td>Cyathochaeta avenacea</td><td></td><td>Y</td></tr>
<tr><td>Dampiera linearis</td><td></td><td></td></tr>
<tr><td>Desmocladus fasciculatus</td><td></td><td></td></tr>
<tr><td>Haemodorum laxum</td><td></td><td></td></tr>
</table>
</td></tr>
</table>

Floristic Community Type/ Comm ID	Community Name	Conservation Status		Presence/ Absence	Justification		
		State (BC Act)	Federal (EPBC Act)				
					Kingia australis	Y	Y
					Mesomelaena tetragona		Y
					Morelotia octandra (previously Tetraria octandra)		Y
					Philotheca spicata		
					Xanthorrhoea preissii	Y	Y
					Sum (%) Match *Percentage match against typical and common species listed in Appendix 1 of Gibson et al, (1994).	4 matches 33%	8 matches 66.66%
***Casuarina obesa* association**	*Casuarina obesa* Association	P1	-	Absent	There was one *Casuarina obesa* identified within relevé 2 although this looked to be planted in a landscape drainage swale of the new subdivision near Copper Road and does not represent this community.		

Banksia WL SCP Banksia Woodlands of the Swan Coastal Plain ecological community (EN)

The pre-survey desktop assessment identified that DBCA database mapping indicates the potential presence of the Banksia Woodlands of the Swan Coastal Plain TEC (The Banksia Woodland TEC). The field survey confirmed that patches of vegetation within VT03 *Banksia attenuata* woodland were consistent with the vegetation structure and composition of the community and that patches of the Banksia TEC were present.

The Conservation Advice describes a four-step process for identifying presence of the community. The steps are:

- Key diagnostic characteristics (location and physical environment, soils and landform, structure, and composition.
- Vegetation condition thresholds.
- Minimum patch size.
- Further information to assist in determining the presence of the ecological community and significant impacts.

The Conservation Advice defines a patch as "a discrete and mostly continuous area of the ecological community. A patch may include small-scale (<30 m) variations, gaps and disturbances, such as tracks, paths or breaks" (DotE, 2016). Where breaks are present (e.g. cleared gaps of >30m or area of non-Banksia Woodland vegetation types) several patches within a Survey Area may be defined and assessed against the criteria separately. The assessment is also tenure blind and requires consideration of vegetation outside of the Survey Area. Within the Survey Area two separate patches of potential Banksia Woodland TEC were identified: one north, and one south, of the cleared pipeline corridor. The assessment of these patches against the criteria are presented below in Table 18 with the extents shown in Figure 10.

Table 18: Banksia Woodland TEC Assessment (As per Conservation Advice)

Characteristic	Key Diagnostic Criteria	Justification
Step 01		
Location and physical environment	Occurs in the Swan Coastal Plain IBRA bioregion. Occurs on well drained, low nutrient soils on sandplain landforms, particularly deep Bassendean and Spearwood sands; occasionally on Quindalup sands or Aeolian sands of the Ridge Hill Shelf, Whicher Scarp and Dandaragan Plateau.	Meets criterion: Both Patches within VT03 occur on the Swan Coastal Plain Occurs on Bassendean and Pinjarra phase soils.
Structure	Low woodland to forest structure Distinctive upper tree layer or tall shrub layer of Banksia species at >2% cover. May have emergent trees of *Eucalyptus* or *Allocasuarina* spp. An often highly species-rich understorey that consists of sclerophyllous shrubs of various heights and a herbaceous ground layer of cord rushes, sedges and perennial and ephemeral forbs	Meets criterion: Patch 1 Patch 1 comprised a woodland structure with a canopy layer dominated by *Banksia attenuata*, at >2 % cover although Patch 2 did not meet >2 %.
Species composition	Canopy is most commonly dominated or co-dominated by and must include at least one of the following species: • *Banksia attenuata* • *Banksia menziesii* • *Banksia prionotes* • *Banksia ilicifolia*	Meets criterion: Both Patches Patch 1 was dominated or co dominated by *Banksia attenuata* and *Banksia menziesii*. Patch 2 was just remnant *Banksia ilicifolia*.

Characteristic	Key Diagnostic Criteria	Justification
Step 02		
Condition thresholds	To be considered as a part of the ecological community a patch should meet at least the Good Condition category.	Meets criterion: Patch 1 Patch 1 was in Good condition. Patch 2 was Completely Degraded.
Step 03		
Size and condition thresholds	'Pristine' – no minimum patch size applies 'Excellent' – 0.5 ha or 5,000 m^2 'Very Good' – 1 ha or 10,000 m^2 (e.g. 100 m x 100 m) 'Good' – 2 ha or 20,000 m^2 (e.g. 200 m x 100 m) Degraded- does not meet criteria A patch is a discrete and mostly continuous area of the ecological community. A patch may continue into vegetation outside of the Survey Area so long as the patch meets key diagnostic criteria. A patch may include small scale (<30m) gaps such as tracks, breaks or disturbed vegetation	Meets criterion: Neither patch Within the Survey Area Patch 1 covers 0.38 ha and outside of the Survey Area roughly 0.5 ha of Good condition. Within the Survey Area Patch 2 covers 0.29 ha.
Step 04		
Assessing variation in canopy cover, quality or condition.	As per the Conservation advice "Patches can be spatially variable and are often characterised by one or more areas within a patch that meet the key diagnostic characteristics and condition threshold criteria, amongst areas of lower condition. Average canopy cover and quality across the broadest area that meets the general description of the community should be used". Hence for patches with a mixture of vegetation condition present, the patch should be assessed considering the "average" condition of the patch	Within the Survey Area patches have been defined applying the average "condition of the patch across the broadest area potentially comprising a patch". In Patch 1, 3 bands of banksia woodland exist along the railway line within 30 m of each other and average a greater than Good condition.

Characteristic	Key Diagnostic Criteria	Justification
	across the broadest area potentially comprising a patch.	
Conclusion		Meets Criterion: Both patches do not meet TEC criteria within Commonwealth guidelines.



Plate 6: Banksia woodland (VT03) Patch 1 on Bishop Road



Plate 7: Banksia woodland (VT03) Patch 2 on Scott Road

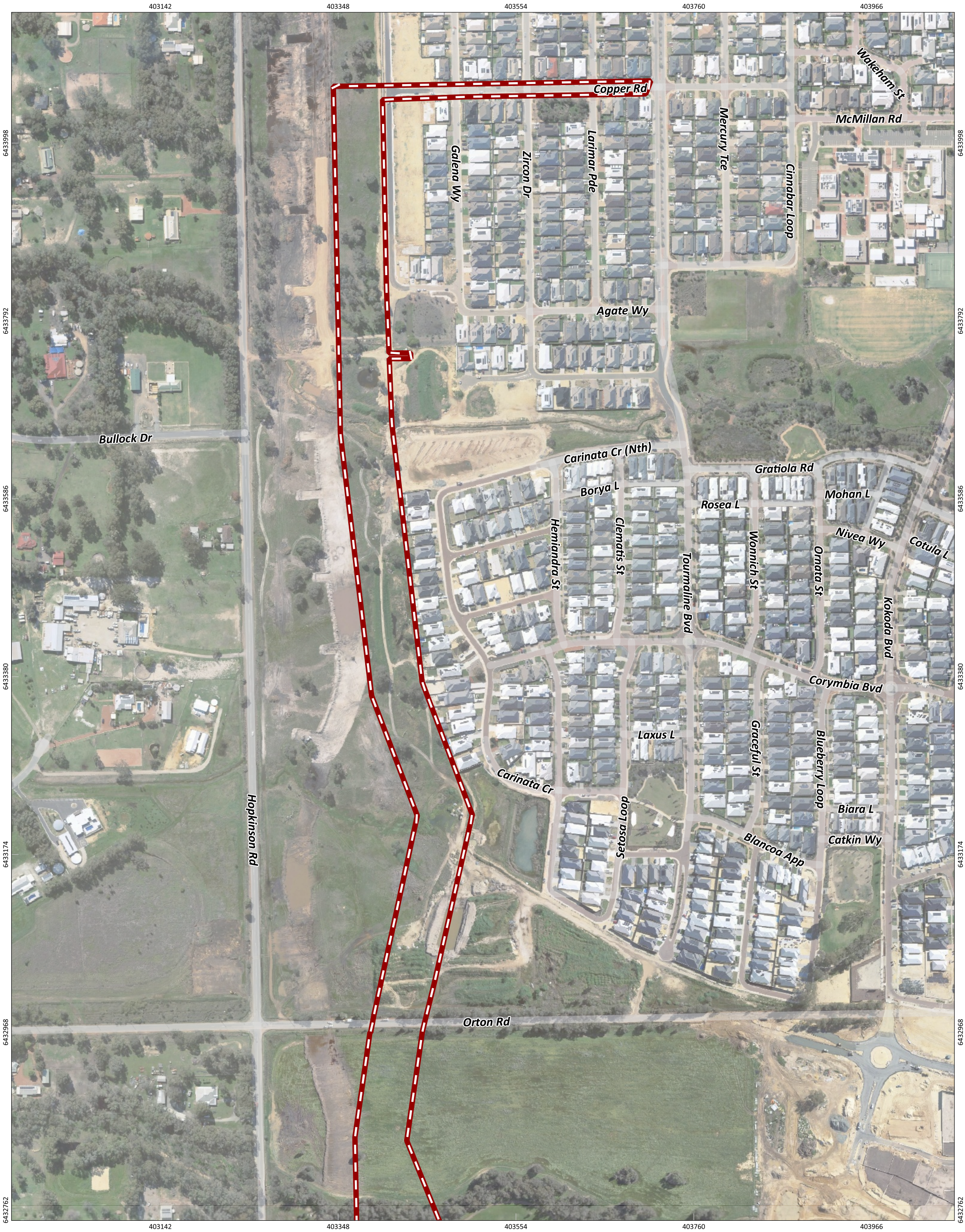


Figure 10a: TECs and PECs Identified within the Survey Area

N

0 30 60 90 120 m

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	5/12/2025

Legend

Survey Area

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	5/12/2025

NOTES:

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

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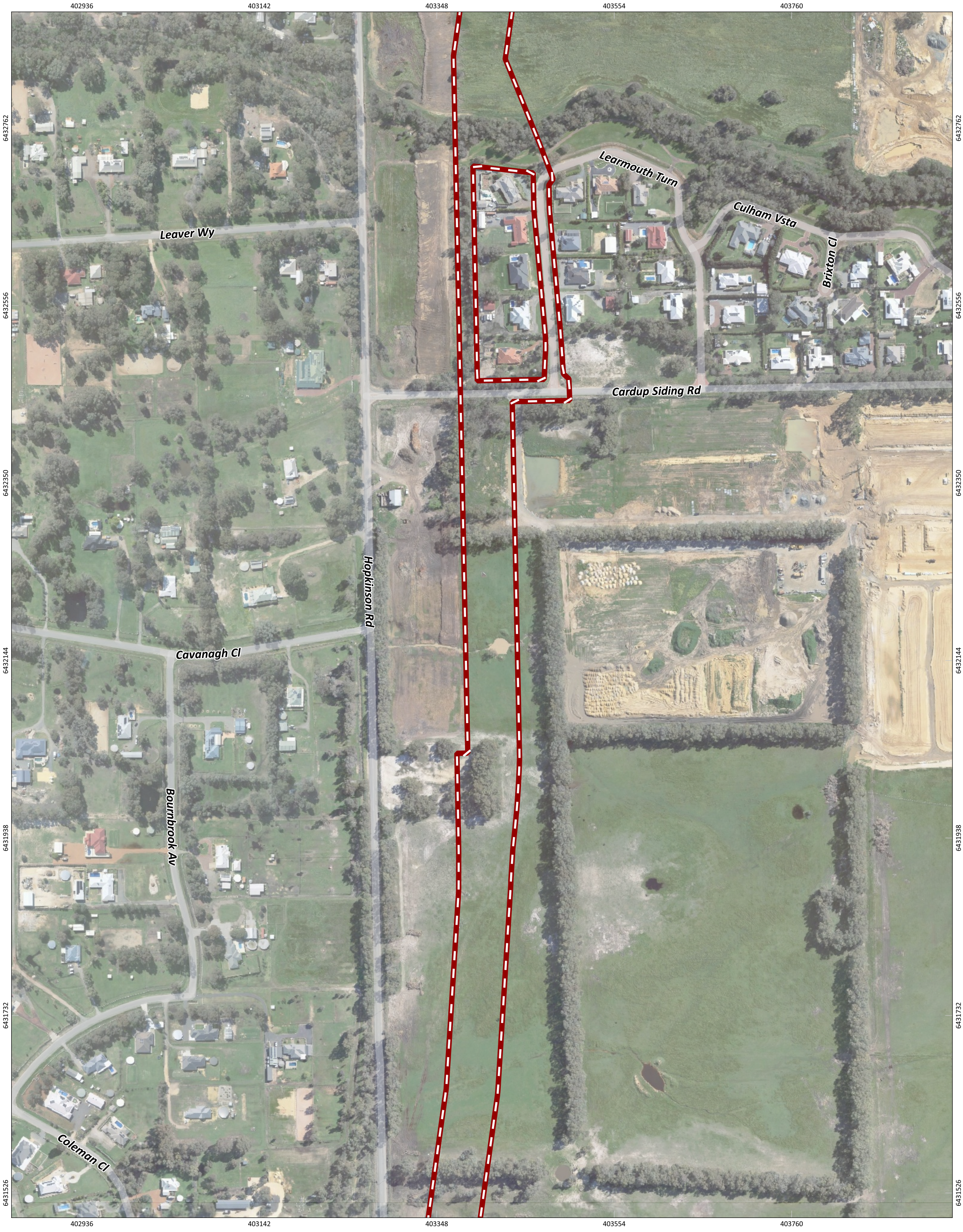


Figure 10b: TECs and PECs Identified within the Survey Area

N

0 30 60 90 120 m

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	5/12/2025

Legend

Survey Area

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	5/12/2025

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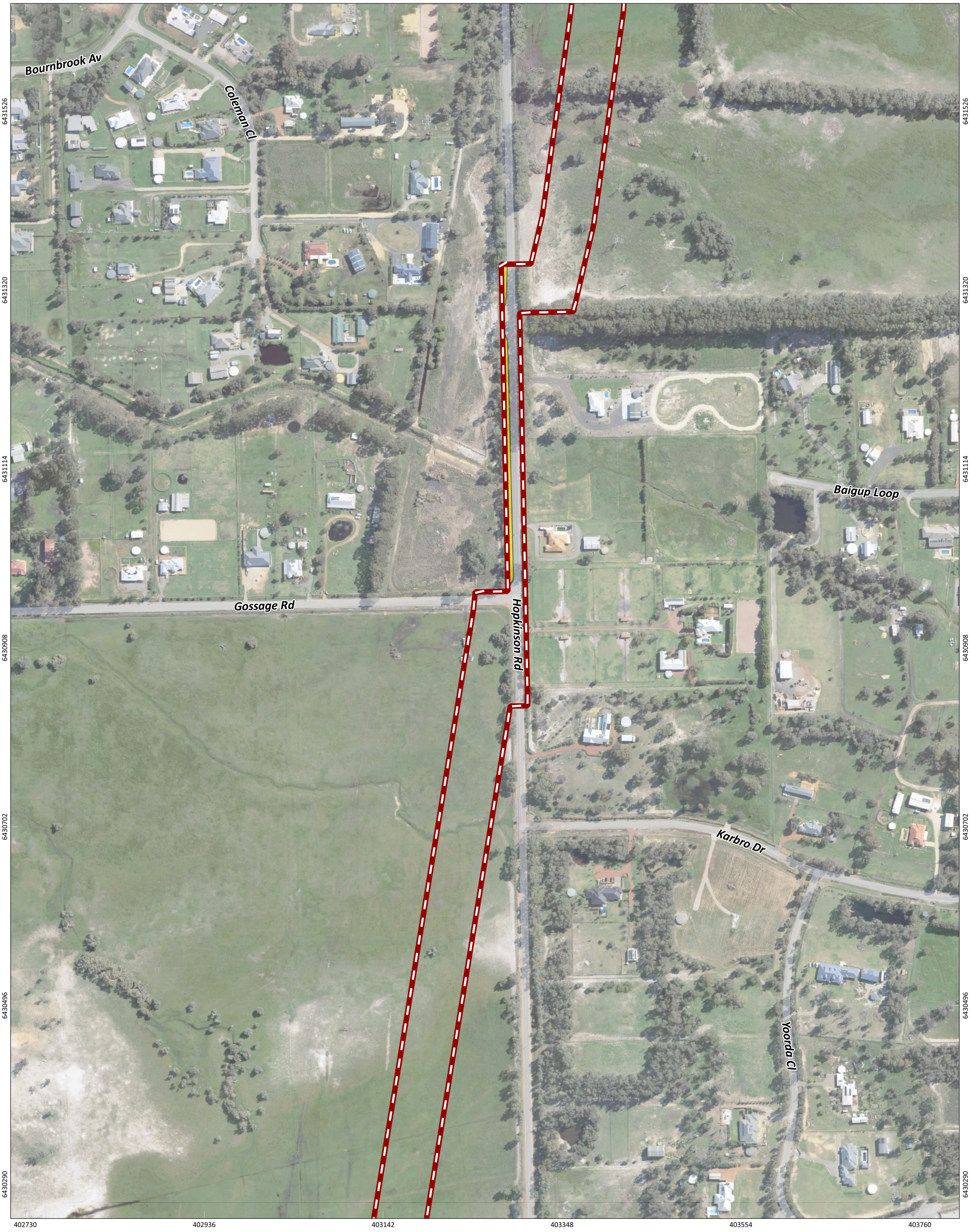


Figure 10c: TECs and PECs Identified within the Survey Area

0 30 60 90 120 m N		PROJECT/REPORT NAME Biological Survey Report Scott Road WWPS to Byford	
SCALE 1:4,112	SHEET SIZE A3 COLOUR	CLIENT Cossil and Webley	
COORDINATE REFERENCE SYSTEM GDA2020 / MGA zone 50		PROJECT NUMBER A24.032	VERSION 0
DATA SOURCE LANDGATE AERIAL IMAGERY NOW		DRAWN BY / REVIEWED BY MD/JR	DATE 5/12/2025

Legend

- Survey Area
- Likely 'SCP3a Marri Kingia woodlands on heavy soils'

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	5/12/2025

NOTES:

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Figure 10d: TECs and PECs Identified within the Survey Area

N

0 30 60 90 120 m

PROJECT/REPORT NAME: Biological Survey Report Scott Road WWPS to Byford		
SCALE: 1:4,112	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A24.032	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW	DRAWN BY / REVIEWED BY: MD/JR	DATE: 5/12/2025

Legend

- Survey Area
- Potential 'SCP20b Banksia attenuata and/or Eucalyptus marginata woodlands of the eastern side of the Swan Coastal Plain'

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	5/12/2025

NOTES:

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Figure 10e: TECs and PECs Identified within the Survey Area

N 0 30 60 90 120 m		PROJECT/REPORT NAME: Biological Survey Report Scott Road WWPS to Byford	
SCALE: 1:4,190	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A24.032	VERSION: 0	
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW	DRAWN BY / REVIEWED BY: MD/JR	DATE: 5/12/2025	

Legend

Survey Area

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	5/12/2025

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4.3.4 Vegetation of Other Significance

As detailed in the Flora and Vegetation Technical Guidance (EPA, 2016) as well as the EPA's Environmental Factor Guideline for Flora and Vegetation, vegetation may be considered of significance for a range of reasons, other than a listing as a TEC or a PEC, including:

- Pre-European vegetation extent being below a threshold level.
- Scarcity.
- Unusual species.
- Novel combinations of species.
- A role as a refuge.
- A role as a key habitat for threatened species or large populations representing a significant proportion of the local to regional total population of a species.
- A restricted distribution.

The remaining areas of vegetation for both the Pinjarra 968 vegetation association of Beard, and the Beermullah and Guildford Complexes are below the 30% targets set by the Commonwealth government (DEH, 2001). As such, these are considered to be endangered under the criteria outlined in Commonwealth of Australia (1997).

No other reasons are present to consider the vegetation as of other significance.

4.4 Fauna Desktop Assessment

4.4.1 Fauna Assemblage

The primary objectives of a basic fauna survey, as detailed in the EPA Fauna Technical Guidance, was to verify the overall adequacy of the desktop study, and to map and describe habitats with a focus on habitat for conservation listed fauna within the Survey Area.

A desktop assessment of expected conservation significant fauna assemblage was undertaken through searches of DBCA database records and the EPBC Act PMST, shown in Figure 11. Results are summarised in Appendix F.

Database searches identified 58 conservation listed fauna species that potentially occur, or habitat likely occurs within the Survey Area, comprising:

- Thirty-five bird species.
- Eleven mammal species.
- Eight invertebrate species.
- Four reptile species.

4.4.2 Fauna Likelihood of Occurrence

Conservation listed species that were determined to have a high or medium pre-Survey likelihood of occurrence are presented below in Table 19

The species assessed as having a low likelihood of occurrence were those that are locally extinct, have no recent records or for which no suitable habitat is present (e.g. wading birds). Species recorded or assessed as having a high or medium likelihood of occurrence are discussed in detail in Section 4.5.2.

Table 19 Fauna with High and Medium Likelihood of Occurrence

Scientific Name	Common name	Conservation Status		Database		Likelihood of Occurrence Pre Survey	Justification
		State	Federal	PMST	DBCA		
Calyptorhynchus banksii naso	Forest Red-tailed Black-Cockatoo, Karrak	VU	VU	x	x	High	Numerous records recorded within 10 km of Survey Area, potential foraging vegetation present in Survey Area and minor freshwater courses present within Survey Area.
Falco peregrinus	Peregrine falcon	OS			x	High	closest record occurs 2.3 km east of Survey Area in Brickwood Reserve, record 20 years old.
Zanda baudinii	Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-cockatoo	EN	EN	x	x	High	Numerous records occurring <1 km from Survey Area, <20 years old. Suitable foraging habitat may be present in Survey Area. Survey Area within occurrence distribution.
Zanda latirostris	Carnaby's Black Cockatoo, Short-billed Black-cockatoo	EN	EN	x	x	High	Numerous records occurring <1 km from Survey Area, <20 years old. Suitable foraging habitat may be present in Survey Area. Survey Area within occurrence distribution.

Scientific Name	Common name	Conservation Status		Database		Likelihood of Occurrence Pre Survey	Justification
		State	Federal	PMST	DBCA		
Synemon gratiosa	Graceful sun moth	P4			x	Medium	Three records 7.7 km west of Survey Area, <20 years old. Host plant *Lomandra hermaphrodita* detected within small patch of banksia woodland in the Survey Area
Westralunio carteri	Carter's freshwater mussel	VU			x	Medium	Numerous records recorded in waterways, closest record was observed 2.2 km in Mandejal Brook, 14 years old. Potential habitat (watercourse) occurs within Survey Area.
Hydromys chrysogaster	Water-rat, rakali	P4			x	Medium	Multiple records 7.5 km from Survey Area near Serpentine River, <20 years old. No suitable habitat (rivers) occurs within Survey Area.
Isoodon fusciventer	Quenda, southwestern brown bandicoot	P4			x	High	An individual deceased quenda was found on the border of the Survey Area during the field survey. Closest record occurs 1 km west of Survey Area near nature reserve, <20 years old. Survey Area is within known distribution of occurrence; species may occur in metro areas.
Phascogale tapoatafa wambenger	South-western brush-tailed phascogale, wambenger	CD			x	Medium	Most recent record is 7.8 km south of Survey area in Lowland Nature Reserve, <10 years old. Potential suitable habitat (open woodland or forest) occurs in Survey Area.

Scientific Name	Common name	Conservation Status		Database		Likelihood of Occurrence Pre Survey	Justification
		State	Federal	PMST	DBCA		
Lerista lineata	Perth slider, lined skink	P3			x	Medium	Most recent records occur 8.5 west of Survey Area in Banksia nature reserve, <20 years old. Potential suitable habitat (Banksia woodland) occurs in Survey Area.
Neelaps calonotos	Black-striped snake, black-striped burrowing snake	P3			x	Medium	Most recent record occur 8.6 km west of Survey Area, <10 years old. No suitable habitat (Banksia woodland) occurs within Survey Area.

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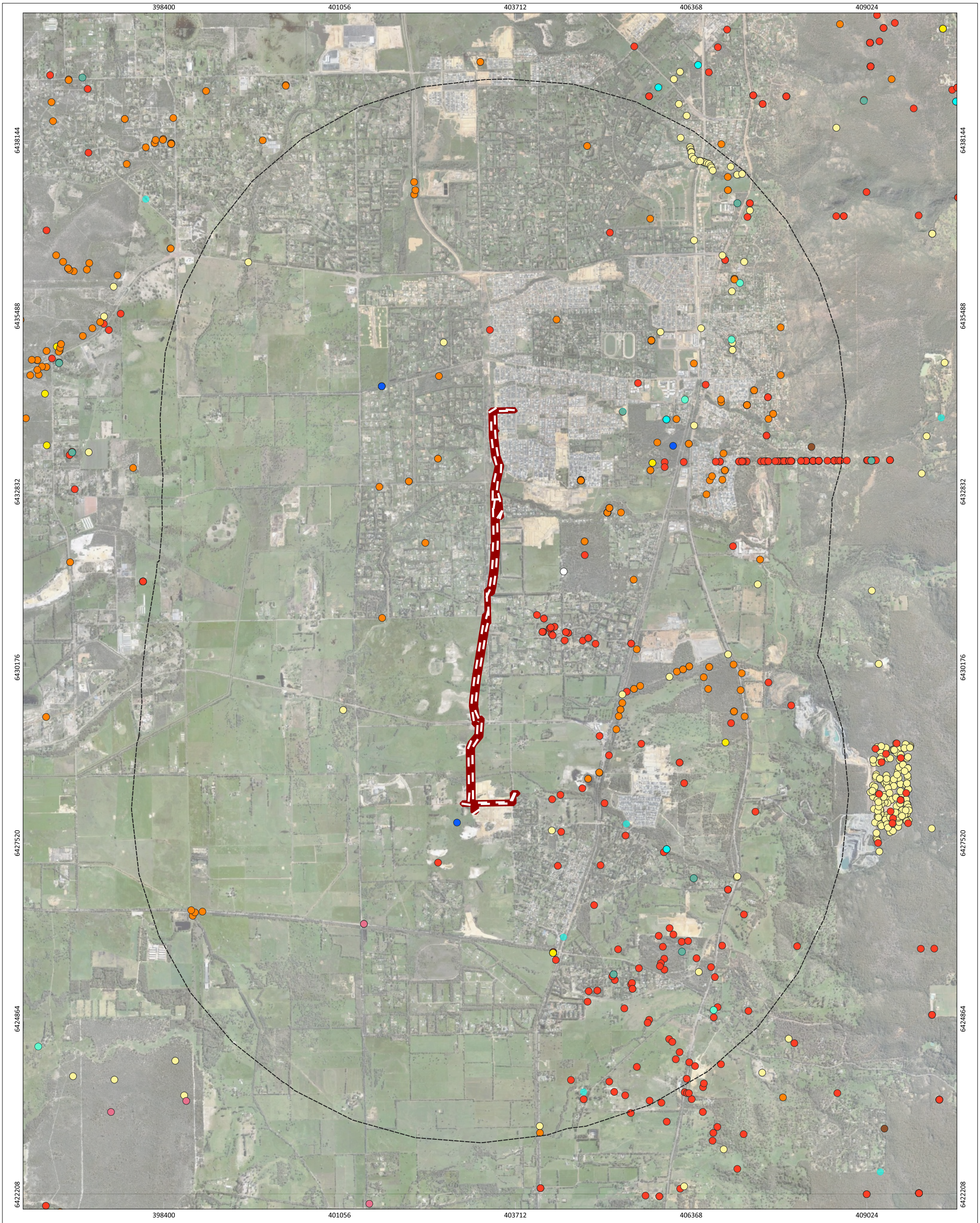


Figure 11: DBCA Database Search Results Fauna

0 400 800 1,200 1,600 m

N

SCALE: 1:53,117	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A24.032	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW		DRAWN BY / REVIEWED BY: MD/JR	DATE: 14/11/2025

PROJECT/REPORT NAME: Biological Survey Report
Scott Road WWPS to Byford

Legend

- Survey Area
- 5km Buffer

DBCA Fauna Search

- Critically endangered species
- Endangered species
- Vulnerable species
- Priority 3
- Priority 4
- Migratory species
- Other specially protected species
- Conservation Dependent
- Endangered or Priority species
- DBCA Fauna (FRTBC)
- DBCA Fauna (BC)

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	14/11/2025

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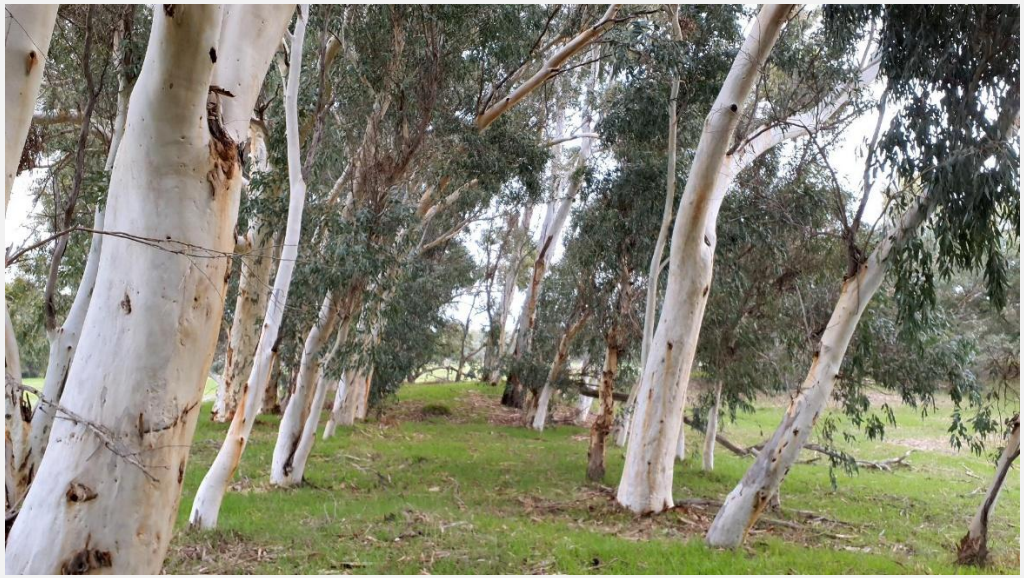
4.5 Fauna Field Survey

4.5.1 Fauna Habitat Types

There are nine fauna habitat types within the Survey Area. These broadly align with the mapped vegetation type boundaries. The fauna habitat types are described below in Table 20 and shown in Figure 12.

For possibly occurring conservation listed fauna species, habitat types are assessed as either core, supporting or non-significant habitat. In accordance with the MNES – Significant Impact Guidelines 1.1, "core" habitat is defined as that critical to the survival of the species and considered to contain denning or breeding sites, primary foraging areas and refuge from drought, fire and other stresses (DotE, 2013). "Supporting" habitat is defined as that which is likely used for foraging and dispersing or connective purposes but is not essential habitat for the continuation of a local population. "Non-significant" habitat is that which would be used only very infrequently for foraging or dispersing.

Table 20: Fauna Habitat Type Description within the Survey Area.

Fauna Habitat Type	Habitat Description	Area (ha); Proportion of Survey Area (%)	Representative Photo
FHT-01 **Scattered small-fruited *Eucalyptus***	Planted rows and stands of small-fruited smooth bark *Eucalyptus* and *Eucalyptus rudis* (Flooded gum) over cleared/grazed paddock. Limited understory species due to agricultural grazing, dominated by paddock grasses. No evidence of foraging was observed. Soil substrate: Variable over Survey Area **No core habitat for all species.** **Supporting habitat for:** Forest red-tailed black cockatoos **Non-significant for:** Carnaby's black cockatoos Baudin's black cockatoos Peregrine falcon Brush-tailed phascogale Quenda Rakali Graceful sun-moth Carter's freshwater mussel) Perth slider Black-striped burrowing snake	2.56 ha 6.63 %	

Fauna Habitat Type	Habitat Description	Area (ha); Proportion of Survey Area (%)	Representative Photo
FHT-02 **Paddock and open grassland**	Cleared pasture grassland, dominated by paddock grasses. **Non-significant habitat for all species.**	30.2 78.16 %	

Fauna Habitat Type	Habitat Description	Area (ha); Proportion of Survey Area (%)	Representative Photo
FHT-03 **Scattered Marri**	Rows and stands of *Corymbia calophylla* (marri) over cleared/grazed paddock. Degraded condition with some connective canopy. No understory species observed, minimal ground leaf cover, mostly dominated by paddock grasses. Scattered hollow fallen logs and branches on ground, with occasional old dead trees containing suitable hollows for black cockatoos (Class 3). Some foraging evidence was observed, no roosting evidence. Soil substrate: deep bleached grey sands/sandy loam over clay **No core habitat for all species.** **Supporting habitat for:** • Forest red-tailed black cockatoos • Carnaby's black cockatoos • Baudin's black cockatoos **Non-significant for:** • Peregrine falcon • Brush-tailed phascogale • Quenda • Rakali • Graceful sun-moth • Carter's freshwater mussel) • Perth slider • Black-striped burrowing snake	0.63 ha 1.64 %	

Fauna Habitat Type	Habitat Description	Area (ha); Proportion of Survey Area (%)	Representative Photo
FHT-04 **Scattered paperbark**	Individual or small rows of *Melaleuca preissiana* (paperbark) along roadsides or over degraded grazed paddock **Non-significant for all species.**	0.17 ha 0.45 %	
FHT-05 ***Banksia* woodland and associated mixed shrubs**	Scattered individual *Banksia attenuata* and *B. menziesii* over mixed native species. Single contiguous area along the railway in south of the Survey Area, scattered *Banksia* and other associated proteaceous species (*Xylomelum occidentale*.) occur sporadically elsewhere. Habitat value for fauna reduced due to small relative size and isolated nature of the patches. Soil substrate: Deep sandy loam soils	0.21 ha 0.54 %	

Fauna Habitat Type	Habitat Description	Area (ha); Proportion of Survey Area (%)	Representative Photo
	No core habitat for all species. **Supporting habitat for:** • Forest red-tailed black cockatoos • Carnaby's black cockatoos • Baudin's black cockatoos • Quenda • Graceful sun-moth • Perth slider • black-striped burrowing snake **Non-significant for:** • Peregrine falcon • Brush-tailed phascogale • Rakali • Carter's freshwater mussel		
FHT-06 **Wetland feature and associated vegetation**	Planted rows and stands of small-fruited smooth bark *Eucalyptus* and *Eucalyptus rudis* (Flooded gum) on banks of seasonal drainage lines (river streams, slow flowing dams) as the survey occurred during winter, all water courses were in active flow. Drainage lines may dry up during summer months. **Core habitat for**: • Carter's freshwater mussel **supporting habitat for**: • Brush-tailed phascogale • Rakali	0.8 ha 2.08 %	

Fauna Habitat Type	Habitat Description	Area (ha); Proportion of Survey Area (%)	Representative Photo
	• Quenda **Non-significant for:** • Forest red-tailed black cockatoos • Carnaby's black cockatoos • Baudin's black cockatoos • Peregrine falcon • Graceful sun-moth • Perth slider • black-striped burrowing snake		
FHT-07 **Reedbed**	Reedbed of *Typha orientalis* on ephemeral creek line **No core habitat for all species.** **Supporting habitat for:** • Quenda **Non-significant for all other listed species**	0.03 ha 0.09 %	
FHT-08 **Planted garden**	Mix non-native and exotic eucalypt and garden species over cleared paddock No core habitat for all species.	0.13 ha 0.33 %	

Fauna Habitat Type	Habitat Description	Area (ha); Proportion of Survey Area (%)	Representative Photo
	patch in the south along Scott rd appears to be dead *Tipuana tipu* **Non-significant for all species.**		

Fauna Habitat Type	Habitat Description	Area (ha); Proportion of Survey Area (%)	Representative Photo
FHT-09 Scattered Jarrah	individual *Eucalyptus marginata* (jarrah) over cleared/grazed paddock. Degraded condition with no connected canopy. No understory species observed, minimal ground leaf cover, mostly dominated by paddock grasses. Scattered hollow fallen logs and branches on ground Soil substrate: deep bleached grey sands/sandy loam over clay **No core habitat for all species.** **Supporting habitat for:** • Forest red-tailed black cockatoos **Non-significant for:** • Carnaby's black cockatoos • Baudin's black cockatoos • Peregrine falcon • Brush-tailed phascogale • Quenda • Rakali • Graceful sun-moth • Carter's freshwater mussel) • Perth slider • Black-striped burrowing snake	0.04 0.1 %	

Fauna Habitat Type	Habitat Description	Area (ha); Proportion of Survey Area (%)	Representative Photo
BG-Bare ground and built structure	Road surface, driveways, built structure and completely degraded substrate (sand/gravel, no vegetation)	3.86 ha 9.98%	
Total		38.63 ha	

4.5.2 Threatened and Priority Fauna

Four of the species identified as having a high likelihood of occurrence were observed within the Survey Area during the field Survey, they were

- *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo)—VU.
- *Zanda baudinii* (Baudin's black cockatoo)—EN.
- *Zanda latirostris* (Carnaby's black cockatoo)—EN.
- *Isoodon fusciventer* (quenda)—P4.

Specific targeted assessments for black cockatoo species were undertaken and are presented in Section 4.6.

No previous DBCA fauna records have been reported within the Survey Area. Other fauna species of conservation significance which were recorded or assessed as having a high or medium likelihood of occurrence are discussed in detail below:

Peregrine falcon - OS

Peregrine falcon (*Falco peregrinus*) is a state listed species, listed as Other Specially Protected (OS) status. A cosmopolitan species that is a predator of other bird species, it can be found in an extremely wide range of habitats. Habitats within the Survey Area have the potential to support a number of potential prey species, as well as perches that the Peregrine Falcon could use to prepare their prey. There is no breeding habitat present within the Survey Area for the Peregrine falcon, which require steep cliffs or tall built structures.

There are 14 DBCA records of peregrine falcons within 10 km of the Survey Area within the last 20 years. The species is likely to be only infrequently present or recorded as a flyover. None of the habitat within the Survey Area would be considered core or supporting habitat for peregrine falcon, however tall trees in FHT-01, FHT-03, and FHT-09 may provide occasional perching opportunities for the species.

Quenda - P4

An individual deceased quenda was recorded along the border of the Survey Area within an open paddock in FHT-02.

Quendas are widely distributed in south-west WA and are associated with wetlands and fringing areas with dense cover of shrubs and sedges adjoining areas of woodland and grassland. Quenda will forage in grassland or paddocks when adjacent to dense cover. Quendas are commonly recorded in bushland <5 km from the Survey Area.

There is no core habitat for quenda within the Survey Area. Fauna habitat type FHT-05, FHT-06 and FHT-07 is considered to provide supporting habitat to this species due to presence of native understory that provides cover and foraging opportunities.

All other habitats are considered non-significant for this species due to lack of understory plant species to support tunnelling, denning and foraging.

Brush-tailed phascogale—CD

The south-western brushed-tailed phascogale is known to occur in the southwest of WA between Perth and Albany, occurring at low densities in the northern Jarrah forest and high densities in the lower southwest in isolated populations. Their preferred habitat is in dry sclerophyll forests and open woodlands that contain hollow-bearing trees and they are often encountered at night along drainage lines. The nearest records to the Survey Area are 6 km southwest in the Lowlands Nature Reserve that borders the Serpentine river.

Within the Survey Area, FHT-06 is considered suitable core habitats for the species as these habitats offer connective tree canopy over drainage lines and contains small tree hollows to support nesting. All other habitat within the Survey Area is considered non-significant habitat for the species.

Rakali – P4

Rakali are amphibious rodents that inhabit permanent water systems within the Swan Coastal Plain. The drainage lines that run through the Survey Area (FHT-06) are not permanent and are dry during the summer and autumn months. There are 32 records of rakali within 20 km of the Survey area within the last 20 years, the majority of these records are along the Serpentine river which is a permanent water system that is located 6 km south of the Survey Area, and the drainage lines within the Survey Area have hydrological linkages to the Serpentine River. FHT-06 is considered supporting habitat for this species within the Survey Area.

Graceful sun-moth - P4

Graceful sun-moth (*Synemon gratiosa*) is listed as a Priority 4 species by DBCA. Graceful sun-moth is associated with coastal heath land, dense vegetation and *Banksia* woodland. The DBCA database search returned three records of graceful sun-moth within a radius of 10 km of the Survey Area within the last 20 years. These records are all in the Jandakot Regional park area northwest of the Survey Area. FHT-05 provide supporting habitat for this species, graceful sun-moth require the host plant *Lomandra hermaphrodita* to complete their life cycle, L. *hermaphrodita* was recorded within the small patch of Banksia woodland in the south of the Survey Area.

Carter's Fresh Water Mussels—VU

This species occurs in greatest abundance in slower flowing waters where sediments are stable and soft enough to allow the species to burrow (<10 cm depth) but are usually visible from the surface to facilitate filter feeding. Carter's freshwater mussel has a complex life cycle involving a parasitic larval stage, which it attaches to a fish host before it metamorphoses into the juvenile form that drops off the fish host to begin its life on the sediment. The period of attachment to a fish host functions as an effective dispersal mechanism for this otherwise sessile animal.

This species has been recorded approximately 4 km northwest of the Survey Area in an ephemeral drain of the Serpentine River in Oakford. All of the drainage lines within the Survey Area serve as tributaries to the Serpentine River, as such FHT_06 is considered core habitat for this species. The only other aquatic habitat

within the Survey Area was the small reed bed in the north (FHT-07 but this habitat is considered too choked with vegetation to provide supporting habitat for Carter's fresh water mussel.

Black-striped snake, - P3

Black-striped snake (*Neelaps calonotos*) is listed as a Priority 3 species by DBCA. The species inhabits coastal dunes and sandplains that support heath or Banksia woodland.

There are three DBCA records of this species within the 10 km buffer of the Survey Area within the last 20 years. The nearest is 6.5 km west in Modong nature reserve. This species is likely infrequently recorded due to its nocturnal and subterranean habit. The Banksia woodland of FHT_05 is considered supporting habitat for this species, all other habitats within the Survey area are considered non-significant for this species.

Perth slider - P3

Perth slider (*Lerista lineata*) is listed as a Priority 3 species by DBCA. The species inhabits coastal dunes and sandplains that support heath or Banksia woodland.

There is 36 DBCA records of this species within the 10 km buffer of the Survey Area within the last 20 years, the nearest is 6.5 km northwest near Forrestdale lake nature reserve. This species is likely infrequently recorded due to its nocturnal and subterranean habit. The Banksia woodland of FHT-05 is considered supporting habitat for this species, all other habitats within the Survey area are considered non-significant for this species.

Extant of core and supporting habitat present within the Survey Area by species is summarised in Table 21.

Table 21: Summary of Fauna Habitat Value

Species	Extent Core Habitat (ha)	Extent Supporting Habitat (ha)
Zanda baudinii **(Baudin's black cockatoo)**	0	0.84
Zanda latirostris **(Carnaby's black cockatoo)**	0	0.84
Calyptorhynchus banksia naso **(Forest red-tailed black cockatoo)**	0	3.44
Falco peregrinus **(peregrine falcon)**	0	0
Isoodon fusciventer **(Quenda)**	0	1.05
Hydromys chrysogaster **(water-rat, rakali)**	0	0.8
Phascogale tapoatafa wambenger **(brush-tailed phascogale)**	0	0.8
Synemon gratiosa **(Graceful sun moth)**	0	0.21
Westralunio carteri **(Carter's freshwater mussel)**	0.8	0
Lerista lineata **(Perth slider)**	0	0.21
Neelaps calonotos **(black-striped burrowing snake)**	0	0.21

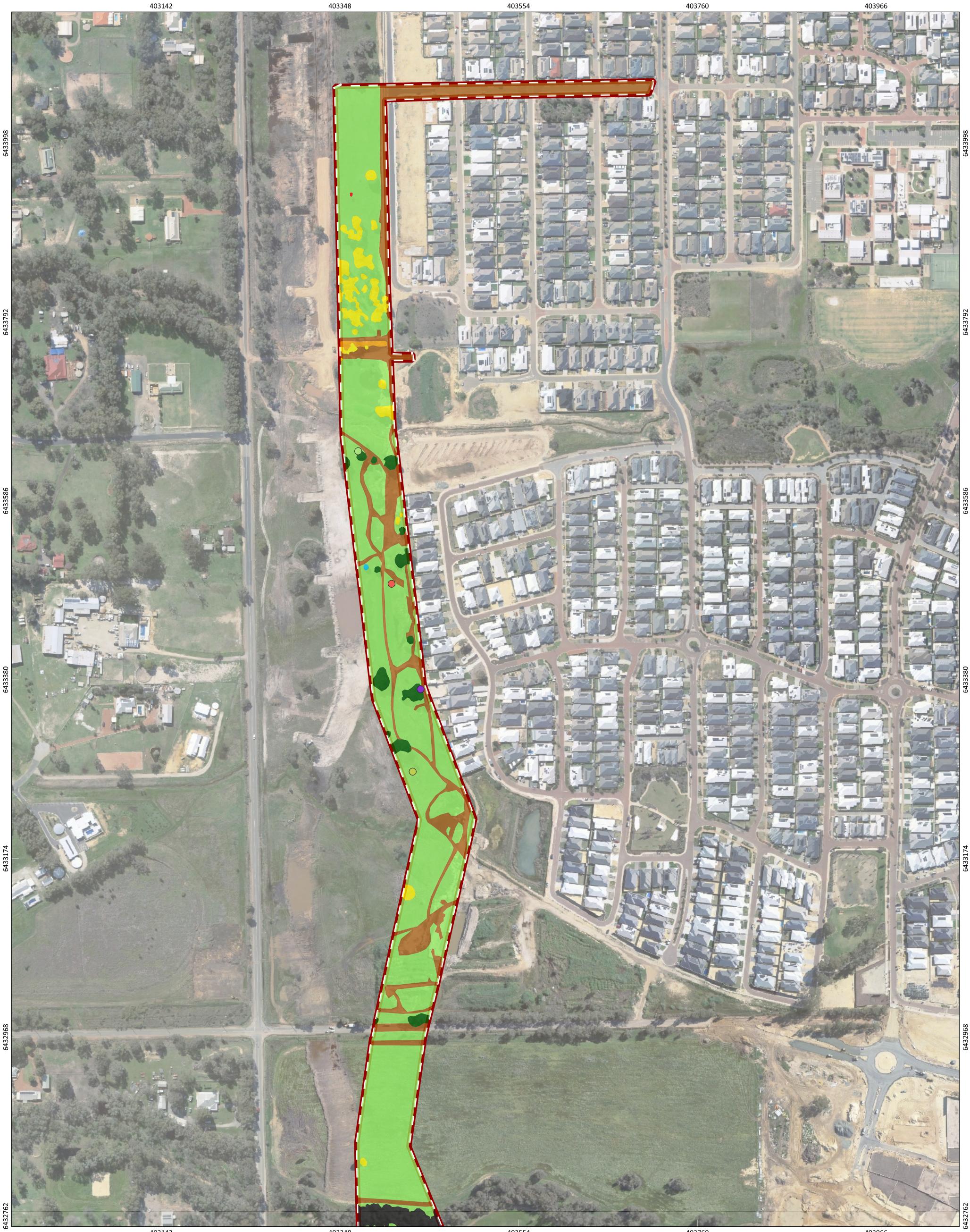


Figure 12a: Fauna Habitat Types And Conservation Significant Fauna Observations

N 0 30 60 90 120 m		PROJECT/REPORT NAME: Biological Survey Report Scott Road WWPS to Byford	
SCALE: 1:4,112	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A24.032	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW		DRAWN BY / REVIEWED BY: MD/JR	DATE: 18/11/2025

Legend

- Survey Area
- Calyptorhynchus banksii
- Calyptorhynchus banksii - Observed
- Calyptorhynchus latirostris (EN) - Observed
- Isoodon fusciventer (P5) - Observed

Fauna Habitat

- BG_01 - Bare ground and built structure
- FHT_01 - Scattered small fruited Eucalyptus
- FHT_02 - Paddock and open grassland
- FHT_03 - Scattered marri
- FHT_04 - Scattered paperbark
- FHT_05 - Banksia woodland and associated mixed native shrubs
- FHT_06 - Wetland feature and associated vegetation
- FHT_07 - Reedbed

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	18/11/2025

NOTES:

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

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402936 403142 403348 403554 403760

6432762 6432556 6432350 6432144 6431938 6431732 6431526

Figure 12b: Fauna Habitat Types And Conservation Significant Fauna Observations

N

0 30 60 90 120 m

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	18/11/2025

Legend

Survey Area

Fauna Habitat

- BG_01 - Bare ground and built structure
- FHT_01 - Scattered small fruited Eucalyptus
- FHT_02 - Paddock and open grassland
- FHT_06 - Wetland feature and associated vegetation
- FHT_08 - Planted garden

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	18/11/2025

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402730 402936 403142 403348 403554 403760

6431526 6431320 6431114 6430908 6430702 6430496 6430290

Figure 12c: Fauna Habitat Types And Conservation Significant Fauna Observations

N

0 30 60 90 120 m

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	18/11/2025

Legend

Survey Area

Fauna Habitat

- BG_01 - Bare ground and built structure
- FHT_01 - Scattered small fruited Eucalyptus
- FHT_02 - Paddock and open grassland
- FHT_03 - Scattered marri
- FHT_08 - Planted garden
- FHT_09 - Scattered jarrah

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	18/11/2025

NOTES:

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

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Figure 12d: Fauna Habitat Types And Conservation Significant Fauna Observations

0 30 60 90 120 m
N

SCALE: 1:4,112	SHEET SIZE: A3 COLOUR
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A24.032 / VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW	DRAWN BY / REVIEWED BY: MD/JR / DATE: 18/11/2025

PROJECT/REPORT NAME: Biological Survey Report
Scott Road WWPS to Byford

CLIENT: Cossil and Webley

Legend

Survey Area
Calyptorhynchus baudinii (EN) - Observed

Fauna Habitat

- BG_01 - Bare ground and built structure
- FHT_01 - Scattered small fruited Eucalyptus
- FHT_02 - Paddock and open grassland
- FHT_03 - Scattered marri
- FHT_04 - Scattered paperbark
- FHT_05 - Banksia woodland and associated mixed native shrubs
- FHT_09 - Scattered jarrah

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	18/11/2025

NOTES:

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

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402990 403200 403410 403620 403830

6429150 6428940 6428730 6428520 6428310 6428100 6427890



402990 403200 403410 403620 403830

Figure 12e: Fauna Habitat Types And Conservation Significant Fauna Observations

0 30 60 90 120 m

N

SCALE: 1:4,190	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A24.032	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW	DRAWN BY / REVIEWED BY: MD/JR	DATE: 18/11/2025

PROJECT/REPORT NAME: Biological Survey Report
Scott Road WWPS to Byford

Legend

Survey Area

Calyptorhynchus banksii - Observed

Fauna Habitat

- BG_01 - Bare ground and built structure
- FHT_01 - Scattered small fruited Eucalyptus
- FHT_02 - Paddock and open grassland
- FHT_03 - Scattered marri
- FHT_04 - Scattered paperbark
- FHT_05 - Banksia woodland and associated mixed native shrubs
- FHT_06 - Wetland feature and associated vegetation
- FHT_08 - Planted garden

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	18/11/2025

NOTES:

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

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4.6 Black Cockatoo Habitat Assessment

4.6.1 Black Cockatoo Observations.

The Survey Area falls within the modelled distribution range for Baudin's black cockatoo, Carnaby's black cockatoo and the forest red-tailed black cockatoo (DAWE, 2022).

During the field survey, Carnaby's black cockatoo and forest red-tailed black cockatoo were both observed within the Survey Area. Carnaby's black cockatoo were seen commuting over the northern section of the Survey Area and did not stop to perch. Forest red-tailed cockatoos were observed commuting over the Survey Area but were also recorded actively foraging marri nuts within an immature marri along the heavily disturbed Scott Rd (See Plate 8).



Plate 8: Female forest red-tailed black cockatoo foraging marri nuts along Scott Rd.

All observations were made in habitat consistent with known high-quality foraging habitat of Baudin's, Carnaby's and forest red-tailed black cockatoos.

There is one confirmed Carnaby's black cockatoo breeding area within 12 km of the Survey Area (DBCA-054). There were numerous observation records for Baudin's, Carnaby's and the forest red-tailed black cockatoos identified in the DBCA database within a 10 km buffer of the Survey Area. Six mapped black cockatoo roosting

sites are present within 12 km of the Survey Area (DBCA-064). All are confirmed Carnaby's black cockatoo roost sites, the nearest roost site is 1 km from the Survey Area, see Figure 13.

4.6.2 Breeding Habitat Assessment

Breeding habitat is defined as that which contains known, suitable or potential nesting trees (DAWE, 2022). Breeding typically occurs in native eucalypt species particularly marri, jarrah, wandoo and tuart, however many species of eucalypt including non-endemic species may develop suitable hollows for breeding (DAWE, 2022). A summary of suitable nesting hollow characteristics for the three species is provided below in Table 22.

Table 22: Black Cockatoo Nesting Hollow Characteristics

Species	Baudin's Black cockatoo	Carnaby's Black cockatoo	Forest Red-tailed Black cockatoo
Tree species and hollow characteristic	Nesting in mainly karri, jarrah wandoo, bullich and tuart. Utilise hollows from 10-65 cm diameter (average 26 cm) and >1 m deep. Hollow depth ranges from 0.1 to 2.5+ m (Johnstone and Kirkby 2011).	Nesting mainly in salmon gum, wandoo, tuart, jarrah, flooded gum, karri and marri. Utilise hollows from 10-65 cm diameter (average 26 cm) and >1 m deep	Nesting mainly in jarrah, marri, karri, wandoo, bullich, blackbutt and tuart Utilise hollow from 12-150 cm diameter (average 34 cm) and >1 m depth
Sources	Johnstone and Kirkby,2011.	DAWE, 2022, Saunders et al., 2014a, Saunders et al., 2014b.	DAWE, 2022, Johnstone et al., 2013.

A total of 249 potential nesting trees were recorded within the Survey Area. Please refer to Figure 14 for tree locations and Appendix G for a summary of tree locations, species, DBH and tree health. No evidence of current or previous nesting behaviour, such as chew marks at hollow entrance attributed to black cockatoos, or individuals flying out of hollows were recorded.

The large majority of potential nesting trees (235 trees) did not show signs of potential nesting hollow development (Class 5 trees). Twelve trees were assessed as possessing small hollows which are of an insufficient size to support nesting (<10 cm entrance); or which have an entrance of >10 cm but the internal dimensions are not suitable, or the hollow is not accessible (Class 4 trees). These Class 4 trees are however of sufficient age and growth form to be developing hollows. Two trees (Tree number 36 and 230) were confirmed to have hollows with suitable dimensions for use by black cockatoos (Class 3), however the trees were in poor condition. See Table 23 for a summary of trees inspected via pole camera. A summary of all potential nesting trees, including species and Bamford class is provided in Table 24.

Table 23: Suitable Nesting Tree Hollow Description

Tree Number	Tree Specie	DBH (cm)	Bamford Class	Hollow Comments	Drone photo
36	Marri	120	3	10cm Spout 7 m up, worn edge, checked with drone and sufficiently deep, large fissure on trunk but edges too cracked to be black cockatoo hollow, small hollow has bees, adjacent trees all housing corellas	
230	Dead (marri)	105	3	3 x 10cm diameter hollows on tree, one obvious spout with definite wear, crack on trunk leading to hollow interior and spout on other side of the fence, light shines through, looks hollow	

Table 24: Summary of Potential Nesting Trees Recorded

Bamford Class and DAWE (2022) Terminology	Class 1	Class 2	Class 3	Class 4	Class 5	Totals (Trees)
	Known Nesting Tree		Suitable Nesting Tree	Potential Nesting Tree	Potential nesting tree	
Tree Species						
Jarrah	-	-	-	1	2	3
Marri	-	-	1	2	40	43
Flooded Gum	-	-	-	5	93	98
Eucalyptus	-	-	-	1	100	101
Dead	-	-	1	3	-	4
Total (Bamford Class	**0**	**0**	**2**	**12**	**235**	**249**

4.6.3 Foraging Habitat Assessment

Habitats within the Survey Area contain species which comprise suitable foraging habitat. Fauna habitat types FHT-01, FHT-03 and FHT-05 all contain a proportion of foraging species for all three black cockatoo species including jarrah, marri, Banksia spp. and other *Eucalyptus* species.

The Commonwealth referral guidelines provide a foraging quality scoring tool to guide referral information (DAWE, 2022). The tool advises that if the Survey Area contains native vegetation used for foraging at any time by a black cockatoo species and is >1 ha in size, that it is considered at face value to be of very high quality and assigned a starting score of 10. The tool then allows for subtractions if attributes are present which reduce the functionality of the foraging habitat. The Commonwealth referral guidelines specify that the tool is to be applied once to the entire impact area even if there is more than one type of foraging habitat present. The calculated foraging habitat quality score is shown below in Table 25.

Table 25: Foraging Quality Scoring Tool (DAWE, 2022)

Attribute	Baudin's Black Cockatoo	Carnaby's Black Cockatoo	Forest Red-tailed Black Cockatoo
Starting score	0- Less than 1 hectare of high-quality foraging habitat	0- Less than 1 hectare of high-quality foraging habitat	0- Less than 1 hectare of high-quality foraging habitat
Foraging potential (-2 if no foraging evidence)	No change, foraging evidence recorded.	No change, foraging evidence recorded.	No change, foraging evidence recorded.
Connectivity (-2 if no other foraging	No change, other foraging habitat <12 km away	No change, other foraging habitat <12 km away	No change, other foraging habitat <12 km away

Attribute	Baudin's Black Cockatoo	Carnaby's Black Cockatoo	Forest Red-tailed Black Cockatoo
habitat in 12 km)			
Proximity to breeding habitat (-2 if no breeding habitat in 12 km)	No change recorded breeding habitat within 12 km	No change recorded breeding habitat within 12 km	No change recorded, breeding habitat within 12 km
Proximity to roosting (-1 if >20 km from known night roost)	No change, known roosting site <20 km distant	No change, known roosting site <20 km distant	No change, known roosting site <20 km distant
Impact from significant plant disease (-1 if >50% impact)	No change, impact from plant disease affecting <50 % of foraging plants	No change, impact from plant disease affecting <50 % of foraging plants	No change, impact from plant disease affecting <50 % of foraging plants
Total score	0	0	0

The Commonwealth referral guidance allows for the inclusion of additional information for foraging habitat which may be considered during an assessment, such as the extent and density of recognised foraging plants within a Survey Area. As an additional source of information, WEPL provides an assessment of foraging habitat quality using a more detailed scoring tool developed by DCCEEW (n.d.) referred to as the Habitat Quality Scoring Tool to produce a numerical foraging habitat score. The Habitat Quality Scoring Tool allows for a score of 0 (none) to 7 (very high) for Site Condition. This is assessed based on density of known foraging species and health of vegetation. The 0-7 Site Condition score is applied to each mapped polygon of fauna habitat. The Habitat Quality Scoring Tool then applies a Site Context score out of three, this is applied only once to the whole Survey Area. This Tool is presented in Appendix H.

The Site Condition habitat quality score for each species, and the total area of that score present within the Survey Area are listed in Table 26.

Table 26: Habitat Quality Scoring Tool - Site Condition Extent

Site Condition	Baudin's Black Cockatoo (ha)	Carnaby's Black Cockatoo (ha)	Forest Red-tailed Black Cockatoo (ha)
7- Very High	0.63	0.63	0.63
6- High	0.21	0.21	0.02
5-Moderate-High	-	-	0.04
4-Moderate	-	-	
3-Low-Moderate	-	-	
2-Low	3.40	3.40	3.55
1-Negligable to Low	30.53	30.53	30.53
0-None	3.86	3.86	3.86
Total	38.63	38.63	38.63

* Shaded cells are classified as not comprising suitable foraging habitat

The Habitat Quality Scoring Tool then requires the application of a Site Context score (out of 3) (see Table 27) which is added to the Site Condition score for a final score (out of 10).

Table 28 provides the final Habitat Quality Scoring Tool score. It should be noted that habitat with a Site Condition score of 2 or less is extremely unlikely to be suitable habitat, and does not have a Site Context score added.

Table 27: Habitat Quality Scoring Tool - Site Context

Site Context					
Proximity of the site in relation to other habitat	3	Site is within 6 km of known breeding site.	or	Site is within 12 km of other foraging resources with site condition of at least 3.	3
	2	Site is within 12 km of known breeding site.		Site is within 15 km of other foraging resources with site condition of at least 4.	
	1	Site is within 15 km of known breeding site.		Site is between 15 km and 20 km of other foraging resources with site condition of at least 5.	
	0	Site is further than 15 km from known breeding site.		Site is further than 20 km from other foraging resources.	
Total					3

Table 28: Final Habitat Scoring Tool Score

Survey Area Condition	Baudin's Black Cockatoo (ha)	Carnaby's Black Cockatoo (ha)	Forest Red-tail Black Cockatoo (ha)
10	0.63	0.63	0.63
9	0.21	0.21	0.02
8	-	-	0.04
7	-	-	-
6	-	-	-
5	-	-	-
4	-	-	-
3	-	-	-
2	3.40	3.40	3.55
1	30.53	30.53	30.53
0	3.86	3.86	3.86
Total	38.63	38.63	38.63

* Shaded cells are classified as not comprising suitable foraging habitat

As per the Habitat Quality Scoring Tool areas with a site condition score of 2 or lower (shaded cells) are "extremely unlikely to be considered as suitable habitat". These areas are therefore classified as not comprising suitable foraging habitat in this assessment.

4.6.4 Regional Foraging Habitat Assessment

Analysis of the estimated foraging habitat extent within the local area was also undertaken to provide further context. The estimated extent of foraging habitat is calculated for a buffer of 12 km around and including the Survey Area. This buffer is selected as recommended in the Commonwealth referral guidelines due to black cockatoos mainly foraging within 12 km of their nest site during the breeding season and their reliance on the proximity of foraging resources to successfully raise chicks (DAWE, 2022).

Analysis considers Remnant Native Vegetation Extent mapping (DPIRD-005) and Vegetation Complexes-Swan Coastal Plain and South-west forest region (DBCA-046 and DBCA-047). See summary of regional vegetation complexes and extents in Table 29 and Figure 18.

Analysis indicates there are approximately 20,677.07 ha of remnant native vegetation mapped within a 12 km buffer of the Survey Area. It is expected that the majority of this vegetation would contain suitable foraging species at the same or greater rate than that present within the Survey Area. Much of this regional remnant native vegetation is located within the jarrah forest in the east.

Consequently, within the Survey Area there is 0.85 ha of foraging habitat scoring between 3 (low to moderate) and 7 (very high) on the Habitat Quality Scoring Tool - Site Condition scale. This represents 0.0041% of the estimated regional habitat extent.

The habitat quality within the Survey Area is considered likely to be of lesser quality than much of the regional foraging habitat, which includes high quality marri-jarrah woodlands of the Jarrah Forest bioregion.

Table 29: Regional Foraging Habitat Extent within 12 km of the Survey Area

Vegetation Complex	Remnant Extent (ha)
Bassendean Complex-Central and South	4441.418004
Beermullah Complex	122.0935552
Cottesloe Complex-Central and South	31.16390502
Dardanup Complex	219.5970008
Darling Scarp, DS2	2149.889935
Dwellingup, D1	845.3438951
Dwellingup, D2	6379.223883
Forrestfield Complex	537.0236101
Guildford Complex	535.9620588
Helena 1, He1	809.8695436
Herdsman Complex	7.294216492
Murray 1, My1	1708.350457
Serpentine River Complex	88.9655952
Southern River Complex	1191.087471
Swamp, S	61.14739811
Yarragil 1, Yg1	1140.518247
Yarragil 2, Yg2	408.1200781
TOTAL	**20,677.06885**

4.6.5 Roosting Habitat Assessment

Six confirmed Carnaby's black cockatoo roost sites are within 6 km of the Survey Areas (DBCA-064). No evidence of roosting within the Survey Area was recorded.

Night roosting locations are typically in proximity to foraging habitat (black cockatoos mainly foraging within 20 km of night roosts) and with access to water points <2 km from roosting location (DAWE, 2022). Any groups of tall trees, particularly large native eucalypts in proximity to water sources may provide night roosting habitat (DAWE, 2022). Within the Survey Area, fauna habitat types FHT-01 and FHT-03 provides the most suitable roosting habitat as they contain medium and large stands of eucalypts with medium canopies. Access to permanent water is within the Survey Area from farm dams and drainage lines.

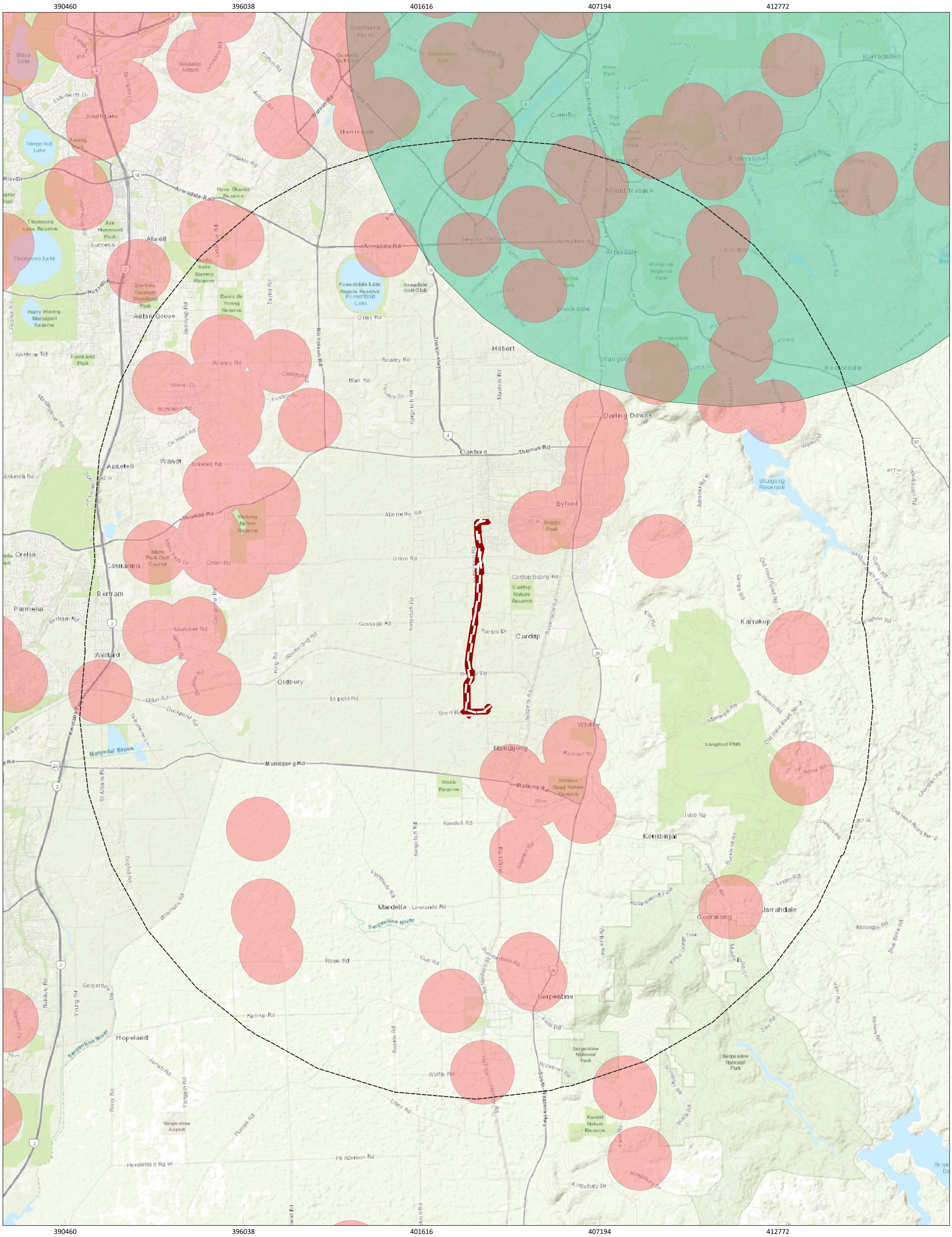


Figure 13: Known Black Cockatoo Roosting and Breeding Sites within 12 km Buffer

N 0 1 2 3 km		PROJECT/REPORT NAME: Biological Survey Report Scott Road WWPS to Byford	
SCALE: 1:111,561	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A24.032	VERSION: 0
DATA SOURCE: ESRI Topographic Map		DRAWN BY / REVIEWED BY: MD/JR	DATE: 14/11/2025

Legend

- Survey Area
- 12km Buffer
- Black Cockatoo Roosting Sites - Buffered (DBCA-064)
- Carnabys Cockatoo Confirmed Breeding Areas within the Swan Coastal Plain and Jarrah Forest IBRA Regions (DBCA-054)

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	14/11/2025

NOTES:

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

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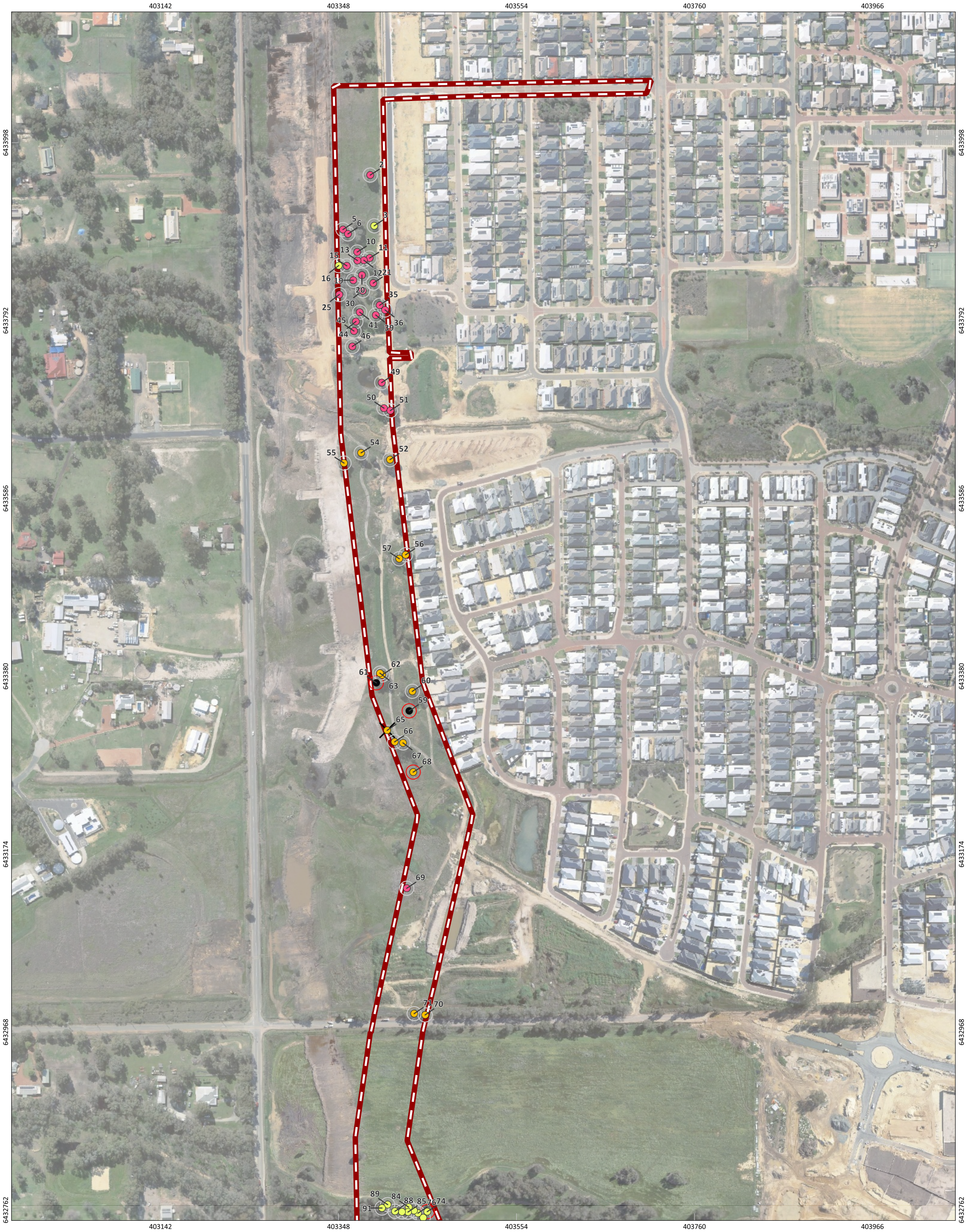


Figure 14a: Black Cockatoo Potential Breeding Habitat

N

0 30 60 90 120 m

SCALE: 1:4,112	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A24.032	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW		DRAWN BY / REVIEWED BY: MD/JR	DATE: 14/11/2025

PROJECT/REPORT NAME: Biological Survey Report
Scott Road WWPS to Byford

Legend

Survey Area

Tree Species
- Dead
- Eucalyptus
- Flooded Gum
- Marri

Bamford Tree Class
- 3
- 4
- 5

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	14/11/2025

NOTES:

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

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Figure 14b: Black Cockatoo Potential Breeding Habitat

0 30 60 90 120 m N		PROJECT/REPORT NAME Biological Survey Report Scott Road WWPS to Byford	
SCALE 1:4,112	SHEET SIZE A3 COLOUR	CLIENT Cossil and Webley	
COORDINATE REFERENCE SYSTEM GDA2020 / MGA zone 50		PROJECT NUMBER A24.032	VERSION 0
DATA SOURCE LANDGATE AERIAL IMAGERY NOW		DRAWN BY / REVIEWED BY MD/JR	DATE 14/11/2025

Legend

- Survey Area

Tree Species

- Eucalyptus
- Flooded Gum
- Marri

Bamford Tree Class

- 4
- 5

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	14/11/2025

NOTES:

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

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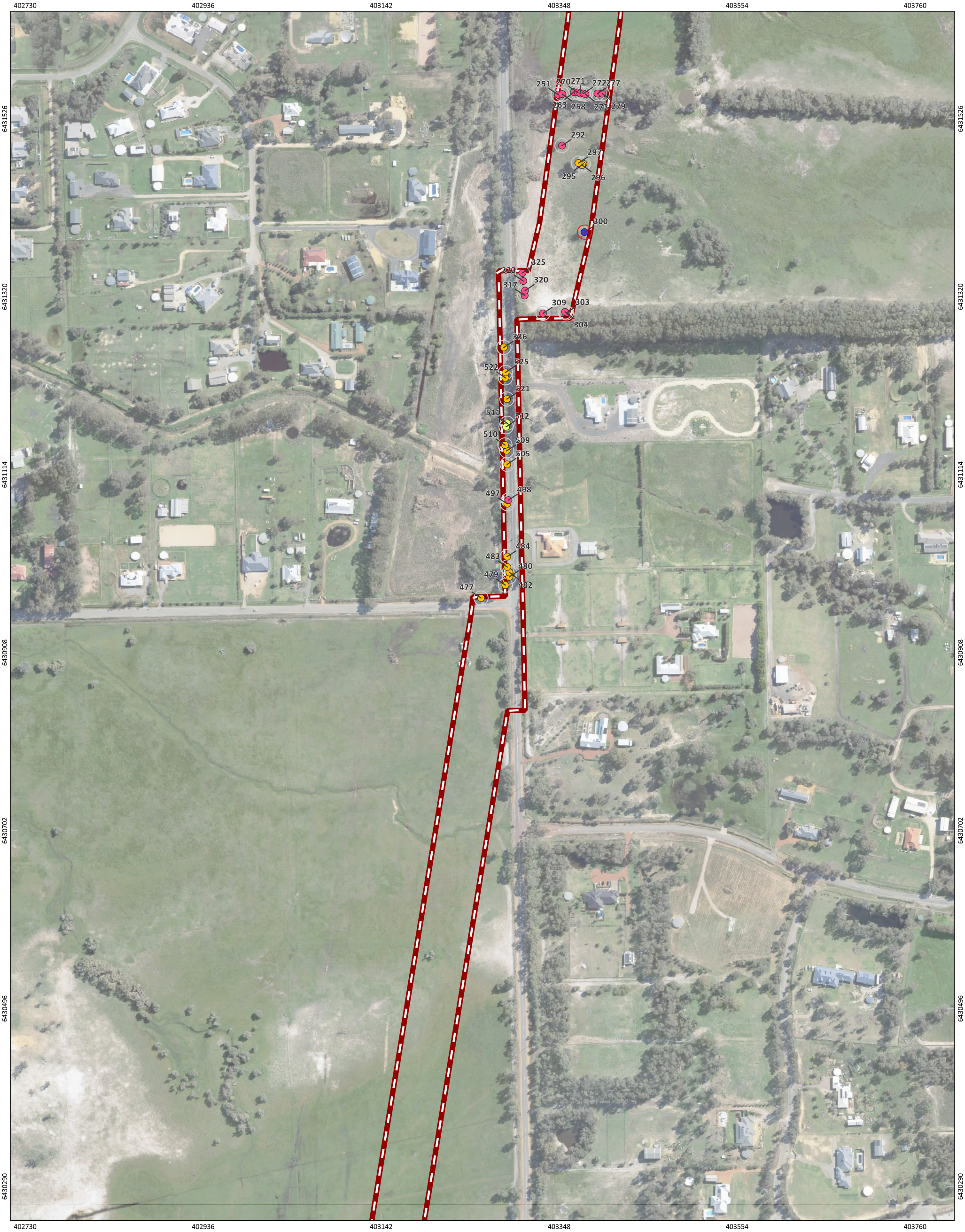


Figure 14c: Black Cockatoo Potential Breeding Habitat

0 30 60 90 120 m

N

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	14/11/2025

Legend

Survey Area

Tree Species
- Eucalyptus
- Flooded Gum
- Jarrah
- Marri

Bamford Tree Class
- 4
- 5

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	14/11/2025

NOTES:

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

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Figure 14d: Black Cockatoo Potential Breeding Habitat

0 30 60 90 120 m
N

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	14/11/2025

Legend

Survey Area

Tree Species
- Dead
- Eucalyptus
- Flooded Gum
- Jarrah
- Marri

Bamford Tree Class
- 3
- 4
- 5

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	14/11/2025

NOTES:

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

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Figure 14e: Black Cockatoo Potential Breeding Habitat

N 0 30 60 90 120 m	PROJECT/REPORT NAME: Biological Survey Report Scott Road WWPS to Byford		
SCALE: 1:4,190	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A24.032	VERSION: 0	
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW	DRAWN BY / REVIEWED BY: MD/JR	DATE: 14/11/2025	

Legend

- Survey Area
- **Tree Species**
  - Dead
  - Eucalyptus
  - Flooded Gum
  - Marri
- **Bamford Tree Class**
  - 4
  - 5

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	14/11/2025

NOTES:

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

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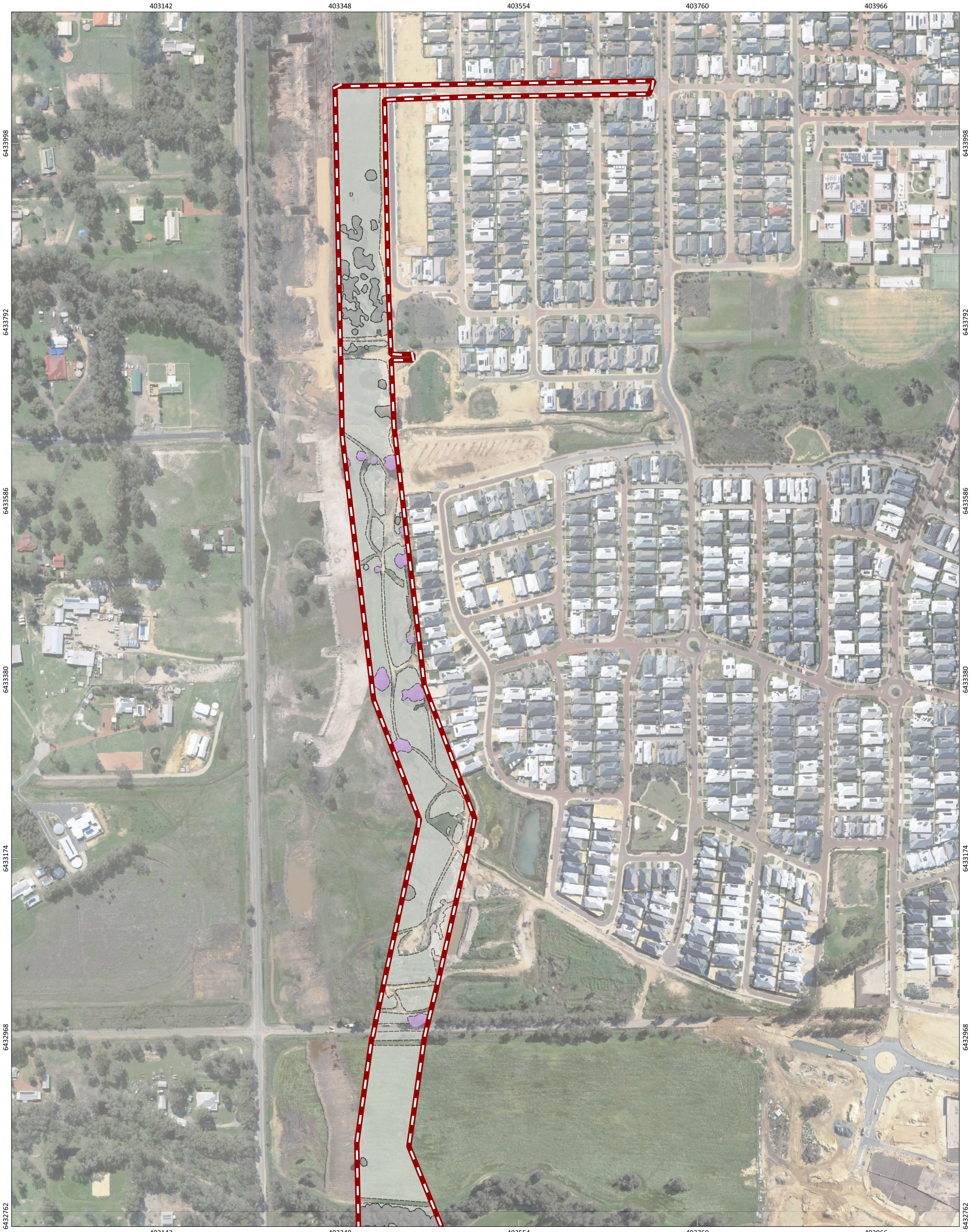


Figure 15a: Black Cockatoo Foraging Habitat (BBC)

0 30 60 90 120 m

N

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	18/11/2025

Legend

Survey Area

Site Condition Score (Habitat Quality Score Tool)

- 0- None
- 1-Negligible
- 2-Low
- 8-10 Very High

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	18/11/2025

NOTES:

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

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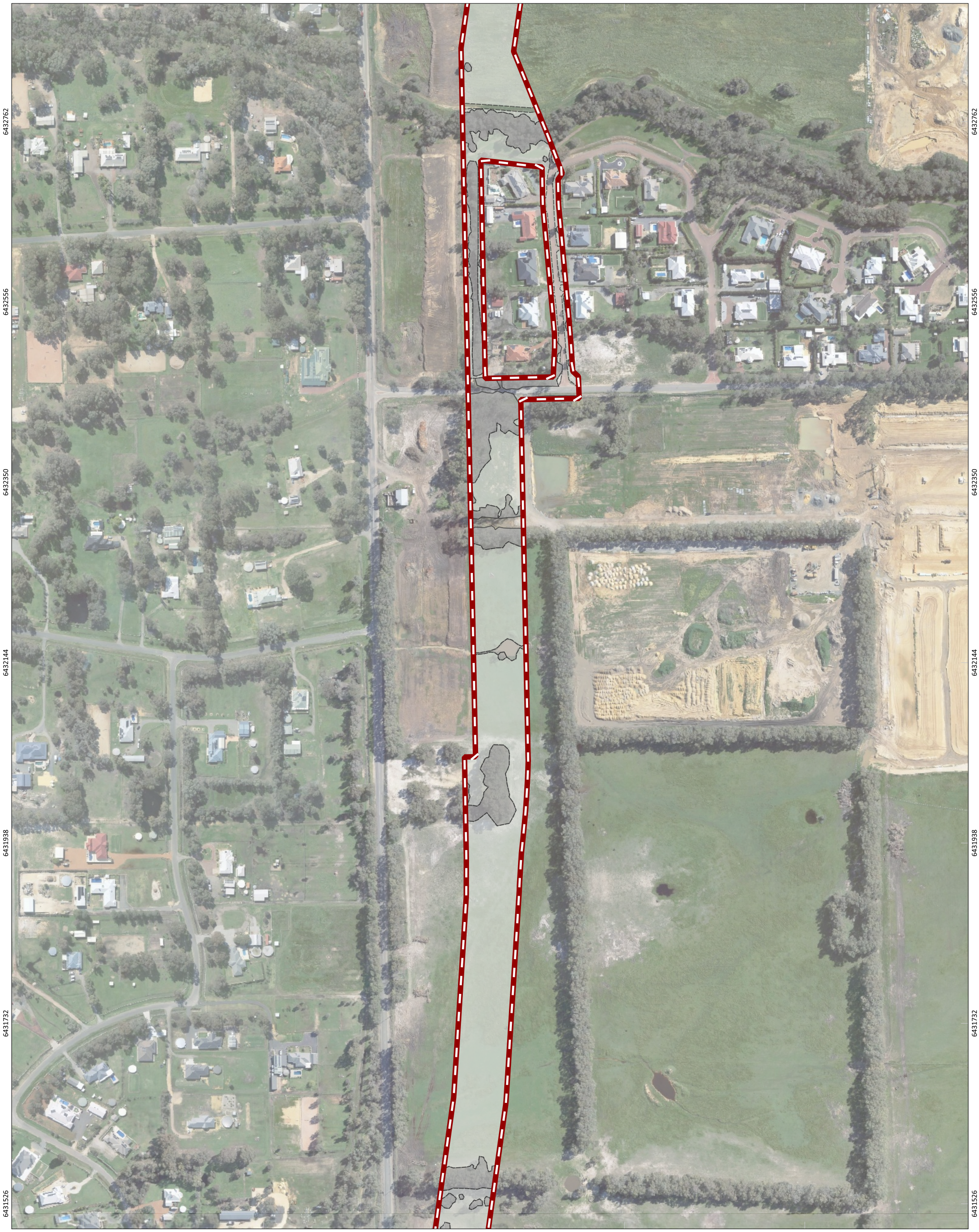


Figure 15b: Black Cockatoo Foraging Habitat (BBC)

0 30 60 90 120 m

N

SCALE: 1:4,112	SHEET SIZE: A3 COLOUR
PROJECT/REPORT NAME: Biological Survey Report Scott Road WWPS to Byford	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A24.032 / VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW	DRAWN BY / REVIEWED BY: MD/JR / DATE: 18/11/2025

Legend

Survey Area

Site Condition Score (Habitat Quality Score Tool)

- 0- None
- 1-Negligible
- 2-Low
- 8-10 Very High

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	18/11/2025

NOTES:

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

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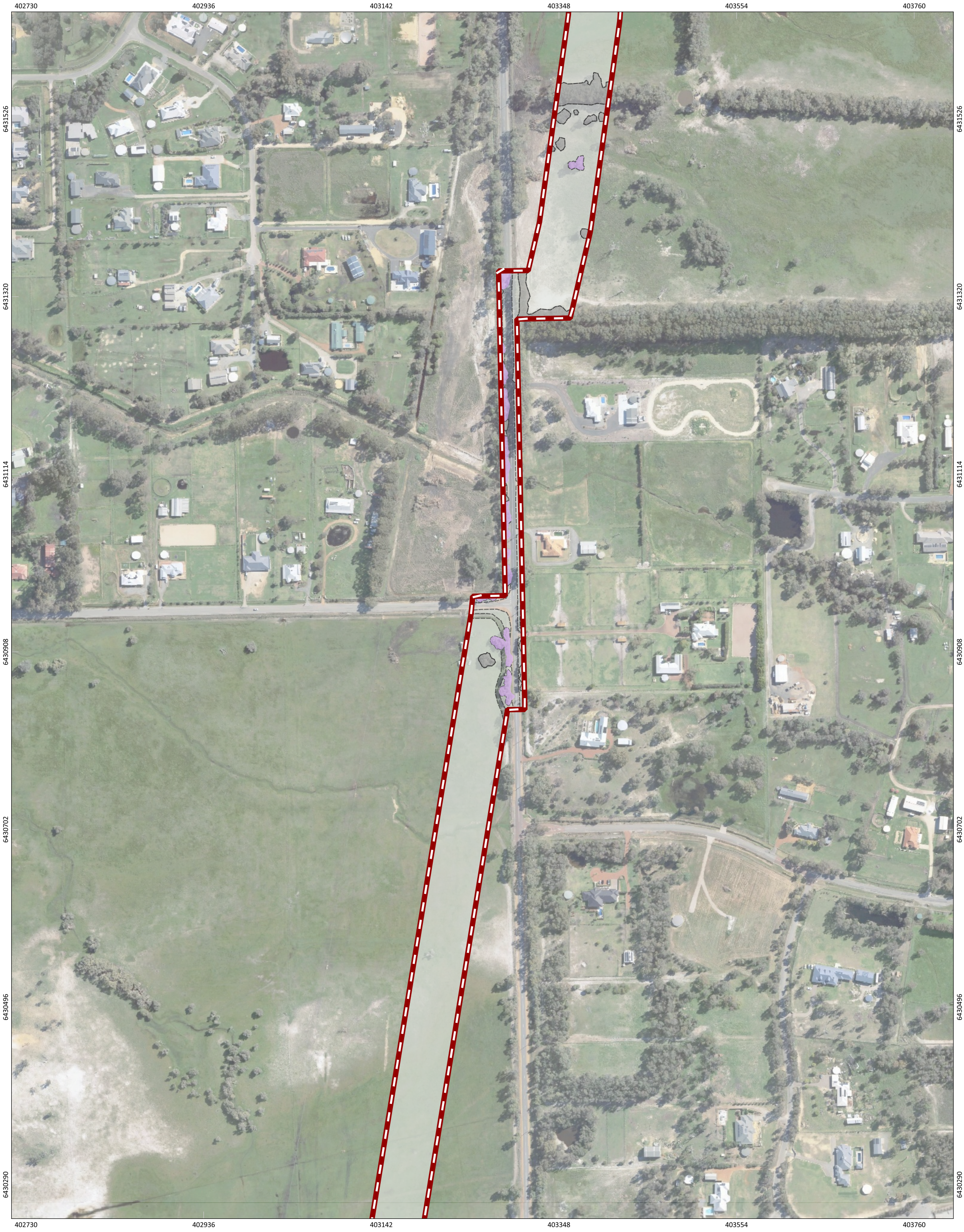


Figure 15c: Black Cockatoo Foraging Habitat (BBC)

N

0 30 60 90 120 m

SCALE: 1:4,112	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A24.032	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW		DRAWN BY / REVIEWED BY: MD/JR	DATE: 18/11/2025

PROJECT/REPORT NAME: Biological Survey Report
Scott Road WWPS to Byford

Legend

Survey Area

Site Condition Score (Habitat Quality Score Tool)

0- None
1-Negligible
2-Low
8-10 Very High

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	18/11/2025

NOTES:

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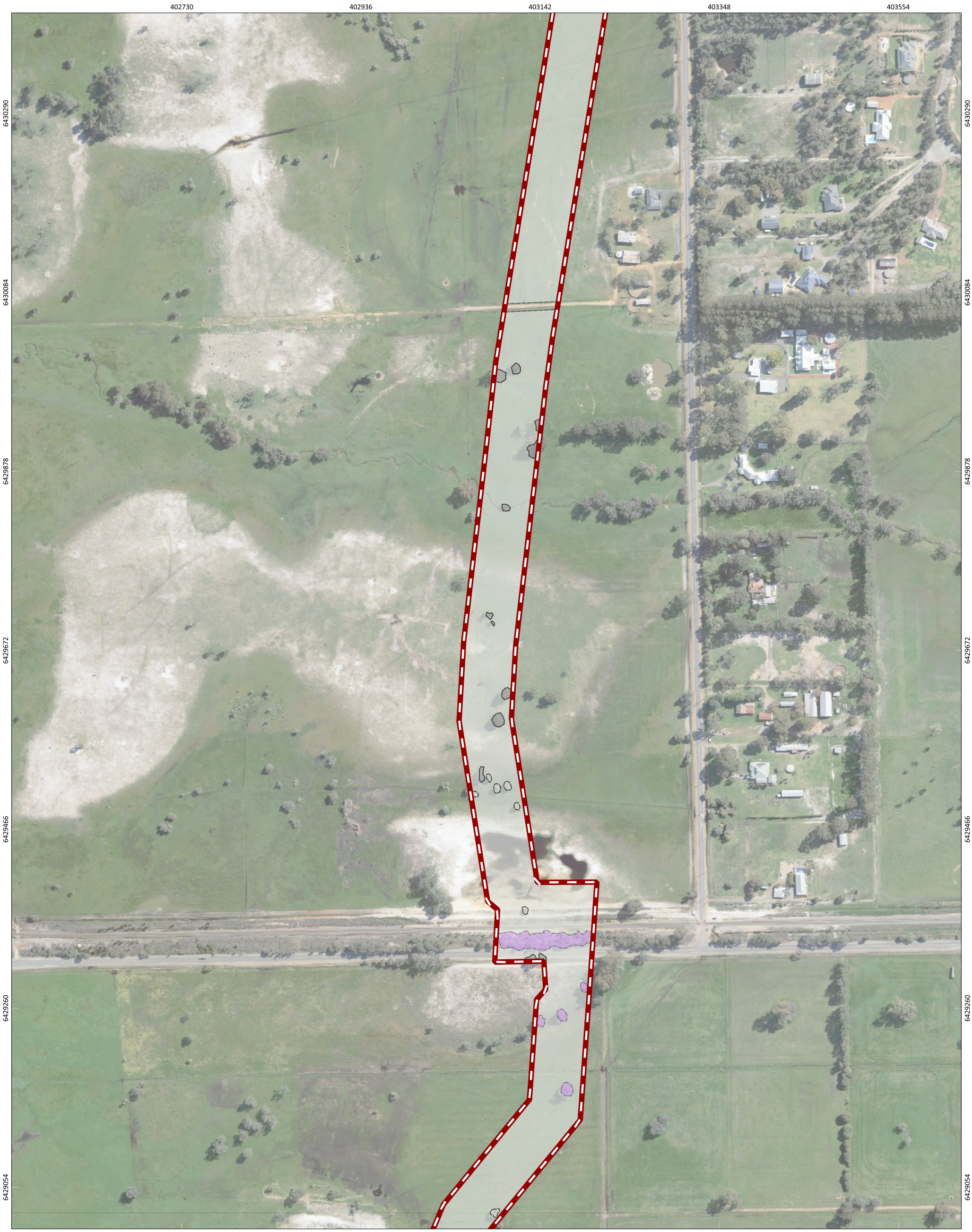


Figure 15d: Black Cockatoo Foraging Habitat (BBC)

0 30 60 90 120 m

N

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	18/11/2025

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Survey Area

Site Condition Score (Habitat Quality Score Tool)

0- None
1-Negligible
2-Low
8-10 Very High

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	18/11/2025

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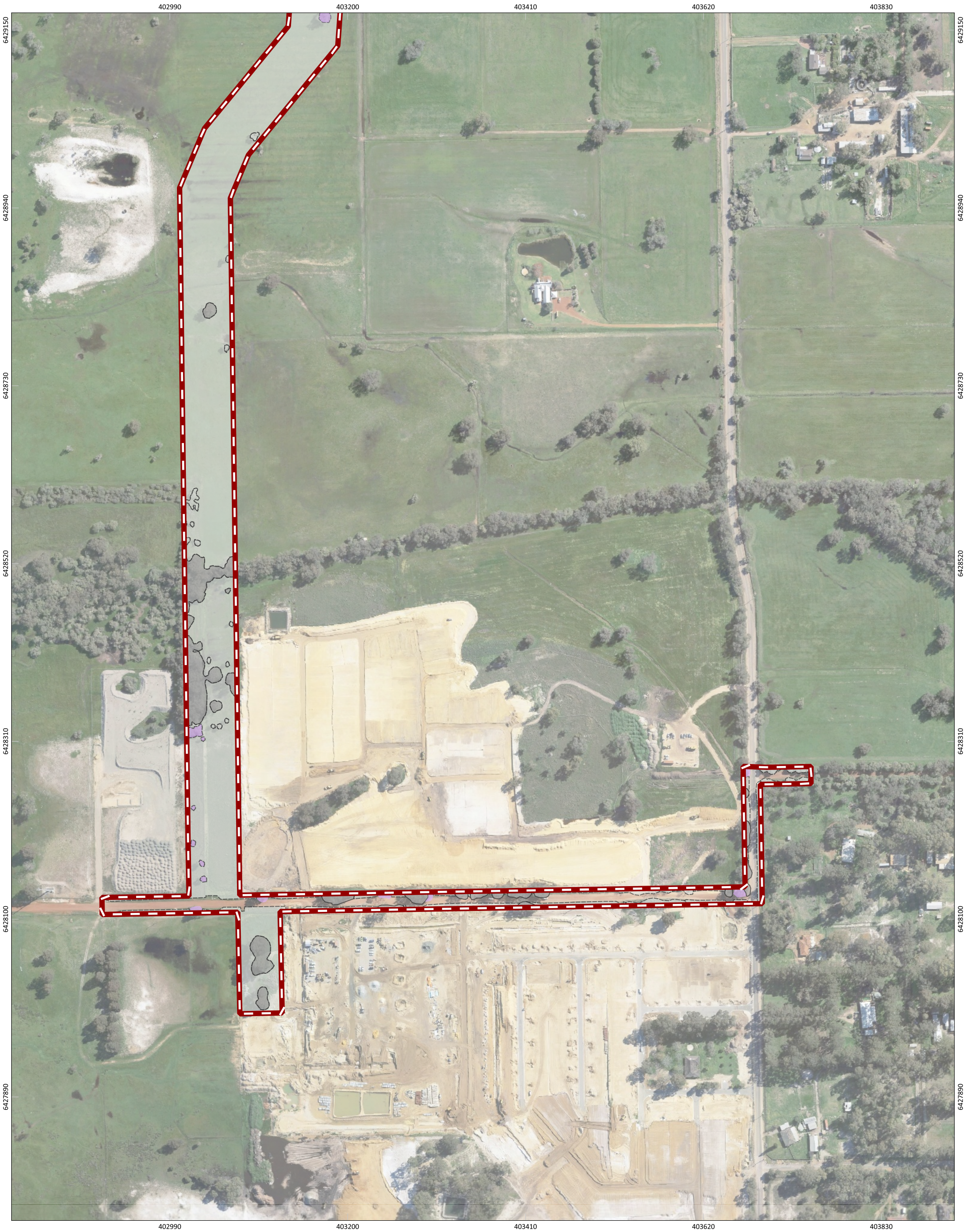


Figure 15e: Black Cockatoo Foraging Habitat (BBC)

0 30 60 90 120 m

N

PROJECT/REPORT NAME: Biological Survey Report Scott Road WWPS to Byford			
SCALE: 1:4,190	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A24.032	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW		DRAWN BY / REVIEWED BY: MD/JR	DATE: 18/11/2025

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Survey Area

Site Condition Score (Habitat Quality Score Tool)

- 0- None
- 1-Negligible
- 2-Low
- 8-10 Very High

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	18/11/2025

NOTES:

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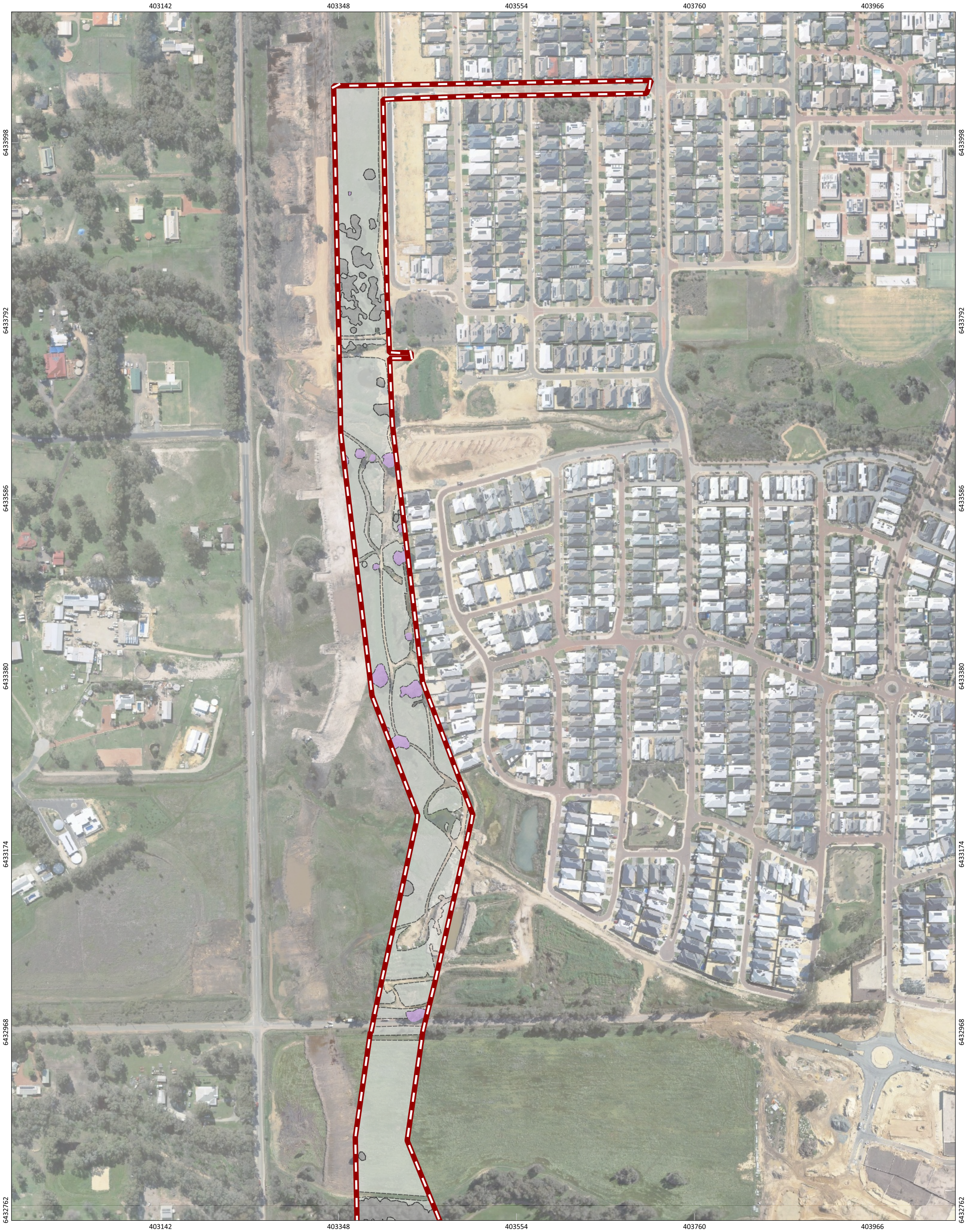


Figure 16a: Black Cockatoo Foraging Habitat (CBC)

0 30 60 90 120 m

N

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	18/11/2025

Legend

Survey Area

Site Condition Score (Habitat Quality Score Tool)

- 0- None
- 1-Negligible
- 2-Low
- 8-10 Very High

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	18/11/2025

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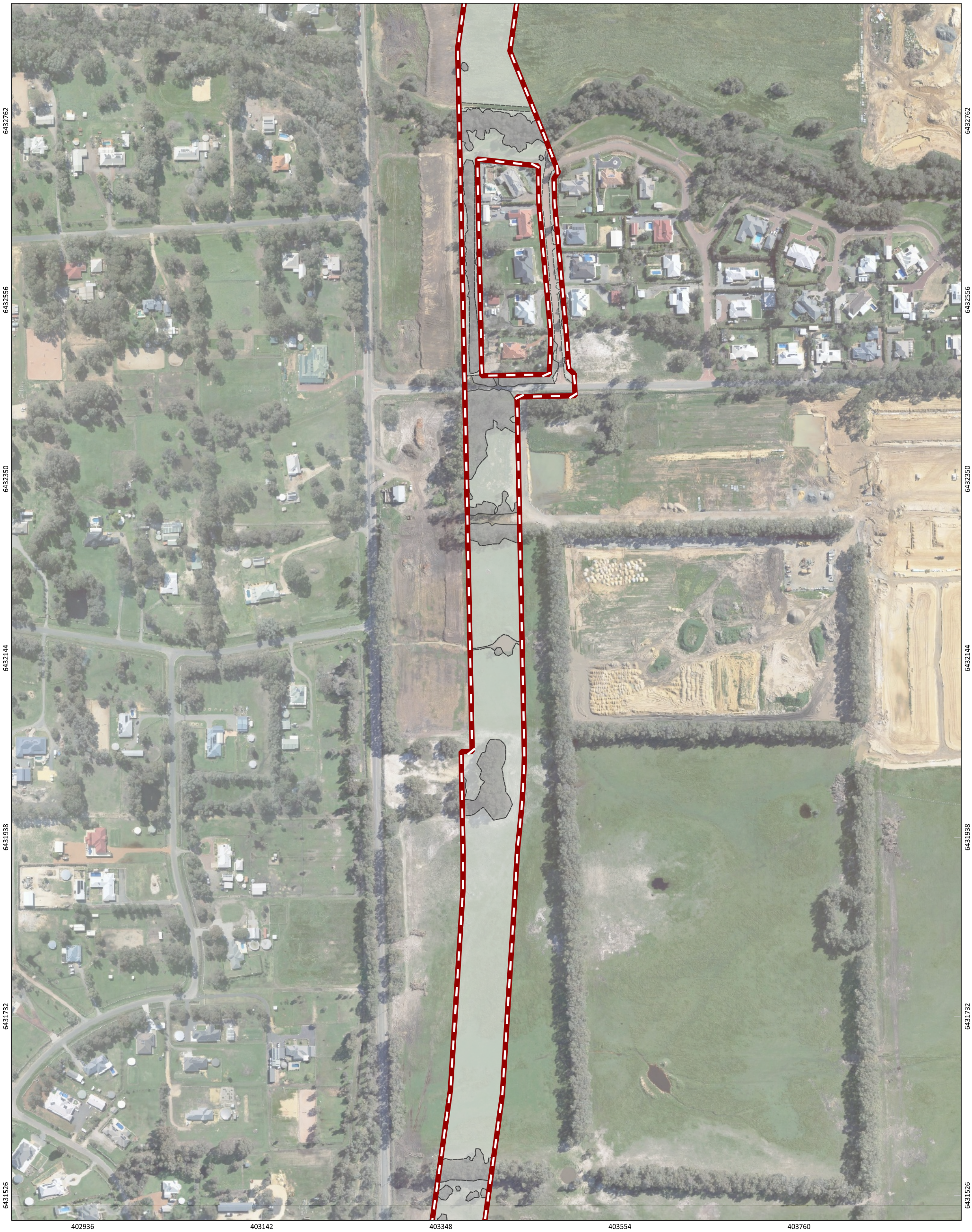


Figure 16b: Black Cockatoo Foraging Habitat (CBC)

0 30 60 90 120 m

N

SCALE: 1:4,112	SHEET SIZE: A3 COLOUR
PROJECT/REPORT NAME: Biological Survey Report Scott Road WWPS to Byford	CLIENT: Cossil and Webley
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A24.032 / VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW	DRAWN BY / REVIEWED BY: MD/JR / DATE: 18/11/2025

Legend

Survey Area

Site Condition Score (Habitat Quality Score Tool)

- 0- None
- 1-Negligible
- 2-Low
- 8-10 Very High

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	18/11/2025

NOTES:

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

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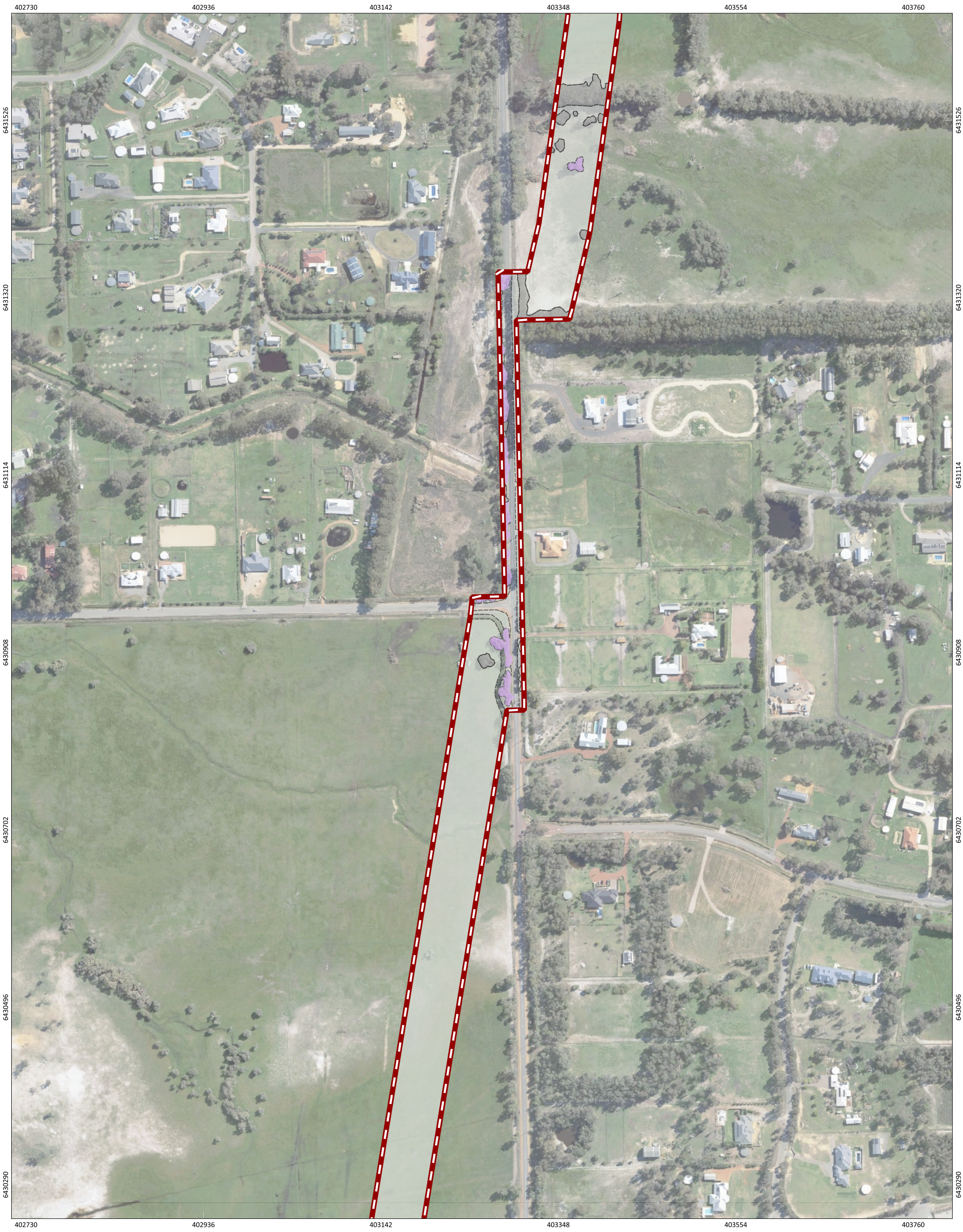


Figure 16c: Black Cockatoo Foraging Habitat (CBC)

0 30 60 90 120 m

N

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	18/11/2025

Legend

Survey Area

Site Condition Score (Habitat Quality Score Tool)

0- None
1-Negligible
2-Low
8-10 Very High

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	18/11/2025

NOTES:

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

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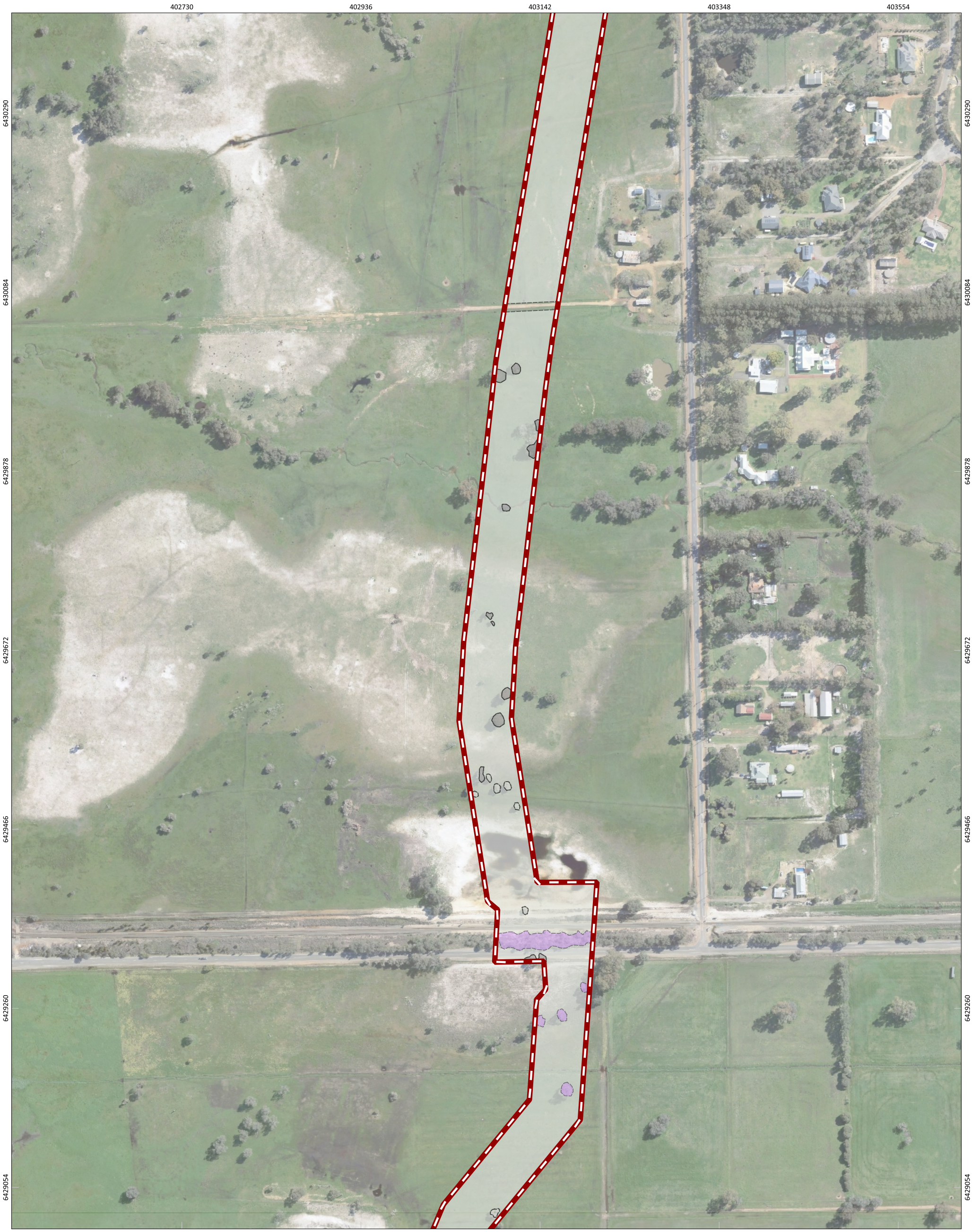


Figure 16d: Black Cockatoo Foraging Habitat (CBC)

0 30 60 90 120 m
N

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	18/11/2025

Legend

Survey Area

Site Condition Score (Habitat Quality Score Tool)

0- None
1-Negligible
2-Low
8-10 Very High

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	18/11/2025

NOTES:

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

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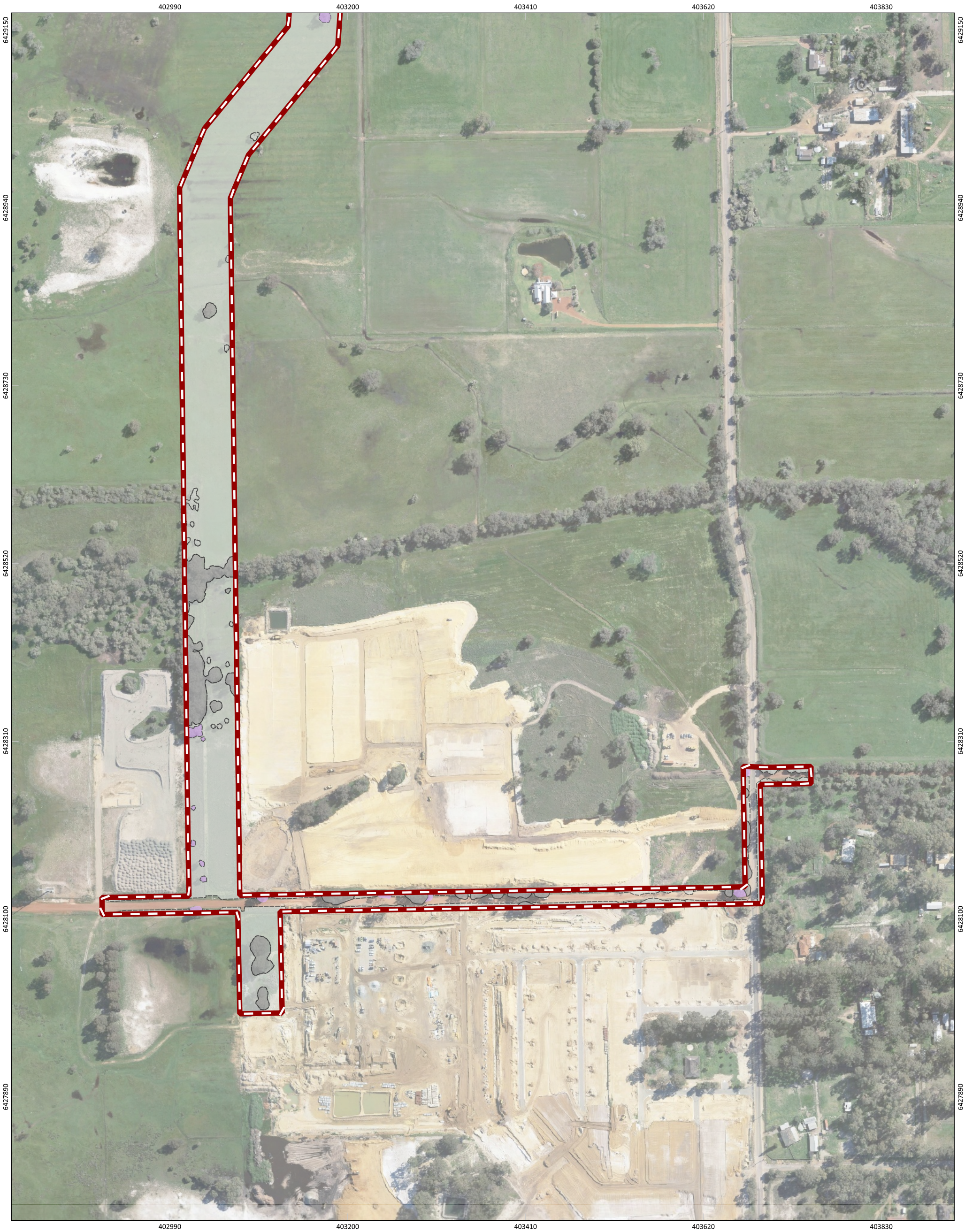


Figure 16e: Black Cockatoo Foraging Habitat (CBC)

0 30 60 90 120 m

N

PROJECT/REPORT NAME: Biological Survey Report Scott Road WWPS to Byford			
SCALE: 1:4,190	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A24.032	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW		DRAWN BY / REVIEWED BY: MD/JR	DATE: 18/11/2025

Legend

Survey Area

Site Condition Score (Habitat Quality Score Tool)

- 0- None
- 1-Negligible
- 2-Low
- 8-10 Very High

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	18/11/2025

NOTES:

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

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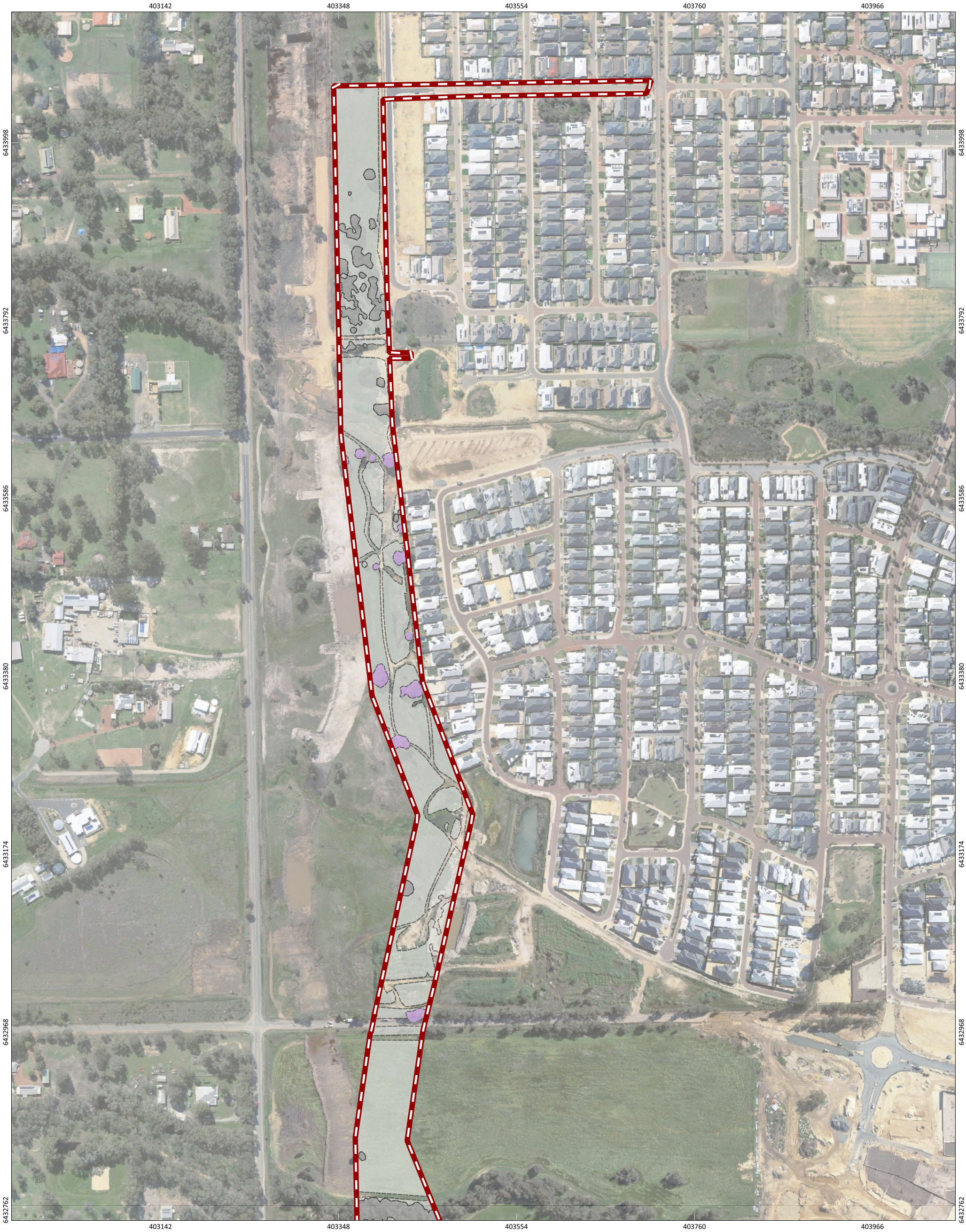


Figure 17a: Black Cockatoo Foraging Habitat (FRBC)

0 30 60 90 120 m

N

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	18/11/2025

Legend

Survey Area

Site Condition Score (Habitat Quality Score Tool)

- 0- None
- 1-Negligible
- 2-Low
- 8-10 Very High

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	18/11/2025

NOTES:

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

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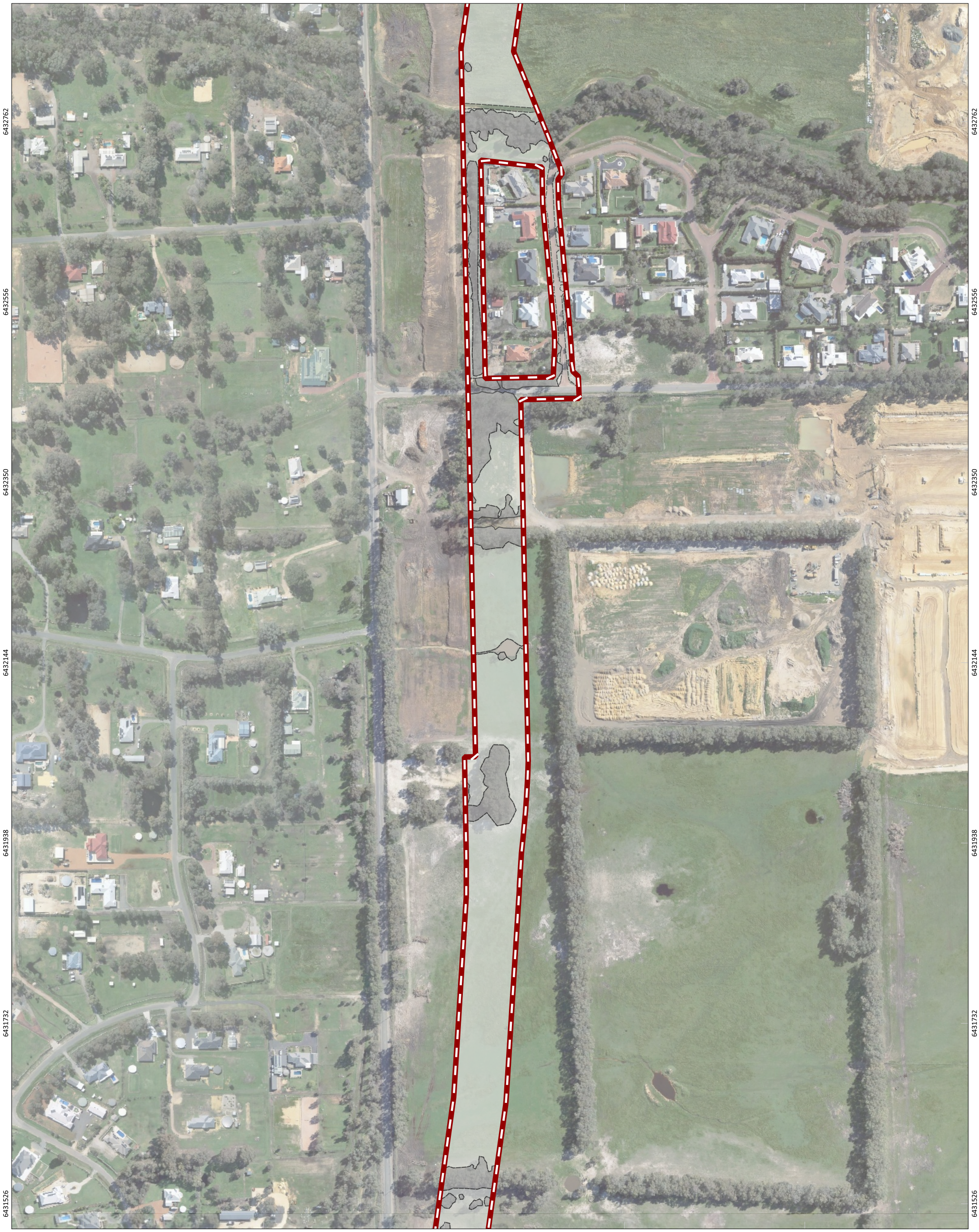


Figure 17b: Black Cockatoo Foraging Habitat (FRBC)

0 30 60 90 120 m

N

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	18/11/2025

Legend

Survey Area

Site Condition Score (Habitat Quality Score Tool)

- 0- None
- 1-Negligible
- 2-Low
- 8-10 Very High

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	18/11/2025

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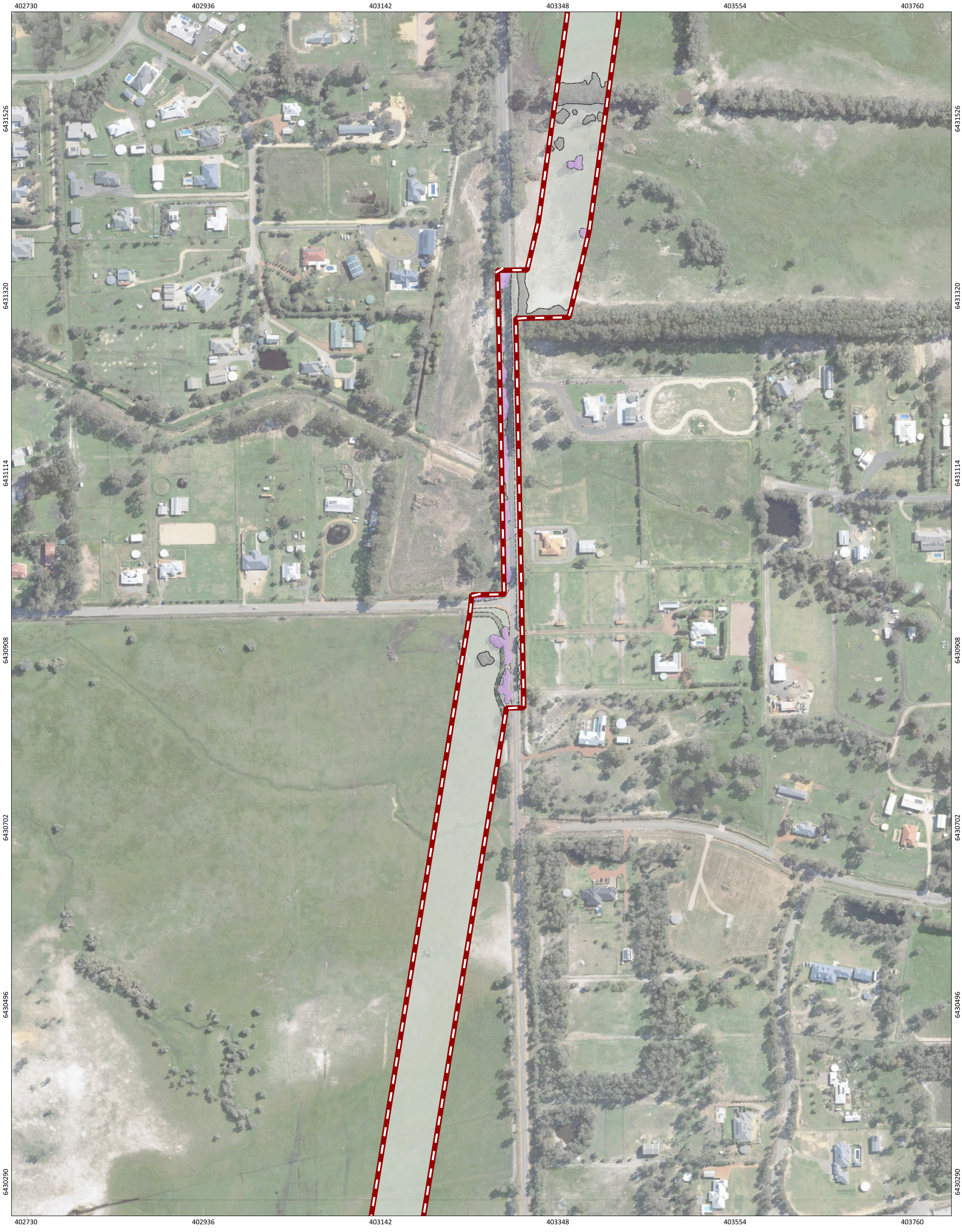


Figure 17c: Black Cockatoo Foraging Habitat (FRBC)

0 30 60 90 120 m
N

SCALE: 1:4,112	SHEET SIZE: A3 COLOUR
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A24.032 / VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW	DRAWN BY / REVIEWED BY: MD/JR / DATE: 18/11/2025
CLIENT: Cossil and Webley	

PROJECT/REPORT NAME
Biological Survey Report
Scott Road WWPS to Byford

Legend

Survey Area

Site Condition Score (Habitat Quality Score Tool)

0- None
1-Negligible
2-Low
8-10 Very High

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	18/11/2025

NOTES:

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

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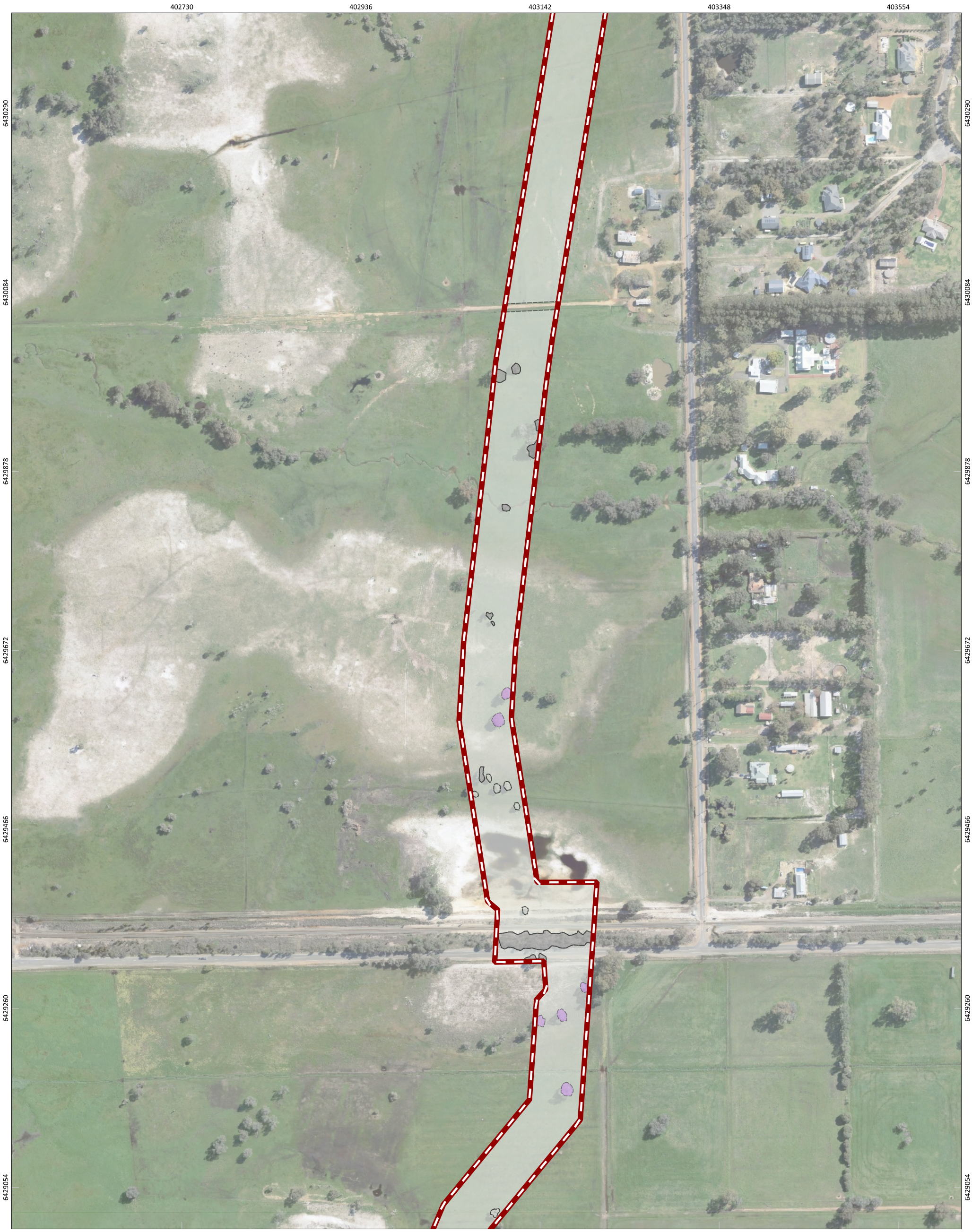


Figure 17d: Black Cockatoo Foraging Habitat (FRBC)

0 30 60 90 120 m
N

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:4,112
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/JR
DATE	18/11/2025

Legend

Survey Area

Site Condition Score (Habitat Quality Score Tool)

0- None
1-Negligible
2-Low
8-10 Very High

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	18/11/2025

NOTES:

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

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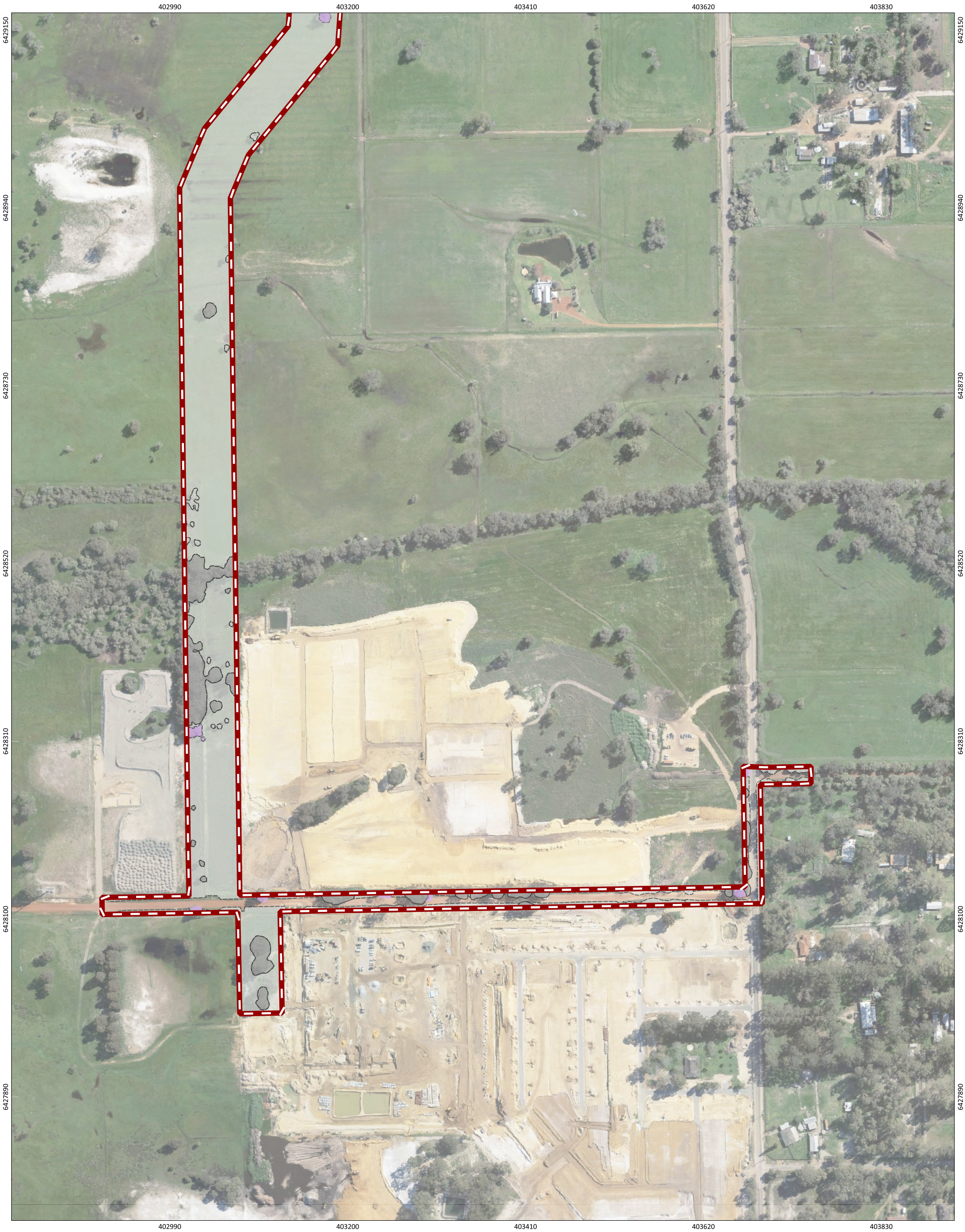


Figure 17e: Black Cockatoo Foraging Habitat (FRBC)

0 30 60 90 120 m

N

SCALE: 1:4,190	SHEET SIZE: A3 COLOUR	CLIENT: Cossil and Webley	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A24.032	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW		DRAWN BY / REVIEWED BY: MD/JR	DATE: 18/11/2025

PROJECT/REPORT NAME: Biological Survey Report
Scott Road WWPS to Byford

Legend

Survey Area

Site Condition Score (Habitat Quality Score Tool)

- 0- None
- 1-Negligible
- 2-Low
- 8-10 Very High

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	18/11/2025

NOTES:

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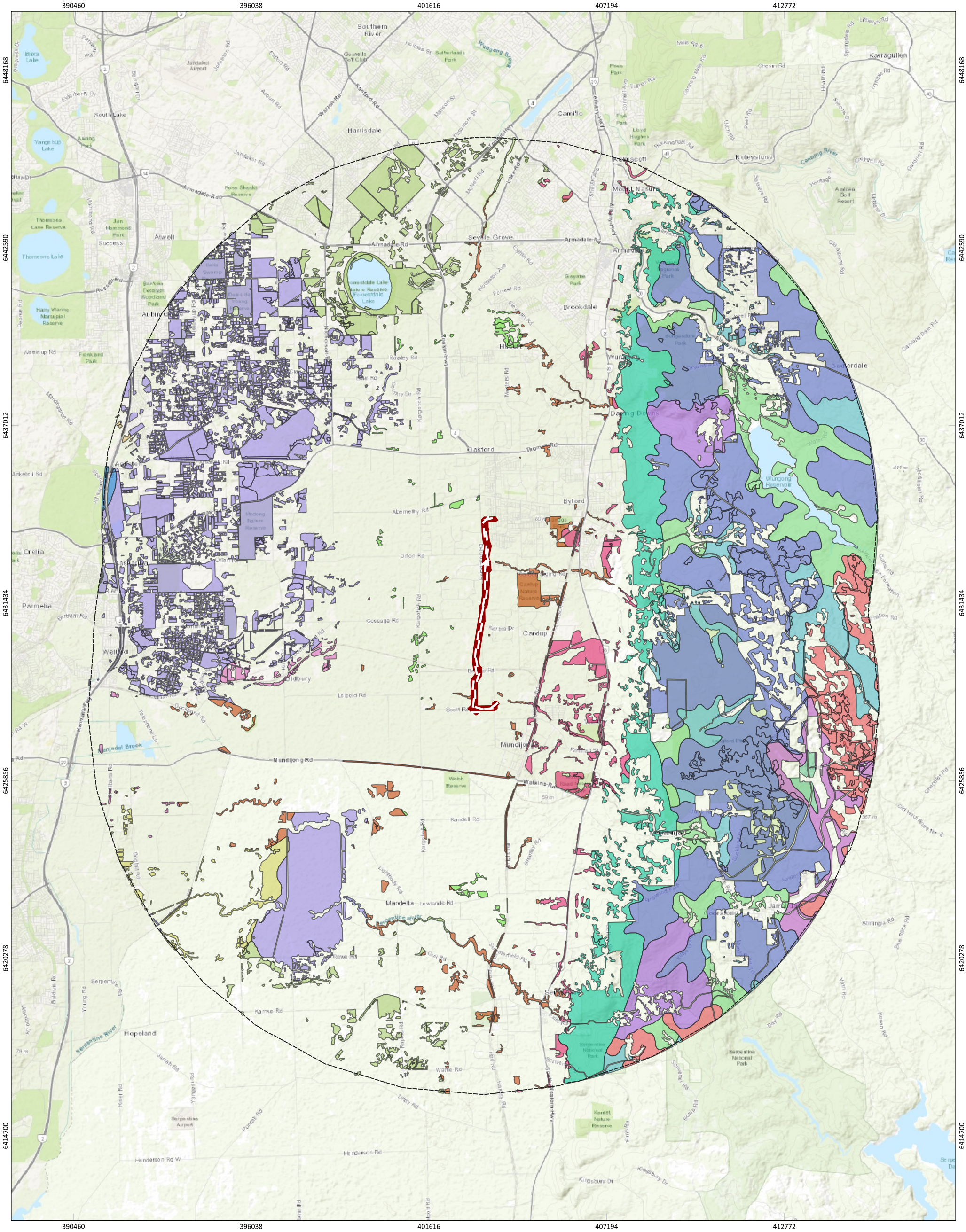


Figure 18: Black Cockatoo Foraging Habitat Extent 12 km Buffer

0 1 2 3 km

N

PROJECT/REPORT NAME	Biological Survey Report Scott Road WWPS to Byford
SCALE	1:111,561
SHEET SIZE	A3 COLOUR
CLIENT	Cossil and Webley
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.032
VERSION	0
DATA SOURCE	ESRI Topographic Map
DRAWN BY / REVIEWED BY	MD/JR
DATE	14/11/2025

Legend

- Survey Area
- 12km Buffer

Native Vegetation Intersected with Vegetation Complexes

- Bassendean Complex-Central and South
- Beermullah Complex
- Cottesloe Complex-Central and South
- Dardanup Complex
- Darling Scarp, DS2
- Dwellingup, D1
- Dwellingup, D2
- Forrestfield Complex
- Guildford Complex
- Helena 1, He1
- Herdsman Complex
- Murray 1, My1
- Serpentine River Complex
- Southern River Complex
- Swamp, S
- Yarragil 1, Yg1
- Yarragil 2, Yg2

No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	14/11/2025

NOTES:

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5. Discussion

5.1 Flora of Conservation Significance

No conservation significant flora were recorded within the Survey Area.

Post-survey assessments were completed for all species identified in the desktop likelihood of occurrence assessment and found to be low with survey timing and coverage considered. The pre survey Likelihood of assessment indicated that 14 species had a high likelihood and 20 species had a medium likelihood of being identified during the survey, although the Survey Area was mostly Cleared (77.23 %), Degraded (6.44 %) or Completely Degraded (15.18 %) decreasing the likelihood of encountering these species.

5.2 Vegetation Significance

Five vegetation types were identified, with the majority of the Survey Area being cleared, degraded or in completely degraded condition. Of the seven TECs and PECs identified by the desktop assessment as having a high or medium likelihood of occurrence, two were identified as likely to be present within the Survey Area. These are:

SCP20b *Banksia attenuata* and/or *Eucalyptus marginata* woodlands of the eastern side of the Swan Coastal Plain

Patch 1 of banksia woodland (Bishop Road within VT03) has similarities in species composition to SCP20b. If FCT analysis was undertaken this patch of banksia woodland has potential to align with SCP20b. The FCT SCP20b has been previously identified 0.6 km to the east of the Survey Area.

SCP3a *Corymbia calophylla - Kingia australis* woodlands on heavy soils of the Swan Coastal Plain

There is one patch within the Survey Area within VT02 that is likely to be representative of SCP3a (Hopkinson's Road). The patch along Hopkinson Road, Byford is in Good condition and covers 0.2 ha. The patch along Hopkinson Road appears likely to be consistent with SCP3a with a 66% correlation to key indicator species. There is a patch along Orton Road that is Degraded and is not determined an occurrence of the TEC due to only 33% of the species listed as "typical and common" presented in Section 2 of the description of the ecological community in approved conservation advice within the relevé.

These patches were on a heavier clay/loam soil with the main overstory composed of *Corymbia calophylla* over a midstory of *Kingia australis*. Most of the patch along Orton Road within the Survey Area has been cleared and in Degraded condition with little impact likely.

Banksia Woodland TEC

Within the Survey Area two separate patches of potential Banksia Woodland TEC were identified: one north, and one south. The assessment of these patches against the Conservation Advice for the Banksia Woodland TEC confirmed both patches do not meet TEC criteria within Commonwealth guidelines.

5.3 Fauna Habitat Significance

The five species that are identified as having a high likelihood of occurrence were:

- *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo)—VU.
- *Zanda baudinii* (Baudin's black cockatoo)—EN.
- *Zanda latirostris* (Carnaby's black cockatoo)—EN.
- *Falco peregrinus* (peregrine falcon) - OS
- *Isoodon fusciventer* (quenda)—P4.

The Six species that had a medium likelihood of occurrence were:

- *Hydromys chrysogaster* (water-rat, rakali) - P4.
- *Phascogale tapoatafa wambenger* (south-western brush-tailed phascogale) - CD.
- *Synemon gratiosa* (Graceful sun moth) - P4
- *Westralunio carteri* (Carter's freshwater mussel) - VU
- *Lerista lineata* (Perth slider, lined skink) - P3
- *Neelaps calonotos* (Black-striped snake, black-striped burrowing snake) - P3

All of the drainage lines within the Survey Area serve as tributaries to the Serpentine River, as such FHT_06 is considered core habitat for the Carter's fresh water mussel. The only other aquatic habitat within the Survey Area was the small reed bed in the north (FHT-07) but this habitat is considered too choked with vegetation to provide supporting habitat for Carter's fresh water mussel.

Extant of core and supporting habitat present within the Survey Area by species is summarised in Table 30.

Table 30: Summary of Fauna Habitat Value

Species	Extent Core Habitat (ha)	Extent Supporting Habitat (ha)
Zanda baudinii **(Baudin's black cockatoo)**	0	0.84
Zanda latirostris **(Carnaby's black cockatoo)**	0	0.84
Calyptorhynchus banksia naso **(Forest red-tailed black cockatoo)**	0	3.44
Falco peregrinus **(peregrine falcon)**	0	0
Isoodon fusciventer **(Quenda)**	0	1.05
Hydromys chrysogaster **(water-rat, rakali)**	0	0.8

Species	Extent Core Habitat (ha)	Extent Supporting Habitat (ha)
Phascogale tapoatafa wambenger **(brush-tailed phascogale)**	0	0.8
Synemon gratiosa **(Graceful sun moth)**	0	0.21
Westralunio carteri **(Carter's freshwater mussel)**	0.8	0
Lerista lineata **(Perth slider)**	0	0.21
Neelaps calonotos **(black-striped burrowing snake)**	0	0.21

5.4 Black Cockatoos

The Survey Area falls within the Swan Coastal Plain which is within the modelled distribution range of all three species of black cockatoos: Baudin's black cockatoo (*Zanda baudinii*), Carnaby's black cockatoo (*Zanda latirostris*), forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*). No known breeding sites are present within or immediately adjacent to the Survey Area. The nearest roost site is 1 km east of the Survey Areas. No evidence of roosting was observed within the Survey Area.

A total of 249 potential nesting trees were recorded within the Survey Area. Of these. Two trees (Tree number 36 and 230) were confirmed to have hollows with suitable dimensions for use by black cockatoos (Class 3), however the trees were in poor condition (both were checked with a drone).

Nine fauna habitat types were described within the Survey Area. Habitats within the Survey Area that contain suitable foraging habitat are scattered marri (FHT-03) and Banksia woodland (FHT-05). These habitats are characterised by foraging species for Baudin's, Carnaby's and forest red-tailed black cockatoo species including marri, jarrah, *Banksia attenuata, Banksia ilicifolia and Allocasuarina spp.* The remainder of the Survey Area comprised cleared areas with scattered individual flooded gums and non-native Eucalyptus spp. which have low foraging habitat value.

Foraging habitat quality was rated using the Commonwealth Habitat Quality Scoring Tool as per the Habitat Quality Scoring Tool areas with a site condition score of 2 or lower (low, negligible or none value) are "extremely unlikely to be considered as suitable habitat". These areas are therefore classified as not comprising suitable foraging habitat in this assessment. Foraging habitat quality extents within the Survey Area out of ten are:

- Baudin's black cockatoo: 0.63 ha (10/10), 0.21 ha (9/10), and 37.79 ha (Low 2 to None 0). Total of 0.83 ha of suitable foraging habitat and 37.79 ha of unsuitable foraging habitat.
- Carnaby's black cockatoo: 0.63 ha (10/10), 0.21 ha (9/10), and 37.79 ha (Low 2 to None 0). Total of 0.83 ha of suitable foraging habitat and 37.79 ha of unsuitable foraging habitat.
- Forest red-tailed black cockatoo: 0.63 ha (10/10), 0.02 ha (9/10), 0.04 ha (8/10), and 35.94 ha (Low 2 to None 0). Total of 0.69 ha of suitable foraging habitat and 35.94 ha of unsuitable foraging habitat.

No evidence of roosting was recorded. Within the Survey Area, fauna habitat types FHT-01 and FHT-03 provides the most suitable roosting habitat as they contain medium and large stands of eucalypts with medium canopies. Access to permanent water is within the Survey Area from the farm dams and drainage lines.

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Appendix A
Legislation

Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act aims to protect matters of national environmental significance (MNES). Under the EPBC Act, the Commonwealth Department of Climate Change, Energy and the Environment lists Threatened species and communities in categories determined by criteria set out in the EPBC Act.

Projects likely to cause a significant impact on MNES should be referred to the DCCEEW for assessment under the EPBC Act.

Biodiversity Conservation Act 2016

The Biodiversity Conservation Act 2016 aims to conserve and protect biodiversity and biodiversity components within the State and to promote ecologically sustainable use of biodiversity components in the State.

Environmental Protection Act 1986

Declared Rare Flora (DRF) and Threatened Ecological Communities (TECs) are given special consideration in environmental impact assessments and have special status as Environmentally Sensitive Areas (ESAs) under the EP Act and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004. Exemptions for a clearing permit do not apply in an ESA. In addition, habitat necessary for the maintenance of indigenous fauna is considered in the clearing principles and assessed during consideration of applications for a clearing permit.

Biosecurity and Agricultural Management Act 2007

Plants may be 'Declared' by the Minister for Agriculture and Food under the BAM Act. The Western Australian Organism List contains information on the area(s) in which a plant is declared and the control and keeping categories to which it has been assigned in Western Australia. A declaration may apply to the whole State, to districts, individual properties or even to single paddocks. If a plant is 'Declared', landholders are obliged to control that plant on their properties.

Weeds of National Significance

The Australian Government along with the State and Territory governments has endorsed 32 WoNS. Four major criteria were used in determining WoNS:

- The invasiveness of a weed species.
- A weed's impacts.
- The potential for spread of a weed.
- Socio-economic and environmental values.

Each WoNS has a national strategy and a national coordinator, responsible for implementing the strategy. WoNS are regarded as the worst weeds in Australia because of their invasiveness, potential for spread, and economic and environmental impacts.

Department of Biodiversity, Conservation and Attractions Priority Lists

DBCA lists 'Priority' flora and fauna that have not been assigned statutory protection as "Threatened" under the BC Act and are under consideration for declaration as Threatened. Flora and fauna assessed as Priority 1-3 are considered to be in urgent need of further survey. Priority 4 flora requires monitoring every 5 -10 years.

DBCA maintains a list of Priority Ecological Communities (PECs) which identifies plant communities that require further investigation before possible nomination for TEC status. Once listed, a community becomes a PEC and, when endorsed by the WA Minister for Environment, becomes a TEC and protected as an ESA under Environmental Protection (Clearing of Native Vegetation) Regulations 2004.

Informal Recognition of Flora and Fauna

Certain populations or communities of flora and/or fauna may be of local significance or interest because of their patterns of distribution and abundance. For example, specific locations of flora and may be locally significant because they are range extensions to the previously known distribution, or are newly discovered taxa (and have the potential to be of more than local significance). In addition, many species are in decline as a result of threatening processes (land clearing, grazing, and changed fire regimes) and relict populations of such species assume local importance for DBCA. It is not uncommon for DBCA to make comment on these species of interest.

Appendix B
Definition and Criteria

EPBC Act Categories for Flora, Fauna and Ecological Communities

Category	Threatened Species	Threatened Ecological Communities
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.	N/A.
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.	N/A.
Critically Endangered (CE)	A native species is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.	An ecological community is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
Endangered (EN)	A native species is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.	An ecological community is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
Vulnerable (VU)	A native species is eligible to be included in the vulnerable category at a particular time if, at that time: (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium term future, as determined in accordance with the prescribed criteria.	An ecological community is eligible to be included in the vulnerable category at a particular time if, at that time: (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium term future, as determined in accordance with the prescribed criteria.
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	N/A.

Category	Threatened Species	Threatened Ecological Communities
	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.	

Conservation Codes for Western Australian Flora and Fauna (DBCA)

Conservation Codes for Western Australian Flora and Fauna	
Threatened, Extinct and Specially Protected fauna or flora1 are species2 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 Wildlife Conservation (Specially Protected Fauna) Notice 2018 and the Wildlife Conservation (Rare Flora) Notice 2018 have been transitioned under regulations 170, 171 and 172 of the Biodiversity Conservation Regulations 2018 to be the lists of Threatened, Extinct and Specially Protected species 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 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 International Union for Conservation of Nature (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 undersection 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

Conservation Codes for Western Australian Flora and Fauna	
	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 undersection 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.
Extinct species **Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.**	
EX	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.

Conservation Codes for Western Australian Flora and Fauna	
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.
1	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.
2	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.
3	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.
4	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.

1 The definition of flora includes algae, fungi and lichens.

DBCA Definitions and Criteria for TECs and PECs

Criteria	Definition
Threatened Ecological Communities	
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. An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant and either of the following applies (A or B): A. Records within the last 50 years have not been confirmed despite thorough searches of known or likely habitats or B. All occurrences recorded within the last 50 years have since been destroyed.
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. An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future. This will be determined on the basis of the best available information, by it meeting any one or more of the following criteria (A, B or C): A. The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90% and either or both of the following apply (i or ii): i. geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 10 years). ii. modification throughout its range is continuing such that in the immediate future (within approximately 10 years) the community is unlikely to be capable of being substantially rehabilitated. B. Current distribution is limited, and one or more of the following apply (i, ii or iii): i. geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the immediate future (within approximately 10 years). ii. there are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes. iii. there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes. C. The ecological community exists only as highly modified occurrences that may be capable of being rehabilitated if such work begins in the immediate future (within approximately 10 years).
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.

Criteria	Definition
	An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B, or C): A. The geographic range, and/or total area occupied, and/or number of discrete occurrences have been reduced by at least 70% since European settlement and either or both of the following apply (i or ii): i. the estimated geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short term future (within approximately 20 years). ii. modification throughout its range is continuing such that in the short term future (within approximately 20 years) the community is unlikely to be capable of being substantially restored or rehabilitated. B. Current distribution is limited, and one or more of the following apply (i, ii or iii): i. geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the short term future (within approximately 20 years). ii. there are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes. iii. there may be many occurrences but total area is small and all or most occurrences are small and/or isolated and very vulnerable to known threatening processes. The ecological community exists only as very modified occurrences that may be capable of being substantially restored or rehabilitated if such work begins in the short-term future (within approximately 20 years).
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. An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B or C): A. The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated. B. The ecological community may already be modified and would be vulnerable to threatening processes, is restricted in area and/or range and/or is only found at a few locations. C. The ecological community may be still widespread but is believed likely to move into a category of higher threat in the medium to long term future because of existing or impending threatening processes.
Priority Ecological Communities	
Priority One	Poorly known ecological communities Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of

Criteria	Definition
	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 small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, state forest, unallocated Crown land, water reserves, etc.) and not under imminent threat 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 within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or. iii. Communities 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, and inappropriate fire regimes. 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 Vulnerable. 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.

Appendix C
Desktop Assessment and Likelihood of Occurrence Flora

Species	Conservation Status		Source		Flowering Period	Preferred habitat	Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA					
Austrostipa jacobsiana	CR	CR	x	-	Oct to Nov	At southern River and Bunbury site.	No	Low - No known records within 10 km buffer.	Low
Caladenia huegelii	CR	CR	x	x	Sep to Oct	Grey or brown sand, clay loam.	Yes	Medium - Multiple records 7.5 km north-west and 7.7 km south-west of Survey Area, <30 years old. Survey Area is 1 km outside of known distribution.	Low
Drakaea elastica	CR	CR	x	x	Oct to Nov.	White or grey sand. Low-lying situations adjoining winter-wet swamps.	Yes	High - One record 3.3 km east of Survey Area and clusters of records 7 km north-west and 9 km south-west of Survey Area, all records <20 years old.	Low
Drosera oreopodion	CR	CR	-	x	Sep to Oct	Clayey sand sometimes mixed with lateritic pebbles.	Yes	Medium - One record 6.7 km south of Survey Area, and records 9.8 km towards south-west of Survey Area, <20 years old.	Low
Synaphea* sp. *Serpentine	CR	CR	x	x	Unknown	Narrow band from the northernmost point west of Byford (38 km SSE of Perth) to south of Serpentine	Yes	High - Closest record 2 km east and 1.9 km south of Survey Area, <30 years old.	Low

Species	Conservation Status		Source		Flowering Period	Preferred habitat	Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA					
						(54 km SSE of Perth), over a range of 18 km.			
Synaphea* sp. *Fairbridge Farm	CR	CR	x	x	Oct.	Sandy with lateritic pebbles. Near winter-wet flats, in low woodland with weedy grasses.	No	Low - Four records 9.8 km south of Survey Area, <30 years old.	Low
Eucalyptus x balanites	CR	EN	x	x	Oct to Dec or Jan to Feb	Sandy soils with lateritic gravel.	No	Low - records 6 km north-east of Survey Area, <30 years old.	Low
Lasiopetalum pterocarpum	CR	EN	x	-	Aug to Dec	Dark red-brown loam or clayey sand over granite. On sloping banks near creeklines.	No	Low - No known records within 10 km of Survey Area.	Low
Lepidosperma rostratum	CR	EN	x	x	Jun to Aug	Sandy soil among low heath in a winterwet swamp	Yes	Medium - Records 2.2 km south of Survey Area within creekline and clustering 7.6 km north-west of Survey Area, <30 years old.	Low
Verticordia plumosa* var. *ananeotes	CR	EN	x	x	Nov to Dec	Sandy loam. Seasonally inundated plains.	No	Low - Two historical records 9.6 km south of Survey area, >100 years old.	Low
Thelymitra magnifica	CR	-	-	x	Sep to Oct	Occurs on slopes in seasonally moist sandy clay and granitic soils in the vicinity of Eucalyptus wandoo trees.	No	Low - One record 8.2 km north-east of Survey Area, no dates available.	Low

Species	Conservation Status		Source		Flowering Period	Preferred habitat	Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA					
Diplolaena andrewsii	EN	EN	x		Jul to Oct	Loam, clay. Granite outcrops & hillsides.	No	Low - No known records within 10 km buffer. Survey Area is not within known distribution.	Low
Diuris purdiei	EN	EN	x	x	Sep to Oct	Grey-black sand, moist. Winter-wet swamps.	Yes	Medium - One record 6.7 km south of Survey Area, and records 9.8 km towards south-west of Survey Area, <20 years old.	Low
Grevillea curviloba	EN	EN	-	x	Aug to Oct	Grey sand, sandy loam. Winter-wet heath.	Yes	High - one record 2.6 km south-east of Survey Area, <20 years old.	Low
Synaphea* sp. *Pinjarra Plain	EN	EN	x	x	Sep to Nov	Grey sandy loam or clay, grey-brown clayey sand, brown clayey loam, laterite. Flats, seasonally wet areas, railroad reserves often with wet depressions or drains.	Yes	High - Closest record 0.5 km south and 1.3 km south-east of Survey Area, <30 years old. Multiple records <5 km north-east of Survey Area	Low
Thelymitra stellata	EN	EN	x	x	Sep to oct	Occurs in low shrubs of the Jarrah Forest or in low heath on rocky lateritic slopes. Soil lateritic loam.	No	Low - Records 7.6 km north-east of Survey Area, <30 years old.	Low
Synaphea* sp. *Pinjarra Plain	EN	EN	x	x	Sep to Nov	Grey sandy loam or clay, grey-brown clayey sand, brown clayey loam, laterite.	Yes	High - Closest record 0.5 km south and 1.3 km south-east of	Low

Species	Conservation Status		Source		Flowering Period	Preferred habitat	Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA					
						Flats, seasonally wet areas, railroad reserves often with wet depressions or drains.		Survey Area, <30 years old. Multiple records <5 km north-east of Survey Area.	
Diuris drummondii	EN	VU	x	-	Nov to Dec or Jan	Low-lying depressions, swamps.	No	Low - No known records within 10 km buffer. Survey Area is not within known distribution.	Low
Drakaea micrantha	EN	VU	x	x	Sep to Oct	White-grey sand.	Yes	Medium - One record 9.5 km south-west of Survey Area, <30 years old. One historical record in the same area, >30 years old. Survey Area is within known distribution.	Low
Andersonia gracilis	VU	EN	x	-	Sep to Nov	White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps.	No	Low - No known records within 10 km buffer.	Low
Banksia mimica	VU	EN	x	-	Dec or Jan to Feb.	White or grey sand over laterite, sandy loam.	Yes	Low - No known records within 10 km buffer.	Low
Anthocercis gracilis	VU	VU	x	-	Sep to Oct	Sandy or loamy soils. Granite outcrops.	No	Low - No known records within 10 km buffer.	Low

Species	Conservation Status		Source		Flowering Period	Preferred habitat	Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA					
Diuris micrantha	VU	VU	x	-	Sep to Oct	Brown loamy clay. Winter-wet swamps, in shallow water.	Yes	Medium - No known records within 10 km buffer. Survey Area is within known distribution.	Low
Eleocharis keigheryi	VU	VU	x	-	Aug to Nov	Clay, sandy loam. Emergent in freshwater: creeks, claypans.	Yes	Medium - No known records within 10 km buffer. Survey Area is within known distribution.	Low
Morelotia australiensis	VU	VU	x	x	Dec to Nov	Grey sand over clay, winter-wet, swampy depressions, drainage lines or rises surrounding swamps. Open forest or Marri (Corymbia calophylla) woodland	Yes	High - Closest record is 2.2 km south of Survey Area with several recorded <5 km along creekline. Other records are 3.8 km east of Survey Area, all records <30 years old.	Low
Acacia lasiocarpa* var. *bracteolata long peduncle variant	P1	-	-	x	May or Aug	Grey or black sand over clay. Swampy areas, winter wet lowlands.	Yes	High- One record 0.3 km west of Survey Area, <5 years old.	Low
Boronia juncea* subsp. *juncea	P1	-	-	x	Apr	Sand. Low scrub.	Yes	Medium - one record 9 km west of Survey Area, <30 years old	Low
Calytrix simplex* subsp. *simplex	P1	-	-	x	Oct to Nov.	Unknown	Yes - distribution	Low - Two historical records 8.7 km west of Survey Area, >30 years old.	Low

Species	Conservation Status		Source		Flowering Period	Preferred habitat	Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA					
Calectasia grandiflora	P2	-	-	x	Jun to Nov	White, grey or yellow sand, sandy clay, gravel, laterite, granite. Swampy areas, rock outcrops, flats, slopes, ridges.	Yes	High - Three record 2 km south of Survey Area, <30 years old.	Low
Johnsonia pubescens* subsp. *cygnorum	P2	-	-	x	Sept	Grey-white-yellow sand. Flats, seasonally wet sites.	Yes	Medium - One record 5.9 km north-east of Survey Area, <20 years old. Historical records show clustering 1.9 km east of Survey Area.	Low
***Leucopogon* sp. *Busselton* (D. Cooper 243)**	P2	-	-	x	Unknown	Unknown	Yes	High -records 2.1 km south of Survey Area within creekline, <20 years old.	Low
Millotia tenuifolia* var. *laevis	P2	-	-	x	Sep to Oct	Granite or laterite soils.	No	Low - three records 6.2 km east of Survey Area, <30 years old.	Low
Poranthera moorokatta	P2	-	-	x	Sept to Nov	Shallow dampland on mixed grey and white sand with scattered leaf litter.	No	Low - one record 8.2 km north-west of Survey Area, <10 years old.	Low
Acacia horridula	P3	-	-	x	May to Aug	Gravelly soils over granite, sand. Rocky hillsides.	No	Low - Two historical records in Serpentine and Armadale, >30 years old.	Low
Acacia oncinophylla* subsp. *oncinophylla	P3	-	-	x	Aug to Oct	Granitic soils.	No	Low - Two historical records 9.5 km south	Low

Species	Conservation Status		Source		Flowering Period	Preferred habitat	Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA					
								of Survey Area, >30 years old.	
Angianthus drummondii	P3	-	-	x	Oct to Dec	Grey or brown clay soils, ironstone. Seasonally wet flats.	Yes	High - One record 2.7 km south-west of Survey Area, 12 years old.	Low
Babingtonia urbana	P3	-	-	x	Jan to March	Associated with wetlands on the Swan Coastal Plain. In the Perth area the species occurs on the eastern side of the plain.	Yes	High - One record 1.5 km west of Survey Area, one record 2.5 km to the east and three records 2.4 km south of Survey Area, records <10 years old.	Low
Banksia kippistiana* var. *paenepeccata	P3	-	-	x	Oct to Nov	Lateritic gravelly soils.	No	Low - One historical record 5.4 km north-east of Survey Area, >100 years old.	Low
Carex tereticaulis	P3	-	-	x	Sep to Oct.	Black peaty sand.	No	Low - One record 8.7 km south-west of Survey Area, <20 years old.	Low
Cyathochaeta teretifolia	P3	-	-	x	-	Grey sand, sandy clay. Swamps, creek edges.	Yes	Medium - Two records 9 km south of Survey Area, <20 years old.	Low
Dampiera triloba	P3	-	-	x	Aug to Dec.	Loamy sand, lower lying area.	Yes	Medium - One record 9 km west of Survey Area, <10 years old.	Low

Species	Conservation Status		Source		Flowering Period	Preferred habitat	Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA					
Dillwynia dillwynioides	P3	-	-	x	Aug to Dec	Sandy soils. Winter-wet depressions.	Yes	Medium - One record 6.7 km south-west of Survey Area, 30 years old. Two other historical records in the same area.	Low
Eryngium pinnatifidum* subsp. *Palustre	P3	-	-	x	Unknown	Clay, sandy clay. Claypans, seasonally wet flats.	Yes	Medium - One record 9.3 km south of Survey Area, 29 years old.	Low
Isopogon autumnalis	P3	-	-	x	Feb to may	Sandy soils, often in Banksia woodlands.	Yes	Medium - one record 9.7 km south of Survey Area, <30 years old.	Low
Jacksonia gracillima	P3	-	-	x	Oct to Nov	Grey sand, well drained flats, seasonally wet	Yes	Medium - One record 6.8 km north-west and one record 6 km south-west of Survey Area, <20 years old.	Low
Lasiopetalum glutinosum* subsp. *glutinosum	P3	-	-	x	sept to dec	Open low scrub over heath, on steep slopes of lateritic gravel, clay or sandy loam near granite outcrops and creeklines.	No	Low - One historical record 9.6 km north-east of Survey Area, >30 years old.	Low
Meionectes tenuifolia	P3	-	-	x	unknown	Unknown	Yes	Low- one record 7.4 km north-west of Survey Area, <30 years old.	Low
Pithocarpa corymbulosa	P3	-	-	x	Jan to Apr	Gravelly or sandy loam. Amongst granite outcrops.	No	Low - two record 6.1 km south-east of	Low

Species	Conservation Status		Source		Flowering Period	Preferred habitat	Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA					
								Survey Area, <30 years old.	
Schoenus capillifolius	P3	-	-	x	Oct to Nov	Brown mud. Claypans.	No	Low - one record 2.6 km south of Survey Area, <20 years old.	Low
Schoenus pennisetis	P3	-	-	x	Aug to Sep	Grey or peaty sand, sandy clay. Swamps, winter-wet depressions.	Yes	Low - Cluster of four historical records 2.3 km east of Survey Area, >30 years old.	Low
Schoenus* sp. *Waroona	P3	-	-	x	Oct to Nov	Clay or sandy clay. Winter-wet flats.	Yes	High - One record 2.6 km north-east of Survey Area, <30 years old.	Low
Stylidium aceratum	P3	-	-	x	Oct to Nov	Sandy soils. Swamp heathland.	Yes	High - One record 2.7 km south-west of Survey Area, <30 years old.	Low
Stylidium paludicola	P3	-	-	x	Oct to Dec	Peaty sand over clay. Winter wet habitats. Marri and Melaleuca woodland, Melaleuca shrubland.	Yes	Medium - Two records, 8.8 km south and 8.6 km north-west of Survey Area, <30 years old.	Low
Stylidium aceratum	P3	-	-	x	Oct to Nov	Sandy soils. Swamp heathland.	Yes	High - One record 2.7 km south-west of Survey Area, <30 years old.	Low
Stylidium paludicola	P3	-	-	x	Oct to Dec	Peaty sand over clay. Winter wet habitats. Marri and	Yes	Medium – Two records, 8.8 km south	Low

Species	Conservation Status		Source		Flowering Period	Preferred habitat	Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA					
						Melaleuca woodland, Melaleuca shrubland.		and 8.6 km north-west of Survey Area, <30 years old.	
Acacia oncinophylla* subsp. *patulifolia	P4	-	-	x	Aug to Nov or Nov to Dec	Granitic soils, occasionally on laterite.	No	Low - One historical record 5 km north of Survey Area, > 30 years old.	Low
Aponogeton hexatepalus	P4	-	-	x	Jul to Oct	Mud. Freshwater: ponds, rivers, claypans.	Yes	Low - One historical record 7.9 km south-west of Survey Area, > 30 years old.	Low
Drosera occidentalis	P4	-	-	x	Oct to Dec or Jan.	Black/white sand over yellow clay	No	Low - Cluster of historical records 2.6 km east of Survey Area, >30 years old.	Low
Eucalyptus rudis* subsp. *cratyantha	P4	-	-	x	Jul to Sep	Loam. Flats, hillsides.	Yes	Medium - One record 9.5 km south of Survey Area, 29 years old.	Low
Jacksonia sericea	P4	-	-	x	Dec or Jan to Feb	Calcareous & sandy soils.	No	Low - One historical record >10 km north of Survey Area, >30 years old.	Low
Ornduffia submersa	P4	-	-	x	Sept to Oct	Clay-based ponds and swamps (semi-aquatic)	No	Low - two historical records 7.6 km north-south of Survey Area, >30 years old.	Low

Species	Conservation Status		Source		Flowering Period	Preferred habitat	Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA					
Parsonsia diaphanophleba	P4	-	-	x	Jan to Feb or Apr to Jun or Sep	Alluvial soils. Along rivers.	Yes	Medium - most recent record is 7.4 km south-west of Survey Area, <30 years old.	Low
Senecio leucoglossus	P4	-	-	x	Aug to Dec	Gravelly lateritic or granitic soils. Granite outcrops, slopes.	No	Low - Two records 9.6 km south of Survey Area, >100 years old.	Low
Verticordia lindleyi* subsp. *lindleyi	P4	-	-	x	May or Nov to Dec or Jan to Feb.	White/grey sand, gravelly sand, sandy loam. Seasonal swamps, sandplains.	Yes	High - Closest record is 0.75 km north of Survey Area, <20 years old.	Low
Senecio leucoglossus	P4	-	-	x	Aug to Dec	Gravelly lateritic or granitic soils. Granite outcrops, slopes.	No	Low - Two records 9.6 km south of Survey Area, >100 years old.	Low
Stylidium longitubum	P4	-	-	x	Oct to Dec	Sandy clay, clay. Seasonal wetlands.	Yes	Medium - Two records, 8.3 km north-west and 8.8 km west of Survey Area, <30 years old.	Low
Ptilotus sericostachyus* subsp. *roseus	X	-	-	x	Sep to Dec.	Unknown	No	Low - Extinct, one historical record 8.2 km north-east of Survey Area, >100 years old.	Low

Appendix D
Quadrat Data Sheet

Releve Number: R01			
Date: 15/07/2025		**Project Number:** A24.032	
Collector: Daniel Rubick		**Photo Number:** JPEG_20250715002451669.jp	
Coordinates (GDA2020, MGA 50)		-32.2285593 mN	115.9751443 mN
Slope	Flat		
Aspect	-		
Position	Creek		
Soil Texture	Sandy loam		
Soil Colour	Pale Grey		
Rock Type	-		
Rock Cover	-		
Bare Ground	25-50%		
Litter	10-25%		
Surface Water	10-25%		
Vegetation Condition	Degraded		
Weed Cover	75%		

Releve Number: R01	
Disturbance	Clearing, weeds
Fire Age Years	>10

VT01

Species	Naturalised	Conservation code	Height	% Cover
Eucalyptus rudis			10	20
Melaleuca preissiana			5	2
Washingtonia filifera	*		1	1
Gomphocarpus fruticosus	*DP		2	2
Typha orientalis			3	40
Juncus pallidus			1	10
Cynodon dactylon	*		0.5	15
Eragrostis curvula	*		1	20
Sonchus oleraceus	*		0.3	1
Ricinus communis	*		0.1	1
Pelargonium capitatum	*		0.5	2
Cenchrus clandestinus	*		0.3	1
Cyperus tenuiflorus	*		0.5	25

Releve Number: R01				
Juncus kraussii* subsp. *australiensis			1	0.5
Juncus articulatus	*		0.3	0.1
Solanum nigrum	*		0.3	1

Releve Number: R02			
Date: 15/07/2025		Project Number: A24.032	
Collector: Daniel Rubick		Photo Number: JPEG_20250715011623539.jp	
Coordinates (GDA2020, MGA 50)		-32.2285656 mN	115.9751368 mN
Slope	Flat		
Aspect	-		
Position	Lower slope		
Soil Texture	Sandy loam		
Soil Colour	Pale Grey		
Rock Type	Laterite		
Rock Cover	1-5%		
Bare Ground	10-25%		
Litter	5-10%		
Surface Water	-		
Vegetation Condition	Degraded		



Releve Number: R02	
Weed Cover	70%
Disturbance	Clearing and Weeds
Fire Age Years	>10

VT01

Species	Naturalised	Conservation code	Height	% Cover
Acacia rostellifera			5	40
Melaleuca rhaphiophylla			3	5
Casuarina obesa			3	3
Ficinia nodosa			1	1
Sonchus oleraceus	*		0.1	1
Conyza bonariensis	*		0.3	0.5
Lomandra longifolia	*		1	1
Lupinus cosentinii	*		0.5	0.5
Vicia sativa	*		0.1	0.5
Conostylis candicans			0.1	0.1
Helianthus annuus	*		0.3	0.5

Releve Number: R02				
Brassica tournefortii	*		0.5	2
Cynodon dactylon	*		0.3	0.1
Arctotheca calendula	*		0.5	0.1
Cucumis myriocarpus	*		0.3	0.5
Ricinus communis	*		1	0.5
Oxalis pes-caprae	*		0.3	1
Eragrostis curvula	*		1	0.1
Euphorbia maculata	*		0.1	0.1
Ornithopus compressus	*		0.1	0.1

Releve Number: R03			
Date: 15/07/2025		Project Number: A24.032	
Collector: Daniel Rubick		Photo Number: JPEG_20250715025004226.jp	
Coordinates (GDA2020, MGA 50)		-32.2356261 mE	115.9745952 Mn,
Slope	Flat		
Aspect	-		
Position	Plain		
Soil Texture	Sandy Loam		
Soil Colour	Pale Grey		
Rock Type	Laterite		
Rock Cover	5-10%		
Bare Ground	25-50%		
Litter	10-25%		
Surface Water	-		
Vegetation Condition	Degraded		
Weed Cover	60%		



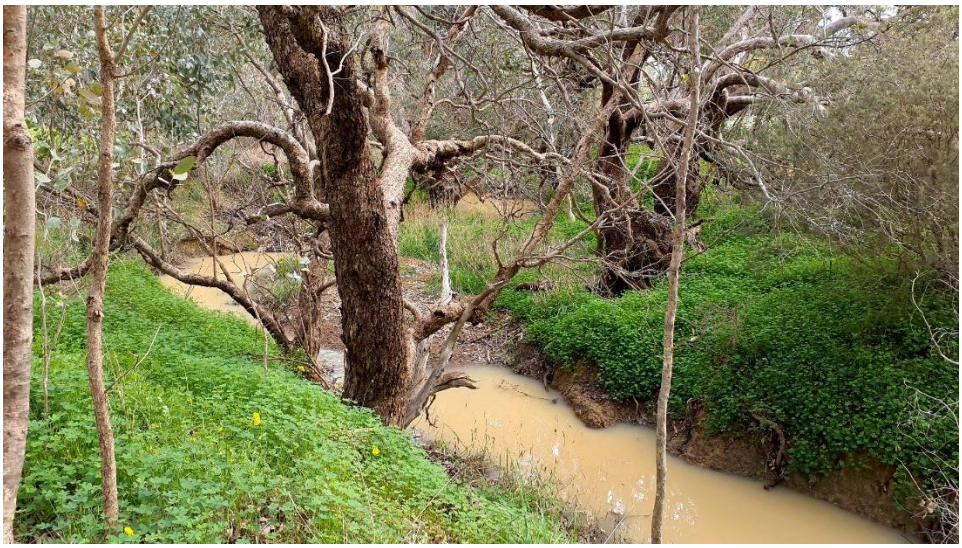
Releve Number: R03	
Disturbance	Clearing and Weeds
Fire Age Years	>10

VT02

Species	Naturalised	Conservation code	Height	% Cover
Corymbia calophylla			15	50
Kingia australis			4	10
Eragrostis curvula	*		1	40
Cynodon dactylon	*		0.1	15
Watsonia meriana	*		1	5
Conyza bonariensis	*		0.5	1
Banksia dallanneyi			0.1	0.5
Vicia sativa	*		0.1	0.1
Jacksonia furcellata			2	1
Xanthorrhoea gracilis			2	2
Xanthorrhoea preissii			0.5	5
Gomphocarpus fruticosus	*DP		1	0.1
Briza minor	*		0.3	0.5

Releve Number: R03				
Lomandra sericea			0.3	0.1
Olea europaea	*		0.1	0.1
Hypocalymma angustifolium			0.2	0.1
Darwinia thymoides **subsp.** ***thymoides***			0.2	0.1

Releve Number: R04			
Date: 15/07/2025		Project Number: A24.032	
Collector: Daniel Rubick		Photo Number: JPEG_20250715042439780.jp	
Coordinates (GDA2020, MGA 50)		-32.2377550 mE	115.9749156 mN
Slope	Gentle		
Aspect	-		
Position	Creek		
Soil Texture	Loam		
Soil Colour	Brown		
Rock Type	-		
Rock Cover	-		
Bare Ground	1-5%		
Litter	25-50%		
Surface Water	25-50%		
Vegetation Condition	Good		
Weed Cover	60%		
Disturbance	Weeds		



Releve Number: R04					
Fire Age Years	>10				
VT01					
Species		Naturalised	Conservation code	Height	% Cover
Eucalyptus rudis				12	80
Corymbia calophylla				10	15
Calothamnus quadrifidus* subsp. *quadrifidus		M		2	8
Gomphocarpus fruticosus		*DP		2	1
Acacia dentifera				2	1
Oxalis pes-caprae		*		0.1	60
Patersonia occidentalis				0.3	3
Banksia dallanneyi				0.2	5
Juncus pallidus				1	2
Eragrostis curvula		*		1	5
Sonchus oleraceus		*		0.3	1
Xanthorrhoea preissii				0.5	1
Asparagus asparagoides		*DP,WoNS		1	1
Alternanthera nodiflora				0.3	0.1
Ficus carica		*		1	0.1

Releve Number: R04				
Hakea lissocarpha			1	1
Hardenbergia comptoniana			2	1
Spergula arvensis				
Eucalyptus lane-poolei			4	3

Releve Number: R05			
Date: 15/07/2025		Project Number: A24.032	
Collector: Daniel Rubick		Photo Number: JPEG_20250715054335191.jp	
Coordinates (GDA2020, MGA 50)		-32.2404750 mE	115.9748257 mN
Slope	Flat		
Aspect	-		
Position	Open Depression		
Soil Texture	Loam		
Soil Colour	Brown		
Rock Type	-		
Rock Cover	<1%		
Bare Ground	5-10%		
Litter	25-50%		
Surface Water	-		
Vegetation Condition	Completely Degraded		

Releve Number: R05	
Weed Cover	85%
Disturbance	Clearing, Weeds
Fire Age Years	>10

VT01

Species	Naturalised	Conservation code	Height	% Cover
Eucalyptus rudis			20	75
Melaleuca preissiana			10	15
Cenchrus clandestinus	*		0.5	25
Oxalis pes-caprae	*		0.5	40
Eragrostis curvula	*		1	10
Asparagus asparagoides	*DP, WoNS		1	1

Releve Number: R06			
Date: 15/07/2025		Project Number: A24.032	
Collector: Daniel Rubick		Photo Number: JPEG_20250715062229191.jp	
Coordinates (GDA2020, MGA 50)		-32.2518772 mE	115.9732515 mN
Slope	Flat		
Aspect	W		
Position	Mid Slope		
Soil Texture	Loamy Sand		
Soil Colour	Brown		
Rock Type	-		
Rock Cover	-		
Bare Ground	5-10%		
Litter	50-75%		
Surface Water	1-5%		
Vegetation Condition	Good		
Weed Cover	20%		



Releve Number: R06	
Disturbance	Weeds and roadside
Fire Age Years	>10

VT02

Species	Naturalised	Conservation code	Height	% Cover
Corymbia calophylla			15	75
Eucalyptus rudis			15	20
Kingia australis			1	5
Jacksonia sternbergiana			2	10
Allocasuarina humilis			1	7
Morelotia octandra			1	1
Eragrostis curvula	*		1	5
Briza maxima	*		0.5	0.1
Lomandra caespitosa			0.3	0.3
Hibbertia hypericoides* subsp. *hypericoides			0.5	7
Fumaria muralis	*		0.1	0.5
Melaleuca preissiana			5	5

Releve Number: R06				
Banksia dallanneyi			0.3	0.5
Melaleuca trichophylla			0.5	1
Hypocalymma angustifolium			0.5	10
Xylomelum occidentale			0.5	0.5
Xanthorrhoea preissii			1	1
Eremaea pauciflora			1	2
Babingtonia camphorosmae			0.5	0.5
Desmocladus fasciculatus			0.1	0.1
Allocasuarina fraseriana			3	1
Cyathochaeta avenacea			1	1
Lyginia imberbis			0.5	1
Lomandra sericea			0.5	0.3
Lepidosperma pubisquameum			0.5	0.5
Lepidosperma apricola			0.5	0.5

Releve Number: R07			
Date: 16/07/2025		Project Number: A24.032	
Collector: Daniel Rubick		Photo Number: JPEG_20250716012322774.jp	
Coordinates (GDA2020, MGA 50)		-32.2684534 mE	115.9718497mN
Slope	Steep		
Aspect	North		
Position	Mid slope		
Soil Texture	Loamy Sand		
Soil Colour	Brown		
Rock Type	-		
Rock Cover	-		
Bare Ground	10-25%		
Litter	10-25%		
Surface Water	-		
Vegetation Condition	Good		
Weed Cover	35%		



Releve Number: R07	
Disturbance	Weeds and clearing, railway
Fire Age Years	>10

VT03

Species	Naturalised	Conservation code	Height	% Cover
Banksia attenuata			4	5
Banksia menziesii			4	15
Kunzea glabrescens			4	30
Jacksonia furcellata			3	25
Adenanthos meisneri			1	5
Stirlingia latifolia			1	2
Eragrostis curvula	*		1	30
Ursinia anthemoides	*		0.1	1
Gompholobium tomentosum			0.8	5
Conostylis juncea			0.4	3
Dasypogon bromeliifolius			0.5	1
Conostephium pundulum			0.4	0.1
Corymbia calophylla			2	0.5

Releve Number: R07				
Eremaea pauciflora			1	10
Hibbertia hypericoides			0.5	2
Hypocalymma robustum			1	1
Burchardia congesta			0.5	0.1
Lyginia imberbis			0.5	0.5
Morelotia octandra			0.5	0.3
Briza maxima	*		0.3	0.1
Scholtzia involucrata			0.5	10
Desmocladus flexuosus			0.1	1
Melaleuca parviflora			0.5	2
Banksia dallanneyi			0.3	1
Lomandra hermaphrodita			0.3	0.1

Releve Number: R08			
Date: 16/07/2025		Project Number: A24.032	
Collector: Daniel Rubick		Photo Number: JPEG_20250716023821785.jp	
Coordinates (GDA2020, MGA 50)		-32.276062 mE	115.970332 mN
Slope	Flat		
Aspect	-		
Position	Creek		
Soil Texture	Loamy Sand		
Soil Colour	Brown		
Rock Type	-		
Rock Cover	-		
Bare Ground	1-5%		
Litter	10-25%		
Surface Water	10-25%		
Vegetation Condition	Degraded		



Releve Number: R08					
Weed Cover	90%				
Disturbance	Grazing and Weeds				
Fire Age Years	>10				
VT01					
Species	Naturalised		Conservation code	Height	% Cover
Eucalyptus rudis				15	80
Melaleuca rhaphiophylla				10	20
Melaleuca preissiana				8	5
Oxalis pes-caprae	*			0.5	75
Cenchrus clandestinus	*			0.5	15
Zantedeschia aethiopica	*DP			1	3
Juncus pallidus				1	1
Asparagus asparagoides	*DP.WoNS			1	1
Alternanthera nodiflora				0.3	0.5

Appendix E
Site x Species Matrix

Family	Full Taxon	Naturalised	Conservation code	Releve 1	Releve 2	Releve 3	Releve 4	Releve 5	Releve 6	Releve 7	Releve 8	Opportunistic
Amaranthaceae	*Alternanthera nodiflora*					X	X				X	
Anarthriaceae	*Lyginia imberbis*								X	X		
Anarthriaceae	*Anarthria laevis*											X
Apocynaceae	*Gomphocarpus fruticosus*	*				X	X					
Araceae	*Zantedeschia aethiopica*	*									X	
Arecaceae	*Washingtonia filifera*	*										
Asparagaceae	*Asparagus asparagoides*	*				X	X	X			X	
Asparagaceae	*Lomandra caespitosa*								X			
Asparagaceae	*Lomandra hermaphrodita*									X		
Asparagaceae	*Lomandra longifolia*	*			X							
Asparagaceae	*Lomandra sericea*								X			
Asteraceae	*Arctotheca calendula*	*			X							
Asteraceae	*Conyza bonariensis*	*			X							
Asteraceae	*Helianthus annuus*	*			X							
Asteraceae	*Sonchus oleraceus*	*			X	X	X					
Asteraceae	*Ursinia anthemoides*	*								X		

Family	Full Taxon	Naturalised	Conservation code	Releve 1	Releve 2	Releve 3	Releve 4	Releve 5	Releve 6	Releve 7	Releve 8	Opportunistic
Brassicaceae	*Brassica tournefortii*	*			X							
Caryophyllaceae	*Spergula arvensis*	*				X	X					
Casuarinaceae	*Allocasuarina fraseriana*								X			
Casuarinaceae	*Allocasuarina humilis*								X			
Casuarinaceae	*Casuarina obesa*	*			X							
Colchicaceae	*Burchardia congesta*									X		
Cucurbitaceae	*Cucumis myriocarpus*	*			X							
Cyperaceae	*Cyathochaeta avenacea*								X			
Cyperaceae	*Cyperus tenuiflorus*	*										
Cyperaceae	*Ficinia nodosa*				X							
Cyperaceae	*Lepidosperma apricola*								X			
Cyperaceae	*Lepidosperma longitudinale*											X
Cyperaceae	*Lepidosperma pubisquameum*								X			
Cyperaceae	*Morelotia octandra*								X	X		
Dasypogonaceae	*Dasypogon bromeliifolius*									X		
Dasypogonaceae	*Kingia australis*								X			

Family	Full Taxon	Naturalised	Conservation code	Releve 1	Releve 2	Releve 3	Releve 4	Releve 5	Releve 6	Releve 7	Releve 8	Opportunistic
Dilleniaceae	*Hibbertia hypericoides*									X		
Dilleniaceae	*Hibbertia hypericoides* subsp. *hypericoides*								X			
Euphorbiaceae	*Euphorbia maculata*	*			X							
Euphorbiaceae	*Ricinus communis*	*			X							
Fabaceae	*Acacia dentifera*					X	X					
Fabaceae	*Acacia rostellifera*	M			X							
Fabaceae	*Gompholobium tomentosum*									X		
Fabaceae	*Hardenbergia comptoniana*					X	X					
Fabaceae	*Jacksonia furcellata*									X		
Fabaceae	*Jacksonia sternbergiana*								X			
Fabaceae	*Lupinus cosentinii*	*			X							
Fabaceae	*Ornithopus compressus*	*			X							
Fabaceae	*Vicia sativa*	*			X							
Geraniaceae	*Pelargonium capitatum*	*										
Haemodoraceae	*Conostylis aculeata* subsp. *aculeata*									X		X
Haemodoraceae	*Conostylis candicans*				X							

Family	Full Taxon	Naturalised	Conservation code	Releve 1	Releve 2	Releve 3	Releve 4	Releve 5	Releve 6	Releve 7	Releve 8	Opportunistic
Haemodoraceae	*Conostylis juncea*									X		
Iridaceae	*Patersonia occidentalis*					X	X					
Iridaceae	*Watsonia meriana*	*										
Juncaceae	*Juncus articulatus*	*										
Juncaceae	*Juncus kraussii subsp. Australiensis*											
Juncaceae	*Juncus pallidus*					X	X				X	
Moraceae	*Ficus carica*	*				X	X					
Myrtaceae	*Babingtonia camphorosmae*								X			
Myrtaceae	*Calothamnus quadrifidus* subsp. *quadrifidus*					X	X					
Myrtaceae	*Corymbia calophylla*					X	X		X	X		
Myrtaceae	*Darwinia thymoides* subsp. *thymoides*											
Myrtaceae	*Eremaea pauciflora*								X	X		
Myrtaceae	*Eucalyptus rudis*					X	X	X	X		X	
Myrtaceae	*Eucalyptus lane-poolei*					X	X					
Myrtaceae	*Hypocalymma angustifolium*								X			
Myrtaceae	*Hypocalymma robustum*									X		

Family	Full Taxon	Naturalised	Conservation code	Releve 1	Releve 2	Releve 3	Releve 4	Releve 5	Releve 6	Releve 7	Releve 8	Opportunistic
Myrtaceae	*Kunzea glabrescens*									X		
Myrtaceae	*Melaleuca parviflora*									X		
Myrtaceae	*Melaleuca preissiana*							X	X		X	
Myrtaceae	*Melaleuca rhaphiophylla*				X						X	
Myrtaceae	*Melaleuca trichophylla*								X			
Myrtaceae	*Scholtzia involucrata*									X		
Oleaceae	*Olea europaea*	*										
Oxalidaceae	*Oxalis pes-caprae*	*			X	X	X	X			X	
Papaveraceae	*Fumaria muralis*	*							X			
Poaceae	*Briza maxima*	*							X	X		
Poaceae	*Briza minor*	*										
Poaceae	*Cenchrus clandestinus*	*						X			X	
Poaceae	*Cynodon dactylon*	*			X							
Poaceae	*Eragrostis curvula*	*			X	X	X	X	X	X		
Proteaceae	*Adenanthos meisneri*									X		
Proteaceae	*Banksia attenuata*									X		

Family	Full Taxon	Naturalised	Conservation code	Releve 1	Releve 2	Releve 3	Releve 4	Releve 5	Releve 6	Releve 7	Releve 8	Opportunistic
Proteaceae	*Banksia dallanneyi*					X	X		X	X		
Proteaceae	*Banksia menziesii*									X		
Proteaceae	*Hakea lissocarpha*					X	X					
Proteaceae	*Stirlingia latifolia*									X		
Proteaceae	*Xylomelum occidentale*								X			
Restionaceae	*Desmocladus fasciculatus*								X			
Restionaceae	*Desmocladus flexuosus*									X		
Restionaceae	*Lepyrodia glauca*											X
Solanaceae	*Solanum nigrum*	*										
Typhaceae	*Typha orientalis*											
Xanthorrhoeaceae	*Xanthorrhoea gracilis*											
Xanthorrhoeaceae	*Xanthorrhoea preissii*					X	X		X			

Appendix F
Fauna Database Search Results and Likelihood of Occurrence

Scientific Name	Common name	Conservation Status		Database		Likelihood of Occurrence Pre Survey	Justification
		State	Federal	PMST	DBCA		
Aves							
Actitis hypoleucos	Common sandpiper	MI	MI	x	x	Low	One known record 7.7 km southwest of Survey Area, 30> years. No suitable habitat occurs within Survey Area, one suitable wetland habitat (Bollard Bulrush Swamp) is >10 km from Survey Area, infrequent fly-over species.
Apus pacificus	Fork-tailed swift	MI	MI	x	x	Low	One known record 8.1 km from Survey Area in Forrestdale Lake, >20 years old. No suitable habitat occurs within Survey area, suitable habitat (Forestdale lakes) occurs <10 km northwest.
Arenaria interpres	Ruddy turnstone	MI	MI		x	Low	Two known record 8.1 km from Survey Area in Forrestdale Lake, >20 years old. No suitable habitat occurs within Survey area, suitable habitat (Forestdale lakes) occurs <10 km north-west.
Botaurus poiciloptilus	Australasian bittern	EN	EN	x	x	Low	Three known record 8.1 km from Survey Area in Forrestdale Lake, <20 years old. No suitable habitat occurs within Survey area, suitable habitat (Forestdale lakes) occurs <10 km north-west.
Calidris acuminata	Sharp-tailed sandpiper	MI	MI	x	x	Low	Numerous known records 8.1 km from Survey Area in Forrestdale Lake, most recent being from 2012 and 2009. No suitable habitat (coastal shores, salt lakes, mudflats) occurs within Survey Area.
Calidris ferruginea	Curlew sandpiper	CR	CR & MI	x	x	Low	Numerous known records 8.1 km from Survey Area in Forrestdale Lake, most

Scientific Name	Common name	Conservation Status		Database		Likelihood of Occurrence Pre Survey	Justification
		State	Federal	PMST	DBCA		
							recent records are from 2009, <20 years old. No suitable habitat occurs within Survey area, suitable habitat (Forestdale lakes) occurs <10 km northwest.
Calidris melanotos	Pectoral sandpiper	MI	MI	x	x	Low	Three known record 8.1 km from Survey Area in Forrestdale Lake, one record is <20 years old. No suitable habitat occurs within Survey area, suitable habitat (Forestdale lakes) occurs <10 km north-west.
Calidris pugnax	Ruff		MI	x		Low	No records observed. No suitable habitats (wetlands) occur within Survey Area.
Calidris ruficollis	Red-necked stint	MI	MI	x	x	Low	Numerous known records, with one record <5 km south of Survey Area,>20 years old. No suitable habitat presents within Survey Area.
Calidris subminuta	Long-toed stint	MI	MI	x	x	Low	Known records recorded 7.5 km from Survey Area in Forrestdale Lake, most recent record in 2009. No suitable Survey Area occurs in Survey Area.
Calyptorhynchus banksii naso	Forest Red-tailed Black-Cockatoo, Karrak	VU	VU	x	x	Recorded	Numerous records recorded within 10 km of Survey Area, potential foraging vegetation present in Survey Area and minor freshwater courses present within Survey Area.
Charadrius dubius	Little ringed plover		MI	x		Low	No records observed. No suitable habitats (wetlands) occur within Survey Area.
Charadrius leschenaultii	Greater sand plover, large sand plover	VU	VU & MI	x	x	Low	Two known records 8 km from Survey Area in Forrestdale Lake, records >20s

Scientific Name	Common name	Conservation Status		Database		Likelihood of Occurrence Pre Survey	Justification
		State	Federal	PMST	DBCA		
							years old. No suitable habitat occurs in Survey Area.
Falco peregrinus	Peregrine falcon	OS			x	High	closest record occurs 2.3 km east of Survey Area in Brickwood Reserve, record 20 years old.
Gallinago megala	Swinhoe's snipe		MI	x		Low	No records observed. No suitable habitats (wetlands) occur within Survey Area.
Gallinago stenura	Pin-tailed Snipe		MI	x		Low	No records observed. No suitable habitats (wetlands) occur within Survey Area.
Hydroprogne caspia	Caspian tern	MI	MI	x	x	Low	One record observed 9.3 km south-west of Survey Area, >20 years old, no suitable habitat within Survey Area.
Leipoa ocellata	Malleefowl	VU	VU	x	x	Low	Two records observed 7.1 km east of Survey Area, 20 years old, no suitable habitat occurs within Survey Area.
Limosa limosa	Black-tailed godwit	MI	MI	x	x	Low	Two records observed 7 km in Forrestdale Lake, <20 years old, no suitable habitat (Wetlands) occurs within Survey Area.
Motacilla cinerea	Grey wagtail		MI	x		Low	No records observed.
Numenius madagascariensis	Eastern curlew, far eastern curlew		CR	x		Low	No records observed. No suitable habitats (wetlands) occur within Survey Area.
Numenius minutus	Little curlew, little whimbrel		MI	x		Low	No records observed. No suitable habitats (wetlands) occur within Survey Area.
Oxyura australis	Blue-billed duck	P4			x	Low	Numerous records observed 7 km in Forrestdale Lake and James Swamp, <20 years old. No suitable habitat (waterbodies) occurs within Survey Area.

Scientific Name	Common name	Conservation Status		Database		Likelihood of Occurrence Pre Survey	Justification
		State	Federal	PMST	DBCA		
Pandion haliaetus	Osprey		MI	x		Low	No records observed. No suitable habitats (wetlands) occur within Survey Area.
Plegadis falcinellus	Glossy ibis	MI	MI		x	Low	Numerous records observed 7 km in Forrestdale Lake and James Swamp, <20 years old. No suitable habitat (waterbodies) occurs within Survey Area.
Pluvialis fulva	Pacific golden plover	MI	MI		x	Low	Three known records observed 8.7 km north-east of Survey Area, <20 years old, no suitable habitat (costal, mudflats and sandflats) in Survey Area.
Pluvialis squatarola	Grey plover	MI	MI		x	Low	Two known records 8 km from Survey Area in Forrestdale Lake, records >20s years old. No suitable habitat (coastal and wetland) occurs in Survey Area.
Rostratula australis	Australian painted snipe		EN	x		Low	No records observed. No suitable habitats (wetlands) occur within Survey Area.
Stercorarius longicaudus	Long-tailed jaeger, long-tailed skua	MI	MI		x	Low	One record observed 7.6 km north-south of Survey Area, >20 years old. No Suitable habitat occurs within Survey Area
Sternula nereis nereis	Australian fairy tern		VU	x		Low	No records observed. No suitable habitat (coastal) occurs in Survey Area.
Tringa glareola	Wood sandpiper	MI	MI	x	x	Low	Numerous records occur 7.1 km northwest of Survey Area in Forrestdale Lake, <20 years old. No suitable habitat (wetlands) occurs within Survey area.
Tringa nebularia	Common greenshank	MI	MI	x	x	Low	Numerous records occur 7.1 km northwest of Survey Area in Forrestdale

Scientific Name	Common name	Conservation Status		Database		Likelihood of Occurrence Pre Survey	Justification
		State	Federal	PMST	DBCA		
							Lake, <20 years old. No suitable habitat (wetlands) occurs within Survey area.
Tringa stagnatilis	Marsh sandpiper, little greenshank	MI	MI	x	x	Low	Two records occur 7.1 km northwest of Survey Area in Forrestdale Lake, 20 years old. No suitable habitat (wetlands) occurs within Survey area.
Zanda baudinii	Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-cockatoo	EN	EN	x	x	High	Numerous records occurring <1 km from Survey Area, <20 years old. Suitable foraging habitat may be present in Survey Area. Survey Area within occurrence distribution.
Zanda latirostris	Carnaby's Black Cockatoo, Short-billed Black-cockatoo	EN	EN	x	x	Recorded	Numerous records occurring <1 km from Survey Area, <20 years old. Suitable foraging habitat may be present in Survey Area. Survey Area within occurrence distribution.
INVERTEBRATE							
Austroconops mcmillani	Mcmillan's biting midge (Swan Coastal Plain)	P2			x	Low	No observed records.
Euoplos inornatus	Inornate trapdoor spider (northern Jarrah Forest)	P3			x	Low	Records occur 3.3 km east of Survey Area, <20 years old, no suitable habitat (Jarrah and Marri forest) occurs within Survey Area.
Idiosoma sigillatum	Swan Coastal Plain shield-backed trapdoor spider	P3			x	Low	Records occurs 2.5 km north-east of Survey Area, <20 years old. No suitable habitat (Banksia woodlands and heathlands) in Survey Area.
Leioproctus contrarius	A short-tongued bee	P3			x	Low	Two records 8 km north-west in Forrestdale area, >60 years old. No

Scientific Name	Common name	Conservation Status		Database		Likelihood of Occurrence Pre Survey	Justification
		State	Federal	PMST	DBCA		
							suitable habitat or feeding vegetation in Survey Area.
Leioproctus douglasiellus	A short-tongued bee	EN	CR	x	x	Low	Two records 8 km north-west in Forrestdale area, one record <20 years old. No suitable habitat or feeding vegetation in Survey Area.
Neopasiphae simplicior	A native bee	EN	CR	x	x	Low	Most recent records 2 km north-west in Forrestdale area, <20 years old. No suitable habitat or feeding vegetation in Survey Area.
Synemon gratiosa	Graceful sun moth	P4			x	Medium	Three records 7.7 km west of Survey Area, <20 years old. Host plant detected within small patch of banksia woodland in the Survey Area
Westralunio carteri	Carter's freshwater mussel	VU			x	Medium	Numerous records recorded in waterways, closest record was observed 2.2 km in Mandejal Brook, 14 years old. Potential habitat (watercourse) occurs within Survey Area.
MAMMALS							
Bettongia penicillata ogilbyi	Woylie		EN	x		Low	Expected to be locally extinct, no records within 10 km in the last 20 years.
Dasyurus geoffroii	Chuditch, western quoll	VU	VU	x	x	Low	Closest record occurs 2.1 km east of Survey Area near nature reserve, <20 years old. No suitable habitat (extensive natural vegetation) occurs within Survey Area.

Scientific Name	Common name	Conservation Status		Database		Likelihood of Occurrence Pre Survey	Justification
		State	Federal	PMST	DBCA		
Falsistrellus mackenziei	Western false pipistrelle, western falsistrelle	P4			x	Low	One record 7.6 km north-east from Survey Area in Bungendore Park, <20 years old. No suitable habitat (Eucalyptus Forest) occurs within Survey Area.
Hydromys chrysogaster	Water-rat, rakali	P4			x	Medium	Multiple records 7.5km from Survey Area near Serpentine River, <20 years old. No suitable habitat (rivers) occurs within Survey Area.
Isoodon fusciventer	Quenda, southwestern brown bandicoot	P4			x	Recorded	An individual deceased quenda was found on the border of the Survey Area during the field survey. Closest record occurs 1 km west of Survey Area near nature reserve, <20 years old. Survey Area is within known distribution of occurrence, species may occur in metro areas.
Myrmecobius fasciatus	Numbat, walpurti	EN	EN	x	x	Low	All records older than 20 years, no suitable habitat occurs in Survey Area. Locally extinct
Notamacropus eugenii derbianus	Tammar wallaby	P4			x	Low	one record 4.5 km south-west of Survey Area, <20 years old. No suitable habitat (dense shrubland) occurs in Survey Area.
Notamacropus irma	Western brush wallaby	P4			x	Low	Records 7 km south-west of Survey Area, <20 years old. No suitable habitat (open forest or woodland) occurs within Survey Area.
Phascogale tapoatafa wambenger	South-western brush-tailed phascogale, wambenger	CD			x	Medium	Most recent record is 7.8 km south of Survey area in Lowland Nature Reserve, <10 years old. Potential suitable habitat

Scientific Name	Common name	Conservation Status		Database		Likelihood of Occurrence Pre Survey	Justification
		State	Federal	PMST	DBCA		
							(open woodland or forest) occurs in Survey Area.
Pseudocheirus occidentalis	Western ringtail possum, ngwayir	CR	CR	x	x	Low	One record 9.6 km south-east of Survey Area, >20 years old. No suitable habitat (woodlands) within Survey Area. Locally extinct.
Setonix brachyurus	Quokka	VU	VU	x	x	Low	Most recent record is 9.5 km north-east of Survey area in Lowland Nature Reserve, <10 years old. No suitable habitat (dense riparian vegetation) occurs in Survey Area.
REPTILE							
Acanthophis antarcticus	Southern death adder	P3			x	Low	One record 2.5 km east of Survey area, all records >30 years old, no suitable habitat (forest and woodlands) within Survey Area.
Ctenotus delli	Dell's skink, Darling Range southwest Ctenotus	P4			x	Low	One record 3.6 km from Survey Area, >40 years old. No suitable habitat (forest and rocky area) occurs within Survey Area.
Lerista lineata	Perth slider, lined skink	P3			x	Medium	Most recent records occur 8.5 km west of Survey Area in Banksia nature reserve, <20 years old. Potential suitable habitat (Banksia woodland) occurs in Survey Area.
Neelaps calonotos	Black-striped snake, black-striped burrowing snake	P3			x	Medium	Most recent record occur 8.6 km west of Survey Area, <10 years old. No suitable habitat (Banksia woodland) occurs within Survey Area.

Appendix G
Black cockatoo Potential Breeding Tree Data

Tree Number	Species	Bamford Class	DBH	Hollow Data	Eastings	Northings
1	Eucalyptus	5	50	None	403384.6803	6433961
2	Flooded Gum	5	50	None	403389.3099	6433902
3	Eucalyptus	5	80	None	403353.1216	6433897
4	Eucalyptus	5	70	None	403358.9203	6433892
5	Eucalyptus	5	55	None	403369.6123	6433871
6	Eucalyptus	5	65	None	403384.0029	6433864
7	Eucalyptus	5	50	None	403377.375	6433862
8	Eucalyptus	5	65	None	403372.1257	6433855
9	Eucalyptus	5	60	None	403357.517	6433855
10	Flooded Gum	5	70	None	403348.1828	6433856
11	Eucalyptus	5	60	None	403365.0689	6433839
12	Eucalyptus	5	50	None	403377.9092	6433842
13	Eucalyptus	5	60	None	403388.1715	6433835
14	Eucalyptus	5	50	None	403348.8742	6433822
15	Eucalyptus	5	55	None	403375.9188	6433827
16	Eucalyptus	5	55	None	403395.5941	6433810
17	Eucalyptus	5	50	None	403401.7936	6433804
18	Eucalyptus	5	85	None	403391.1248	6433798
19	Eucalyptus	5	55	None	403372.5062	6433802
20	Eucalyptus	5	55	None	403368.0768	6433791
21	Eucalyptus	5	65	None	403365.4202	6433776

Tree Number	Species	Bamford Class	DBH	Hollow Data	Eastings	Northings
22	Eucalyptus	5	100	None	403365.5386	6433761
23	Eucalyptus	5	55	None	403400.8459	6433720
24	Eucalyptus	5	70	None	403400.5396	6433691
25	Eucalyptus	5	95	None	403409.6886	6433687
26	Marri	5	120	None	403409.3263	6433630
27	Marri	5	70	None	403372.7718	6433635
28	Marri	5	70	None	403354.298	6433627
29	Marri	5	105	None	403425.6345	6433521
30	Marri	5	95	None	403416.9664	6433520
31	Dead	4	85	Hollows with corella inside, none big enough for black cockatoo	403429.7975	6433340
32	Marri	5	140	None	403436.1194	6433366
33	Dead	4	70	Small hollows, not suitable for black cockatoo	403391.7301	6433372
34	Marri	5	70	None	403398.5424	6433382
35	Marri	5	120	None	403395.8925	6433384
36	Marri	3	120	10cm Spout 7 m up, chewed edge, checked with drone and sufficiently deep, large fissure on trunk but edges too cracked to be black hollow, small hollow has bees, adjacent trees all housing corellas,	403407.2902	6433315
37	Marri	5	75	None	403412.9724	6433304
38	Marri	5	75	None	403422.6053	6433303
39	Marri	4	80	Small hollows, not suitable for black cockatoo, occupied by galah	403437.5475	6433272
40	Eucalyptus	5	60	None	403431.4828	6433138
41	Marri	5	50	None	403448.2217	6432988
42	Marri	5	50	None	403435.5428	6432989

Tree Number	Species	Bamford Class	DBH	Hollow Data	Eastings	Northings
43	Flooded Gum	4	75	Small hollows, not suitable for black cockatoo	403450.7369	6432760
44	Flooded Gum	5	55	None	403446.0042	6432753
45	Flooded Gum	5	100	None	403439.9721	6432758
46	Flooded Gum	5	110	None	403435.3151	6432761
47	Flooded Gum	5	80	None	403429.2291	6432765
48	Flooded Gum	5	90	None	403428.3838	6432759
49	Flooded Gum	5	60	None	403421.4145	6432760
50	Flooded Gum	5	90	None	403413.3086	6432760
51	Flooded Gum	5	100	None	403404.7989	6432768
52	Flooded Gum	5	55	None	403398.2447	6432764
53	Eucalyptus	5	65	None	403391.0219	6432487
54	Eucalyptus	5	50	None	403392.0349	6432494
55	Flooded Gum	4	85	Small hollows not suitable for black cockatoo	403392.9605	6432465
56	Flooded Gum	5	50	None	403390.6577	6432463
57	Flooded Gum	5	50	None	403401.0788	6432458
58	Flooded Gum	5	50	None	403406.609	6432459
59	Flooded Gum	5	65	None	403417.6458	6432463
60	Flooded Gum	5	85	None	403436.4218	6432464
61	Flooded Gum	5	120	None	403440.3263	6432465
62	Flooded Gum	5	50	None	403444.5823	6432465
63	Flooded Gum	5	100	None	403473.8014	6432463

Tree Number	Species	Bamford Class	DBH	Hollow Data	Eastings	Northings
64	Marri	5	50	None	403474.4706	6432464
65	Flooded Gum	5	60	None	403478.3177	6432478
66	Flooded Gum	5	55	None	403491.3188	6432488
67	Flooded Gum	5	200	None	403479.5884	6432505
68	Flooded Gum	5	90	None	403487.8677	6432533
69	Flooded Gum	5	50	None	403421.3883	6432448
70	Flooded Gum	5	70	None	403410.7291	6432449
71	Flooded Gum	5	200	None	403403.0468	6432445
72	Flooded Gum	5	60	None	403389.4832	6432448
73	Flooded Gum	5	60	None	403383.1434	6432448
74	Flooded Gum	5	75	None	403378.3827	6432448
75	Eucalyptus	5	55	None	403382.5768	6432425
76	Eucalyptus	5	80	None	403397.7045	6432413
77	Flooded Gum	5	55	None	403420.9166	6432420
78	Flooded Gum	5	80	None	403426.6952	6432420
79	Flooded Gum	5	50	None	403432.2581	6432433
80	Flooded Gum	5	50	None	403418.642	6432442
81	Flooded Gum	5	50	None	403417.3357	6432441
82	Eucalyptus	5	120	None	403426.1464	6432323
83	Eucalyptus	5	80	None	403404.1394	6432321
84	Eucalyptus	5	80	None	403400.5562	6432321

Tree Number	Species	Bamford Class	DBH	Hollow Data	Eastings	Northings
85	Eucalyptus	5	70	None	403387.7985	6432321
86	Eucalyptus	5	75	None	403384.1263	6432322
87	Eucalyptus	5	100	None	403379.5054	6432322
88	Eucalyptus	5	105	None	403378.5864	6432295
89	Eucalyptus	5	100	None	403379.6224	6432291
90	Eucalyptus	5	60	None	403391.5872	6432291
91	Eucalyptus	5	70	None	403396.4148	6432289
92	Eucalyptus	5	55	None	403399.543	6432291
93	Eucalyptus	5	95	None	403403.3014	6432291
94	Eucalyptus	5	75	None	403405.2957	6432290
95	Eucalyptus	5	60	None	403409.8417	6432291
96	Eucalyptus	5	70	None	403412.7848	6432291
97	Eucalyptus	5	60	None	403417.1409	6432292
98	Eucalyptus	5	90	None	403426.3931	6432294
99	Eucalyptus	5	50	None	403431.9089	6432293
100	Eucalyptus	5	50	None	403434.8724	6432292
101	Eucalyptus	5	100	None	403415.3914	6432042
102	Eucalyptus	5	90	None	403415.9628	6432041
103	Eucalyptus	5	110	None	403412.9901	6432036
104	Eucalyptus	5	55	None	403409.8496	6432034
105	Eucalyptus	5	55	None	403380.8028	6431976

Tree Number	Species	Bamford Class	DBH	Hollow Data	Eastings	Northings
106	Eucalyptus	5	50	None	403385.1222	6431972
107	Eucalyptus	5	80	None	403391.9934	6431973
108	Eucalyptus	5	50	None	403414.141	6431971
109	Eucalyptus	5	60	None	403418.4556	6431974
110	Flooded Gum	5	130	None	403412.9634	6431975
111	Eucalyptus	5	80	None	403407.6629	6431981
112	Eucalyptus	5	70	None	403412.973	6431985
113	Eucalyptus	5	55	None	403403.7559	6431992
114	Eucalyptus	5	80	None	403405.4023	6431996
115	Eucalyptus	5	80	None	403411.1216	6431998
116	Eucalyptus	5	60	None	403411.5391	6432008
117	Eucalyptus	5	60	None	403406.6848	6432013
118	Eucalyptus	5	65	None	403402.3916	6432024
119	Eucalyptus	5	65	None	403410.4141	6432024
120	Eucalyptus	5	65	None	403402.8724	6432021
121	Flooded Gum	5	100	None	403414.5621	6432028
122	Flooded Gum	5	100	None	403375.1643	6432335
123	Flooded Gum	5	65	None	403377.541	6432342
124	Eucalyptus	5	110	None	403387.6163	6432369
125	Eucalyptus	5	75	None	403387.1003	6432377
126	Eucalyptus	5	85	None	403381.3744	6432366

Tree Number	Species	Bamford Class	DBH	Hollow Data	Eastings	Northings
127	Eucalyptus	5	75	None	403385.5127	6432382
128	Eucalyptus	5	90	None	403386.0922	6432392
129	Eucalyptus	5	75	None	403389.0107	6432394
130	Eucalyptus	4	80	Small crack hollow, not suitable for black cockatoo	403394.9255	6432377
131	Eucalyptus	5	70	None	403391.8158	6432398
132	Eucalyptus	5	50	None	403395.2766	6432396
133	Flooded Gum	5	60	None	403393.7992	6432406
134	Eucalyptus	5	70	None	403375.1374	6432404
135	Eucalyptus	5	70	None	403346.7046	6431554
136	Eucalyptus	5	50	None	403351.6437	6431555
137	Eucalyptus	5	55	None	403365.0942	6431557
138	Eucalyptus	5	50	None	403369.6435	6431556
139	Eucalyptus	5	60	None	403372.556	6431555
140	Eucalyptus	5	55	None	403375.9971	6431555
141	Eucalyptus	5	50	None	403378.357	6431554
142	Eucalyptus	5	60	None	403392.2938	6431555
143	Eucalyptus	5	65	None	403397.9532	6431555
144	Eucalyptus	5	65	None	403355.865	6431501
145	Marri	5	65	None	403375.9743	6431474
146	Marri	5	50	None	403374.5852	6431472
147	Marri	5	70	None	403372.5398	6431473

Tree Number	Species	Bamford Class	DBH	Hollow Data	Eastings	Northings
148	Jarrah	4	110	Small hollows, defensive galahs in tree	403380.0717	6431395
149	Eucalyptus	5	60	None	403356.3896	6431301
150	Eucalyptus	5	70	None	403354.8543	6431302
151	Eucalyptus	5	55	None	403329.2845	6431301
152	Eucalyptus	5	55	None	403308.1444	6431321
153	Eucalyptus	5	50	None	403308.5165	6431327
154	Eucalyptus	5	50	None	403306.4177	6431338
155	Eucalyptus	5	55	None	403305.4958	6431347
156	Marri	5	65	None	403283.9918	6431261
157	Marri	5	95	None	403671.7294	6428279
158	Marri	5	80	None	403672.4625	6428280
159	Flooded Gum	5	150	None	403674.0705	6428211
160	Flooded Gum	5	85	None	403675.5905	6428206
161	Flooded Gum	5	55	None	403674.8413	6428199
162	Flooded Gum	5	68	None	403670.5448	6428138
163	Marri	5	65	None	403665.9358	6428134
164	Eucalyptus	5	300	None	403104.1622	6428061
165	Eucalyptus	5	185	None	403102.2149	6428047
166	Eucalyptus	5	95	None	403101.1923	6428015
167	Eucalyptus	5	80	None	403100.0695	6428003
168	Marri	5	80	None	403023.8277	6428114

Tree Number	Species	Bamford Class	DBH	Hollow Data	Eastings	Northings
169	Marri	5	70	None	403023.8943	6428113
170	Flooded Gum	5	110	None	403045.0056	6428353
171	Flooded Gum	5	95	None	403046.6442	6428354
172	Flooded Gum	5	50	None	403068.9962	6428374
173	Flooded Gum	5	70	None	403071.2763	6428380
174	Flooded Gum	5	120	None	403046.543	6428394
175	Flooded Gum	5	50	None	403030.5571	6428501
176	Flooded Gum	5	65	None	403038.8933	6428502
177	Flooded Gum	5	90	None	403067.5666	6428507
178	Flooded Gum	5	120	None	403066.3574	6428513
179	Flooded Gum	5	60	None	403049.3673	6428513
180	Flooded Gum	5	50	None	403040.7327	6428512
181	Flooded Gum	5	50	None	403030.3722	6428510
182	Flooded Gum	5	65	None	403022.8931	6428514
183	Flooded Gum	5	70	None	403023.818	6428517
184	Flooded Gum	4	120	Large open branch, but only 3.5 m high, no wear or chew, not a black cockatoo hollow	403044.8266	6428828
185	Flooded Gum	5	60	None	403010.9993	6428521
186	Flooded Gum	5	70	None	403010.4856	6428508
187	Flooded Gum	5	80	None	403009.4515	6428494
188	Flooded Gum	5	55	None	403014.7964	6428489
189	Flooded Gum	5	70	None	403019.142	6428491

Tree Number	Species	Bamford Class	DBH	Hollow Data	Eastings	Northings
190	Flooded Gum	5	65	None	403023.9336	6428494
191	Flooded Gum	5	85	None	403027.7516	6428490
192	Flooded Gum	5	50	None	403017.9872	6428484
193	Flooded Gum	5	60	None	403015.1658	6428429
194	Flooded Gum	5	50	None	403013.3767	6428415
195	Flooded Gum	5	50	None	403013.424	6428413
196	Flooded Gum	5	50	None	403019.8483	6428409
197	Flooded Gum	5	70	None	403013.0653	6428397
198	Flooded Gum	5	55	None	403024.9953	6428401
199	Flooded Gum	5	55	None	403026.1193	6428375
200	Flooded Gum	5	100	None	403011.5611	6428374
201	Flooded Gum	5	110	None	403013.1795	6428372
202	Flooded Gum	5	60	None	403013.6708	6428370
203	Flooded Gum	5	75	None	403024.3758	6428357
204	Flooded Gum	4	150	Small hollows not suitable for black cockatoo	403023.7	6428348
205	Flooded Gum	5	70	None	403018.7407	6428337
206	Marri	5	95	None	403018.4698	6428321
207	Marri	5	70	None	403027.7894	6428325
208	Marri	5	90	None	403100.5807	6428127
209	Flooded Gum	5	85	None	403192.1499	6428127
210	Flooded Gum	5	50	None	403203.7135	6428123

Tree Number	Species	Bamford Class	DBH	Hollow Data	Eastings	Northings
211	Eucalyptus	5	65	None	403250.6708	6428112
212	Flooded Gum	5	70	None	403279.1288	6428126
213	Flooded Gum	5	75	None	403289.9028	6428126
214	Flooded Gum	5	60	None	403376.717	6428128
215	Flooded Gum	5	90	None	403384.8274	6428135
216	Flooded Gum	5	55	None	403407.1711	6428128
217	Flooded Gum	5	80	None	403407.5102	6428114
218	Flooded Gum	5	50	None	403412.6017	6428131
219	Flooded Gum	5	80	None	403418.3389	6428134
220	Flooded Gum	5	50	None	403425.7788	6428132
221	Flooded Gum	5	65	None	403416.6313	6428113
222	Flooded Gum	5	50	None	403431.786	6428129
223	Dead	4	65	Small hollows not suitable for black cockatoo	403470.1947	6428115
224	Flooded Gum	5	55	None	403411.4149	6428116
225	Marri	5	55	None	403168.3641	6429252
226	Marri	5	60	None	403098.2109	6429281
227	Marri	4	60	Small hollows not suitable for black cockatoo	403130.8895	6429227
228	Jarrah	5	60	None	403104.0917	6429623
229	Jarrah	5	55	None	403096.5472	6429594
230	Dead	3	105	3 10cm diameter hollows on tree, one obvious spout with definite chew, and wear, crack on trunk leading to hollow interior and spout on other side of the fence, light shines through, looks hollow	403067.0953	6429719
231	Eucalyptus	5	70	None	403102.757	6429846

Tree Number	Species	Bamford Class	DBH	Hollow Data	Eastings	Northings
232	Eucalyptus	5	60	None	403102.757	6429846
233	Flooded Gum	4	180	Small hollows not suitable for black cockatoo	403096.6719	6429996
234	Marri	5	55	None	403257.546	6430971
235	Marri	5	50	None	403285.7858	6430986
236	Marri	5	50	None	403290.3041	6430996
237	Marri	5	60	None	403290.3862	6431001
238	Marri	5	60	None	403288.0142	6431007
239	Marri	5	60	None	403290.9679	6431018
240	Marri	5	80	None	403287.922	6431080
241	Eucalyptus	5	55	None	403289.2788	6431085
242	Marri	5	50	None	403290.6911	6431128
243	Marri	5	50	None	403287.2273	6431142
244	Marri	5	70	None	403285.2323	6431148
245	Flooded Gum	5	75	None	403287.8573	6431173
246	Flooded Gum	5	55	None	403288.5578	6431173
247	Marri	5	55	None	403287.5316	6431201
248	Marri	5	55	None	403285.7701	6431226
249	Marri	5	50	None	403285.9367	6431232

Appendix H
Foraging Habitat Quality Scoring Tool (DCCEEW,n.d)

Habitat Scoring System for WA black cockatoo foraging habitat

This habitat scoring system describes elements indicative of suitable foraging habitat[1] for the three WA black cockatoo species (Carnaby's Black Cockatoo, Baudin's Black Cockatoo and the Forest Red-tailed Black Cockatoo) in WA. Its use must be supported by survey information and reporting, undertaken by suitably qualified and experienced ecologists.

Appropriate scores will best fit a description. Where all components of the 'detail' column description are not met, this must be specified, and justification provided for that score to be accepted by the Department.

For an offset site to be considered by the Department, the offset site must have a start score of 1 for each indicator (e.g., there must be a species stocking rate score of at least 1).

Indicator	Score	Detail	Impact site	Offset start quality	Without offset	With offset
Site Condition						
	Foraging value	Details				
Vegetation condition and structure. Habitat features	**7**	Very High	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland (>30% projected foliage cover), banksia and eucalypt woodlands with >50% projected foliage cover. Low percentage (< 5%) of tree deaths[2].				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest and woodlands with >50% projected foliage cover. Low percentage (< 5%) of tree deaths.				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands, with >50% projected foliage cover. Low percentage (< 5%) of tree deaths.				
	6	High	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland (>25% projected foliage cover), banksia and eucalypt woodlands with >40% projected foliage cover. Low percentage (< 10%) of tree deaths.				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest and woodlands with >40% projected foliage cover. Low percentage (< 10%) of tree deaths.				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands, with >40% projected foliage cover. Low percentage (< 10%) of tree deaths.				

[1] In some cases, an impact or offset site may contain or require both foraging and breeding habitat for one or more black cockatoos. Breeding habitat is species of trees known to support breeding within the range of the species which either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow. For most species of trees, suitable DBH is 500 mm. For salmon gum and wandoo, suitable DBH is 300 mm.

[2] No tree deaths indicate robustness of habitat, unlikely for the habitat to decline in the medium-term. Tree deaths may be owing to disease, water stress, fire, etc.

Vegetation condition and structure. Habitat features	**5**	Moderate to high	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland (>20% projected foliage cover), banksia and eucalypt woodlands with 30-40% projected foliage cover; OR > 60% projected foliage cover but veg. condition reduced due to tree deaths (up to 20%).				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest or woodlands with 30-40% projected foliage cover; OR > 60% projected foliage cover but veg. condition reduced due to tree deaths (up to 20%).				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands, with 30-40% projected foliage cover; OR > 60% projected foliage cover but veg. condition reduced due to tree deaths (up to 20%).				
	4	Moderate	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland, banksia or eucalypt woodlands with 20-30% projected foliage cover. Moderate percentage of tree deaths (30-40%).				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest or woodlands with 20-30% projected foliage cover; OR Marri-Jarrah Forest with 40-60% projected foliage cover but vegetation condition reduced due to tree deaths (up to 30-40%).				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands with: 20-30% projected foliage cover; OR 40-60% projected foliage cover but veg. condition reduced due to tree deaths (up to 30-40%).				
	3	Low to moderate	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland, banksia or eucalypt woodlands with 10-20% projected foliage cover.				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest or woodlands with 5-20% projected foliage cover.				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands with 5-20% projected foliage cover.				
	2	Low	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland, banksia and eucalypt woodlands with <10% projected foliage cover; OR Paddocks and/or urban areas with scattered foraging trees such as banksias, marri.				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest or woodlands with 1-5% projected foliage cover; OR Paddocks and/or urban areas with scattered foraging trees such as banksia, hakea, dryandra.				

Vegetation condition and structure. Habitat features			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands with 1-5% projected foliage cover; OR Paddocks and/or urban areas with scattered food plants such as Cape Lilac, *Eucalyptus caesia* and *E. erythrocorys*.				
	1	Negligible to low	All species				
			Scattered specimens of known food plants but projected foliage cover of these is <2%. May include: paddocks or urban areas with scattered foraging trees.				
	0	None	All species				
			No Proteaceae, eucalypts or other potential sources of food. May include bare ground or developed sites devoid of vegetation (e.g. infrastructure, roads, gravel pits).				
			Totals				

Site Context								
Proximity of the site in relation to other habitat.	**3**	Site is within 6km of known breeding site.	or	Site is within 12km of other foraging resources with site condition of at least 3.				
	2	Site is within 12km of known breeding site.	or	Site is within 15km of other foraging resources with site condition of at least 4.				
	1	Site is within 15km of known breeding site.	or	Site is between 15km and 20km of other foraging resources with site condition of at least 5.				
	0	Site is further than 15km from known breeding site.	or	Site is further than 20km from other foraging resources.				
				Totals				

Final Totals				

Indicator		**Species Stocking Rate**[3]	**Impact Site**			**Offset Site**		
			CBC	**BBC**	**FRT**	**CBC**	**BBC**	**FRT**
Confirm presence/ absence of species.	**Yes**	Species is seen or reported regularly and/or there is abundant foraging evidence, e.g. chewed nuts can be identified as this species. Regularly is when the species is seen at intervals of every few days or weeks for at least several months of the year.						
	No	Species is recorded or reported very infrequently and there is little or no foraging evidence.						

[3] Species stocking rate is indicated by yes or no to confirm if any of the species is frequently present or not. If yes, the presence must be for the species being impacted by the proposal, not for a species that will not be impacted.

Legend	
	If the site scores between 0-2 (low to no value) for site condition, 0 for the site context score, or is **No** for species stocking rate, it is extremely unlikely to be considered as suitable habitat. This would not be appropriate to use as an offset site.

The metrics used to determine Site Condition, Site Context, and Species Stocking Rate were developed by the Department of Climate Change, Energy, the Environment, and Water in consultation with species experts in WA.

A standard habitat quality scoring system for a species allocates scores out of 3 for both site condition and site context, and out of 4 for species stocking rate. However, as black cockatoos are very mobile, this HQS uses a score out of 7 for site condition and a score out of 3 for site context. Site condition is considered the key factor in determining the quality of habitat for these black cockatoo species. Species stocking rate is considered only in terms of presence or absence of the species and does not add to the total score. Note that the species, or strong indicators of the species, must be present, consistent with the presence/usage description above, for an offset to be considered suitable.

Appendix I
Desktop Assessment and Likelihood of Occurrence Ecological Communities

Floristic Community Type	Community name	Conservation Status		Database		Likelihood of Occurrence	Justification
		State	Federal	PMST	DBCA		
121	Clay Pans of the Swan Coastal Plain	CR	CR	x	-	High	Community likely to occur within feature area
SCP07	Herb rich saline shrublands in clay pans (floristic community type 7 as originally described in Gibson et al. 1994) Components of the 'Clay Pans of the SCP' (CR)	EN	CR	-	x	Low	Closest record is 9.1 km south of Survey Area.
SCP08	Herb rich shrublands in clay pans (floristic community type 8 as originally described in Gibson et al. 1994)	EN	CR	-	x	Low	No clay pans present within Survey Area.
SCP09	Dense shrublands on clay flats (floristic community type 9 as originally described in Gibson et al. 1994). Component of 'Clay Pans of the Swan Coastal Plain' (Critically endangered).	EN	CR	-	x	Low	No clay flats present within Survey Area.
SCP10a	Shrublands on dry clay flats (floristic community type 10a as originally described in Gibson et al. 1994)	EN	CR	-	x	Low	No clay flats present within Survey Area.
153	Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	P3	CR	x	-	Low	No records within 10 km buffer.
SCP20b	Banksia attenuata and/or Eucalyptus marginata woodlands of the eastern side of the Swan Coastal Plain (floristic community type 20b as originally described in Gibson et al. 1994)	CR	EN	-	x	High	Closest record is 0.6 km east of Survey Area
Mound Springs SCP	Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain)	CR	EN	-	x	Low	No Tumulus Springs within Survey Area.
Muchea Limestone	Shrublands and woodlands on Muchea	EN	EN	-	x	Low	Record >10 km north of Survey

Floristic Community Type	Community name	Conservation Status		Database		Likelihood of Occurrence	Justification
		State	Federal	PMST	DBCA		
	Limestone of the Swan Coastal Plain						Area. No limestone present within Survey Area.
SCP3c	Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands of the Swan Coastal Plain	EN	EN	x	x	Medium	Closest record is 2 km south of Survey Area, community known to occur in buffer of Survey Area.
SCP22	Banksia ilicifolia woodlands	P3	EN	-	x	Low	Closest record is 8 km west of Survey Area.
Banksia WL SCP (131)	Banksia Woodlands of the Swan Coastal Plain ecological community	P3	EN	x	x	High	Numerous records towards the east and west of Survey Area, closest record is 1.4 km east.
SCP21c	Low lying Banksia attenuata woodlands or shrublands, component of the Endangered Banksia Woodlands of the Swan Coastal Plain EPBC listed TEC.	P3	EN	-	x	Low	Closest record is 6.8km west of Survey Area.
16	Assemblages of plants and invertebrate animals of tumulus (organic mound) springs of the Swan Coastal Plain	-	EN	x	-	Low	No tumulus springs in Survey Area.
174	Empodisma peatlands of southwestern Australia	-	EN	x	-	Low	No Empodisma peatlands within Survey Area. No records within 10 km Survey Area buffer.
SCP3a	Corymbia calophylla - Kingia australis woodlands on heavy soils of the Swan Coastal Plain (floristic community type 3a as originally described in Gibson et al. 1994)	CR	EN	x	x	High	Closest record is 0.2 km north of Survey Area. Community known to occur within area.
SCP3b	Corymbia calophylla - Eucalyptus marginata woodlands on sandy clay soils of the southern Swan Coastal Plain (floristic	EN	VU	-	x	High	Closest record is 0.5 km east of Survey Area.

Floristic Community Type	Community name	Conservation Status		Database		Likelihood of Occurrence	Justification
		State	Federal	PMST	DBCA		
	community type 3b as originally described in Gibson et al. 1994)						
SCP02	Southern wet shrublands, Swan Coastal Plain (floristic community type 2 as originally described in Gibson et al. 1994)	CR	-	-	x	Low	Record 3 km southeast of Survey Area in nature reserve.
Casuarina obesa association	Casuarina obesa Association	P1	-	-	x	High	Closest record is 0.5 km north-west of Survey Area