Biodiversity Impact Assessment

Surat Gas Project North Stage 5

(EA0001399)

Version	*2.0*
Released	*2026*
Document Status	*Final*
Security Classification	*Routine*

Please see document administration in **Section 7** for more information

Table of Contents

1 Introduction ***9***

1.1 Project Overview and Components **9**

1.2 Project description **10**

1.3 Approach to assessment of impacts **10**
1.3.1 Likelihood of occurrence assessment 10
1.3.2 Spatial relationship between Study area and Project footprint 12

1.4 Coverage of this report **12**
1.4.1 Limitations 13

1.5 Regulatory Framework **13**
1.5.1 Environment Protection and Biodiversity Conservation Act 1999 13
1.5.2 *Environmental Protection Act 1994* – Queensland 14
1.5.3 Environmental Offsets Act 2014 16
1.5.4 Nature Conservation Act 1992 16
1.5.5 Vegetation Management Act 1999 17

2 Methodology ***17***

2.1 Desktop analysis of ecological data **18**
2.1.1 Overview of general ecological matters 18
2.1.2 Flora and Fauna desktop assessment 18

2.2 Ecological field assessment **19**
2.2.1 Flora survey effort 19
2.2.2 Terrestrial fauna survey 21
2.2.1 Threatened species habitat 23

2.3 Impact analysis **24**

3 Description of ecological values ***29***

3.1 Environmentally Sensitive Areas **29**

3.2 Flora - description of environmental values **31**
3.2.1 Vegetation communities 31
3.2.2 Protected plant trigger mapping 34
3.2.3 Threatened Flora species 34

3.3 Fauna - description of environmental values **34**
3.3.1 Environmental habitat categories and conditions 34
3.3.1 Watercourse 35
3.3.2 State Forest 35
3.3.3 Conservation-significant fauna 35
3.3.4 Near Threatened fauna species 63
3.3.5 Essential habitat mapping 63

4 Impact Assessment ***64***

4.1 Planning and design 64
4.1.1 Field development layout 64
4.1.2 Waterway crossing methodologies 64

4.2 Overview of impacts 65
4.2.1 Vegetation clearing 65
4.2.2 Habitat fragmentation and landscape connectivity 66
4.2.3 Impacts to hollow-bearing trees 67
4.2.4 Secondary and cumulative impacts 67

4.3 Impact on States Forest 68

4.4 Impact on terrestrial flora values 68
4.4.1 Impacts on habitat for threatened or near threatened flora species 68
4.4.2 Endangered RE by VM Class 68
4.4.3 Of Concern REs by VM Class 68
4.4.4 Impacts on watercourses vegetation 68

4.5 Impacts on terrestrial fauna values 69
4.5.1 Significant Residual Impact assessment for threatened fauna species identify as Known', 'Likely' and 'Possible' to Occur in the Study area 70

5 Environmental Authority Amendment Application – Impact Summary 92

5.1 Environmental Sensitive Area 92
5.1.1 Assessment of ESA impacts on PLs 305, 491 and 492 for SGP North Stage 5 92

5.2 Prescribed Environmental Matters 97
5.2.1 Prescribed environmental matters for SGP North Stage 5 97

6 References 99

7 Document Administration 103

Appendices

Appendix A - Environmental Protection and Biodiversity Conservation Act 1999 approval 2010/5344 104
Appendix B – SGPN Stage 5 Environmental Authority 105
Appendix C – Desktop survey 106
Appendix D – Likelihood of occurrence assessments 107
Appendix E - Ecological Field Survey (Arrow 2025) 108
Appendix F – (EA0001399) Landscape Fragmentation and Connectivity (LFC) 109

Figures

Figure 1.1 - Spatial overview of the Study area and proposed Project Footprint 11
Figure 2.1 - Flora Survey effort 26
Figure 2.2 – Fauna survey effort 27
Figure 3.1 – Overview of the Ecological values within the Study area 46
Figure 3.2 - Environmentally Sensitive Areas 47
Figure 3.3 – Environmentally Sensitive Areas Category C – Protected Wildlife Habitat 48
Figure 3.4 – Essential habitat map 49
Figure 3.5 - State Regional Ecosystem mapping 50
Figure 3.6 - Ground-truthed Regional Ecosystem mapping 51
Figure 3.7 - Conservation significate flora records 52
Figure 3.8 - Conservation-significant fauna that are known or likely to occur in the Study area 53
Figure 3.9 - Conservation-significant Gastropoda that are known or likely to occur in the Study area 54
Figure 3.10 - Conservation-significant Aves that are known or likely to occur in the Study area 55
Figure 3.11 - Conservation-significant Mammalia that are known or likely to occur in the Study area 56

Tables

Table 1.1 – Proposed infrastructure for the SGPN Stage 5 15
Table 2.1 – Criteria for assessing the likelihood of populations being present 19
Table 2.2 – Ecological survey summary for the Study area 19
Table 2.3 - Summary of flora ecological survey effort across the SGPN Stage 5 20
Table 2.4 – Fauna survey effort conducted as part of pre-clearance ecological assessment 25
Table 3.1 – SGPN Stage 5 Environmentally Sensitive Areas 29
Table 3.2 – Government-mapped Regional Ecosystem mapping by Biodiversity status 31
Table 3.3 – Ground-truthed Regional Ecosystem by Biodiversity status 32
Table 3.4 – Flora species assessed as "Likely" or "Possible" to occur within Study area 36
Table 3.5 – Habitat types within the Study area are based on ground-truthed RE mapping 37
Table 3.6 – Prescribed Environmental Matters – Fauna species 'Known', 'Likely' and 'Possible' to Occur in the Study area 44
Table 4.1 – Proposed impact to vegetation communities for SGPN Stage 5 65
Table 4.2 – Summary of Project impact on protected wildlife habitat 69
Table 4.3 – Significant Residual Impact Assessment for the Endangered Adclarkia cameroni 70
Table 4.4 - Significant Residual Impact Assessment for the Endangered Adclarkia dulacca 72
Table 4.5 - Significant Residual Impact Assessment for the Vulnerable Jalmenus eubulus 74
Table 4.6 – Significant Residual Impact Assessment for the Vulnerable Calyptorhynchus lathami lathami . 76
Table 4.7 – Significant Residual Impact Assessment for the Vulnerable Hirundapus caudacutus 78
Table 4.8 – Significant Residual Impact Assessment for the Vulnerable Stagonopleura guttata 80
Table 4.9 - Significant Residual Impact Assessment for the Vulnerable Nyctophilus corbeni 82
Table 4.10 - Significant Residual Impact Assessment for the Endangered Petauroides volans volans 84
Table 4.11 – Significant Residual Impact Assessment for the Vulnerable Petauroides australis australis ... 86
Table 4.12 – Significant Residual Impact Assessment for the Endangered Phascolarctos cinereus 88
Table 4.13 – Significant Residual Impact Assessment for the Special least concern Tachyglossus aculeatus 90
Table 5.1 - Additional ESA disturbance SGP North for Stage 5 92
Table 5.2 - Schedule F, Table 2 – Additional ESA disturbance SGP North for Stage 5 96
Table 5.3 - Proposed amendments to Protecting biodiversity values, Schedule F, Table 3 – Significant residual impacts to prescribed environmental matters for SGP North Stage 5 97

Acronyms / Abbreviations

Term	Definition
Arrow	Arrow Energy Pty Ltd
BD status	Biodiversity status
BIA	Biodiversity impact assessment
BVG	Broad vegetation group
CE	Critically endangered
CSG	Coal seam gas
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DETSI	Queensland Department of the Environment, Tourism, Science and Innovation
DPI	Department of Primary Industries
DXP	Dalby Expansion Project
E	Endangered
EA	Environmental authority under the EP Act
EFS	Ecological field survey
EIS	Environmental impact statement
EO	*Environmental Offsets Act 2014* (Qld)
EO Regulation	Environmental Offsets Regulation 2014 (Qld)
EP Act	*Environmental Protection Act 1994* (Qld)
EP Regulation	Environmental Protection Regulation 2019 (Qld)
EPBC	*Commonwealth Environmental Protection and Biodiversity Conservation Act 1999*
ESA	Environmentally Sensitive Area
ESE	Ecosmart Ecology
ESR	Ecological ummary Report
ESU	Environmental tratification unit
EW	Extinct in the wild
GIS	Geographic Information System
GTRE	Ground-truthed regional ecosystem
HDD	Horizontal Directional Drilling
HES	High ecological significance
LFC	Landscape Fragmentation and Connectivity
LOO	Likelihood of occurrence
MNES	Matters of national environmental significance
MSES	Matters of state environmental significance
NC Act	*Nature Conservation Act 1992* (Qld)
NC Animal Regulation	Nature Conservation (Animal) Regulation 2020 (Qld)
NC Plant Regulation	Nature Conservation (Plants) Regulation 2020 (Qld)
NT	Near threatened
PEM	Prescribed environmental matter
PPZ	Primary Protected Zone
PL	Petroleum Lease
PMST	Protected matters search tool
RE	Regional ecosystem
REDD	Regional ecosystem description database

RoW	Right of Way
RVM	Regulated Vegetation Management
SAT	Spot assessment technique
SGP	Surat Gas Project
SPZ	Secondary Protected Zone
SRI	Significant residual impact
SLC	Special least concern
V	Vulnerable
VM class	Vegetation management class
WMP	Weed Management Plan

1 Introduction

1.1 Project Overview and Components

Arrow Energy Pty Ltd (Arrow) operates the Surat Gas Project (SGP) in southern Queensland, which involves exploring, developing, and producing coal seam gas (CSG) (**Figure 1.1**). In response to growing domestic and international demand, Arrow proposes to expand the SGP through an amendment to its existing Environmental Authority (EA) for SGP North (EA0001399) in accordance with the *Environmental Protection Act 1994* (Qld) (EP Act). The proposed amendment seeks to address the environmental impacts associated with the development of SGP North Stage 5 (the Project) gas field which involves the construction of well pads and associated supporting activities and additional infrastructure. Refer to **Figure 1.1**.

The Biodiversity Impact Assessment (BIA) report forms a key component of the biodiversity impact assessment for the SGPN Stage 5, providing detailed analysis to demonstrate compliance with relevant environmental requirements and to support a robust and well-informed EA amendment application.

The Project entails the construction of approximately 102 well pads, a gathering and wide right of way (RoW) for the construction of pipelines lines (gas and water) and access tracks, as well as the construction of associated infrastructure. These activities are proposed to occur within the following Petroleum Lease (PL) tenements:

- PL 305;
- PL 491; and
- PL 492.

The total proposed disturbance for the Project does not seek to increase the petroleum activities approved by the current SGP North EA (EA0001399) but might lead to an increase in the level of environmental harm caused by the authorised activity, therefore an update to impacts to environmentally sensitive areas (ESAs) and Prescribed Environmental Matters (PEMs) is required (refer to **Section 4** and **Section 5**).

Although the scope of this report considers project installations across three different PLs, the area in which this infrastructure is proposed is referred to as the Study area throughout this report. The values and impact on ESAs and PEMs have been reported using a Study area around the development footprint (refer **Figure 1.1**).

The PEMs impacts for the Project will be managed in accordance with EA0001399, with the most recent version granted on 28 January 2026.

To enable a thorough assessment of biodiversity values and potential impacts, the Study area comprised the Project footprint[1] and an adjoining 500-metre buffer zone (see **Figure 1.1**). This report systematically compiles and presents the critical information required to underpin the EA application, as listed below:

- Conduct a comprehensive assessment of the ecological values present within the Study area, including flora, fauna, and habitat characteristics;
- Quantify the anticipated impacts on these ecological values resulting from the updated project design, considering both direct and indirect effects;
- Identify and determine the extent to the impacts to be reported / approved under an EA(s);

[1] **Project footprint** - The project footprint refers to the spatial extent of the proposed infrastructure layout, encompassing all areas where physical disturbance is expected to occur as a result of construction to SGPN Stage 5 project.

- Undertake a detailed evaluation and provide a thorough report on the likely significance and potential environmental consequences of these impacts; and
- This report has been specifically prepared to accompany and support the application for the SGP North Stage 5 EA amendment (EA0001399).

1.2 Project description

Arrow proposes to construct wells, access and gathering within the project area to facilitate the transport of natural gas to the QGC Bellevue Delivery Point. The proposed water pipeline is part of a series of interconnected on-tenure pipelines crucially linking Arrow-operated gas and water facilities to QGCs Water Treatment Facilities for Beneficial use.

1.3 Approach to assessment of impacts

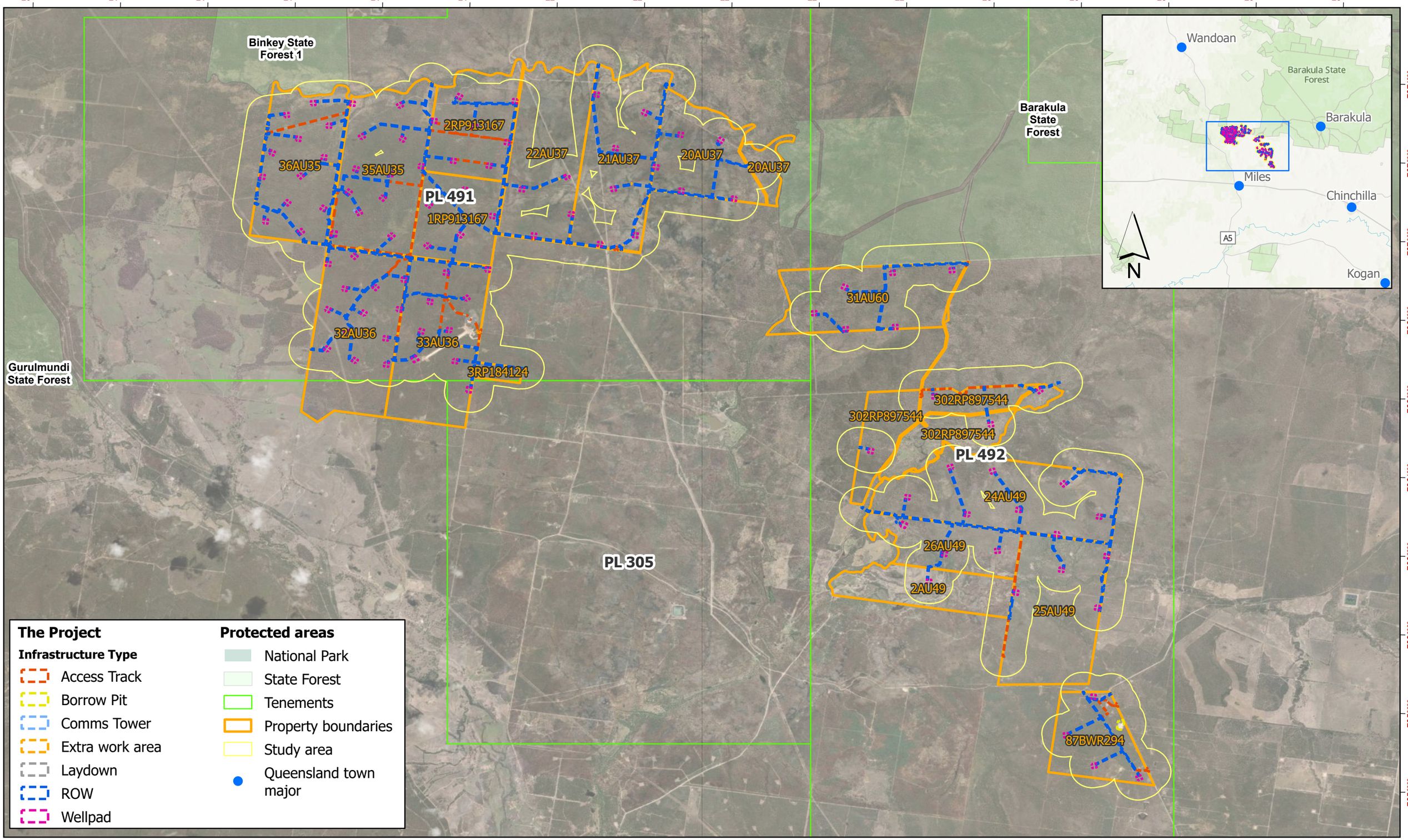
1.3.1 Likelihood of occurrence assessment

This report incorporates a Likelihood of Occurrence (LOO) assessment analysis to determine the relevance of State-listed threatened species to the Project's biodiversity assessment. The LOO assessment forms the basis for identifying species that merit detailed consideration, based on their potential to be present within the Study area. Only species classified as 'Known' or 'Likely' to occur (specific definition is described **Section 2.1.2.1**) are included in the ecological values for the Project (see **Section 3**). In accordance with the Significant Residual Impact (SRI) Guidelines (DEHP, 2014), further evaluation is conducted only for those species with mapped habitat overlapping the Project footprint. This ensures the assessment is targeted, evidence-driven, and consistent with regulatory requirements.

While the known distribution of a species provides a scientifically valid basis for identifying potential habitat, it does not, on its own, confirm the species' current use of those areas. Habitat mapping based on regional distribution and ecological values is a critical first step in assessing potential presence. However, local evidence such as verified historical records or recent field observations within or near the Study area is essential to establish ecological relevance and likelihood of occurrence. Relevant historical records need to exist within 50 km of the Study area before an impact assessment for the species is included in this BIA. Without this local confirmation, mapped habitat may reflect theoretical suitability rather than actual occupancy, particularly for species with fragmented ranges or limited dispersal capacity. Therefore, a combination of broad-scale distribution data and site-specific evidence provides a more accurate and defensible foundation for biodiversity impact assessment.

Although the habitat within the Study area presents features that may be considered suitable for *Adclarkia cameroni* (Brigalow Woodland Snail), the absence of reliable and/or recent historical records in the surrounding region indicates that the species is unlikely to utilise this habitat. Accordingly, the Arrow development is not anticipated to result in any significant impact on habitat for this species. In line with standard ecological assessment practice, the precautionary principle has been applied, and the species has been assigned a 'Possible' to occur rating in LOO assessment. As such, it has not been considered further in this report or evaluated against the SRI criteria.

Furthermore, desktop assessments commonly identify a number of species with broad, generalised, or poorly defined habitat requirements, making it impractical to definitively exclude their presence within a given locality. For those species, adopting the precautionary principle, such species are typically assigned a classification of 'Possible' to occur (or an equivalent category) to acknowledge the inherent uncertainty in their predicted distribution.



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Figure 1.1
Page 1 of 5

Spatial overview of the Study area and the proposed Project Footprint

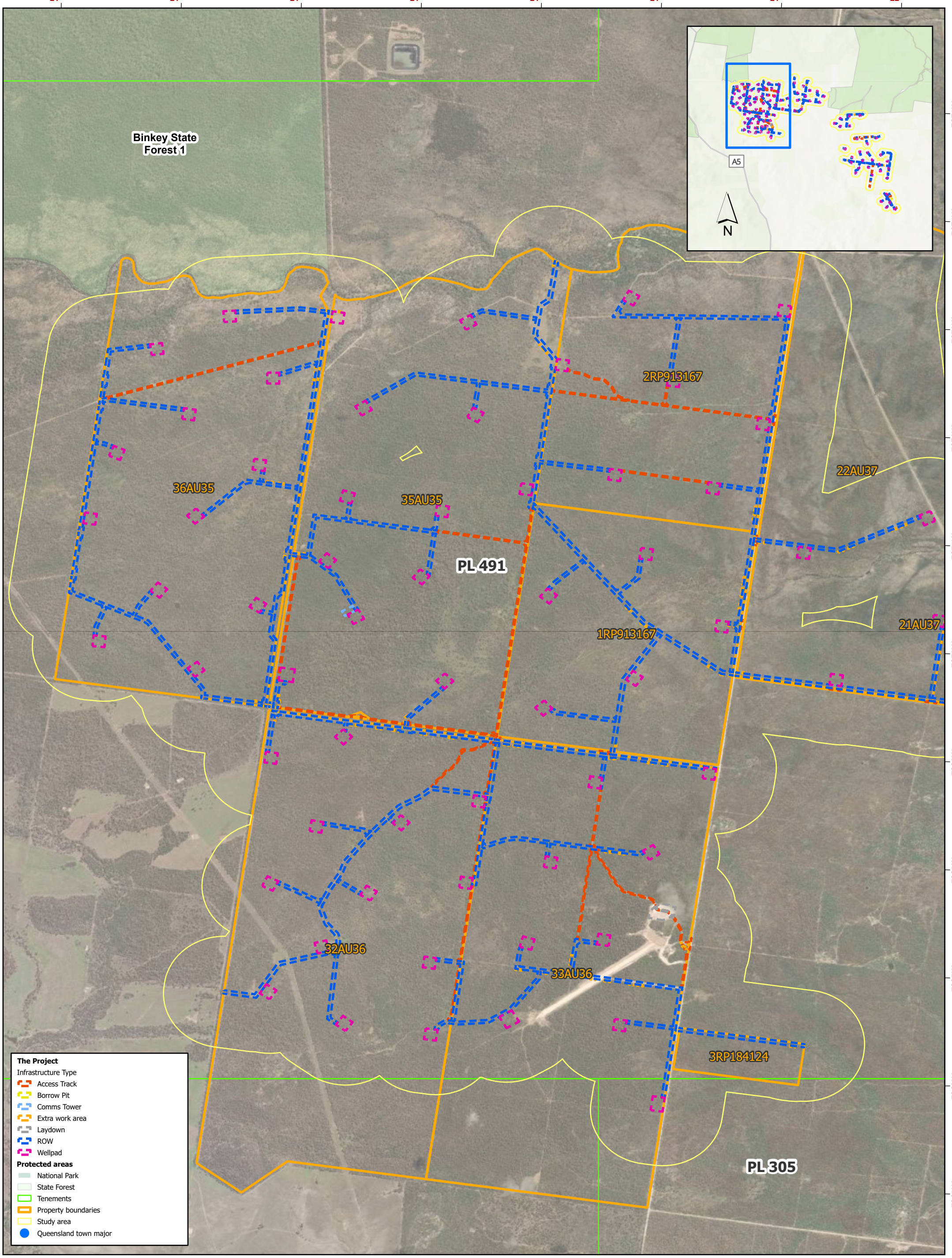
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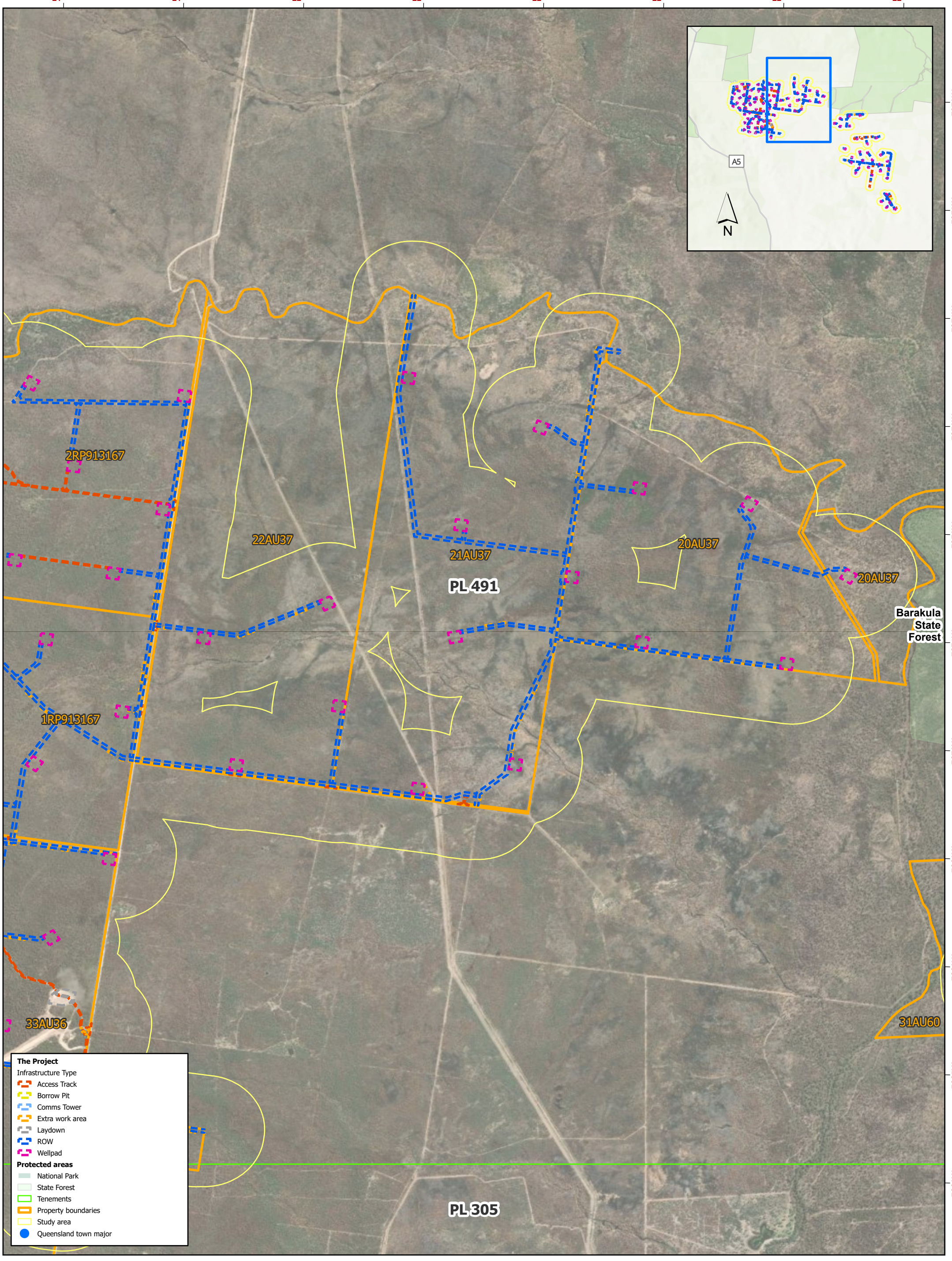
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Spatial overview of the Study area and the proposed Project Footprint

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Spatial overview of the Study area and the proposed Project Footprint

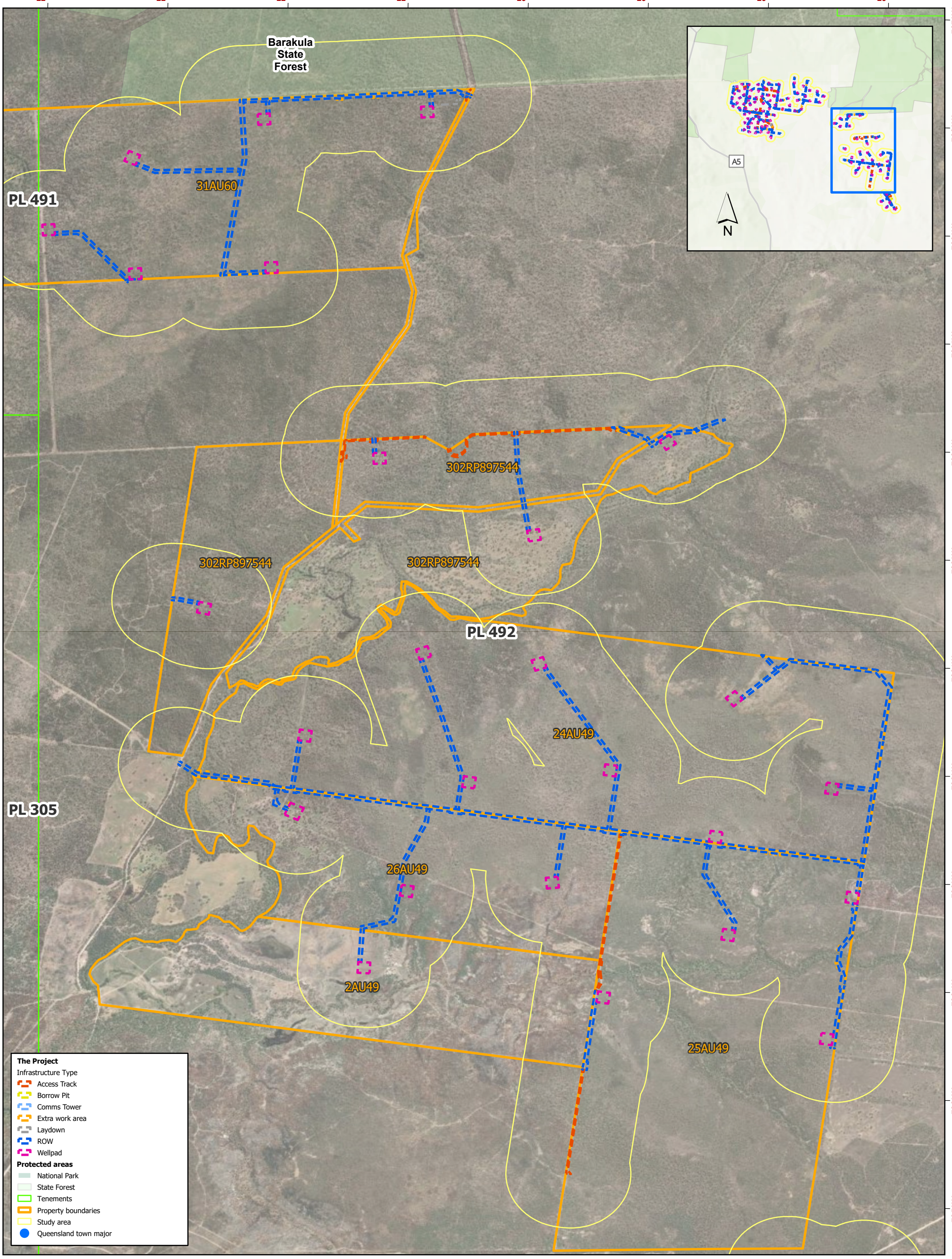
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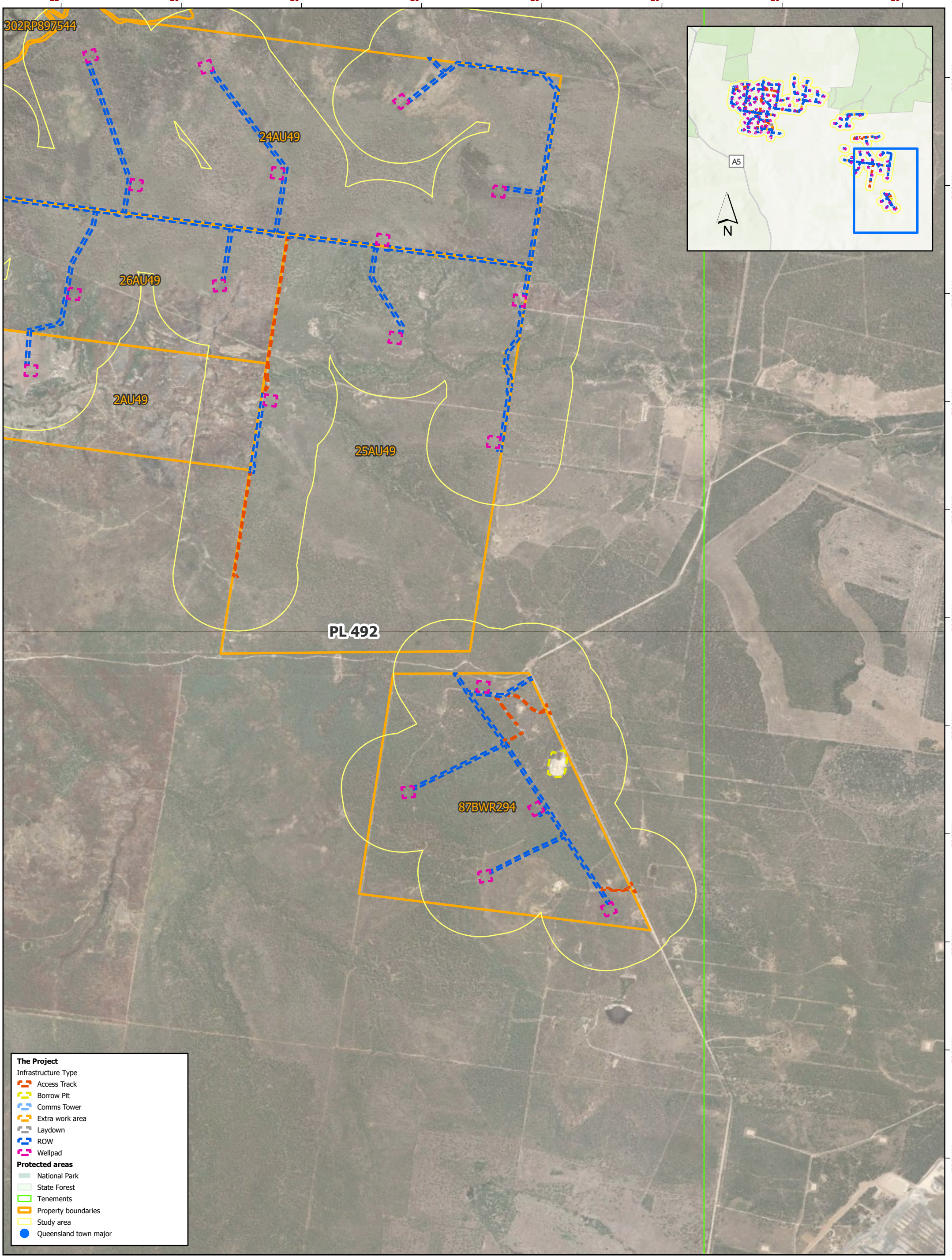
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Figure: 1.1

Spatial overview of the Study area and the proposed Project Footprint

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Figure: 1.1

Spatial overview of the Study area and the proposed Project Footprint

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Notwithstanding a classification of 'Unlikely' to occur the presence of any species whose known distribution overlaps with the Study area cannot be conclusively ruled out entirely. Although there are habitats within the Study area which meet the ecological requirements of the *Geophaps scripta scripta* (Squatter pigeon), the species has not been recorded at the site. This is despite extensive and targeted survey efforts, as well as a substantial increase in ecological investigations throughout the broader SGP region by Arrow (ESE, 2017 and 2019; where the species is described as "possible only as a transient") and other coal seam gas proponents. Additionally, *G. s. scripta* holds substantial interest among the ornithological community, further enhancing the likelihood of incidental detection by both professional ecologists and amateur birdwatchers. The lack of confirmed records is particularly significant given the species' high mobility, conspicuous behaviour, and well-documented preference for open and disturbed habitats, including cleared trails and roadsides, where detectability is generally high during standard surveys.

Even though the Study area may contain potentially suitable habitat values for certain species, the lack of reliable and/or recent records (i.e. records located more than 50 km from the impact area or before 1975 (DETSI, 2025)) indicates that these species do not meet the criteria to be classified as 'Known' or 'Likely' to occur. As suggested by the absence of historical records in the vicinity, it is unlikely that these habitat values are actively utilised by the species. Nonetheless, applying a precautionary approach, the presence of these species has not been ruled out, and they are instead identified as having the potential to occur within the Study area.

Fauna species noted as 'Possible' within the Study area are detailed in **Table 3.6**. The SRI assessment will focus on species with a LOO of 'Known' or 'Likely' and impacts on their habitat are then documented within the Prescribed Environmental Matters (PEMs) table in **Section 5**.

1.3.2 Spatial relationship between Study area and Project footprint

Notably, the spatial distinction between the Study area and the project footprint relates to the type of assessment being undertaken. The Study area, which includes the project footprint (i.e. the proposed infrastructure layout) and an additional 500-metre buffer, was used to inform the LOO assessment across a broader landscape context. In contrast, the project footprint represents the area of habitat expected to be directly impacted by the Project, and PEMs values are derived specifically from this area.

This method is commonly applied to linear infrastructure projects, where the impact zones are typically narrow or broken up, and there are no clear barriers to stop mobile fauna from moving into the Project footprint, even in areas lacking suitable habitat for a specific species. As a result, a species may be considered 'Known' or 'Likely' to occur within the broader Study area, despite not having identified habitat within the Project footprint itself.

Although environmental values were assessed at both the 'Study area' and 'Project footprint' scales, the Impact Assessment (outlined in **Section 4**) focuses solely on summarising impacts within the Project footprint.

1.4 Coverage of this report

This BIA report provides coverage of the key matters relevant to the EA0001399 amendment for SGPN Stage 5, including the following:

- A review of existing desktop biodiversity data, combined with ecological field surveys conducted across the Study area, to identify relevant ecological values and matters that may contribute to EA applications;
- Calculation of the predicted impacts on Environmentally Sensitive Areas (ESAs) protected under the *Environmental Protection Act 1994*, as defined by the *Environmental Protection Regulation 2019* (Qld);

- Calculation of the predicted impacts on Prescribed Environmental Matters (PEMs) protected under the Environmental Offsets Act 2014 (Qld) (EO Act) (as defined under the Environmental Offsets Regulation 2014 (Qld) (EO Regulation)).

1.4.1 Limitations

In conducting this analysis, Arrow used the spatial data from the Queensland Government for regional ecosystem data and threatened or near threatened species records. Those data were extracted in July 2025. In addition, Arrow has ground-verified the vegetation communities surrounding the proposal impact area in August to October 2025. Limitations include:

- Disturbances from the Project may overlap with those from other infrastructure (e.g. another gas field company, landowner disturbance). This report assesses only the impacts (measured in hectares) directly caused by Arrow and linked to the Project footprint;
- Some aspects of this assessment have been informed by secondary data sources, including existing databases, historical records, and government mapping products. While these sources provide valuable context, they may not always reflect current on-ground conditions or site-specific variability;
- In certain areas of the Study site, habitat classification was based on desktop analysis due to access constraints. As a result, ecological values in these locations may be subject to future ground-truthing in some areas.
- Species data used in this assessment may be limited by gaps in survey coverage or under-reporting, particularly in remote or previously unsurveyed areas outside the project footprint. Consequently, some species of conservation significance may be underrepresented or undetected; and
- This report focuses solely on terrestrial biodiversity values, including vegetation communities, terrestrial fauna, and associated habitats. It does not assess biodiversity features that are dependent on groundwater systems, such as groundwater-dependent ecosystems (GDEs), which may include certain wetlands or phreatophyte vegetation, nor does it address subterranean fauna (stygofauna) that inhabit groundwater aquifers.

1.5 Regulatory Framework

1.5.1 Environment Protection and Biodiversity Conservation Act 1999

The SGP's environmental impacts were assessed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and documented in an Environmental Impact Statement (EIS) submitted in 2013. Limits of disturbance to core habitat for Matters of National Environmental Significance (MNES) listed under the EPBC Act at the time of submission and approval are specified in Table 1 of the EPBC approval (EPBC 2010/5344) (see **Appendix A**).

The assessment takes into account habitat disturbance for MNES species and communities previously approved under EPBC 2010/5344. It also considers additional MNES within the Study area that have since been listed as conservation-significant under the EPBC Act following the original 2013 approval.

The MNES species included in the assessment are listed below:

- *Adclarkia cameroni*, (Brigalow Woodland Snail) – listed as 'Endangered' in December 2016;
- *Adclarkia dulacca,* (Dulacca Woodland Snail) - listed as 'Endangered' in December 2016;
- *Aphelocephala leucopsis*, (Shouthern whiteface) – listed 'Vulnerable' in November 2022;
- *Calidris acuminata*, (Sharp-tailed Sandpiper) – listed 'Vulnerable' in January 2024;
- *Calidris ferruginea*, (Curlew Sandpiper) – listed 'Critically endangered' in January 2015;

- *Calyptorhynchus lathami lathami*, (Glossy Black-cockatoo, south-eastern) – listed as 'Vulnerable' in August 2022;
- *Climacteris picumnus victoriae*, (Brown treecreeper south-eastern) – listed as 'Vulnerable' in March 2023;
- *Elseya albagula,* (white-throated snapping turtle) – listed as 'Vulnerable' in March 2014;
- *Furina dunmalli*, (Dunmall's snake) - listed as 'Vulnerable' in July 2000;
- *Gallinago hardwickii*, (Latham's Snipe) - listed as 'Vulnerable' in July 2024;
- *Grantiella picta*, (Painted Honeyeater) – listed as 'Vulnerable' in July 2015;
- *Hemiaspis damelii*, (Grey snake) - listed as 'endangered' in October 2022;
- *Hirundapus caudacutus*, (White-throated Needletail) – listed as 'Vulnerable' in July 2019;
- *Hypochrysops picelatus* (Bulloak jewell butterfly) - listed as 'Critically endangered' in August 2019
- *Petauroides volans* ssp. *volans* (Greater glider) – listed as 'Endangered' in December 2022;
- *Petaurus australis australis* (Yellow-bellied glider) – listed as Vulnerable in November 2021);
- *Phascolarctos cinereus*, (Koala) – first listed in April 2012; uplisted to 'Endangered' in February 2022;
- *Limosa lapponica baueri*, (Bar-tailed Godwit) - listed as 'Vulnerable' in May 2016 and uplisted to "Endangered' in January 2024;
- *Melanodryas cucullata cucullata*, (South-eastern Hooded Robin) – listed as "Endangered' in in March 2023;
- *Stagonopleura guttata*, (Diamond Firetail) – listed as 'Vulnerable' in March 2023;
- *Tympanocryptis condaminensis*, (Condamine Earless Dragon) - listed as 'Endangered' in May 2023;

1.5.2 *Environmental Protection Act 1994* – Queensland

The amendment applications to the relevant EAs are currently being prepared in parallel with this report to support the primary State-level approval for the operation of the SGPN Stage 5 project, in accordance with the EP Act. The EA amendment seeks to authorise the PEM's authorisations for the construction of a gas field, which involves the development of well pads, associated supporting activities, and additional infrastructure. (refer to **Appendix B**).

The EA will regulate the environmental management of the SGPN Stage 5 development, ensuring that activities are conducted in compliance with Queensland's environmental protection legislation. Of particular relevance to biodiversity, the EA includes a dedicated 'Biodiversity Conditions' schedule, which outlines the statutory obligations relating to the avoidance, mitigation, and management of impacts to ecological values. This schedule comprises Conditions *Biodiversity 1 to 16*, which collectively address key requirements such as habitat protection, species-specific management measures, offset obligations, and post-clearance monitoring.

These conditions align with the outcomes of the environmental assessment and are intended to safeguard Matters of State Environmental Significance (MSES) within the SGPN Stage 5 project area.

1.5.2.1 Petroleum activities

To regulate the types of operations permitted within ESAs and their associated protection zones, the Study area establishes three categories of petroleum activities: These include 'Petroleum activities', 'Essential petroleum activities' and 'Low impact petroleum activities'. Definitions for each category is provided in the EA (refer to **Appendix B**).

The different kinds of incidental activities that have been suggested for the Project's development along with the definitions that go with them is listed on **Table 1.1**. Since low impact petroleum operations are already permitted under the SGPN Stage 5 EA, they are not listed in this table.

Table 1.1 – Proposed infrastructure for the SGPN Stage 5

Infrastructure Type	Essential Petroleum Activity	Petroleum activity	Impact Area (ha)
Access track	✓		26.8
Comms Tower		✓	0.5
Extra Work Areas		✓	5.2
Laydown	✓		5.6
Right of Way	✓		278.8
Well Pad	✓		106.6

1.5.2.1 Conservation status of Regional Ecosystem

The Regional Ecosystem Description Database (REDD) provides a comprehensive inventory of Regional ecosystem (RE) types, including their Biodiversity status (BD status) and Vegetation management class (VM class).

In addition to the criteria used to determine the class under the *Vegetation Management Act 1999* (Qld) (VM Act), the BD status is determined by an assessment of the condition of remnant vegetation. Finding ESAs, which are used to regulate the mining and petroleum industries through provisions in the EP Act, is one of its many planning and management uses. This BIA takes into account the Brigalow Belt Bioregion REDD (Version 13.1(BRB), May 2024). For the current evaluation's purposes:

- ESAs are based on the BD status:
  - Endangered REs are mapped as Category B ESAs;
  - Of concern REs are mapped as Category C ESAs; and
- PEMs are based on VM class.

1.5.2.2 Essential Habitat

Essential habitat is classified as a Category C ESA under the SGPN Stage 5 EA where it supports wildlife species listed as endangered and / or vulnerable. This classification applies only to areas that have been confirmed as 'Essential habitat' through ground-truthing surveys conducted in accordance with the VM Act.

This assessment uses the Queensland Government's current 'Essential habitat' mapping as the basis for evaluating potential impacts to essential habitat. The revised definition of 'Essential habitat' issued by the Department of the Environment, Tourism, Science and Innovation (DETSI) has not been applied, as it is not currently reflected in the conditions of the existing EA. Arrow intends to engage with the Department to clarify whether and how the updated definition may be retrospectively applied to previously assessed and approved impacts under existing EAs.

Essential habitat is only considered a PEM where it supports flora and fauna species listed as Critically endangered (CE), Endangered (E), or Vulnerable (V) under the NC Act, in accordance with Schedule 2 of the EO Regulation. For flora and fauna species listed as near threatened, essential habitat is only treated as a PEM under the EO Act when associated impacts are being assessed under the *Planning Act 2016* and trigger the application of State Code 16 – Clearing of Native Vegetation. Although Table 1 of the Protecting biodiversity values SGPN Stage 5 EA references 'Essential regrowth habitat' as part of its biodiversity commitments, the EA does not define this term.

Essential Habitat impacts in relation to the EAs amendment are discussed further in **Section 5.1**.

1.5.3 Environmental Offsets Act 2014

Pursuant to Queensland's Environmental Offsets Framework, established by the EO Act and associated legislation—an environmental offset is required when a significant residual impact is expected on a MSES. MSES are defined in Schedule 2 of the EO Regulation and include, but are not limited to:

- Habitat for fauna species classified as Endangered, Vulnerable, or Special least concern (i.e., protected wildlife habitat);
- RE types identified as 'Endangered' or 'Of concern' under the VM Act;
- Essential habitat as mapped by the DETSI;
- Areas mapped (or unmapped) as high-risk zones on the flora survey trigger map where Endangered or Vulnerable flora species are present;
- Regulated vegetation associated with wetlands and watercourses;
- Landscape features that provide ecological connectivity;
- Wetlands classified as having High ecological significance (HES);
- Protected areas, including nature refuges;
- Declared fish habitat areas and waterways important for fish movement; and
- Areas that have been legally secured for offset purposes.

As part of the EAs decision-making process pursuant to the EP Act, significant residual impacts on these MSES are authorised through their inclusion in Condition *Biodiversity 10*, within the 'Protecting Biodiversity Values' section of the EAs, specifically Table 3 – Significant Residual Impacts to Prescribed Environmental Matters (refer to **Section 5.2**)

1.5.4 Nature Conservation Act 1992

The NC Act establishes the legal framework for declaring protected areas, such as nature refuges, and outlines classifications of wildlife. It also sets regulatory controls on the taking, handling, or harming of native species without appropriate authorisation. This assessment considers threatened flora and fauna species with the potential to occur within the Study area. The NC Act categorises wildlife into defined classes, which include

- Extinct in the Wild (EW) - Species no longer found in the wild in Queensland but known to survive in cultivation, captivity, or as a naturalised population outside their past range;
- Critically endangered (CE) - species is one that faces an extremely high risk of extinction in the immediate future;
- Endangered (E) - Species facing a very high risk of extinction in the wild in the near future;
- Vulnerable (V) - Species considered at high risk of extinction in the medium term;
- Near Threatened (NT) - species is not currently listed as endangered or vulnerable but is likely to become so in the near future if current threats continue; and
- Special Least Concern (SLC) - A subcategory for some wildlife species that are common but subject to regulatory controls (e.g., iconic or high-interest species).

Habitat for near threatened species is not designated as an ESA nor identified as a PEM under the EO Act. Although the presence or potential presence of near threatened species triggers obligations under the NC Act, these requirements are handled separately from the EA approval process. Therefore, the presence or

possible occurrence of near threatened species or their habitats does not require modification of the Study area boundaries.

Likewise, habitat for plant species classified as SLC is neither considered a PEM nor an ESA. However, habitat for animal species within the SLC category is recognised as a PEM under the EO Act. Accordingly, while the presence of SLC plants has been recorded, only SLC fauna has been included in the PEMs table.

1.5.4.1 Protected Plant Framework

In accordance with the Queensland Government's Protected Plants Framework, established under the NC Act and the *Nature Conservation (Plants) Regulation 2020* (NC Plant Regulation), proponents must undertake a flora survey prior to any non-exempt clearing of protected plants in mapped high-risk areas. The primary objective of the survey is to identify the presence of any species listed as Extinct, Extinct in the wild, Critically endangered, Endangered, Vulnerable, or Near threatened within the proposed clearing impact area. These pre-clearance assessments are generally conducted within 12 months of the planned construction activities to inform and support applications for a clearing permit under the NC Act, where applicable.

1.5.5 Vegetation Management Act 1999

Permits under the VM Act are not required for petroleum activities, as vegetation clearing is regulated through the EA under the EP Act. This assessment references the classification of REs as defined by the VM Act where relevant. These classifications are also utilized to determine PEMs according to the EO Act.

- In Queensland, the VM Act classifies vegetation communities—referred to as RE—into three distinct categories, known as VM classes:
- Endangered (E) – less than 10% of the pre-clearing extent of a particular community remains across a given bioregion; or 10-30% of the pre-clearing extent remains and the remnant area is less than 10,000 ha;
- Of concern (OC) – 10-30% of the pre-clearing extent of a particular community remains across a given bioregion; or more than 30% of the pre-clearing extent remains and the remnant area is less than 10,000 ha; and
- Least concern (LC) – more than 30% of the pre-clearing extent of a particular community remains across a given bioregion, and the remnant area is greater than 10,000 ha.

2 Methodology

The ecological values outlined in this BIA report were originally identified through a combination of desktop analyses and on-ground ecological assessments. These included Terrestrial Ecological Surveys conducted across the wider SGP area (ESE, 2017, 2019, 2023 and 2025) and Arrow ecological field surveys[2] carried out from 2025 onward.

Multiple ecological surveys have been conducted throughout sections of the SGP to inform both State and Commonwealth approval processes. These included on-ground verification of proposed infrastructure sites carried out by Arrow ecologists. Collectively, these investigations have contributed to a detailed understanding of the ecological values, as well as the typical flora and fauna associated with the vegetation communities and habitats within the Study area.

The following sections provide an overview of the relevant desktop and field data for the Study area, along with a description of the methods used to gather this information.

[2] ORG-ARW-HSM-GUI-00070 – Ecological Survey guideline. Version 6.0. Released June 2025.

2.1 Desktop analysis of ecological data

2.1.1 Overview of general ecological matters

A desktop analysis was undertaken using Queensland Government spatial mapping to identify key ecological features at the landscape scale, including MSES within the Study area. This process involved reviewing the following datasets:

- Conservation designations for MSES – including protected area estates, nature refuges, special wildlife reserves, declared fish habitat areas, legally secured offset areas, designated precincts within strategic environmental areas, and highly protected zones of Queensland marine parks;
- Ecological Connectivity – as identified through the Queensland Statewide Biodiversity Corridors mapping;
- Wetland Attributes – including protection areas, declared as HES waters (both watercourses and wetlands), and regulated vegetation associated with defined watercourses;
- Drainage Basin and Waterway Features – based on Queensland major watercourse datasets, watercourse identification mapping, and high ecological value (HEV) waters classified as MSES;
- MSES Regulated Vegetation and Habitat Values – encompassing remnant and high-value regrowth vegetation relevant under State regulations; and
- Fish Passage Waterways – identifying watercourses that support fish movement and habitat connectivity.

2.1.2 Flora and Fauna desktop assessment

The assessment undertaken between September to November 2025 aimed to characterize terrestrial flora and fauna values pertinent to the Study area. The analysis focused on delineating ESAs and PEM of ecological importance, with particular emphasis on threatened, near threatened, and migratory species of conservation concern recognized as of the current reporting period.

The analyses comprised a comprehensive review of:

- The Department of Climate Change, Energy, the Environment and Water's (DCCEEW) Protected Matters Search Tool (PMST) for the Study area (refer to **Appendix C** for results);
- The DETSI WildNet database to identify previously recorded flora and fauna within the SGPN Stage 5 region. Results from the February 2026 search, based on PLs 305, 491 and 492 is available as **Appendix C**;
- Queensland Government spatial datasets, encompassing MSES, certified RE Mapping (Version 13), and Protected Plants Trigger Mapping;
- Project-specific, Ground-truthed regional ecosystem (GTRE) mapping conducted by qualified ecologists for Arrow, along with threatened flora records maintained within Arrow's GIS;
- Project-specific survey reports, associated species data, and habitat mapping protocols developed from terrestrial fauna surveys relevant to the Study area;
- Recent ecological data consolidation and updates performed by Ecosmart Ecology (ESE) (2017 to 2025), incorporating database searches within a 50 km radius of the entire SGP region; and
- Available published ecological literature pertaining to threatened flora and fauna species relevant to the Study area.

2.1.2.1 Likelihood of occurrence (LOO) assessment

A LOO assessment was carried out using the outcomes of the desktop searches outlined above. This process refined the list of potentially occurring flora and fauna species by considering habitat suitability within the Study area, the spatial proximity of verified species records, and species-specific habitat mapping criteria developed by Arrow for the wider SGP Project and deemed relevant to the current assessment area.

The assessment applied likelihood criteria and probability as described in **Table 2.1**.

Table 2.1 – Criteria for assessing the likelihood of populations being present

Likelihood	Criteria	Probability
Known to occur	Recorded within and/or immediately adjacent the SGPN Stage 5 area	100%
Likely to occur	Suitable habitat within or immediately adjacent the SGPN Stage 5 area; numerous relevant records (< 30 years old and within 20 km).	>80%
Possible to occur	Suitable habitat within or adjacent the SGPN Stage 5; numerous records but records > 20 km away or > 30 years old; **Or** Marginal habitat within the SGP; few, but recent (<30 yrs), records within 20 km of SGP.	10-20%
Unlikely to occur	No suitable habitat; few records from desktop assessment and records > 20 km from the SGPN Stage 5.	<10%
Will Not Occur*	Despite records within 50 km, these species will not occur due to local extinction or the lack of suitable habitat.	0%
Transient	Species highly mobile and known to occasionally appear in areas away from known population centres (usually birds). Species not expected to permanently establish.	N/A

* Some species may occur at Lake Broadwater, which is unique in the landscape and provides habitat not located in the broader SGP.

2.2 Ecological field assessment

The Study area has been surveyed for ecological purposes, including flora and fauna, on several occasions. **Table 2.2** summarizes the key ecological survey programs undertaken within the Study area, providing an overview of their scope and methodologies. Subsequent sections offer a comprehensive and detailed analysis of the flora and fauna survey efforts, including sampling techniques, temporal coverage, and spatial distribution.

The datasets generated from the Ecological Field Survey (EFS) conducted by Arrow ecologists and/or consultant, encompassing species observations, habitat assessments, and environmental parameters. The result of EFSs and RE Assessment are compiled as ESR in **Appendix E** for reference and further analysis.

2.2.1 Flora survey effort

The terrestrial flora assessment and RE mapping for the Project are based on broader field surveys conducted across the SGP area since the original EIS in 2013. The survey results contribute to GTRE mapping across the broader SGP gas field, builds upon the mapping prepared for the EIS and has been progressively refined and expanded through successive studies by ESE (2017, 2018, 2019, 2023 and 2025).

Arrow ecologists have systematically conducted ground-truthing and updated the GTRE based on targeted field survey efforts, including reconnaissance scouting and pre-clearance assessments, conducted as part of implementing the mitigation hierarchy for the field development layout.

Table 2.2 – Ecological survey summary for the Study area

Survey	Survey Type	Timing	Undertaken by

Supplementary EIS Surveys	Flora and Fauna	February 2013	3D Environmental Ecosmart
Surat Gas Project – Terrestrial Ecology Report	Flora and Fauna	October 2016 March 2017	Ecosmart
Off-Tenement Terrestrial Ecology Survey Report	Flora and Fauna	December 2019	Ecosmart
Threatened species mapping rules	Flora and Fauna	September 2023 May 2025	Ecosmart
Surat Ecological Studies	Flora and Fauna	August 2025 September 2025 October 2025	Arrow CHEC Environmental

In total, 257 vegetation assessments have been undertaken in the Study area in accordance with the methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland (Neldner et al., 2024) including:

- **Secondary site assessments** – used as primary source to describe in detail the vegetation communities present and classified under a RE code. Involving the documentation of the overall structural characteristics and the species composition within each vegetation layer;
- **Quaternary site assessments** – used as a rapid survey tool to confirm vegetation community data across the survey area, where vegetation communities had already been identified through the Secondary Survey method. These surveys were conducted at regular intervals to validate the extent of these communities and to refine mapping units in areas where vegetation community boundaries had changed; and
- **Opportunistic observations** - Throughout survey activities undertaken across the broader SGP, incidental records of flora and fauna species were documented. Observations of threatened flora and fauna species made within the Study area or in nearby vegetation communities have also been considered in this BIA.

Flora survey sites for both Secondary and Quaternary assessments were initially selected through a desktop pre-site analysis, incorporating GTRE mapping and aerial imagery. For larger survey areas (typically greater than one hectare), vegetation communities were stratified to ensure adequate coverage of each distinct community and associated disturbance regimes (e.g. Cultivated, Pastures / Grazing, Derived grassland, Shrublands, Woodlands, and Forests). Within each Environmental Stratification Unit (ESU), at least one Secondary Survey was conducted, with survey intensity determined by the size and land use characteristics of each unit. Quaternary surveys were also carried out opportunistically as field teams traversed the broader SGP area. Findings from both targeted and opportunistic assessments within and adjacent to the Study area informed the refinement of GTRE mapping. The result of field assessment has been summarized into Ecological Summary Report (ESR). Refer to **Appendix E**.

A summary of ecological flora survey effort is detailed in **Table 2.3**. The locations of all survey sites are shown in **Figure 2.1**.

Table 2.3 - Summary of flora ecological survey effort across the SGPN Stage 5

Survey method	Survey effort	Undertaken by
Secondary	70	Arrow (56) CHEC Environmental (14)
Quaternary	187	Arrow (90) CHEC Environmental (97)

2.2.1.1 Protected plant surveys

The Project proposed infrastructure intersect a 'high-risk' area on the Protected Plant Survey Trigger Map approx. 20 ha split into lot plans 36AU35 and 21AU3. The entire Project footprint, including the area within and adjacent to the 'high-risk' trigger zone, has been traversed by an Arrow ecologist using secondary and quaternary flora survey methods, along with an informal meander survey[3]. These methods were employed to capture detailed information on vegetation communities, identify potential threatened species habitat, and highlight ecological constraints such as the presence of threatened and near threatened flora species.

The flora survey effort map (**Figure 2.1**) shows the proposed disturbance footprint for the Project in relation to the 'high-risk' trigger mapping area.

2.2.2 Terrestrial fauna survey

The Study area extends widely across the Brigalow Belt South Bioregion. Extensive sampling of habitat types occurring throughout the Brigalow Belt South Bioregion has been undertaken as part of a long-term, systematic flora and fauna survey program implemented across the wider SGP from 2011 to current date. Based on the data collected and the results of those surveys, Arrow has developed a comprehensive understanding of the fauna assemblages, encompassing microhabitat characteristics, the broader associated vegetation communities, and the core potential habitats for fauna that could occur on SGP and consequent on the Study area.

The broader survey efforts undertaken for the SGP project have played a key role in building the knowledge base used to support the assessment of terrestrial fauna for the Project. The delineation of fauna habitats and species groupings within the Study area draws largely from comprehensive field surveys, including targeted terrestrial fauna surveys conducted by ESE in October 2016 and March 2017 (ESE, 2017). This foundation has been further strengthened by a range of targeted assessments, such as BioCondition and habitat quality score surveys (ESE, 2021), threatened species mapping rules (ESE, 2017; ESE, 2023), Off-Tenure terrestrial ecology surveys (ESE, 2018 and 2019), and the broader Terrestrial Ecology Report (ESE, 2025). Collectively, these surveys establish a scientifically robust and data-driven foundation for understanding the terrestrial fauna values applicable to the SGPN assessment area.

Arrow's understanding of terrestrial fauna has been complemented with supplementary habitat assessments such as Koala Spot Assessment Technique (SAT) (Phillips and Callaghan, 2011) and Habitat Assessment (Jurskis, 2001) surveys, and opportunistic fauna observations undertaken during field assessments on scouting and pre-clearance surveys, conducted as part of implementing the impact minimisation hierarchy for the field development layout.

2.2.2.1 Fauna survey effort

ESE undertook extensive terrestrial fauna surveys in 2016 and 2017 (ESE, 2017) across the SGP, focusing on strategically selected patches of remnant and non-remnant vegetation. These survey areas were identified through a combination of desktop analysis—including the review of existing biodiversity records—and aerial imagery interpretation to prioritise habitats with potential ecological value. Site selection for detailed field assessment followed a structured methodology designed to capture representative fauna assemblages across habitat types and landscape features, ensuring adequate spatial and ecological coverage across the SGP that reflects the full extent of the proposed impacts from Arrow's projects.

Site selection for further assessment considered the following:

[3] Ecological field survey where the observer walks through an area without following a strict, predefined path or sampling method. Instead, they "meander" through the landscape, recording observations on vegetation types, species presence (flora or fauna), habitat features, or ecological conditions as they go.

- Areas with limited or no previous survey coverage were identified by overlaying the locations of past fauna survey efforts onto existing RE mapping, allowing the identification of priority zones for targeted fauna assessment.
- Broad Vegetation Group (BVG) mapping, prepared by the Queensland Herbarium at a 1:2,000,000 scale, was utilised to determine the spatial distribution and extent of BVGs across the Study area. The proportional contribution of each BVG to the overall remnant vegetation extent was quantified, and theoretical trapping effort was allocated accordingly to ensure representative survey coverage.
- A five-day pilot survey was undertaken in August 2016 to ground-truth priority areas, assess potential logistical or environmental constraints, and identify suitable locations for the deployment of detailed fauna trapping arrays; and
- Detailed survey sites were selected on the basis of spatial and BVG stratification, taking into consideration landholder access constraints, travel logistics and limitations, notable geomorphological features such as rock outcrops and caves, habitats likely to support specially protected species and vegetation condition (in particular, fire scarring).

Following initial selection, all proposed trapping sites underwent on-ground inspection and approval by Traditional owners to ensure survey activities did not conflict with indigenous cultural heritage values. As pitfall trapping could not proceed without prior cultural heritage clearance, the locations of trapping arrays were fixed post-pilot assessment and could not be altered thereafter. The pilot study was conducted prior to the detailed flora surveys and did not reflect any subsequent refinements to vegetation mapping.

Where feasible, each trapping site was surveyed in both the dry and wet seasons to capture seasonal variation in fauna activity; however, in some instances, dual-season sampling was not achievable without compromising spatial distribution or representation across BVGs.

The terrestrial fauna survey methods employed are listed below:

- **Trap sites:** Fauna trapping sites were established using a multi-method approach tailored to the habitat characteristics and the target fauna species present at each location. The trapping array typically included pitfall traps, Elliott traps, and funnel traps, deployed over a standard four-night period per site. Pitfall trapping involved the installation of four 20 L buckets positioned along drift fences arranged in a T-shaped configuration. Funnel traps were placed at the terminal ends of the drift fences to complement the pitfall component and increase capture success. Elliott traps were spaced approximately 5 metres apart within the adjacent vegetation surrounding each pitfall/funnel trap array to broaden species detectability. Each trapping site was checked twice daily—once in the morning and once in the late afternoon—to minimise animal stress and ensure animal welfare. Deployment durations and trap densities followed the survey effort standards outlined in Table 4 of the *Terrestrial Fauna Survey Guidelines* (DES, 2022), achieving the following effort per site:
- **Harp traps:** Targeted survey for insectivorous microbats was undertaken using harp traps, strategically positioned along prominent flyways—typically linear vegetation clearings such as tracks, firebreaks, and riparian corridors. These locations were selected to maximise the likelihood of intercepting bat movement. Harp trapping was generally conducted at separate locations from the primary terrestrial fauna trapping arrays to ensure appropriate habitat targeting and to avoid potential disturbance to other survey efforts. Trap deployment followed standard microbat survey protocols to optimise detection of volant nocturnal species;
- **Camera traps:** Remote sensor cameras were deployed at each site for a period of four nights to monitor small to large terrestrial vertebrates. To enhance detection probability, cameras were baited using a mixture of peanut butter and macadamia oil, applied to the ground within the camera's detection zone;
- **Ultrasonic bat call detection:** Microbat activity was monitored using Anabat ultrasonic detectors programmed to record continuously from dusk until dawn. Deployment sites were strategically selected in areas with anticipated high bat activity, including flight corridors (flyways) and over water bodies, to maximise call detection and species identification;

- **Bird surveys:** Bird surveys were conducted not only at each trap site but also opportunistically across additional areas of suitable habitat throughout the survey program. Each survey session lasted between 20 and 30 minutes and was typically carried out prior to 9:00 AM to coincide with peak avian activity periods;
- **Diurnal survey:** Active diurnal searches were conducted across the Study area by two observers systematically traversing suitable fauna habitats for 30-minute intervals. The surveys involved overturning rocks and logs, inspecting leaf litter and debris, examining trees for scratch marks, and searching for signs of fauna presence such as scats or feeding remains;
- **Koala SAT Surveys:** The SAT was employed as the preferred method for assessing localized *Phascolarctos cinereus* (Koala) habitat use, consistent with the protocol outlined in *The Spot Assessment Technique: A Tool for Determining Localised Levels of Habitat Use by Koalas* (Phillips & Callaghan, 2011). This method involved systematic searches for *P. cinereus* scats at the base of 30 selected suitable food trees within each survey site, providing an indicator of *P. cinereus* presence and habitat utilization;
- **Spotlighting:** Spotlighting surveys were carried out by two observers on foot, systematically traversing suitable habitats to detect arboreal and terrestrial mammals, reptiles, and amphibians. Each survey typically lasted 60 minutes and was conducted over two consecutive nights at each site. Target species were detected through eye shine, vocalisations, or direct visual observation;
- **Habitat Assessments:** In addition to direct fauna survey techniques, comprehensive habitat assessments were conducted across the Study area and within adjacent representative vegetation communities. These assessments focused on gathering detailed microhabitat data to support the development of habitat mapping protocols, which have since been integrated into broader SGP regional mapping frameworks; and
- **Opportunistic Fauna Observations:** Fauna species that were either unrecorded during systematic surveys or infrequently encountered were documented opportunistically throughout all survey activities conducted across the broader SGP. Observations of threatened fauna species within the Study area, as well as in adjacent and representative vegetation communities, have been incorporated into this biodiversity impact assessment.

Although of the survey sites from ESE (2017), Arrow subsequently conducted fauna surveys in 2025, providing more recent and site-specific data for the assessment. The spatial distribution of the fauna survey sites the Project (ESE, 2017 and Arrow, 2025) are illustrated in **Figure 2.2** and detailed on **Table 2.4.**

2.2.1 Threatened species habitat

Arrow has adopted threatened species mapping rules to map the distribution of threatened species habitat across the Study area. These mapping rules were developed by Ecosmart as part of the terrestrial ecology impact assessment conducted on a broad scale for the SGP (ESE, 2011). This work involved reviewing relevant data sources to identify threatened flora and fauna species specifically protected under the EPBC Act and the NC Act, which are known to occur within and around the SGP.

The rules were designed to map habitat for MNES and MSES using Geography Information System (GIS) data, enabling the prediction of high-value habitat. Habitats were classified as either ‘core’ habitat or ‘general’ habitat. Core habitat areas represent REs likely to be regularly occupied by, or of high importance to, the species. General habitats are REs that may be used less frequently by fauna (ESE, 2011) and generally provide lower-quality habitat. These definitions closely align with the ‘Core Habitat Possible’ and ‘General Habitat Possible’ categories described in DETSI (2025).

The threatened species mapping rules have been regularly reviewed to align with updated requirements for threatened species. Considerable new data from field assessments and improved local knowledge have led, in some cases, to modifications and refinements of the mapping rules for greater accuracy. In addition, newly listed MNES and MSES species under relevant legislation have been incorporated into the latest version of the threatened species mapping rules.

The threatened species mapping rules are now in their third version with the first version was released in 2017 and subsequent updates made in 2018, and most recently in 2023 (ESE, 2023). Rules for individual species are outlined in **Section 3.2** (flora) and **Section 3.3** (fauna) of this report.

2.3 Impact analysis

The impact analysis was quantitatively conducted relative to the proposed Project impact area (Project footprint), utilizing environmental values derived from Arrow's ground-verified survey data. These environmental metrics were systematically compared against baseline conditions within the Study area and corresponding data documented in the EA Conditions. The assessment scope is detailed in **Section 1.3.**

Impacts to ESAs and PEMs are summarised in **Section 3** includes:

- Interactions with Category A, B or C ESAs and the extent to which these are authorised by Condition (Biodiversity 8) *Protecting biodiversity values*, *Table 1* which restricts the kinds of activities that can be undertaken in ESAs and their protection zones;
- Despite condition (Biodiversity 8A) *Protecting biodiversity values, Table 2* which limits the maximum significant disturbance that can be undertaken in ESAs; and
- Interactions with values that are 'PEMs' under the EO Act and the extent to which these are authorised by Condition (Biodiversity 10) *Protecting biodiversity values, Table 3*.

2.3.1.1 Supplementary fauna survey

The Study area has been supplemented for fauna survey with pre-clearance survey and habitat assessment undertaken by Arrow field ecologist (**Table 2.4**). The survey field results (EFS and RE Assessments) are included as **Appendix E**.

2.3.1.2 Target fauna survey

Targeted surveys were used to confirm the presence of *P. cinereus* within the Project area by Arrow ecologists. Moreover, fauna habitat assessment was conducted to identify presence of habitat features for target species. Overall, the following targeted detection effort has been undertaken for the Project:

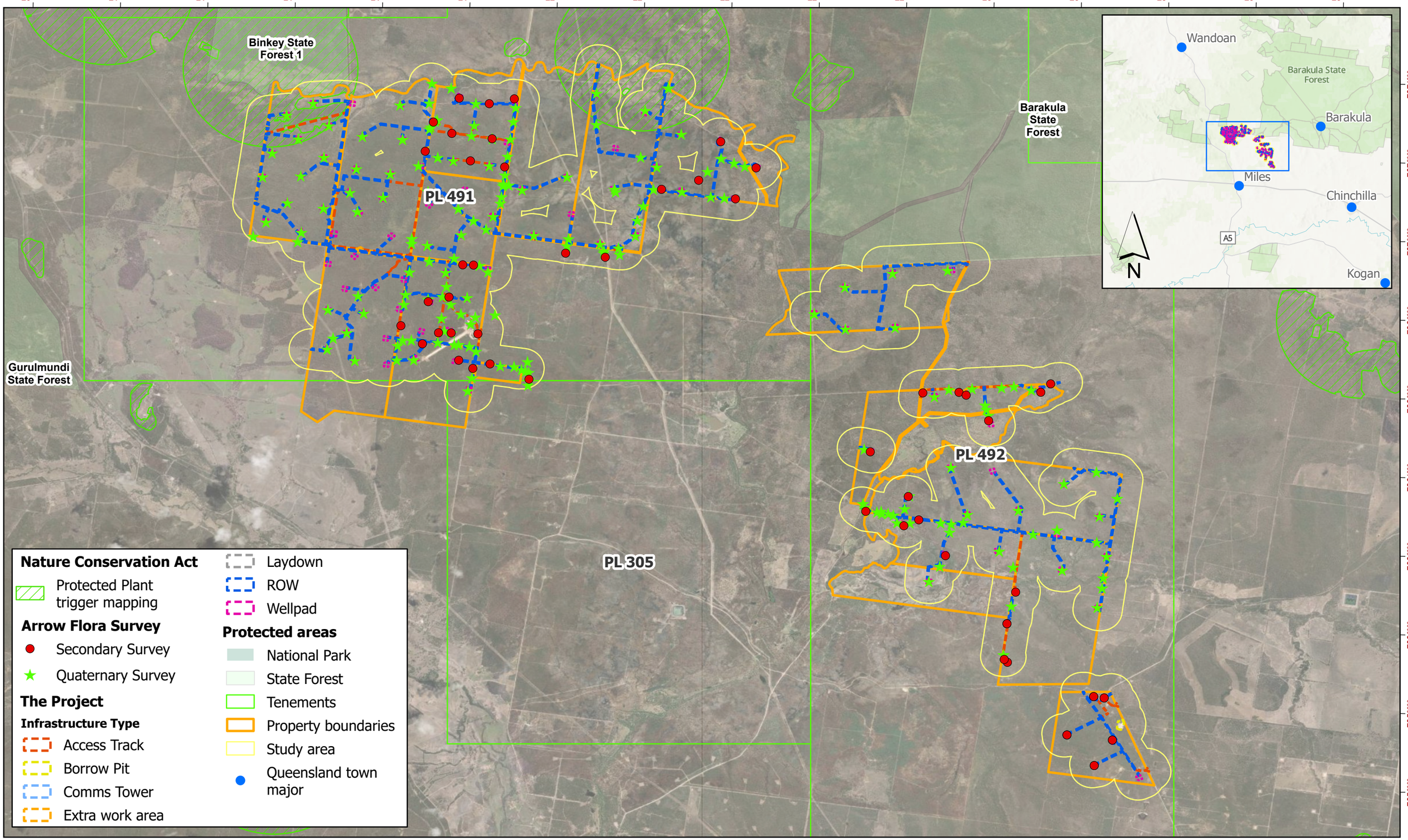
- *P. cinereus* detection based on SAT and Habitat Assessment methods (Jurskis, 2001; Phillip and Callaghan, 2011) (total of 1 surveys);
- The habitat assessments are designed to systematically identify key habitat features that have the potential to support fauna species, including but not limited to:
  - *A. cameroni* – Brigalow and alluvial eucalypt woodland, which have dense cover and scattered debris, especially logs, dense leaflitter, piles of fallen bark and flood debris;
- *H. damelii* – Presence of cracking clay soil or with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (up to 2-3 months) or gilgai microrelief; and
- *P. volans* ssp. *volans* - Presence of old eucalypts with an abundance of hollows, especially those larger than 30 cm.
- *P. a. australis* - Presence of mature eucalyptus with smooth and gum-barked with deep, narrow and high hollow.

Extensive targeted surveys were conducted to identify areas of suitable habitat as part of the main fauna survey effort by Ecosmart within SGP project area (ESE, 2017).

Table 2.4 – Fauna survey effort conducted as part of pre-clearance ecological assessment

Survey type	Surveys effort								Total survey effort by survey method	
	ESE 2027				Supplementary EIS					
	October 20216		Mach 2017		February 2013		August 2025			
	Sites	Duration	Sites	Duration	Sites	Duration	Sites	Duration	Number of sites	Duration
*Trap sites	10	40	10	40	7	28	-	-	27	108 nights
*Harp trap sites	10	20	8	8	5	5	-	-	23	33 nights
*Camera trap sites	14	56	15	60	1	4	-	-	30	120 nights
*Anabat	7	7	7	7	-	-	-	-	14	14 nights
**Active searches	16	16	16	16	4	4	-	-	36	36 hours
**Bird surveys	14	26	12	24	13	26	-	-	39	76 hours
**Spotlight	14	28	17	34	5	10	-	-	36	72 hours
**Koala SAT surveys	13	-	5	-	-	-	4	-	22	-

**Duration in nights*
***Duration in hours*



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0 1.25 2.5 5 Kilometers

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Scale: 1:87,000

Figure 2.1
Page 1 of 3

Flora Survey effort

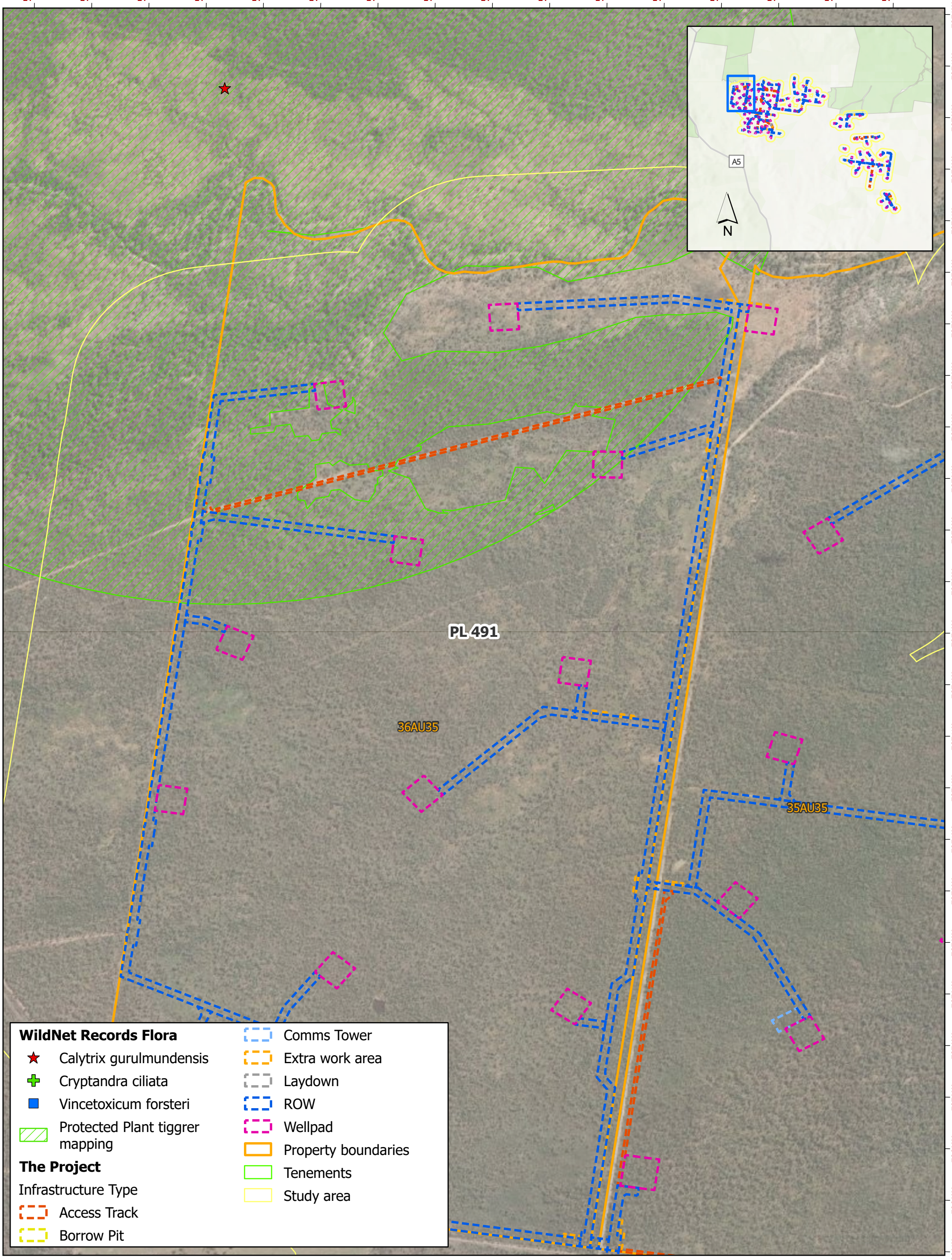
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0 0.13 0.25 0.5 Kilometers

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Scale: 1:13,000

Figure: 2.1
Page 2 of 3
Flora Survey effort

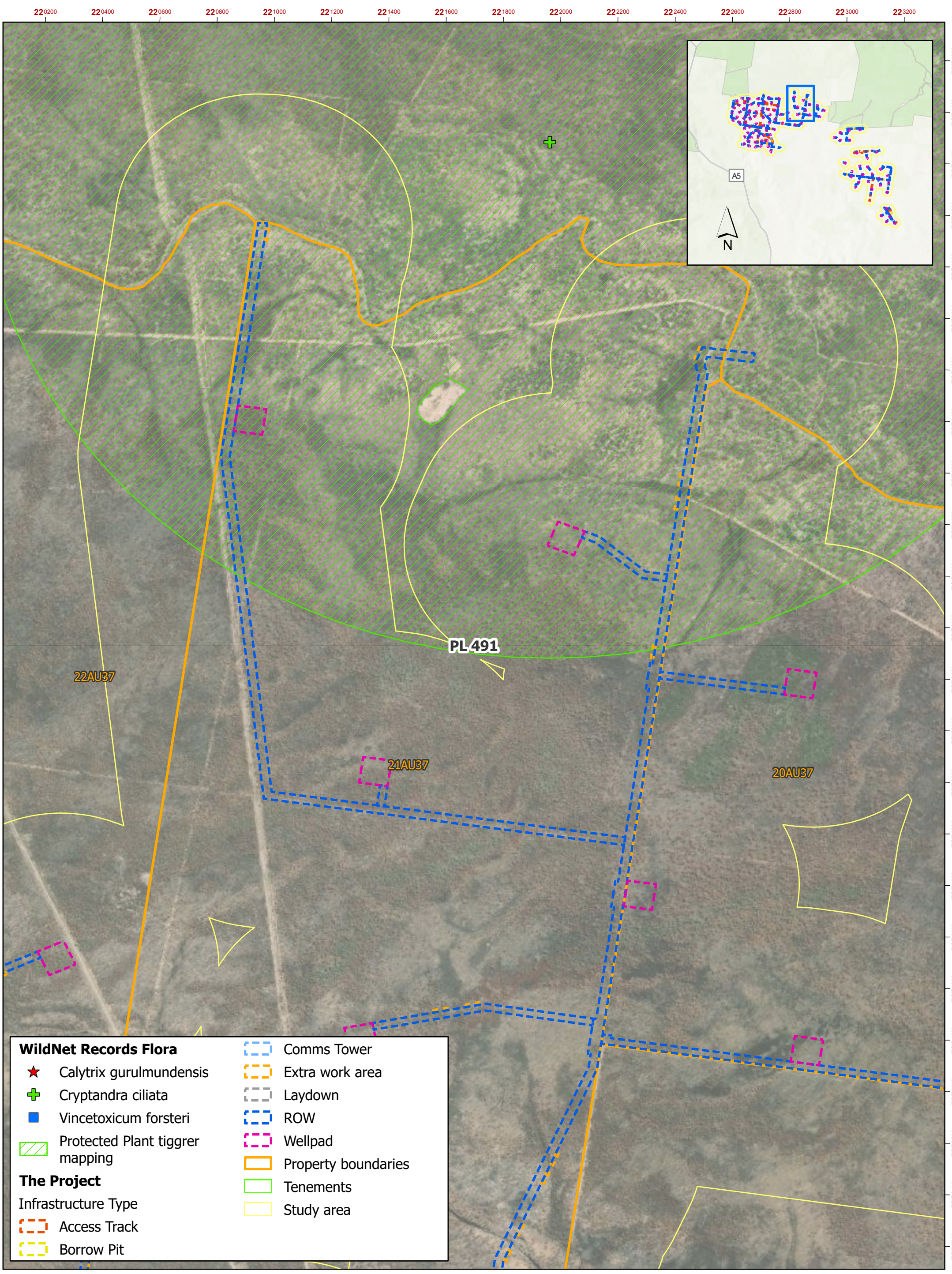
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Figure: 2.1
Page 3 of 3
Flora Survey effort

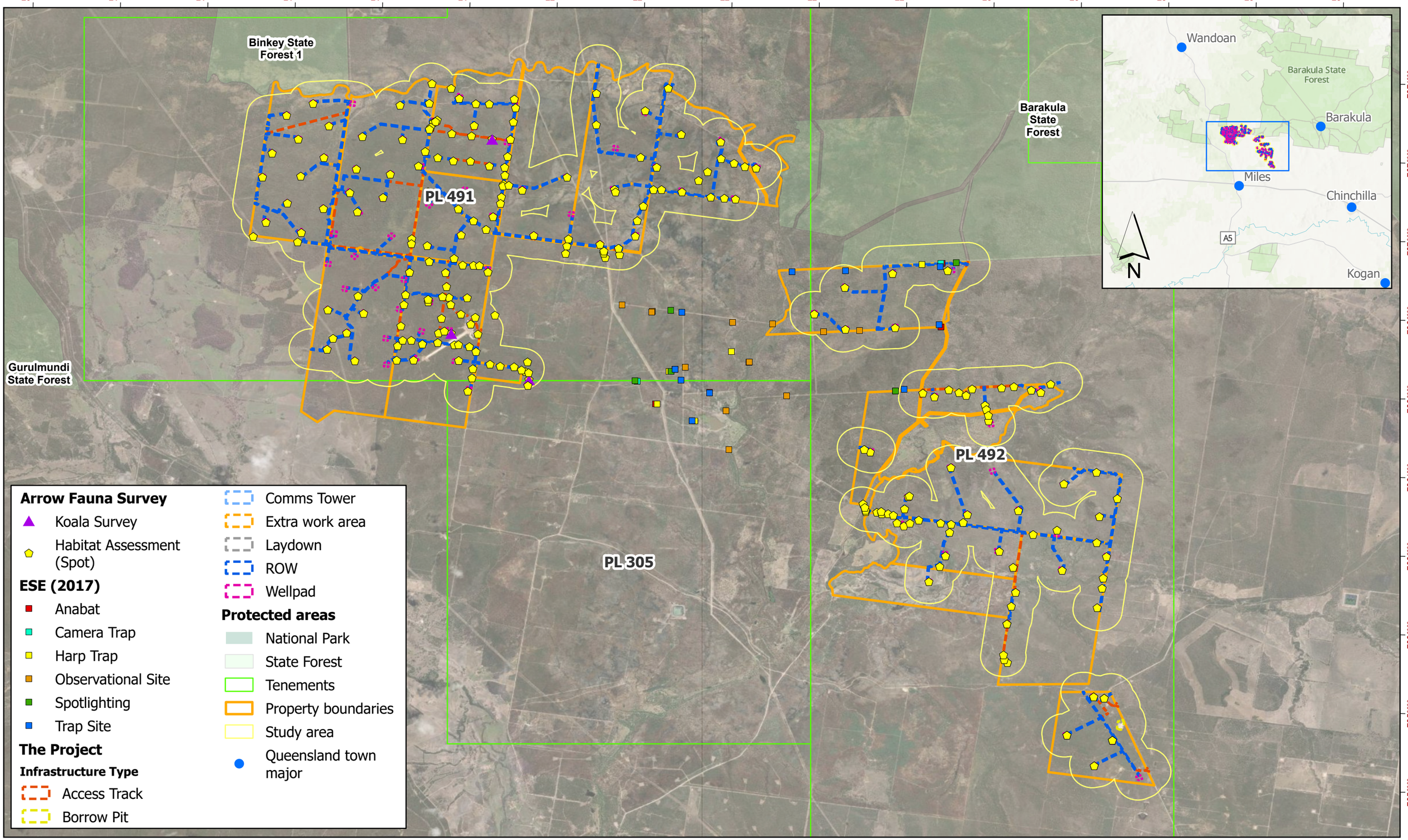
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Figure 2.2
Page 1 of 1

Fauna Survey effort

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2.3.1.3 Survey for cryptic species

In this assessment, species are classified as 'cryptic' if they are unlikely to be observed through conventional survey methods (e.g. trapping or spotlighting). Among the fauna identified as 'likely' or 'possibly present' in the Study area, the following species pose detection challenges using these standard techniques:

- *Adclarkia cameroni* (Brigalow woodland snail);
- *Adclarkia dulacca* (Dulacca woodland snail);
- *Acanthophis antarcticus* (Common death adder)
- *Furina dunmalli* (Dunmall's snake); and
- *Hemiaspis damelii* (Grey snake).

A. cameroni is predominantly associated with *Acacia harpophylla* habitats, which were not observed within the Survey area. Nevertheless, this species may occur in alluvial eucalypt woodland communities characterized by dense vegetation cover and the presence of structural habitat components such as coarse woody debris, dense leaf litter, accumulations of fallen bark, and flood-derived detritus. No record within Study area or during field assessments

Adclarkia dulacca has been located in a variety of habitats including vine thicket and *A. harpophylla* woodland with rock outcrops and *A. shirleyi*, *E. woollsiana* woodlands on ridges with and without rock (TSSC 2016b). It has been found persisting in brigalow regrowth but only where there are abundant suitable microhabitats (e.g., logs, dense leaf litter). No record within Study area or during field assessments.

Acanthophis antarcticus can be found throughout most of Queensland (Wilson and Swan 2020). Once abundant in the Brigalow Belt, they are now rarely observed and, when located, often associated with large contiguous tracts of vegetation. *A. antarticus* is found in a wide variety of habitats, including rainforest, open woodland, shrubland and heath (Ehmann 1992; Wilson and Swan 2020). They are typically not associated with grasslands or very open woodlands as these lack complex ground strata layers and abundant debris. No record within Study area or during field assessments

Furina dunmalli confined to the Brigalow Belt bioregion of south-eastern Queensland and north-eastern New South Wales, occurring north to Clermont and near Rockhampton. Most records are from the Dalby-Tara area of the Darling Downs (Hobson 2012). Limited information is available on habitat preferences of the *F. dunmalli*. It has been recorded from a wide range of habitats, including forests and woodlands dominated by *A. harpophylla* and other acacias (A. burowii, A. deanii, A. leiocalyx), *Callitris* sp.) or *Allocasuarina luehmannii* on black alluvial cracking clay and clay loams (Covacevich et al. 1998; Stephenson and Schmida 2007; Brigalow Belt Reptiles Workshop 2010; Hobson 2012). The species can, on rare occasions, inexplicably appear in sub-optimal vegetation. Advanced regrowth habitat should not be discounted, particularly when adjacent or linking areas of suitable habitat.

H. damelii is typically detected via spotlighting surveys conducted under specific environmental conditions (e.g., optimal weather and seasonal periods), which complicates confirmation of its presence based solely on survey records. Alternatively, the presence of key habitat attributes in alluvial vertosol soils—such as soil cracking or fissures within freshwater features capable of retaining moisture for 2–3 weeks, gilgai microrelief, and suitable refugia including multilayered or deep accumulations of leaf litter and coarse woody debris—provides a reliable proxy for potential habitat suitability for the species.

The habitat features data has been appropriate collected on the survey methods described on **Table 2.3** and **Table 2.4**.

Impacts on ESAs or PEMs in the Study area under the relevant EA still need to be approved via an EA amendment.

All impact calculations are based on GTRE mapping for the Study area in accordance with Condition (Biodiversity 3) of the SGPN Stage 5 EA, which states that "*where mapped biodiversity values differ from [on-the-ground biodiversity values], petroleum activities may proceed…based on the confirmed on-the-ground biodiversity value*".

3 Description of ecological values

The Study area is located approximately 20 km north-east of Miles in the Barakula subregion of the Brigalow Belt Bioregion (**Figure 1.1**). The Study area is predominantly characterised by Least concern vegetation in different stage of conservation (i.e. remnant, regrowth) with disturbed area by road / access tracks, tree removal and fire. These remnants are primarily classified as gentle slopes plain eucalypt woodland to open forest ecosystem on land zone five and seven, with a canopy structure dominated by *Eucalyptus crebra*, *E. fibrosa* and *E. decorticans.* Alluvial plan areas were identified in a smaller portion of the vegetation present (3.5%) with an open woodland dominated by *E. populnea* and *E. tereticornis*. These vegetation communities are dissected by open forest to woodland associated with L Tree Creek and Dog wood Creek. The Project intersect the Terrestrial Biodiversity Corridor and buffer that enhance connectivity between area of high ecological values, promoting the movement of species and the persistence of ecological processes (refer to **Figure 3.1**).

3.1 Environmentally Sensitive Areas

Under the *Environmental Protection Regulation 2019* (EP Regulation), ESAs are categorised into Categories A, B, and C, reflecting varying levels of ecological significance and regulatory protection. The associated eligibility criteria and standard environmental conditions applicable to petroleum activities, as outlined by the Department of Environment and Heritage Protection (DEHP, 2013), are summarised in **Table 3.1**.

The recent inclusion of a Category C ESA for a Protected Wildlife Habitat is defined in **Table 3.1**. The ESA areas that are within and in the vicinity of the Project area are shown in **Figure 3.2** and **Figure 3.3**.

Table 3.1 – SGPN Stage 5 Environmentally Sensitive Areas

ESA Category	ESA Type	Occurrence in Study area
Category A	Any of the following under the *Nature Conservation Act 1992:*	
	▪ National Park (scientific)	None
	▪ National Park	None
	▪ National Park (Aboriginal land)	None
	▪ National Park (Torres Strait Islander land)	None
	▪ National Park (Cape York Peninsula Aboriginal land)	None
	▪ Conservation Park	None
	▪ Special wildlife reserve	None
	▪ Forest reserve.	None
	The Wet Tropics Area under the *Wet Tropics World Heritage Protection and Management Act 1993*.	None
	The Great Barrier Reef Region under the *Great Barrier Reef Marine Park Act 1975*;	None
	A marine park under the Marine Parks Act 2004, other than a part of the park that is a general use zone under that Act.	None
Category B	Any of the following areas under the *Nature Conservation Act 1992:*	
	▪ Coordinated conservation area	None

	▪ An area of critical habitat or major interest identified under a conservation plan.	None
	▪ An area subject to an interim conservation order.	None
	An area subject to the following conventions to which Australia is a signatory:	
	▪ The 'Convention on the Conservation of Migratory Species of Wild Animals' (Bonn, 23 June 1979);	None
	▪ The 'Convention on Wetlands of International Importance, especially as Waterfowl Habitat' (Ramsar, Iran, 2 February 1971);	None
	▪ The 'Convention Concerning the Protection of the World Cultural and Natural Heritage' (Paris, 23 November 1972).	None
	A zone of a marine park under the *Marine Parks Act 2004* that is within a general use zone of the marine park under that Act.	None
	An area to the seaward side of the highest astronomical tide.	None
	The following under the *Queensland Heritage Act 1992*:	
	▪ Place of cultural heritage significance	None
	▪ Queensland heritage place, unless there is an exemption certificate issued under that Act.	None
	An area recorded in the Aboriginal Cultural Heritage Register established under the *Aboriginal Cultural Heritage Act 2003*, section 46, other than the area known as the 'Stanbroke Pastoral Development Holding', leased under the *Land Act 1994* by lease number PH 13/5398.	None
	A feature protection area, State Forest Park or Scientific area under the *Forestry Act 1959*.	None
	A declared fish habitat area under the *Fisheries Act 1994*.	None
	An 'Endangered Regional Ecosystem' identified in the Regional Ecosystem Description Database (REDD) (by biodiversity status).	None
Category C	Nature refuges as defined in the conservation agreement for that refuge under the *Nature Conservation Act 1992*	None
	Koala habitat areas as defined under the Nature Conservation (Koala) Conservation Plan 2006	None
	State forests or timber reserves as defined under the *Forestry Act 1959*	None
	Regional parks (previously known as resource reserves) under the *Nature Conservation Act 1992*	None
	'Of concern regional ecosystems' that are remnant vegetation and identified in the database called 'RE description database' containing regional ecosystem numbers and descriptions.	RE 11.3.2 is mapped in the Study area. These communities are discussed in **Section 3.2.1** and mapped in **Figure 3.2**.
	An area validated from ground-truthing surveys as 'protected wildlife habitat' that is category A, B or C on the remnant vegetation management map, in accordance with section 20A of the *Vegetation Management Act 1992*, for a species of wildlife listed as critically endangered, endangered or vulnerable under the *Nature Conservation Act 1992*.	Protected wildlife habitat for endangered and vulnerable species occurs within the Study area. Refer to **Section 3.2.3** and mapped in **Figure 3.3**.

	An area validated as from ground-truthing surveys as 'essential habitat' on the Queensland Government essential habitat map in accordance with section 20AC of the *Vegetation Management Act 1999* for a species of wildlife listed as critically endangered, endangered, vulnerable under the *Nature Conservation Act 1992*	Essential Habitat for *Nyctophilus corbeni* occurs within the Study Area. Refer to **Section 3.3.5** and mapped in **Figure 3.4**

3.2 Flora - description of environmental values

3.2.1 Vegetation communities

Consistent with the broader landscape condition of the Brigalow Belt bioregion, the Study area shows a good percentage of native vegetation comprising 90% (9506.4 ha) of the total area *Vegetation Management Act 1999* (VMA). Historical and ongoing land use practices, predominantly broadscale agricultural clearing and livestock grazing, have resulted in extensive habitat loss, landscape fragmentation, and ecological degradation. The non-remnant vegetation is largely confined to small, isolated patches, associated with road / access tracks, tree removal and fire disturbances.

Vegetation mapping supplied by the DETSI identified six (6) REs within the Study area (refer to **Figure 3.5**). The classification, conservation status and total mapped areas of these REs are detailed in **Table 3.2** and include:

- One (1) RE is classified as Of Concern under the *Vegetation Management Act 1999* (VMA), indicating they have been substantially cleared or degraded and now occur in less than 2.2% of their pre-clearing extent.
- Non-remnant areas: These areas consist predominantly of cleared land used for road / access tracks, tree removal and fire disturbances or other modified land uses and lack remnant vegetation structure and function.

3.2.1.1 Ground-verified Regional Ecosystems

The GTRE mapping for the Study area was developed from detailed vegetation community surveys incorporating systematic ground-truthing and high-resolution spatial analysis as outlined in **Section 2.2**. The mapping integrates field-validated data with existing RE datasets to improve the delineation of vegetation community boundaries and the attribution of biodiversity status classifications. The final outputs, stratified by biodiversity status, are presented in **Figure 3.6**.

All six (6) REs in the VMA mapping for the Study area were detected during field surveys (refer to **Table 3.3**). In addition of the REs showed on VMA mapping, seven (7) REs had been detected within the Project area (refer to **Table 3.3**).

Table 3.2 – Government-mapped Regional Ecosystem mapping by Biodiversity status

Land Zone	RE Code	Description	Occurrence in Study area (ha)
Of concern REs			
3 - Quaternary alluvial plains	11.3.2	*Eucalyptus populnea* woodland to open woodland. Occasionally, *E. melanophloia* or *E. crebra* may be present. A secondary tree layer may occur and include species such as *Geijera parviflora*, *Eremophila mitchellii*, *Acacia salicina*, *Cassia brewsteri*, and *Acacia excelsa*. The ground layer is dominated by a range of tussock grasses, including *Chloris* spp., *Enteropogon* spp., and *Aristida* spp.	235.3

Total remnant vegetation community			**235.3**
Not concern at present REs			
3 - Quaternary alluvial plains	11.3.14	Eucalyptus spp., Angophora spp., Callitris spp. woodland on alluvial plains	130.2
5 - Tertiary-early Quaternary loamy and sandy plains and plateaus	11.5.1	*Eucalyptus crebra* and/or *E. populnea, Callitris glaucophylla, Angophora leiocarpa, Allocasuarina luehmannii* woodland on Cainozoic sand plains and/or remnant surfaces	1250.1
	11.5.21	*Corymbia bloxsomei* +/- *Callitris glaucophylla* +/- *Eucalyptus crebra* +/- *Angophora leiocarpa* woodland on Cainozoic sand plains and/or remnant surfaces	1466.9
7 - Cainozoic duricrusts	11.7.4	*Eucalyptus decorticans* and/or Eucalyptus spp., Corymbia spp., Acacia spp., *Lysicarpus angustifolius* woodland on Cainozoic lateritic duricrust	6143.6
	11.7.7	*Eucalyptus fibrosa* subsp. nubilis +/- Corymbia spp. +/- Eucalyptus spp. woodland on Cainozoic lateritic duricrust	279.5
Total remnant vegetation community			**9270.3**

Table 3.3 – Ground-truthed Regional Ecosystem by Biodiversity status

Land Zone	RE Code	Description	Occurrence within proposed impact area (ha)
Of Concern REs			
3 - Quaternary alluvial plains	11.3.2	*Eucalyptus populnea* woodland to open woodland. Occasionally, *E. melanophloia* or *E. crebra* may be present. A secondary tree layer may occur and include species such as *Geijera parviflora*, *Eremophila mitchellii*, *Acacia salicina*, *Cassia brewsteri*, and *Acacia excelsa*. The ground layer is dominated by a range of tussock grasses, including *Chloris* spp., *Enteropogon* spp., and *Aristida* spp.	0.68
	*11.3.25	Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines	0.65
	*11.3.4	*Eucalyptus tereticornis* woodland to open forest on Cainozoic alluvial plains. Other tree species that may be present include *E. camaldulensis, Corymbia tessellaris, C. clarksoniana, E. melanophloia, E. platyphylla* or *Angophora floribunda*. A shrub layer is usually absent, and a grassy ground layer is prominent.	0.93
Total Of concern vegetation communities			**2.26**
Not concern at present REs			

3 - Quaternary alluvial plains	11.3.14	Eucalyptus spp., Angophora spp., Callitris spp. woodland on alluvial plains	0.82
	*11.3.6	Eucalyptus melanophloia woodland on alluvial plains	1.5
5 - Tertiary-early Quaternary loamy and sandy plains and plateaus	11.5.1	Eucalyptus crebra and/or E. populnea, Callitris glaucophylla, Angophora leiocarpa, Allocasuarina luehmannii woodland on Cainozoic sand plains and/or remnant surfaces	151.2
	11.5.21	Corymbia bloxsomei +/- Callitris glaucophylla +/- Eucalyptus crebra +/- Angophora leiocarpa woodland on Cainozoic sand plains and/or remnant surfaces	44.2
	*11.5.4	Eucalyptus chloroclada, Callitris glaucophylla, C. endlicheri, Angophora leiocarpa woodland on Cainozoic sand plains and/or remnant surfaces	1.6
7 - Cainozoic duricrusts	*11.7.2	Acacia spp. woodland on Cainozoic lateritic duricrust. Scarp retreat zone	8.6
	11.7.4	Eucalyptus decorticans and/or Eucalyptus spp., Corymbia spp., Acacia spp., Lysicarpus angustifolius woodland on Cainozoic lateritic duricrust	126.2
	*11.7.5	Corymbia citriodora or Eucalyptus crebra woodland on Cainozoic lateritic duricrust	5
	*11.7.6	Eucalyptus fibrosa subsp. nubilis +/- Corymbia spp. +/- Eucalyptus spp. woodland on Cainozoic lateritic duricrust	6.4
	*11.7.7	Eucalyptus fibrosa subsp. nubilis +/- Corymbia spp. +/- Eucalyptus spp. woodland on Cainozoic lateritic duricrust	24.1
Total Of concern vegetation communities			**369.62**
Non-remnant			
5 - Tertiary-early Quaternary loamy and sandy plains and plateaus	Regrowth undifferentiated	Vegetation that has naturally re-established or regenerated after clearing or disturbance, but where the structural and floristic composition has not yet developed sufficiently to be classified into a specific RE or remnant status.	0.43
	Cleared	Areas where vegetation has been removed, cut down, ring-barked, pushed over, poisoned, or destroyed by burning flooding or draining, but does not include destroying vegetation by stock or lopping a standing tree.	0.04
	Significance disturbance	Areas such as roads, dams, and cultivated land that have undergone substantial modification of natural landforms, soil profiles, and vegetation structure.	4.7
7 - Cainozoic duricrusts	Regrowth undifferentiated	Vegetation that has naturally re-established or regenerated after clearing or disturbance, but where the structural and floristic composition has not yet	0.9

		developed sufficiently to be classified into a specific RE or remnant status.	
	Pasture/Grazing	An area of land covered with grasses or low plants, maintained for the purpose of allowing animals to feed directly on the vegetation growing in the pasture.	4.2
	Cleared	Areas where vegetation has been removed, cut down, ring-barked, pushed over, poisoned, or destroyed by burning flooding or draining, but does not include destroying vegetation by stock or lopping a standing tree.	7.17
	Significance disturbance	Areas such as roads, dams, and cultivated land that have undergone substantial modification of natural landforms, soil profiles, and vegetation structure.	31.2
Total Of concern vegetation communities			**48.64**

*REs not shown on Government-mapped

3.2.2 Protected plant trigger mapping

The Project proposed infrastructure intersect a ‘high-risk’ area on the Protected Plant Survey Trigger Map approx. 20 ha split into lot plans 36AU35 and 21AU37 (**Figure 3.7**). The Project footprint, including areas near the mapped 'high-risk' trigger area, was surveyed by a suitably qualified Arrow ecologist using a combination of secondary and quaternary flora survey techniques, supplemented by informal meander surveys (see **Section 2.2.1.1**). These approaches were used to gather comprehensive data on vegetation communities, assess potential habitat for threatened species, and identify ecological constraints such as the occurrence of threatened or near threatened plant species.

The impact area under a ‘high-risk’ area on the Protected Plant Survey Trigger Map will be survey according with the latest version of the Flora Survey Guideline – Protected Plants – *Nature Conservation Act 1992* (Current version 2.03. Feb 2025) with appropriated time based on Arrow impact schedule.

3.2.3 Threatened Flora species

A desktop ecological assessment identified three (3) threatened species and one (1) near-threatened flora species listed under the NC Act within a 50 km buffer of the Study area. Of these, two (2) species were assessed as "Likely” and one (1) are “Possible” to occur within the Study area, based on habitat suitability, regional records, and ecological context, as outlined in **Table 3.4**.

It is acknowledged that habitat associated with near threatened flora species does not meet the criteria for classification as an ESA, nor does it constitute a PEM under the EO Act. While the identification or potential occurrence of near threatened species within the Study area requires consideration under the NC Act, this does not translate to offset obligations or conditions within the EA. The assessment of potential impacts on these species is addressed independently within this report, in line with NC Act requirements.

3.3 Fauna - description of environmental values

3.3.1 Environmental habitat categories and conditions

The Study area is dominated by Least concern vegetation areas. The remaining vegetation is dominated by eucalypt woodland to open forest habitats on soils Tertiary-early Quaternary loamy and sandy plains and plateaus and Cainozoic duricrusts. Predominantly characterised by old near-level to gently undulating loamy and sandy plains, with minor ironstone jump-ups and associated scarps.

The majority of the Study area (87.5%) is mapped as Least concern vegetation in different stage of conservation value (i.e. remnant and regrowth) and age. The remaining vegetation communities (2.2%) are situated along the creeks Tree creek and Dogwood Creek with the biodiversity status classified as Of concern. These vegetation communities for both biodiversity status, range from early regrowth—dominated by young, fast-growing species or resprouts—to old-growth vegetation with an intact canopy and clear vertical stratification.

The habitat is dominated by *E. crebra*, *E. fibrosa* and *E. decorticans* which alternate between dominance and sub-dominance depending on the section, with *Callitris glaucophylla* and/or *Allocasuarina luehmannii* consistently present as a sub-dominant species and *Allocasuarina luehmannii* the most common associated species. Based on GTRE mapping, the Study area supports the broad habitat types described in **Table 3.5** (refer to **Figure 3.6** for spatial distribution).

3.3.1 Watercourse

The primary watercourse-related feature within the Study area is the L Tree Creek and Dogwood Creek, a major watercourse in the Murray-Darling Basin.

The Brigalow Belt bioregion is known for its waterway systems, which often provide the only remaining landscape connectivity. These watercourses are significant landscape features that function as key migratory and dispersal corridors for a wide range of flora and fauna, supporting diverse habitat requirements such as access to food, water, and shelter

The waterways present within the Study area contribute to local surface water dynamics and influence riparian vegetation patterns, floodplain processes, and the formation of associated alluvial landforms across the landscape.

3.3.2 State Forest

The Project will not impact any area classified as State Forest as shown in **Figure 3.1**.

3.3.3 Conservation-significant fauna

The desktop assessment identified records of 47 threatened fauna species considered during the LOO analysis (refer to **Appendix D**). Among these, two (2) species are listed as MNES under the EPBC Act but are not recognised as threatened under the MSES criteria, NC Act. In addition, these species are considered unlikely to occur (Appendix D) and as such, the two species identified below have been excluded from further impact assessment:

- *Maccullochella peelii* (Murray cod) (V); and
- *Pteropus poliocephalys* (Grey-headed flying-fox) (V).

Of the total threatened fauna considered, 12 species under the NC Act have been assessed, with seven (7) as 'Known' and five (5) as 'Likely' to occur within the defined Study area, based on a combination of desktop records and habitat suitability. Spatial records supporting these occurrences are presented in **Figure 3.8**. Summary information for these species including conservation status and habitat associations, is provided in **Table 3.6**. Corresponding spatial representations of species records and modelled habitat for species assessed as 'Known' or 'Likely' to occur are shown in **Figure 3.8** to **Figure 3.11**. Detailed ecological profiles and habitat assessments for these species are outlined in **Section 3.3.3** and **Section 3.3.4**. Species that were assessed as 'Unlikely' or 'Possible' to occur in the Study area (see **Section 1.2.1**) do not have an associated significant residual impact and are therefore not PEMs (under the EO Act) for the Project

Table 3.4 – Flora species assessed as "Likely" or "Possible" to occur within Study area

Scientific name	Status		No. records within 50 km of Study area	Likelihood of Occurrence	Supporting Rationale
	NCA	EPBC			
Vincetoxicum forsteri	E	E	2	Possible	The species is a vine of eucalypt woodland and associated non-remnant areas Potentially could occur in any eucalypt woodland area. Has been recorded north of Miles
Cryptandra ciliata	NT		6	Likely	Suitable habitat in eucalypt dominated woodland, lancewood (*Acacia shirleyi*) woodland and Triodia grassland on rocky on low lateritic and sandstone ridges. Habitat in the PDA is consistent with RE 11.7.5, 11.7.4, 11.7.6, 11.5.1, 11.5.4, 11.5.21. Woodlands in the Chinchilla/Miles region in the Central assessment area provide for potential habitat for the species. Three herbarium records within 5km of the assessment area boundary with a single record within 1km of the eastern boundary, 30km to the north of Miles.
Calytrix gurulmundensis	V	V	31	Likely	Grows in patches of shrubland on shallow lateritic soils at sandstone ridges. Vegetation is predominately eucalypt, acacia, casuarina dense shrublands with spinifex, and spinifex grassland with scattered shrubs. This habitat description is consistent with RE 11.7.5 (shrubland on natural scalds on deeply weathered coarse-grained sedimentary rocks). Suitable habitats include patches of RE11.7.5 and RE11.7.4 into the west and north-west of the central assessment area. Nearest local record is 12 km west of the SGP study area (30 km north of Miles) within Gurulmundi State Forest.

Table 3.5 – Habitat types within the Study area are based on ground-truthed RE mapping

Vegetation community		Representative within proposed impact area	
Structure	**Description**	**Ha**	**%**
Alluvial woodlands REs 11.3.2, 11.3.25,11.3.6 11.3.4)	Native vegetation often structured as fringing forests or woodlands and support moisture-adapted associated with natural watercourses, including rivers, creeks, and drainage lines, typically occurring on Quaternary alluvial soils (Plate 1 and Plate 2).	3	0.7
Woodland REs 11.3.14, 11.5.1, 11.5.21, 11.5.4, 11.7.2, 11.7.4, 11.7.6 and 11.7.7	Area of land dominated by trees and other woody plants, but with a relatively open tree canopy that allows plenty of light to reach a well-developed understorey of shrubs and grasses (Plate 3 and Plate 4).	341.2	80
Shrub RE 11.7.5	The vegetation type dominated by shrubs (woody plants under 5-8m tall with multiple stems), often mixed with grasses, herbs, and geophytes, typically in semi-arid or Mediterranean climates with open canopies (Plate 5 and Plate 6).	5	1.2
Regrowth REs 11.3.14, 11.5.1, 11.7.4 and 11.7.7	Vegetation that has naturally re-established or regenerated after clearing or disturbance, but where the structural and floristic composition has not yet developed sufficiently to be classified into a specific RE (Plate 7 and Plate 8).	7	2
Regrowth undifferentiated Land Zone 5	Vegetations that has naturally regenerated following disturbance that contain key species to enable its association with a specific RE (Plate 2 and Plate 3).	0.5	0.1
Regrowth undifferentiated Land Zone 7	Vegetation that has naturally re-established or regenerated after clearing or disturbance, but where the structural and floristic composition has not yet developed sufficiently to be classified into a specific RE (Plate 9 and Plate 10).	4.1	1
Cleared	Areas where vegetation has been removed, cut down, ring-barked, pushed over, poisoned, or destroyed by burning flooding or draining, but does not include destroying vegetation by stock or lopping a standing tree (Plate 11 and Plate 12).	64.2	15



Plate 1 – Example of alluvial woodlands present within Study area.
RE assessment BMAC 39 (RE11.3.25) – 28 August 2025.



Plate 2 – Example of alluvial woodlands present within Study area.
RE assessment BMAC 67 (RE11.3.25) – 28 August 2025.



Plate 3 – Example of woodland present within Study area.
RE assessment BMAC 61 (RE11.5.1) – 19 September 2025.



Plate 4 – Example of woodland present within Study area.
RE assessment BMAC 02 (RE11.7.4) – 25 August 2025.



Plate 5 – Example of regrowth undifferentiated present within Study area.
EFS YET-167 – 10 September 2025.



Plate 6 – Example of regrowth undifferentiated present within Study area.
EFS YET-167 – 10 September 2025.



Plate 7 – Example of regrowth present within Study area.
RE assessment GCRE7 (Regrowth RE11.7.4) – 19 September 2025.



Plate 8 – Example of regrowth present within Study area.
RE assessment GCRE8 (Regrowth RE11.7.4) – 19 September 2025.



Plate 9 – Example of Regrowth undifferentiated present within Study area.
RE assessment BMAC 71 (Regrowth undifferentiated land zone 5) – 7 October 2025.

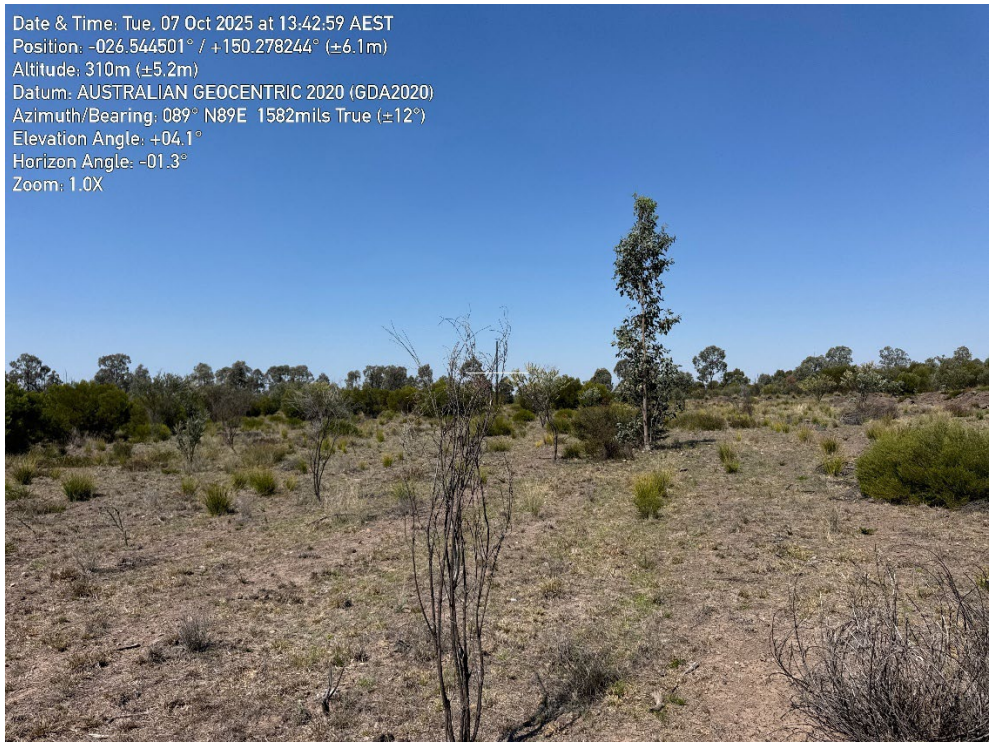


Plate 10 – Example of Regrowth undifferentiated present within Study area.
RE assessment BMAC 71 (Regrowth undifferentiated land zone 5) – 7 October 2025.



Plate 11 – Example of cleared present within Study area.
RE assessment GC-P3-RE9 (Cleared) – 12 August 2025.

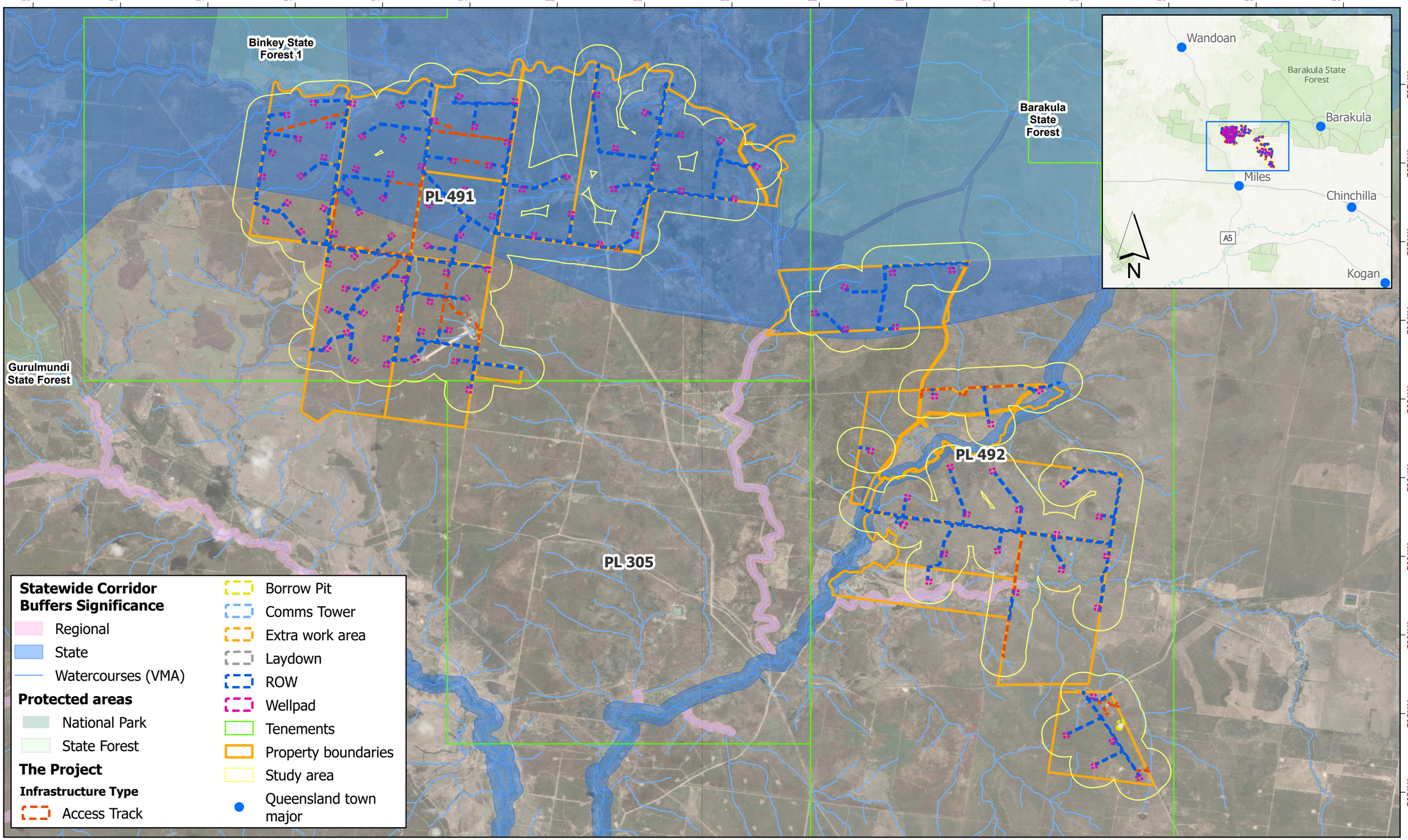


Plate 12 – Example of cleared present within Study area.
RE assessment GC-P3-RE9 (Cleared) – 12 August 2025.

Table 3.6 – Prescribed Environmental Matters – Fauna species 'Known', 'Likely' and 'Possible' to Occur in the Study area

Scientific Name	Status		Likelihood Assessment for SGP
	NCA	EPBC	
Gastropoda			
Adclarkia cameroni	E	E	**Likely** Suitable habitat is present within the Study area, with no historical records identified in the vicinity
Adclarkia dulacca	E	E	**Likely** No suitable habitat for the species exists within the impact area, as confirmed by site surveys
Jalmenus eubulus	V	-	**Likely** No suitable habitat for the species exists within the impact area, as confirmed by site surveys. Six records with 50 km with the closed within 12 km (ALA, 2008)
Reptilia			
Strophurus taenicauda	-	NT	**Known** This species has been recorded within the Study area at numerous locations. An abundance of suitable habitat is present. This species has been recorded within the Study area at numerous locations. An abundance of suitable habitat is present.
Aves			
Calyptorhynchus lathami lathami	V	V	**Known** Species presence has been confirmed on 15 occasions surrounding the study area. Suitable habitat is present within the study area.
Hirundapus caudacutus	V	V	**Known** Two records of this species were recorded within the study area, and suitable habitat is abundant there. This species is predominantly aerial. Consequently, terrestrial habitat loss is unlikely to have a significant impact, so it was not considered further in the impact assessment.
Stagonopleura guttata	V	V	**Known** Suitable habitat is present within the Project and historical records from 2019 have been identified nearby. Other historical records have been recorded within the Study area, but no dates were provided.
Mammalia			
Nyctophilus corbeni	V	V	**Known** This species was recorded from one (1) location on Girrahween Station during Project surveys in 2013, and from two locations south of Myall Park Hookswood Road in 2016. There are also a number of records for Nyctophilus sp. from passive acoustic detection sites. Suitable habitat is present throughout. Impacts on habitat for this species approved under EPBC 2010/5344.
Petauroides volans volans	E	E	**Known** *P. v. volans* was recorded at one (1) location in the study area during surveys or in the SGP Supplementary

			EIS. The species was recorded 12 more times in the vicinity of the study area.
Petaurus australis australis	V	V	**Likely** This species is well represented in Barakula and Gurulmundi State Forests and there are large contiguous areas of forest, particularly in the north of the Study area. It is yet to be detected in the broader SGP but is considered likely to occur.
Phascolarctos cinereus	E	E	**Known** This species was not recorded in the study area. However, there are more than 20 records in the vicinity of the study area, and the abundance of suitable habitat was confirmed through field assessments.
Tachyglossus aculeatus	SLC	-	**Likely** There are no records of the species within the study area. However, there are more than 20 records of the species in the surrounding areas.



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0 1.25 2.5 5 Kilometers

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Figure 3.1
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Overview of the Ecological values within the Study area

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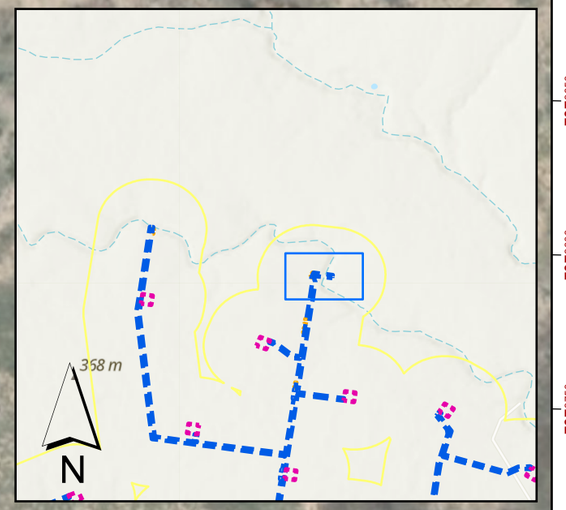
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21AU37

PL 491

20AU37

Stream Ordered Drainage
- 4
- 5

Protected areas
- National Park
- State Forest

The Project

Infrastructure Type
- Access Track
- Borrow Pit
- Comms Tower
- Extra work area
- Laydown
- ROW
- Wellpad
- Tenements
- Property boundaries
- Study area
- Queensland town major

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0 0.05 0.1 Kilometers

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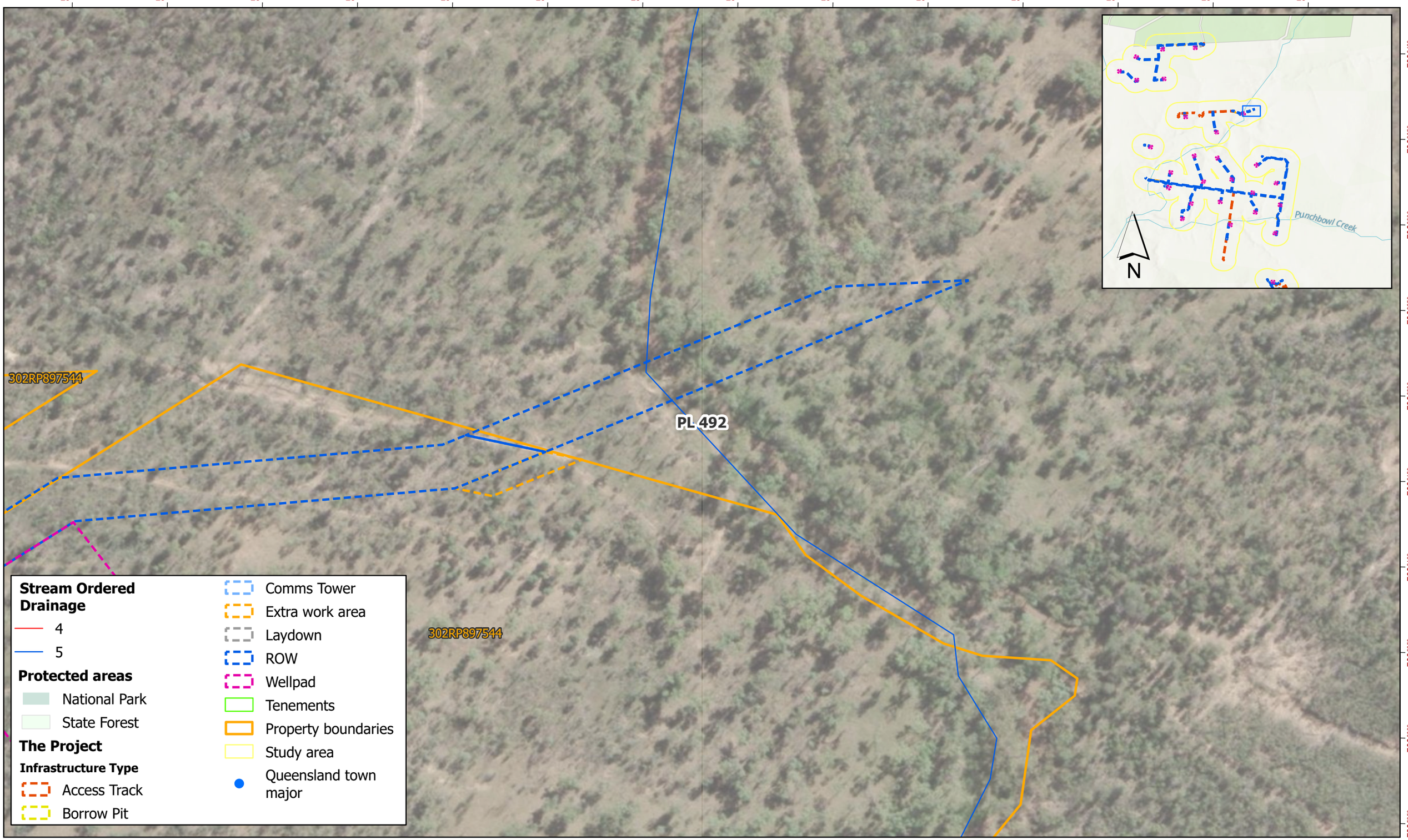
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Figure 3.1

Overview of the Ecological values within the Study area

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0 0.05 0.1 Kilometers

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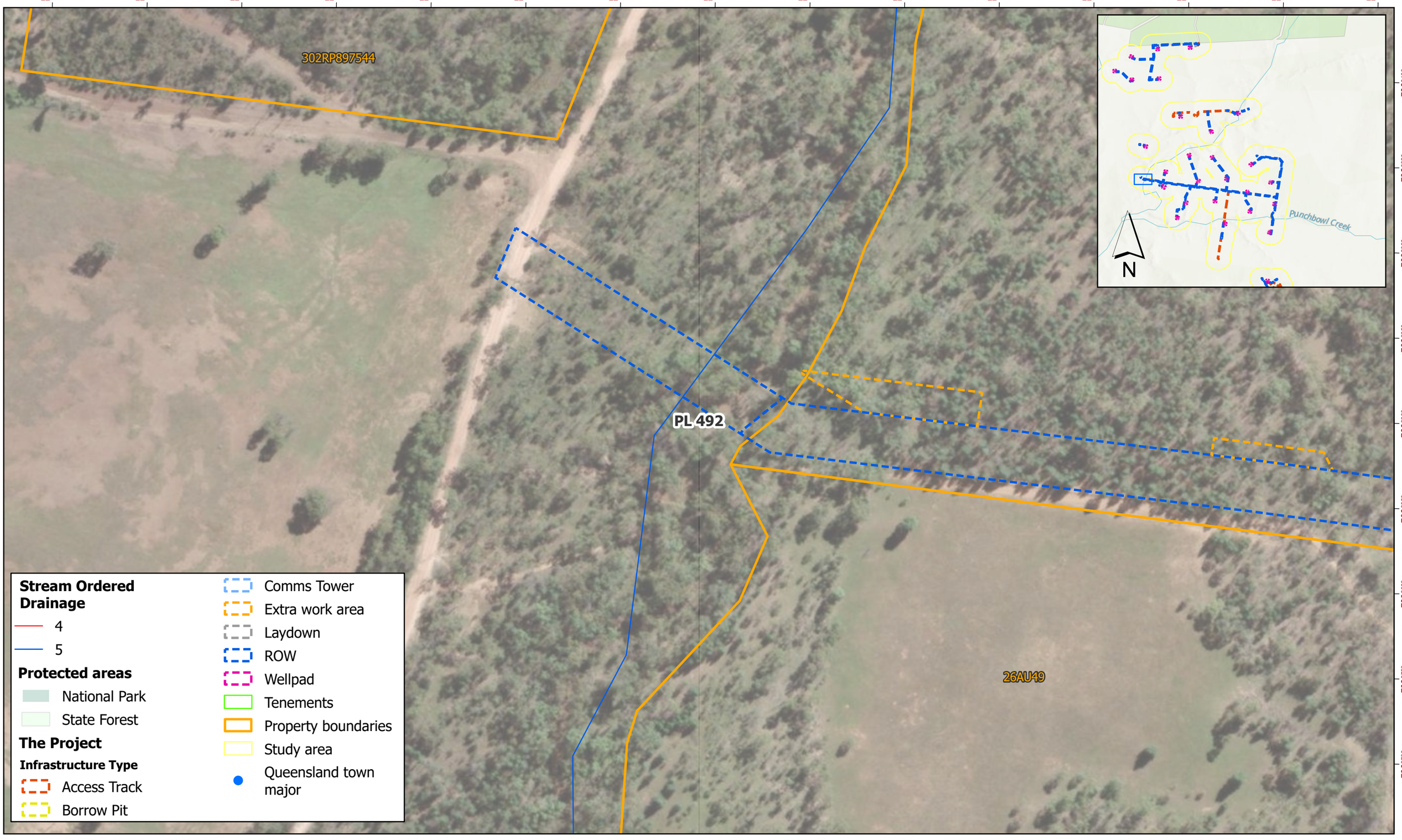
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0 0.05 0.1 Kilometers

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Figure 3.1
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Overview of the Ecological values within the Study area

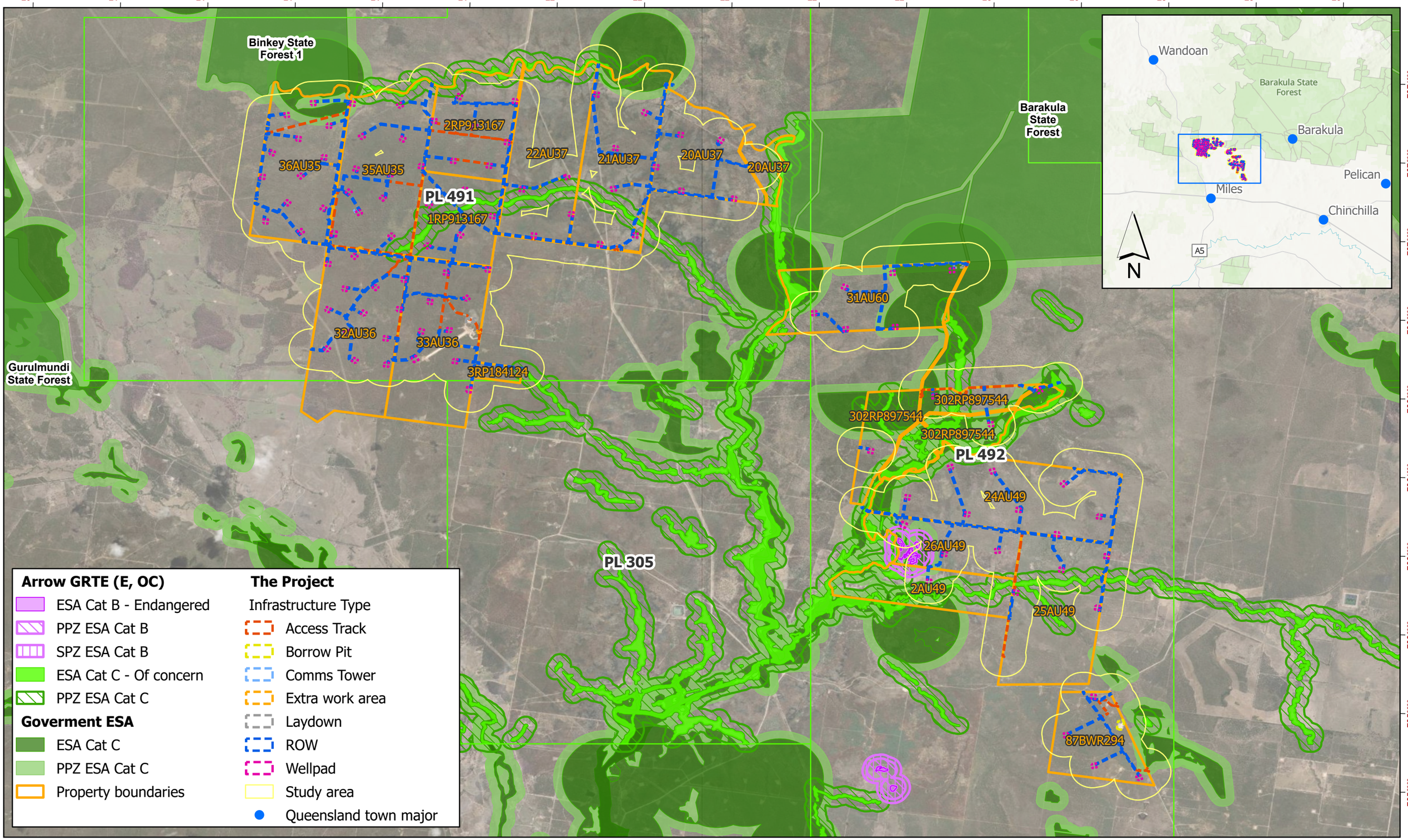
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0 2.26 4.52 Kilometers

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Figure 3.2
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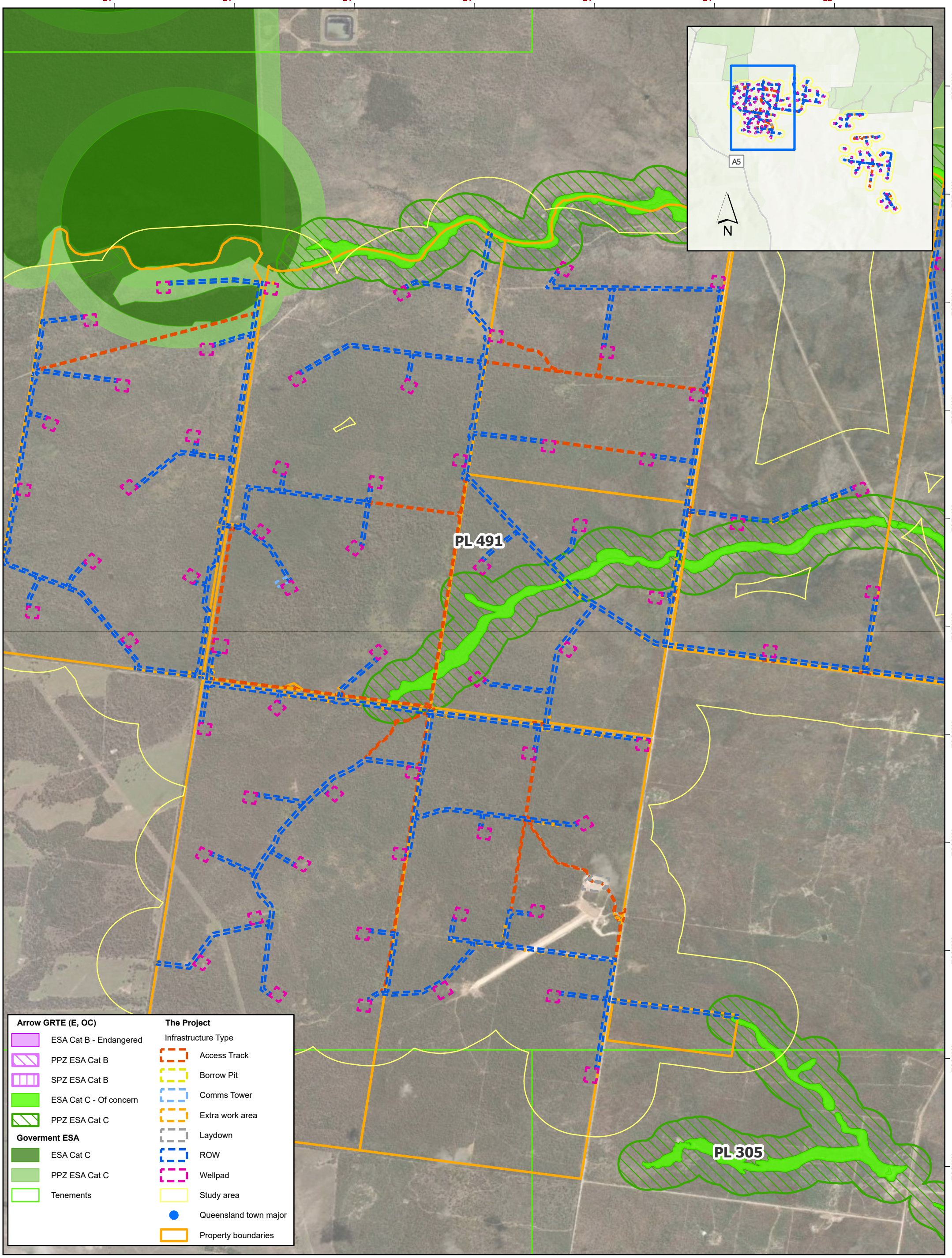
Environmentally Sensitive Areas

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0 0.38 0.75 1.5 Kilometers

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Scale: 1:31,000

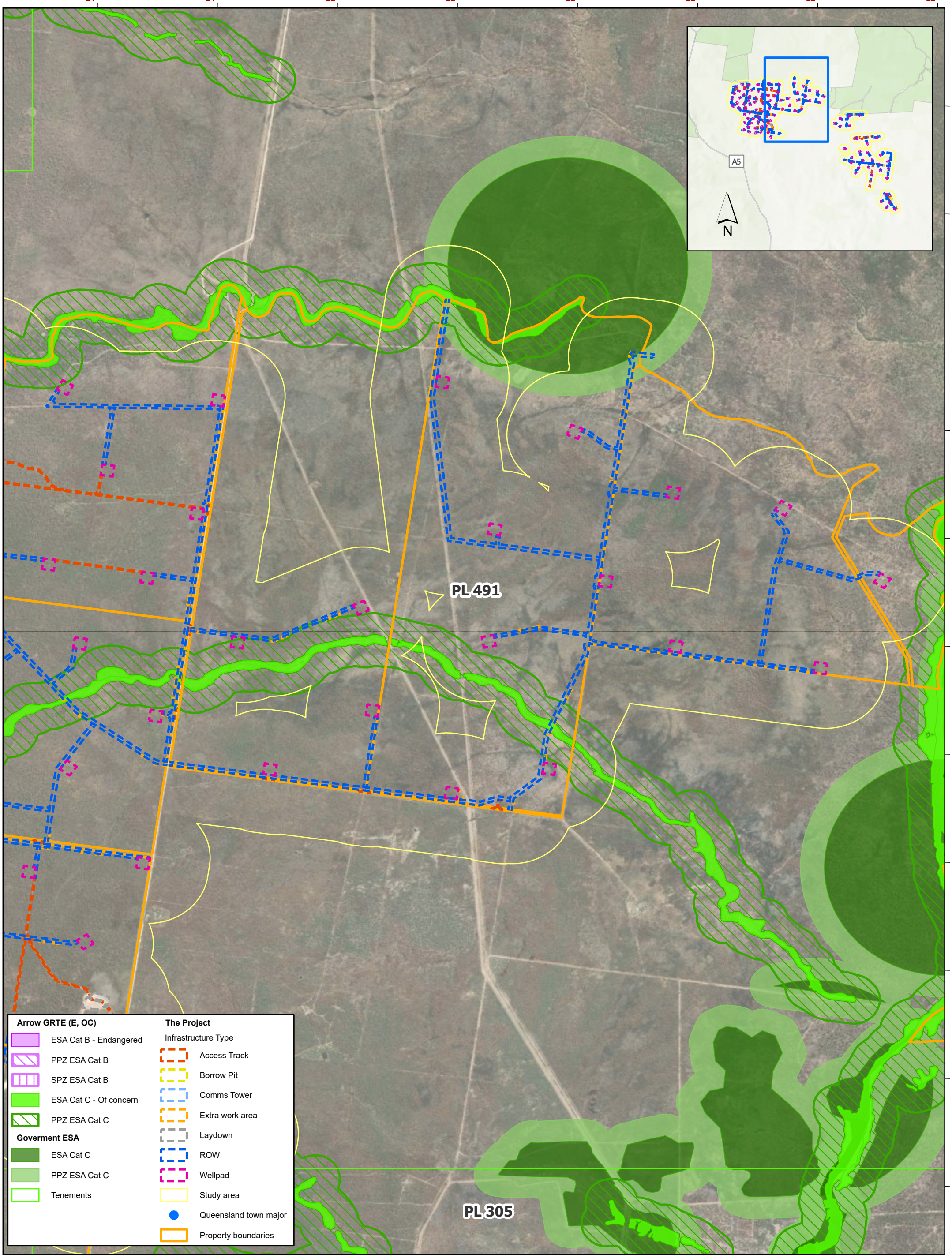
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Environmentally Sensitive Areas

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0 0.38 0.75 1.5 Kilometers

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Environmentally Sensitive Areas

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Arrow GRTE (E, OC)

- ESA Cat B - Endangered
- PPZ ESA Cat B
- SPZ ESA Cat B
- ESA Cat C - Of concern
- PPZ ESA Cat C

Goverment ESA

- ESA Cat C
- PPZ ESA Cat C
- Tenements

The Project

Infrastructure Type

- Access Track
- Borrow Pit
- Comms Tower
- Extra work area
- Laydown
- ROW
- Wellpad
- Study area
- Queensland town major
- Property boundaries

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0 0.38 0.75 1.5 Kilometers

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Figure: 3.2

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Environmentally Sensitive Areas

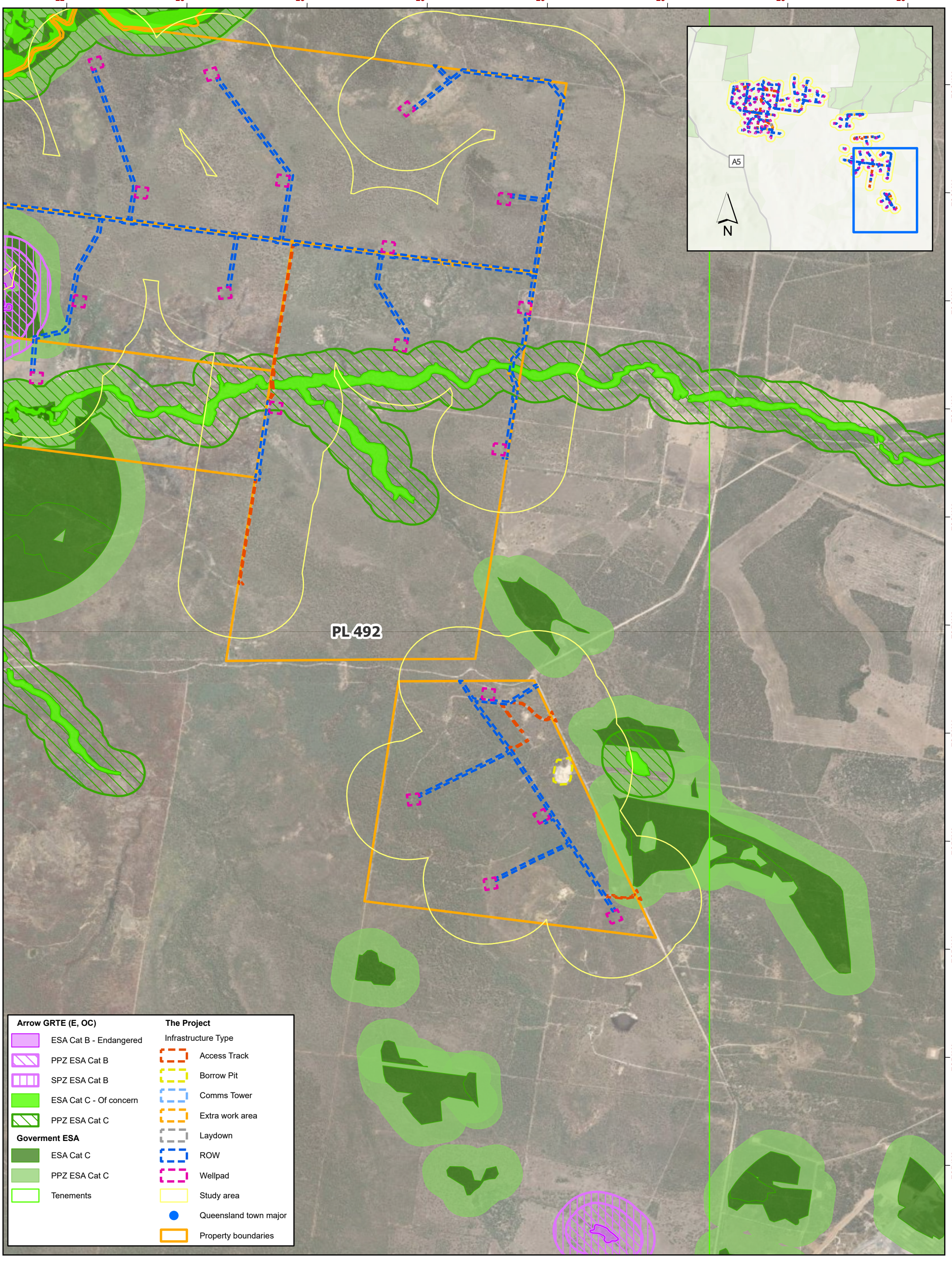
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0 0.38 0.75 1.5 Kilometers

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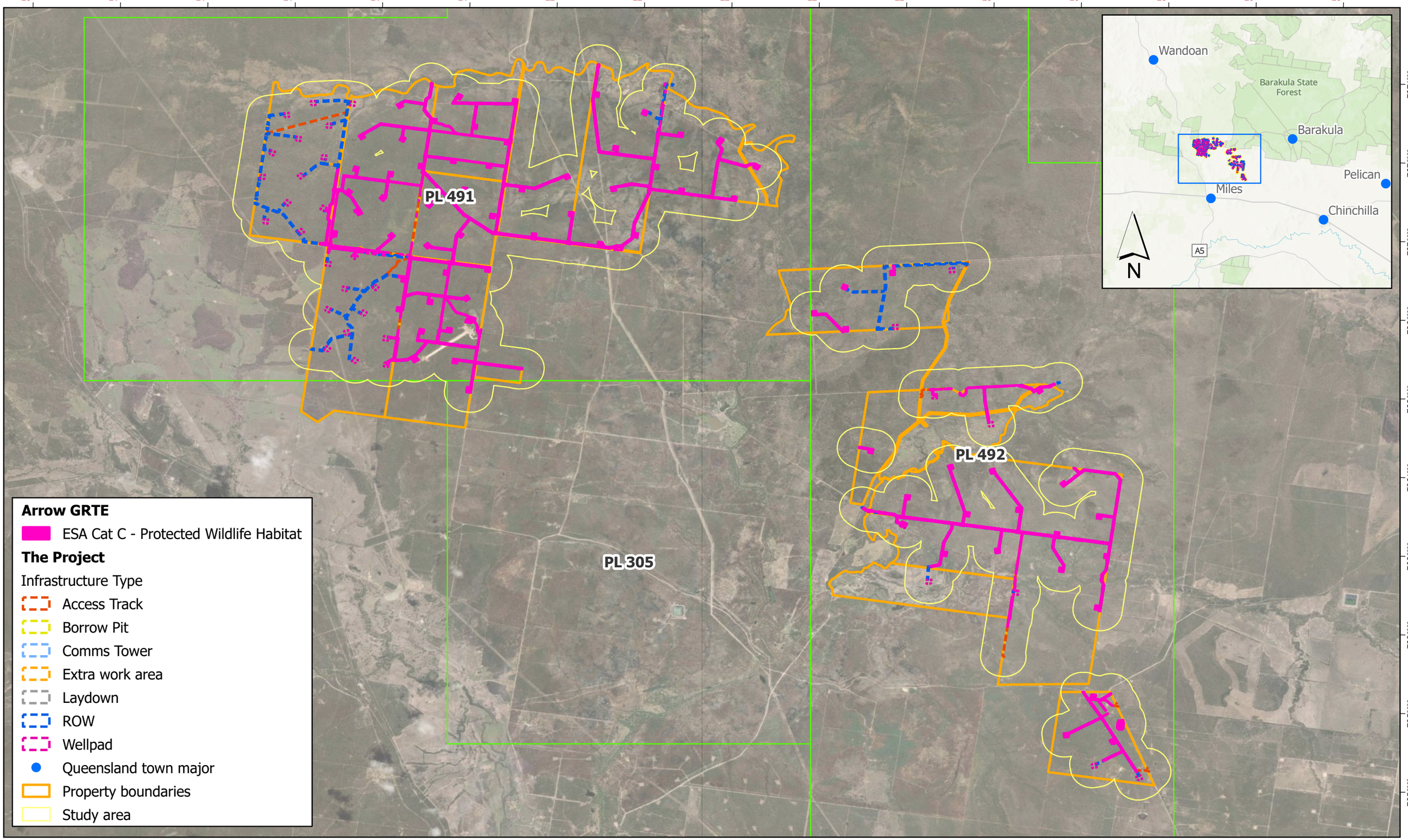
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Environmentally Sensitive Areas

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0 2.26 4.52 Kilometers

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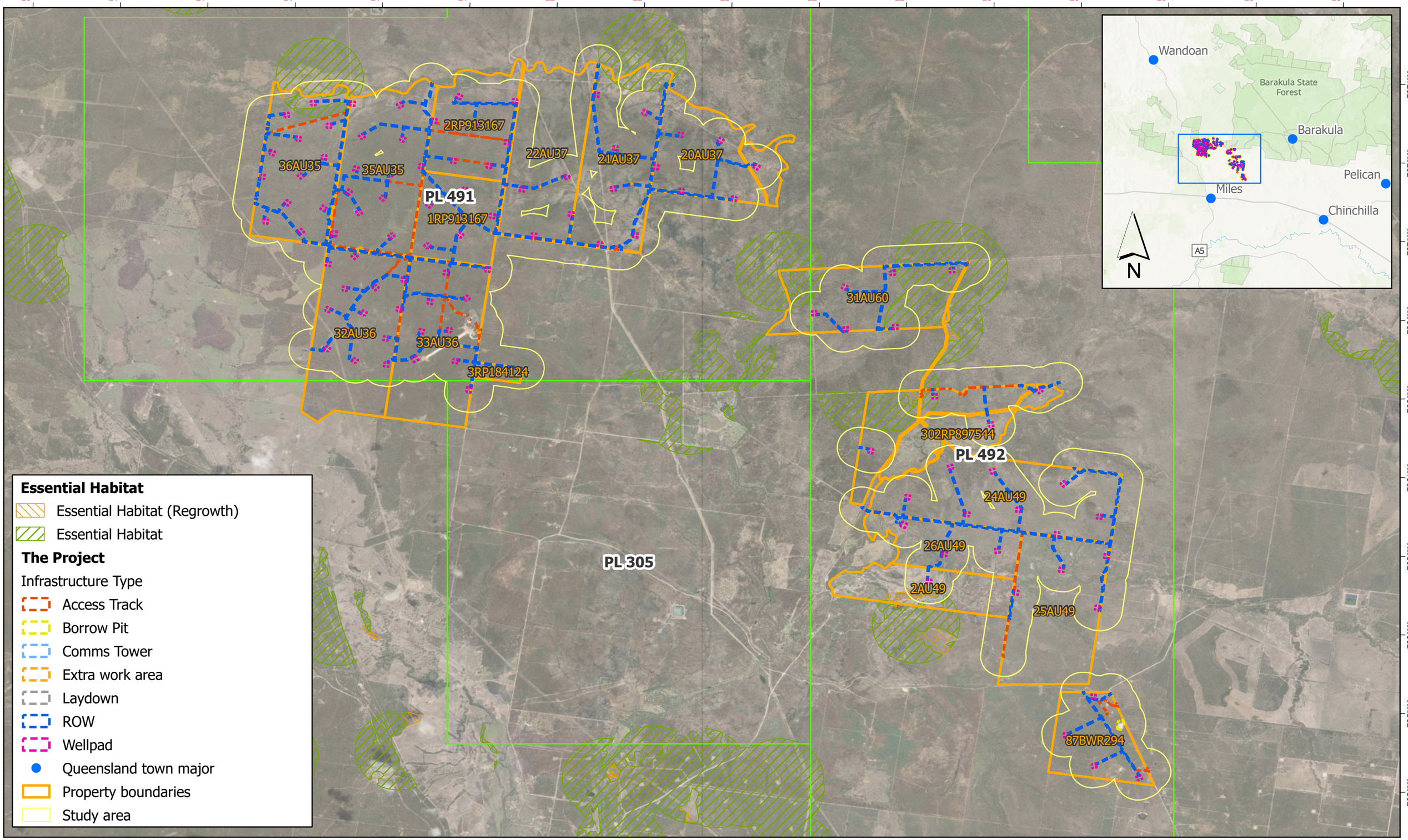
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Figure 3.3

Environmentally Sensitive Areas Category C Protected Wildlife Habitat

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0 2.5 5 Kilometers

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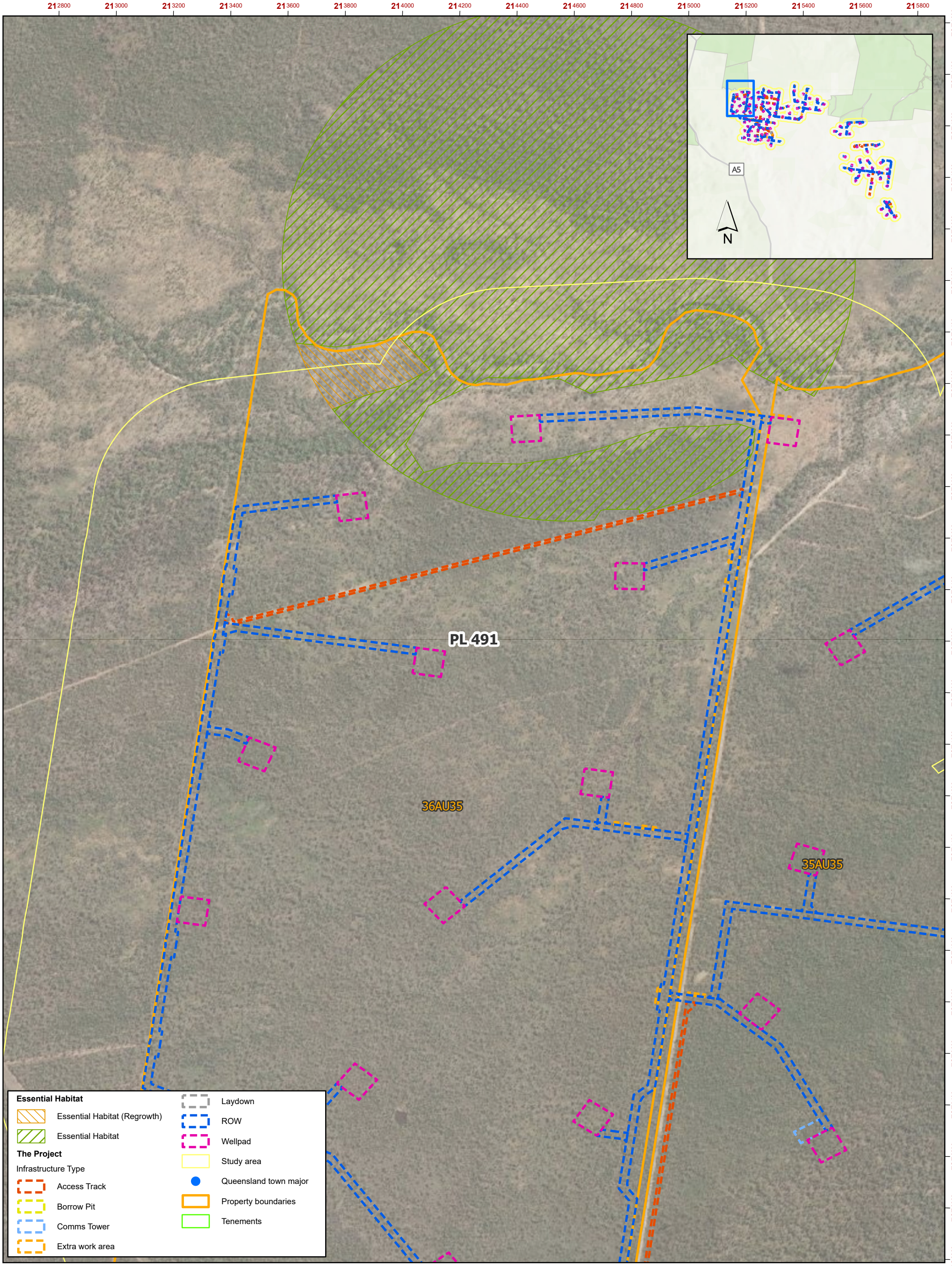
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Figure 3.4

Essential habitat

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0 0.16 0.32 0.63 Kilometers

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Figure: 3.4
Page 2 of 4
Essential habitat map

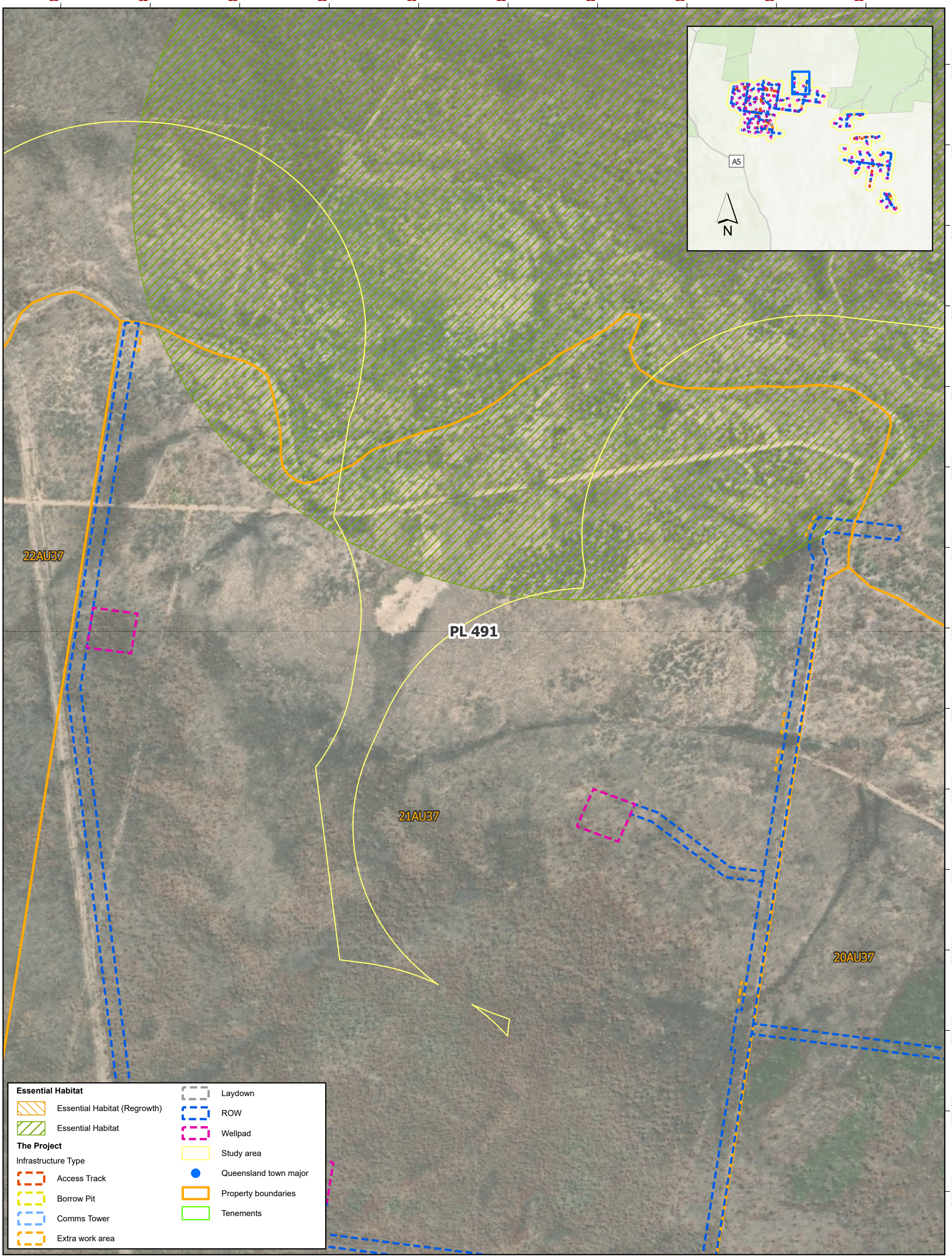
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Issued To: DETSI
Author: Thiago Moura
Date: 6/03/2026

0 0.1 0.2 0.4 Kilometers

N

@A3

Scale: 1:8,320

Figure: 3.4
Page 3 of 4
Essential habitat map

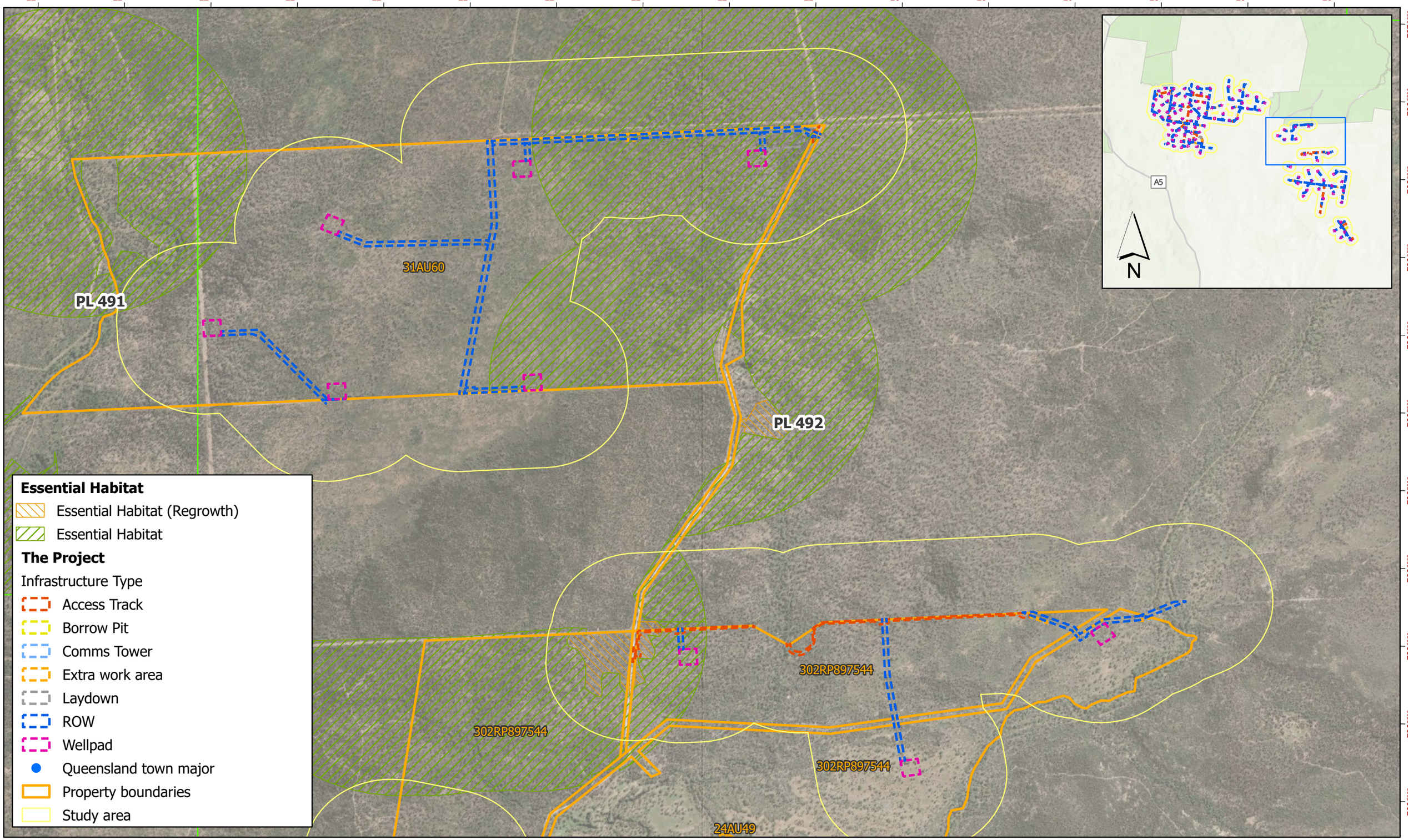
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Date: 6/03/2026

0 0.75 1.5 Kilometers

N

@A3

Scale: 1:22,000

Source: Arrow Energy Pty Ltd
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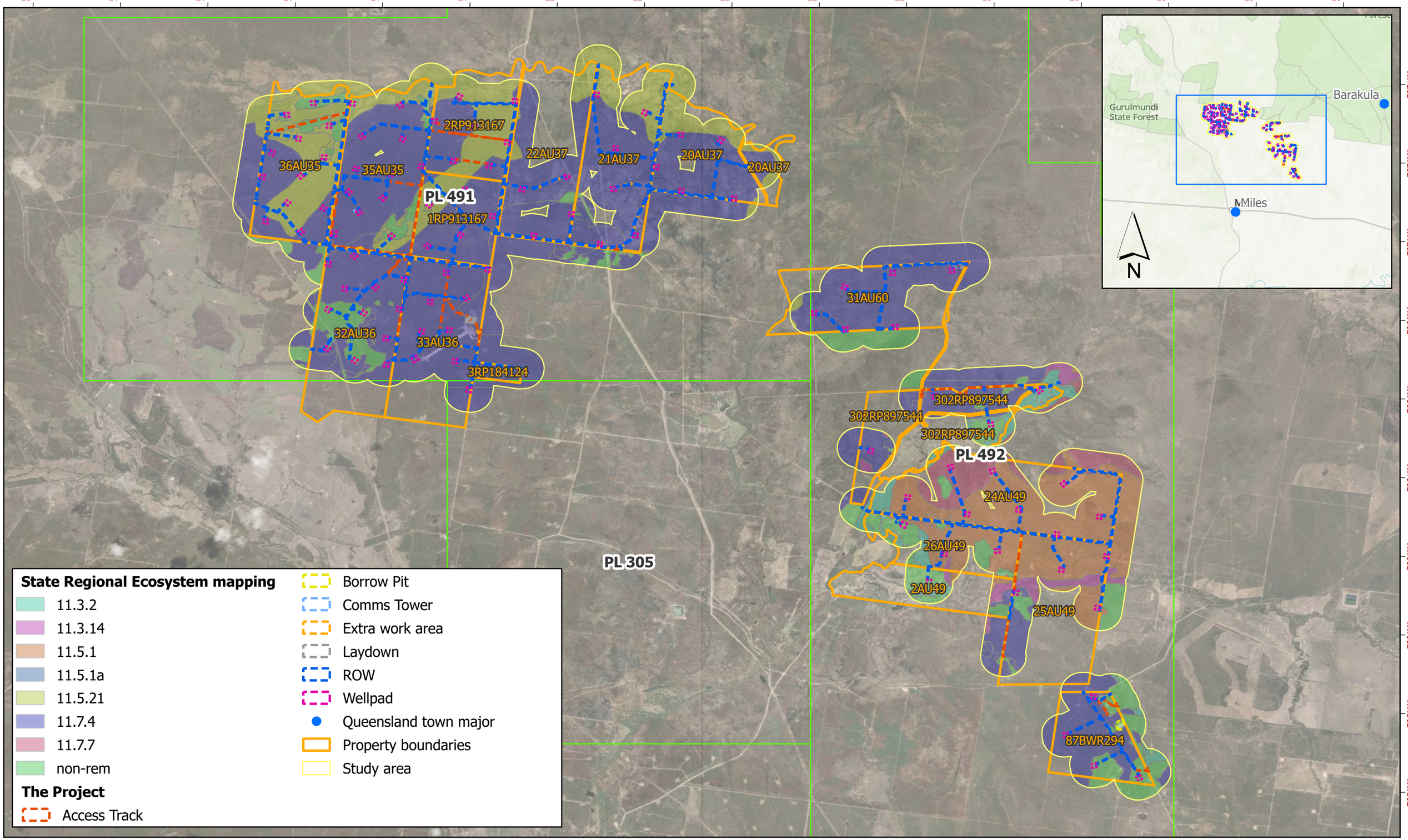
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Figure 3.4

Essential habitat

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Date: 6/03/2026

0 2.96 5.92 Kilometers

N

@A3

Scale: 1:87,000

Figure 3.5
Page 1 of 1

State Regional Ecosystem mapping

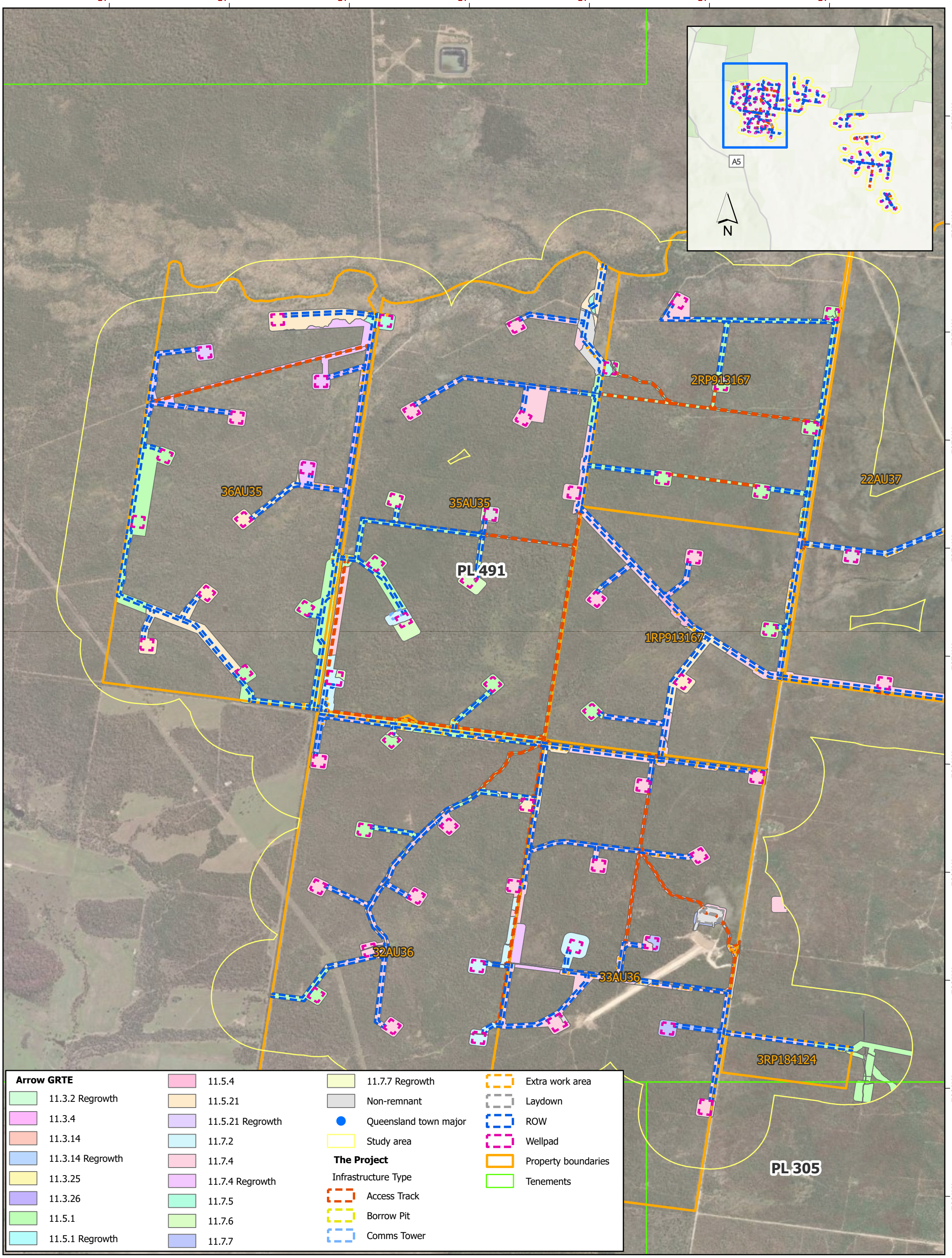
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Issued To: DETSI
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Date: 6/03/2026

0 0.38 0.75 1.5 Kilometers

N

@A3
Scale: 1:31,000

Figure: 3.6
Page 1 of 4
Ground-truthed Regional Ecosystem mapping

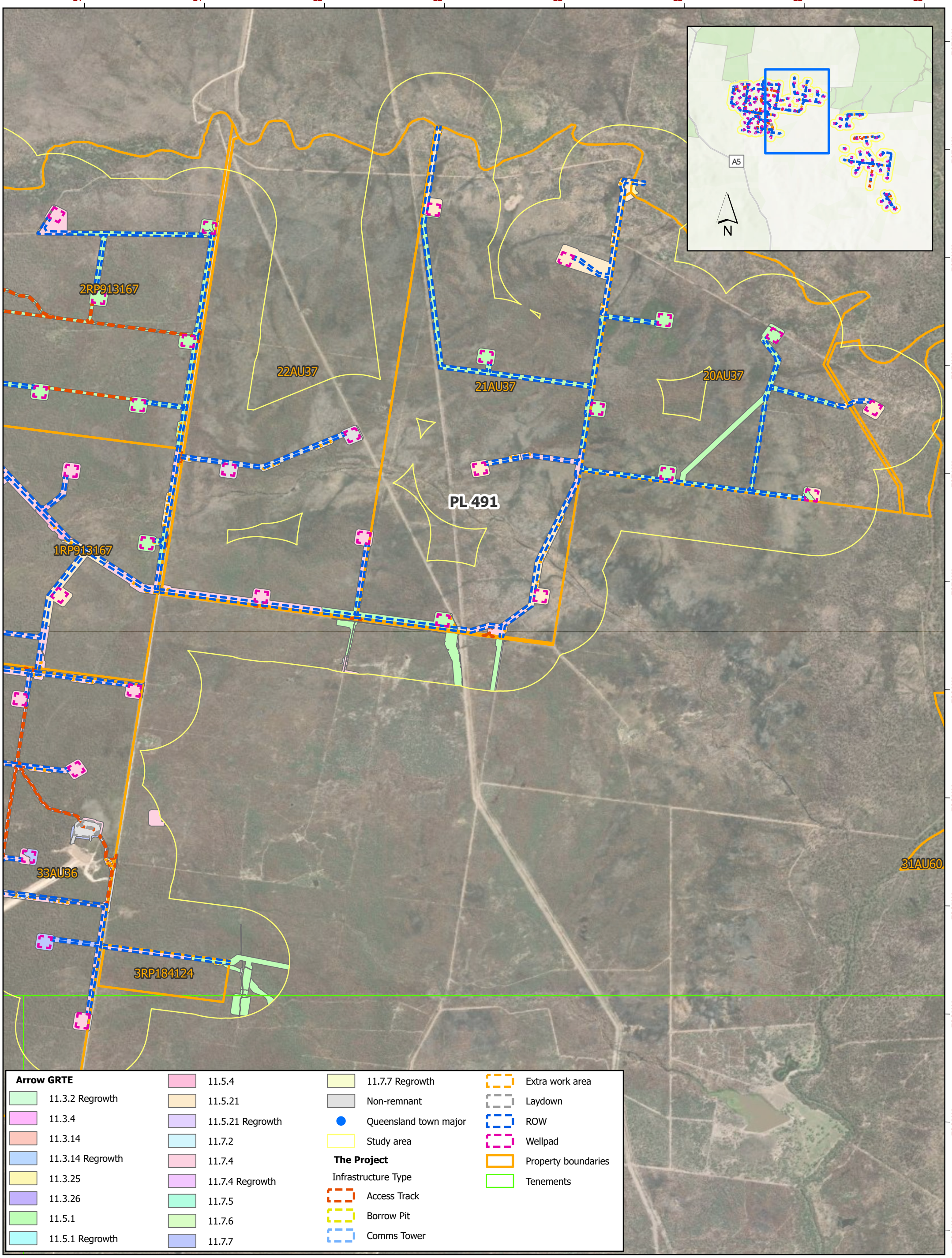
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Date: 6/03/2026

0 0.38 0.75 1.5 Kilometers

N

@A3

Scale: 1:31,000

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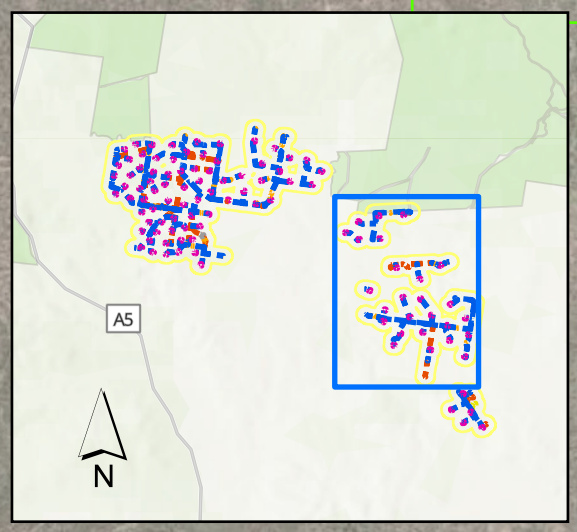
Figure: 3.6

Ground-truthed Regional Ecosystem mapping

NOT FOR CONSTRUCTION

22 6000 | 22 7000 | 22 8000 | 22 9000 | 23 0000 | 23 1000 | 23 2000 | 23 3000

707 0000 | 706 9000 | 706 8000 | 706 7000 | 706 6000 | 706 5000 | 706 4000 | 706 3000 | 706 2000 | 706 1000 | 706 0000 | 705 9000



PL 491

31AU60

302RP897544

PL 492

24AU49

PL 305

26AU49

2AU49

25AU49

Arrow GRTE

- 11.3.2 Regrowth
- 11.3.4
- 11.3.14
- 11.3.14 Regrowth
- 11.3.25
- 11.3.26
- 11.5.1
- 11.5.1 Regrowth
- 11.5.4
- 11.5.21
- 11.5.21 Regrowth
- 11.7.2
- 11.7.4
- 11.7.4 Regrowth
- 11.7.5
- 11.7.6
- 11.7.7
- 11.7.7 Regrowth
- Non-remnant
- Queensland town major
- Study area

The Project

Infrastructure Type

- Access Track
- Borrow Pit
- Comms Tower
- Extra work area
- Laydown
- ROW
- Wellpad
- Property boundaries
- Tenements

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Date: 6/03/2026

0 0.38 0.75 1.5 Kilometers

N

@A3

Scale: 1:31,000

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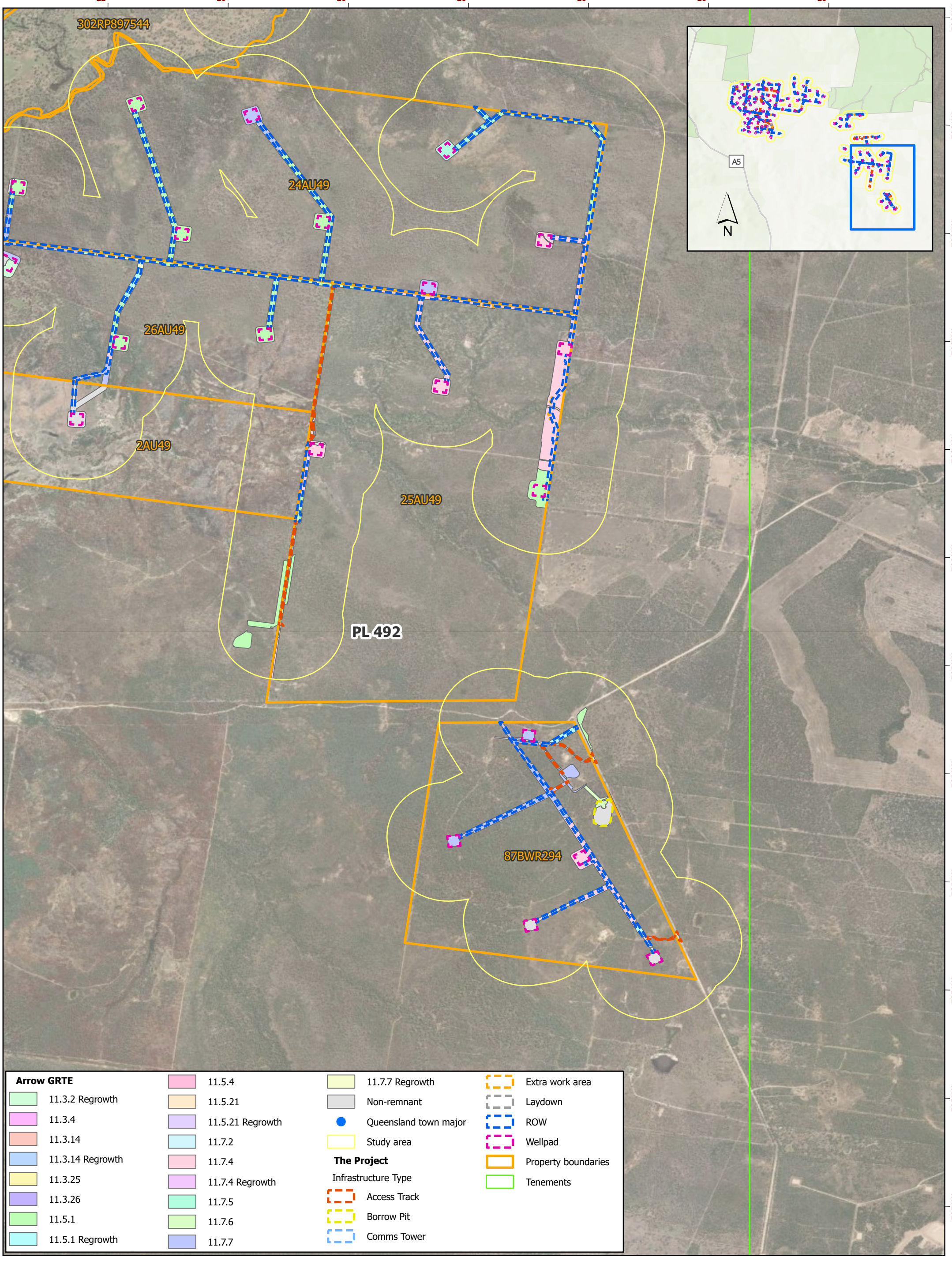
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Figure: 3.6

Ground-truthed Regional Ecosystem mapping

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Date: 6/03/2026

0 0.38 0.75 1.5 Kilometers

N

@A3
Scale: 1:31,000

Figure: 3.6
Page 4 of 4
Ground-truthed Regional Ecosystem mapping

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Binkey State Forest 1

Binkey State Forest 2

Gurulmundi State Forest

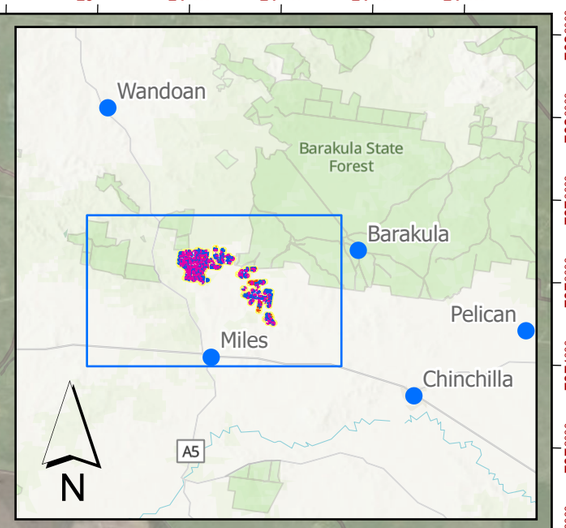
Barakula State Forest

PL 491

PL 305

PL 492

Miles



WildNet Records Flora
- Calytrix gurulmundensis
- Cryptandra ciliata
- Vincetoxicum forsteri

Protected areas
- National Park
- State Forest

The Project

Infrastructure Type
- Access Track
- Borrow Pit
- Comms Tower
- Extra work area
- Laydown
- ROW
- Wellpad
- Tenements
- Study area
- Queensland town major

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Date: 6/03/2026

0 4.29 8.58 Kilometers

N

@A3

Scale: 1:149,197

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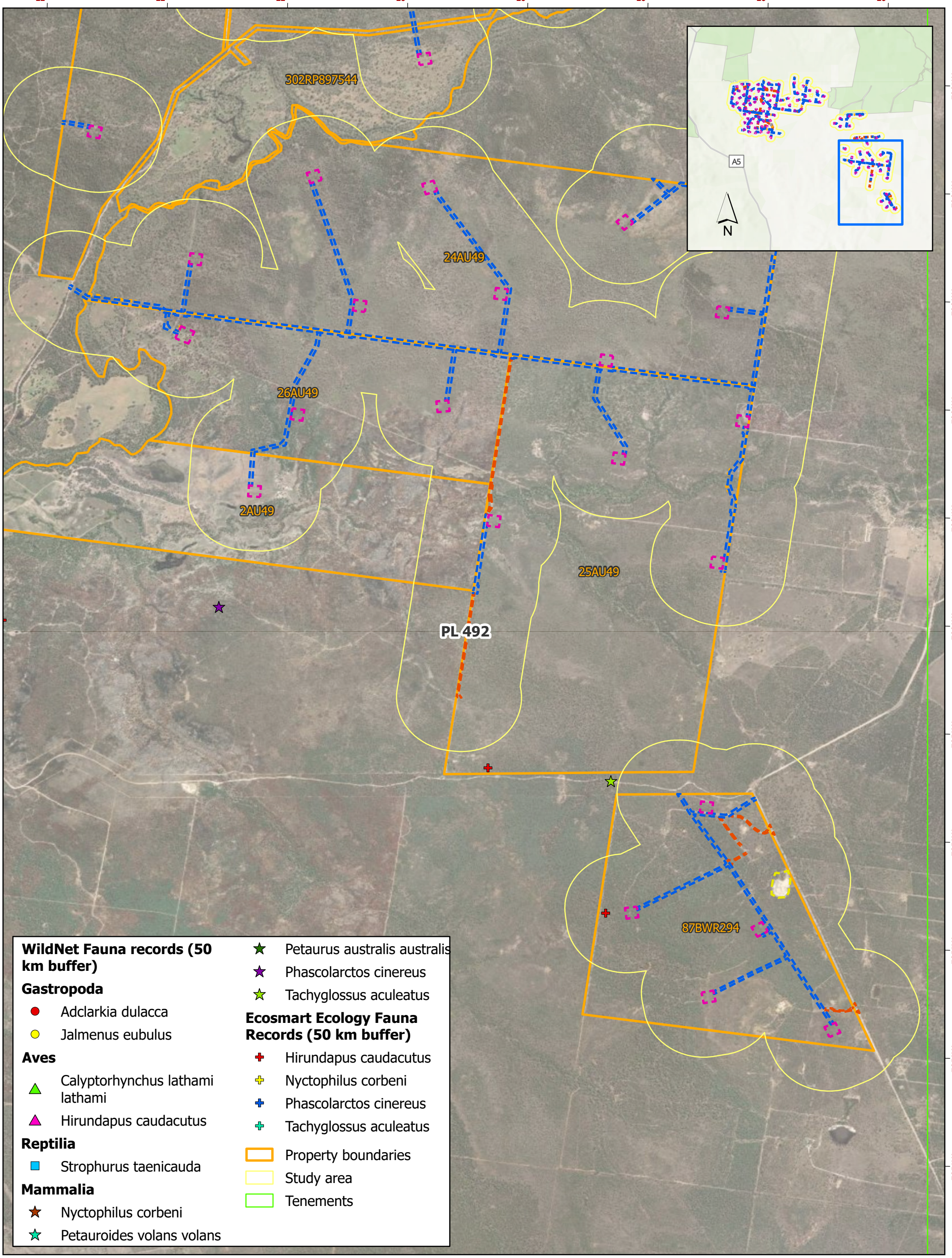
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Figure 3.7

Conservation significate flora records that are known or likely to occur in the Study

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Issued To: DETSI
Author: Thiago Moura
Date: 10/03/2026

0 0.25 0.5 1 Kilometers

N

@A3

Scale: 1:31,000

Figure: 3.8
Page 4 of 4
Conservation-significant fauna records that are known or likely to occur in the Study

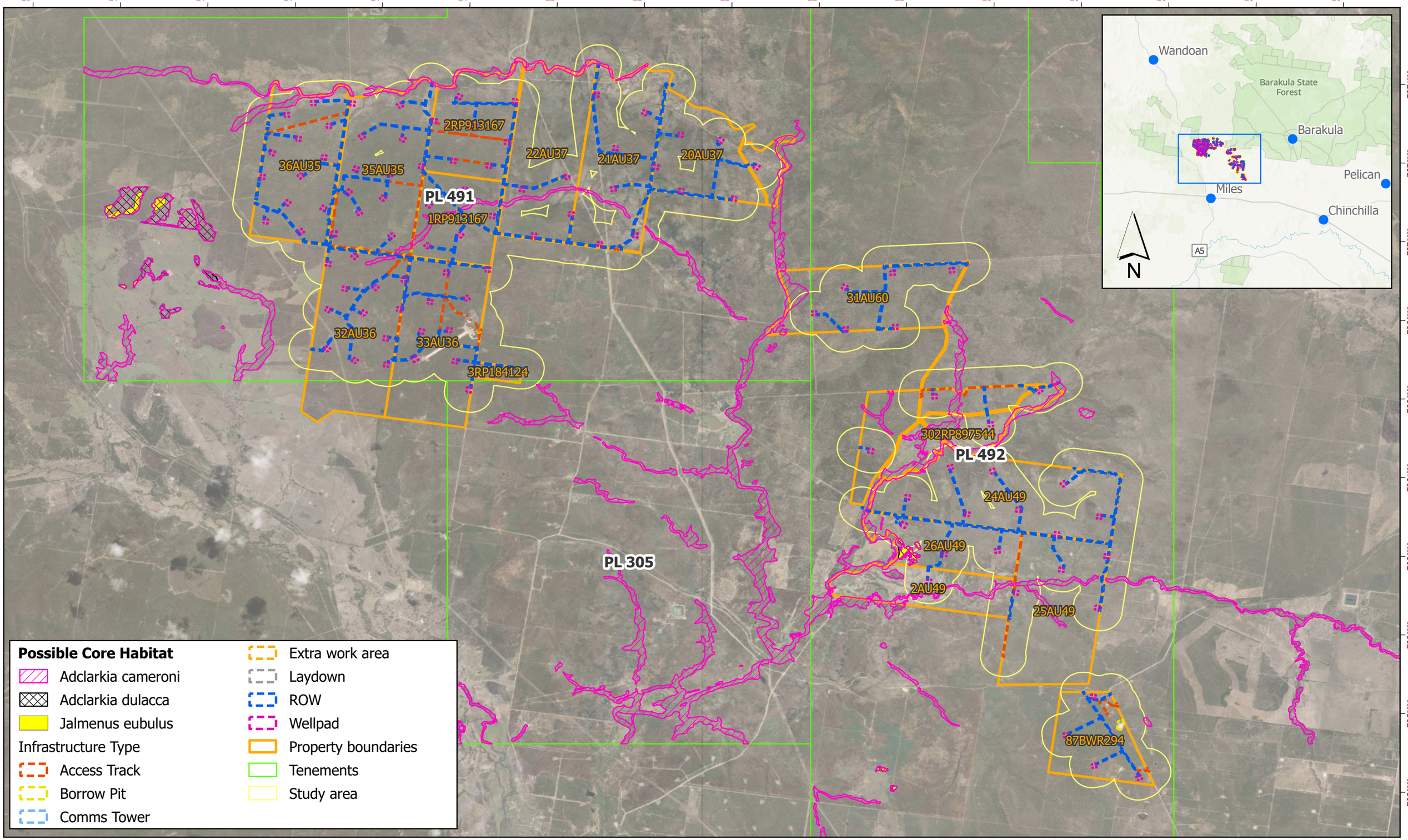
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Date: 10/03/2026

Source: Arrow Energy Pty Ltd
Geoscience Australia
Dept. Natural Resources and Mines

0 2.49 4.99 Kilometers

N

@A3

Scale: 1:87,000

Figure 3.9
Page 1 of 5

Conservation-significant Gastropoda that are known or likely to occur in the Study

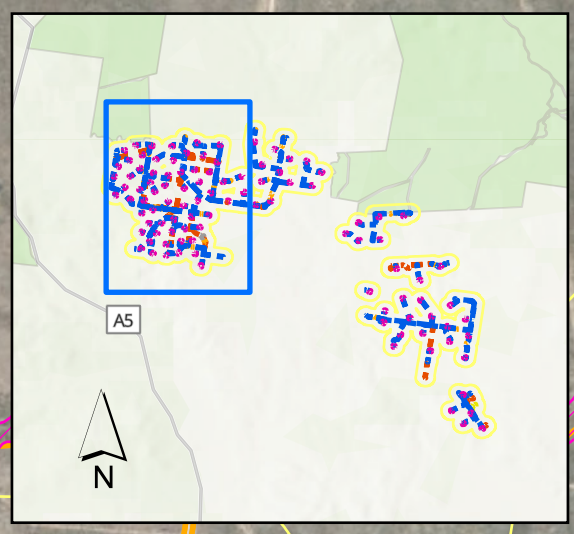
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21 3000 21 4000 21 5000 21 6000 21 7000 21 8000 21 9000 22 0000

707 5000 707 4000 707 3000 707 2000 707 1000 707 0000 706 9000 706 8000 706 7000 706 6000 706 5000



2RP913167
22AU37
36AU35
35AU35
PL 491
1RP913167
21AU37
32AU36
33AU36
3RP184124
PL 305

Possible Core Habitat
- Adclarkia cameroni
- Adclarkia dulacca
- Jalmenus eubulus

The Project

Infrastructure Type
- Access Track
- Borrow Pit
- Comms Tower
- Extra work area
- Laydown
- ROW
- Wellpad
- Property boundaries
- Tenements
- Study area

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Date: 10/03/2026

0 0.32 0.63 1.26 Kilometers

N

@A3
Scale: 1:31,000

Source: Arrow Energy Pty Ltd
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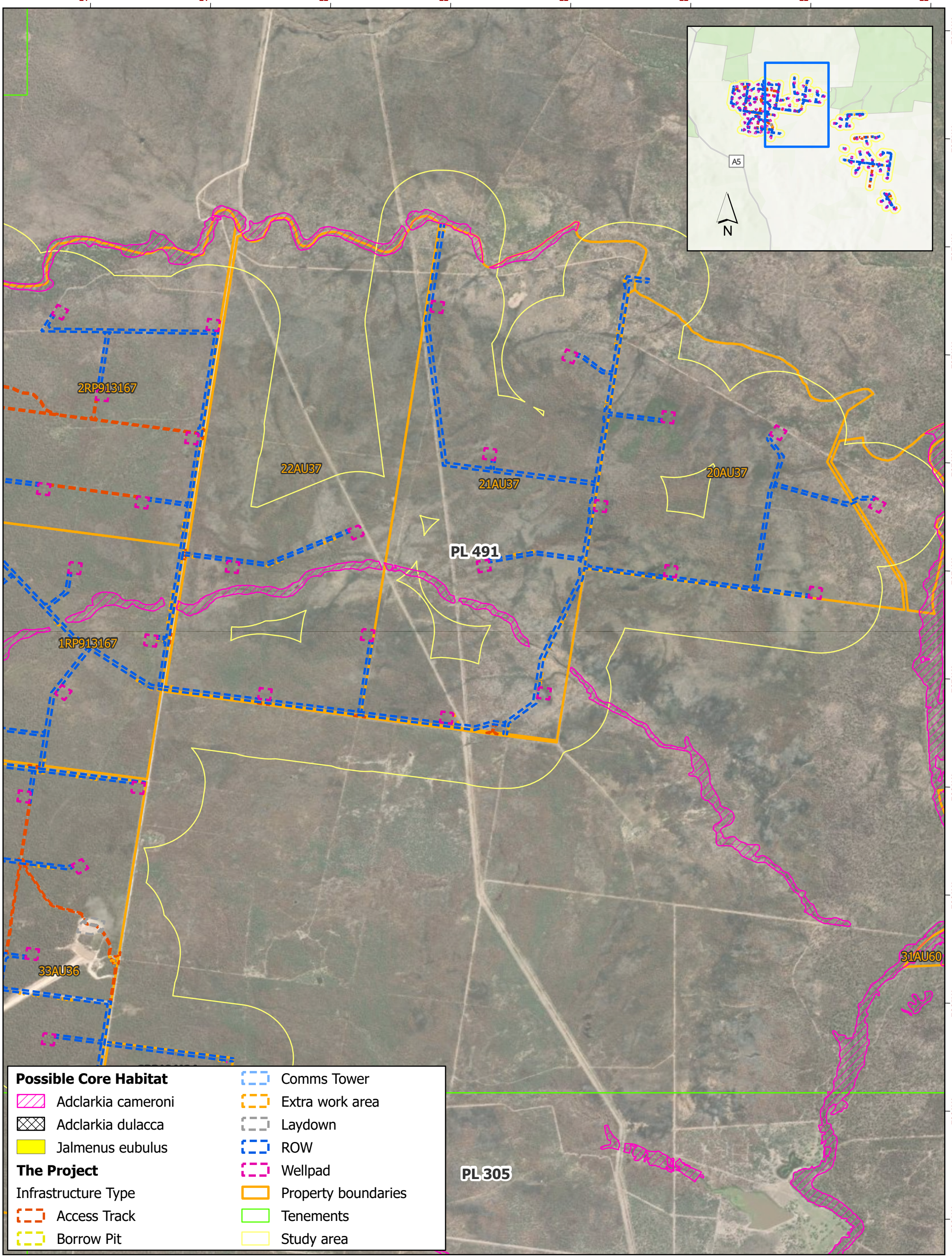
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Figure: 3.9
Page 2 of 5
Conservation-significant Gastropoda that are known or likely to occur in the Study

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Issued To: DETSI
Author: Thiago Moura
Date: 10/03/2026

0 0.32 0.63 1.26 Kilometers

N

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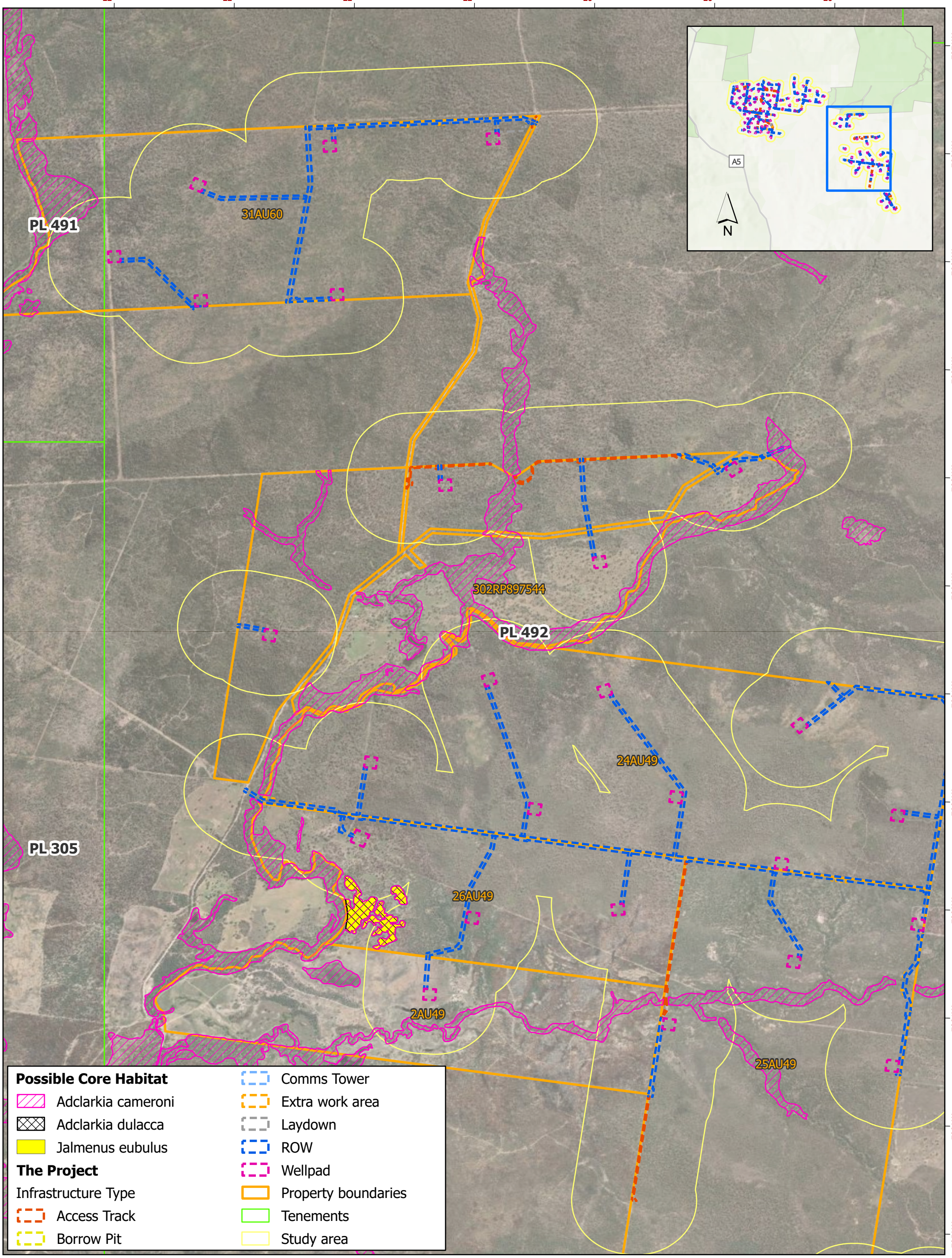
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Figure: 3.9

Conservation-significant Gastropoda that are known or likely to occur in the Study

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Date: 10/03/2026

0 0.32 0.63 1.26 Kilometers

N

@A3
Scale: 1:31,000

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Figure: 3.9

Conservation-significant Gastropoda that are known or likely to occur in the Study

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Date: 10/03/2026

0 0.5 1 2 Kilometers

N

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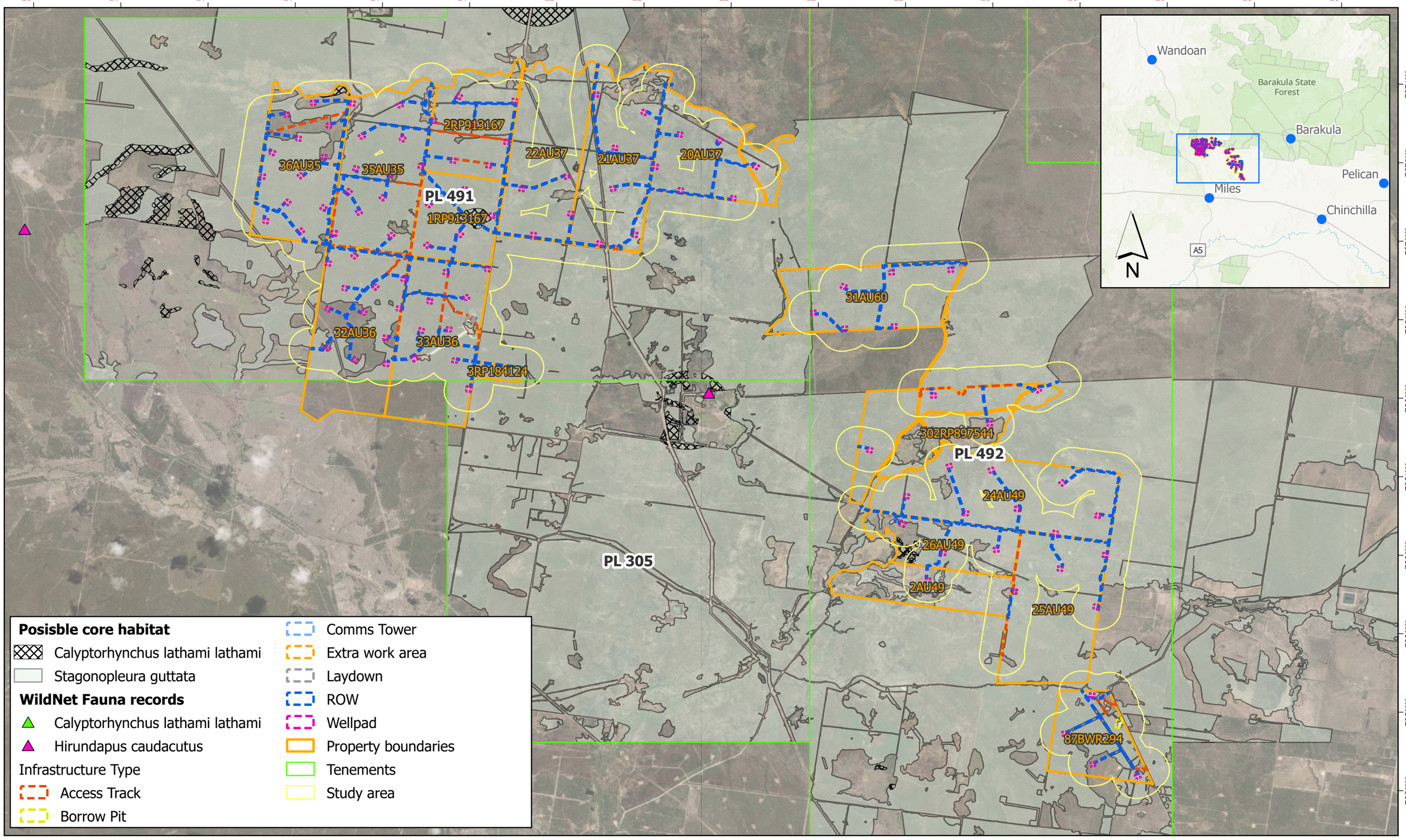
@A3
Scale: 1:31,000

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Figure: 3.9

Conservation-significant Gastropoda that are known or likely to occur in the Study

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Issued To: DETSI
Author: Thiago Moura
Date: 11/03/2026

0 2.5 5 Kilometers

N

@A3

Scale: 1:87,000

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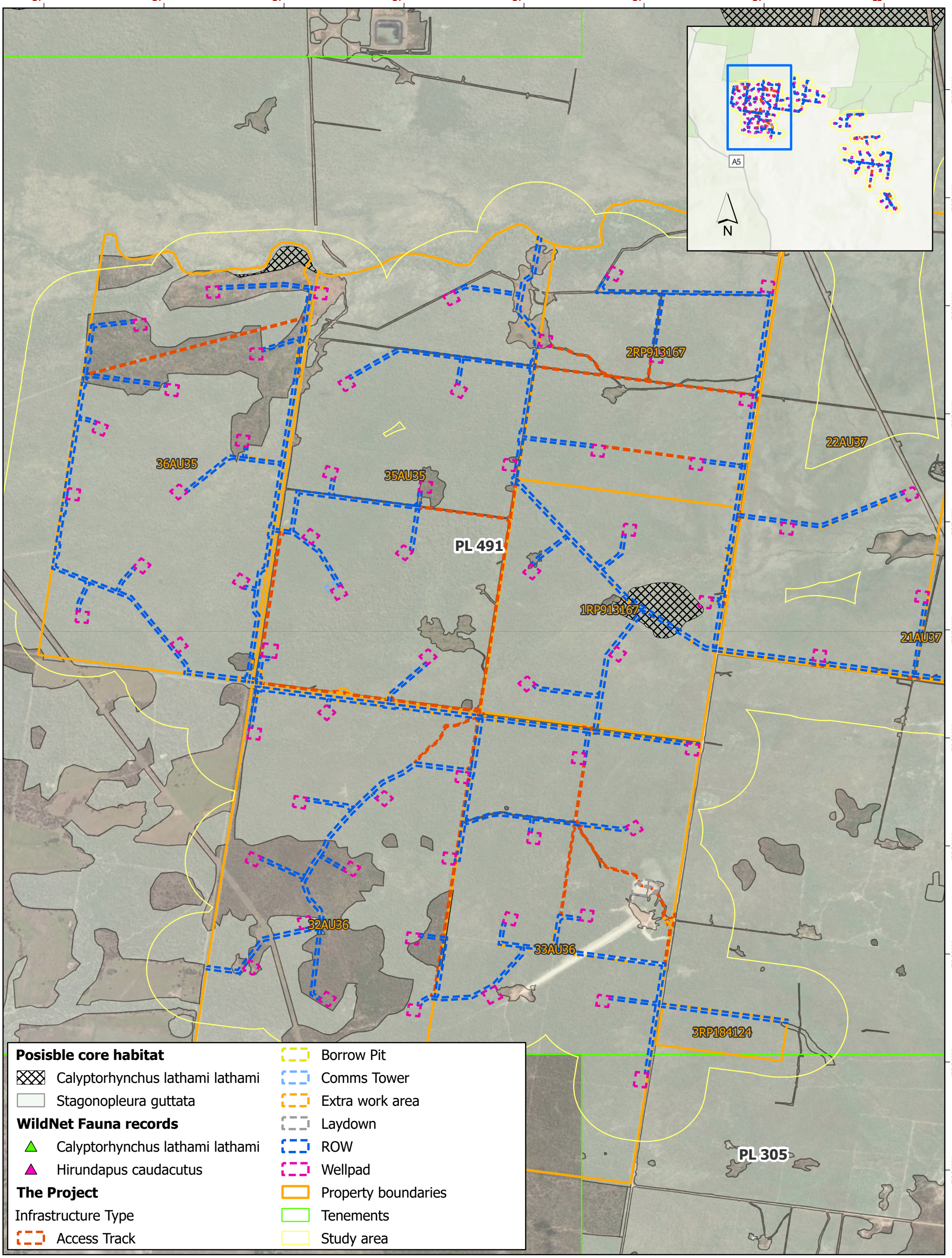
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Figure 3.10

Conservation-significant Aves that are known or likely to occur in the Study area

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Date: 11/03/2026

0 0.5 1 2 Kilometers

N

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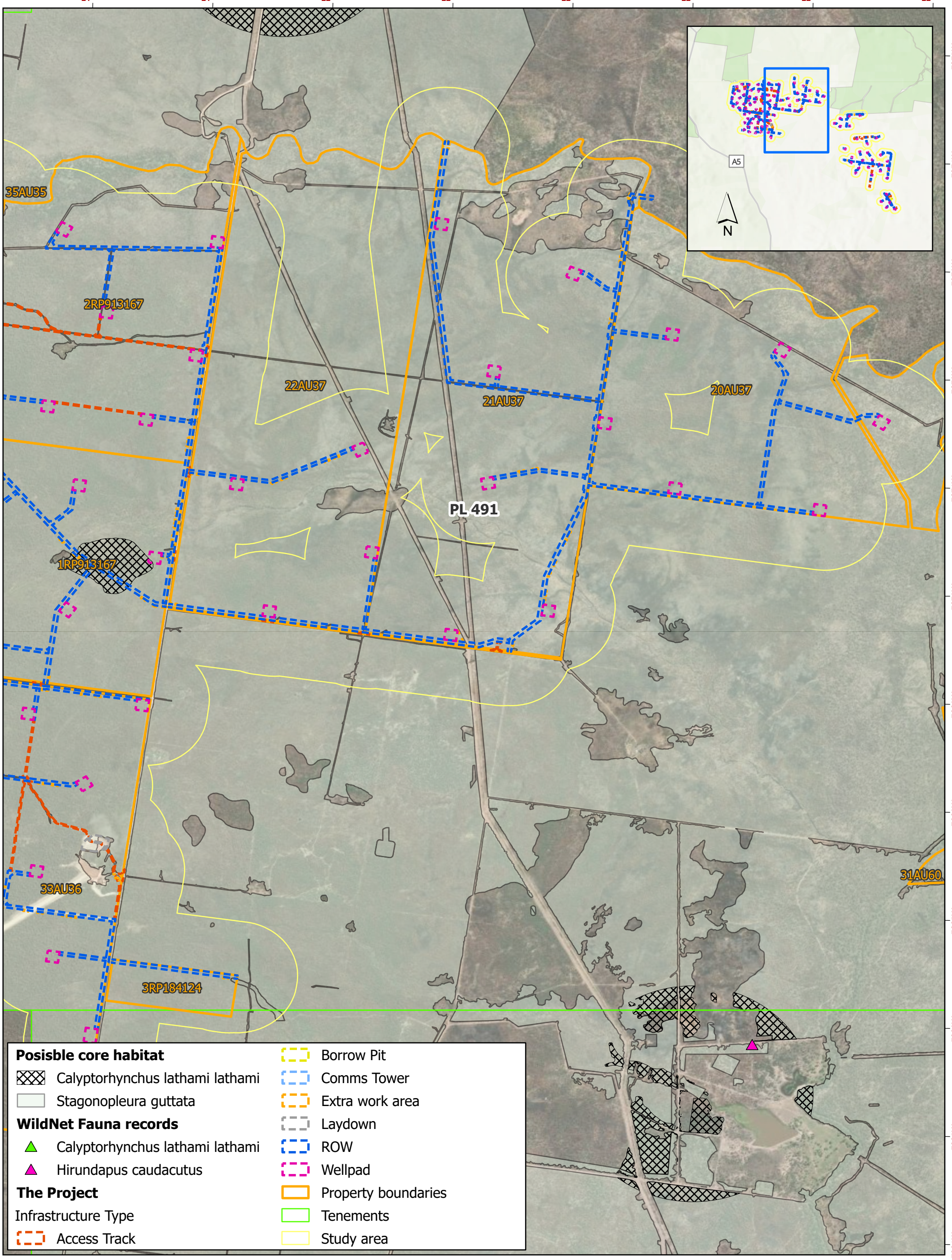
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Figure: 3.10

Conservation-significant Aves that are known or likely to occur in the Study area

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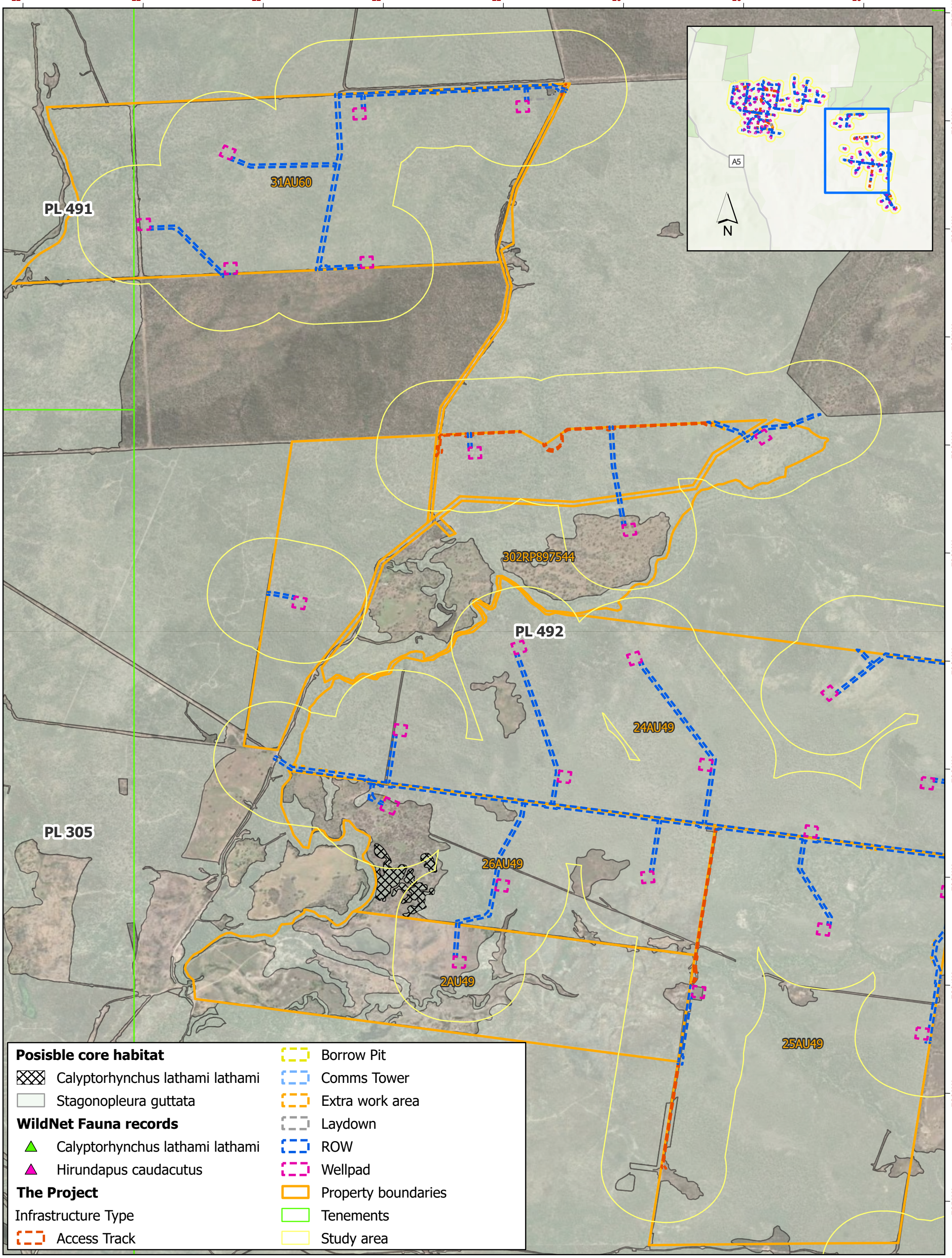
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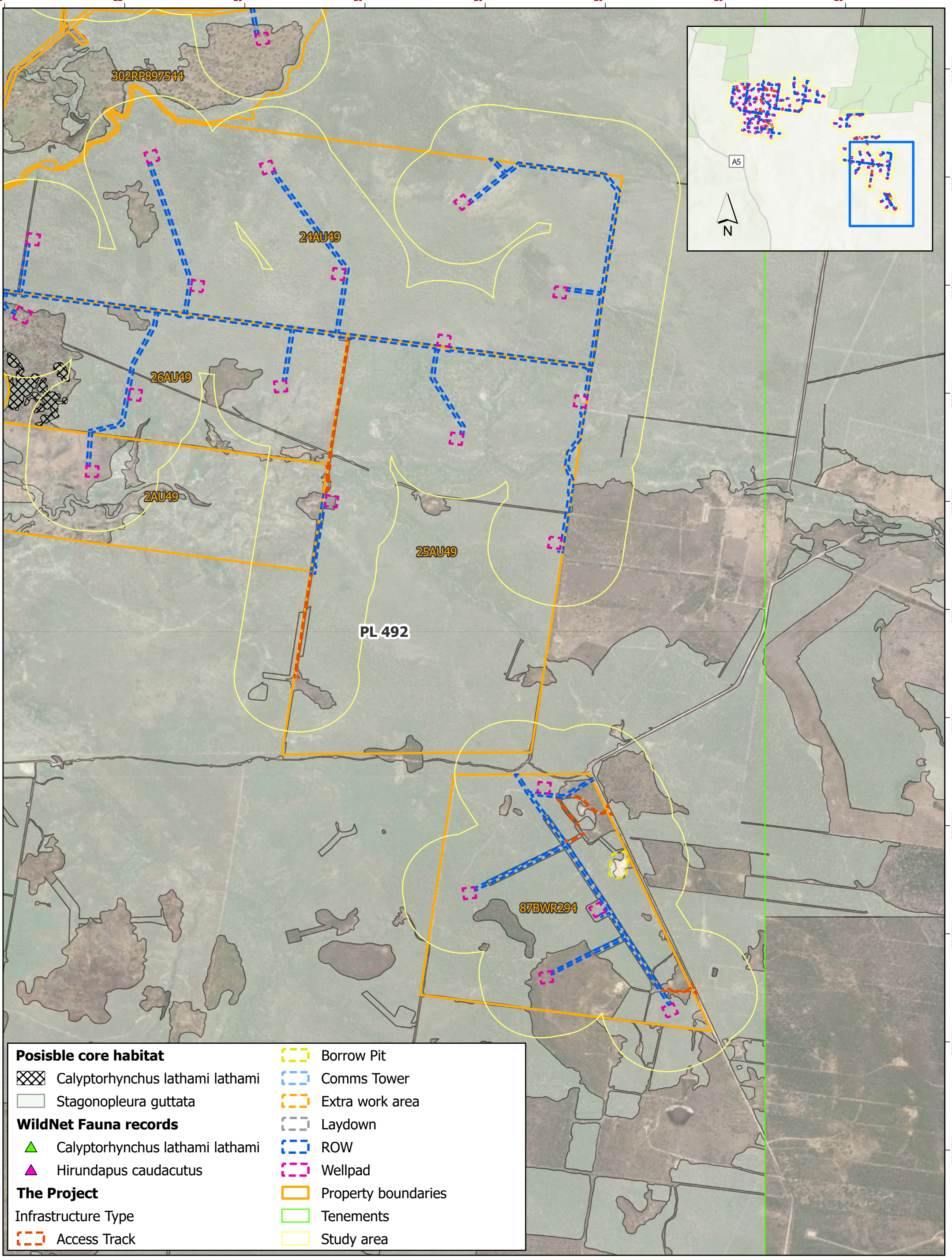
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Conservation-significant Aves that are known or likely to occur in the Study area

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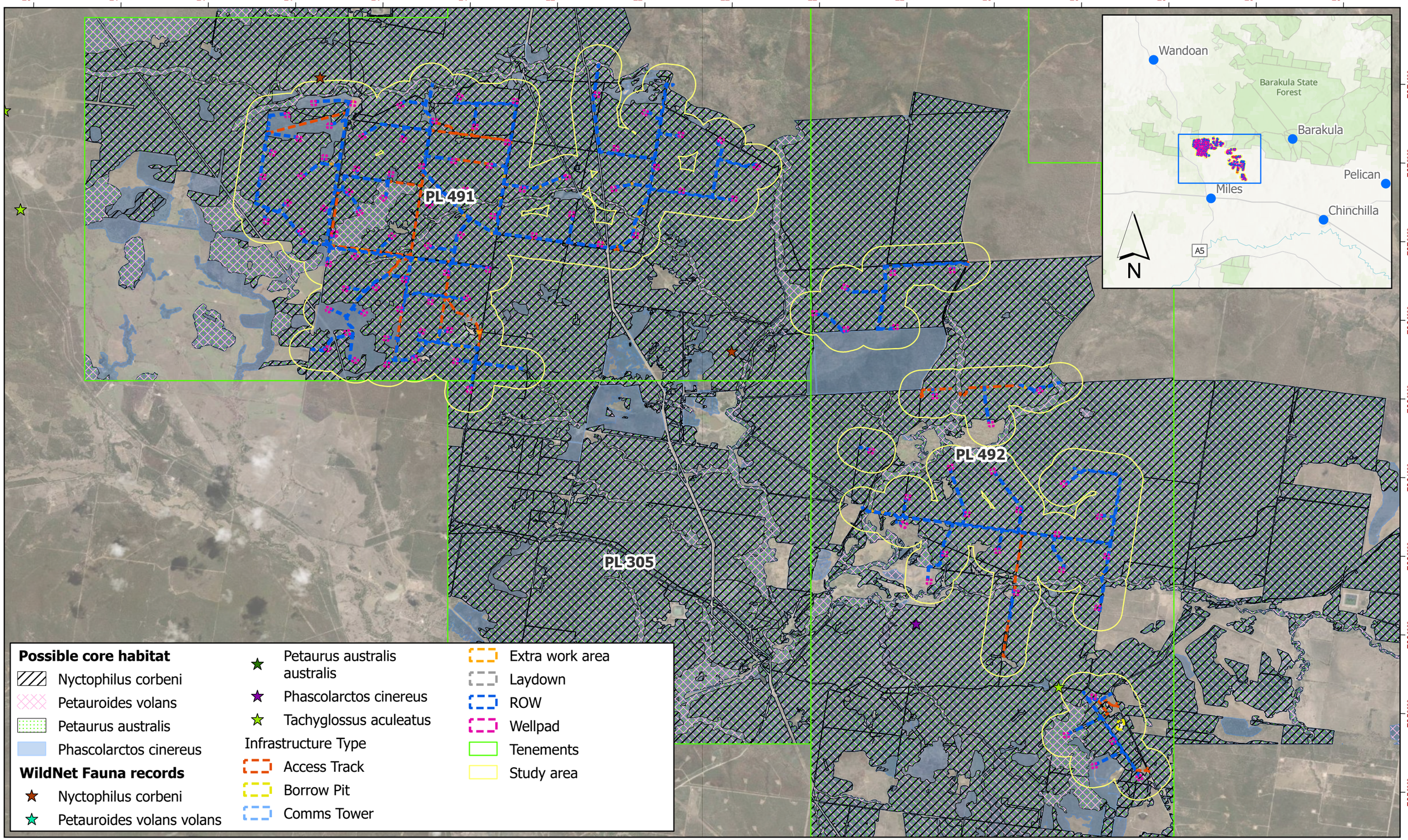
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Conservation-significant Aves that are known or likely to occur in the Study area

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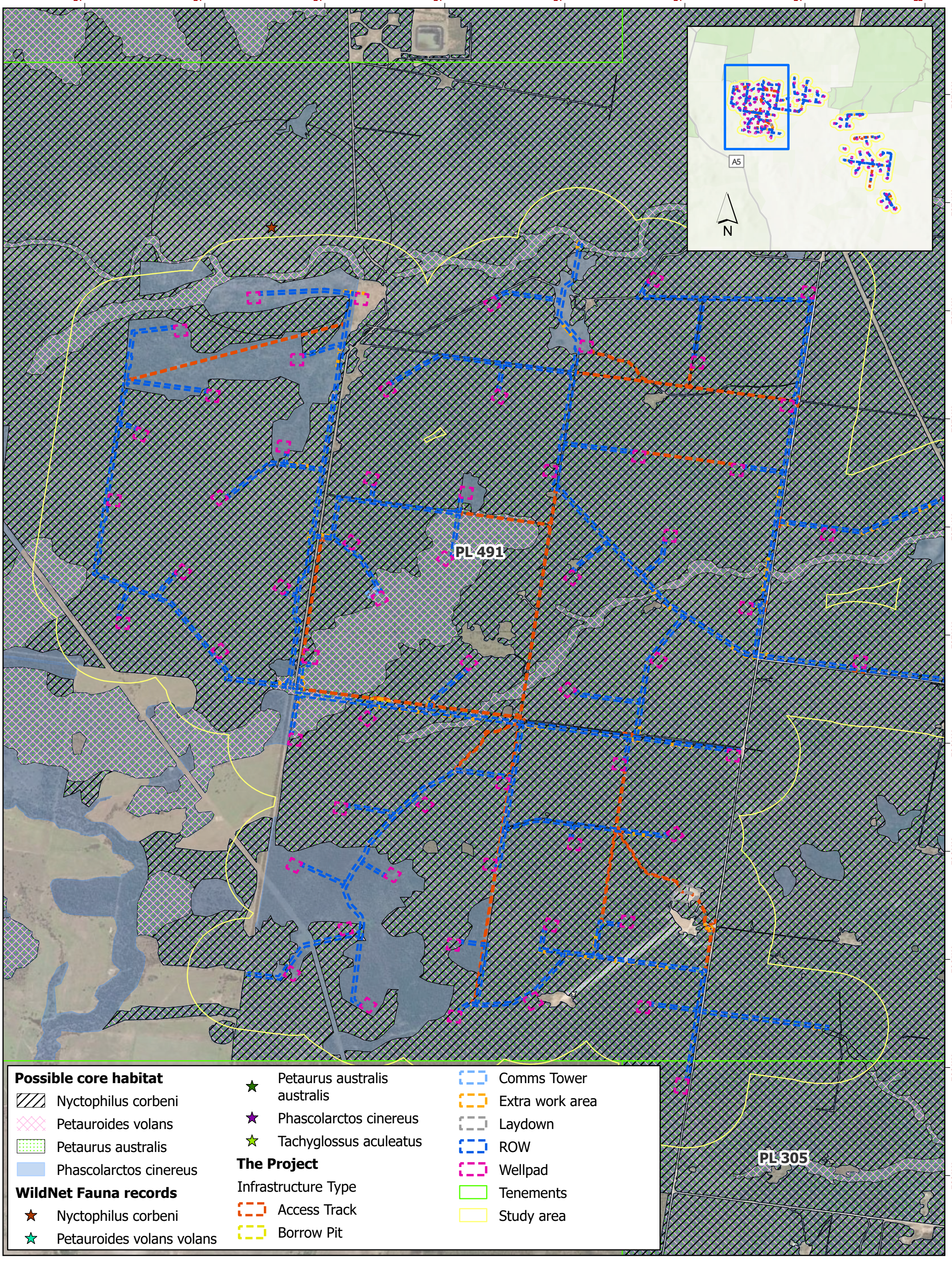
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Figure 3.11

Conservation-significant Mammalia that are known or likely to occur in the Study area

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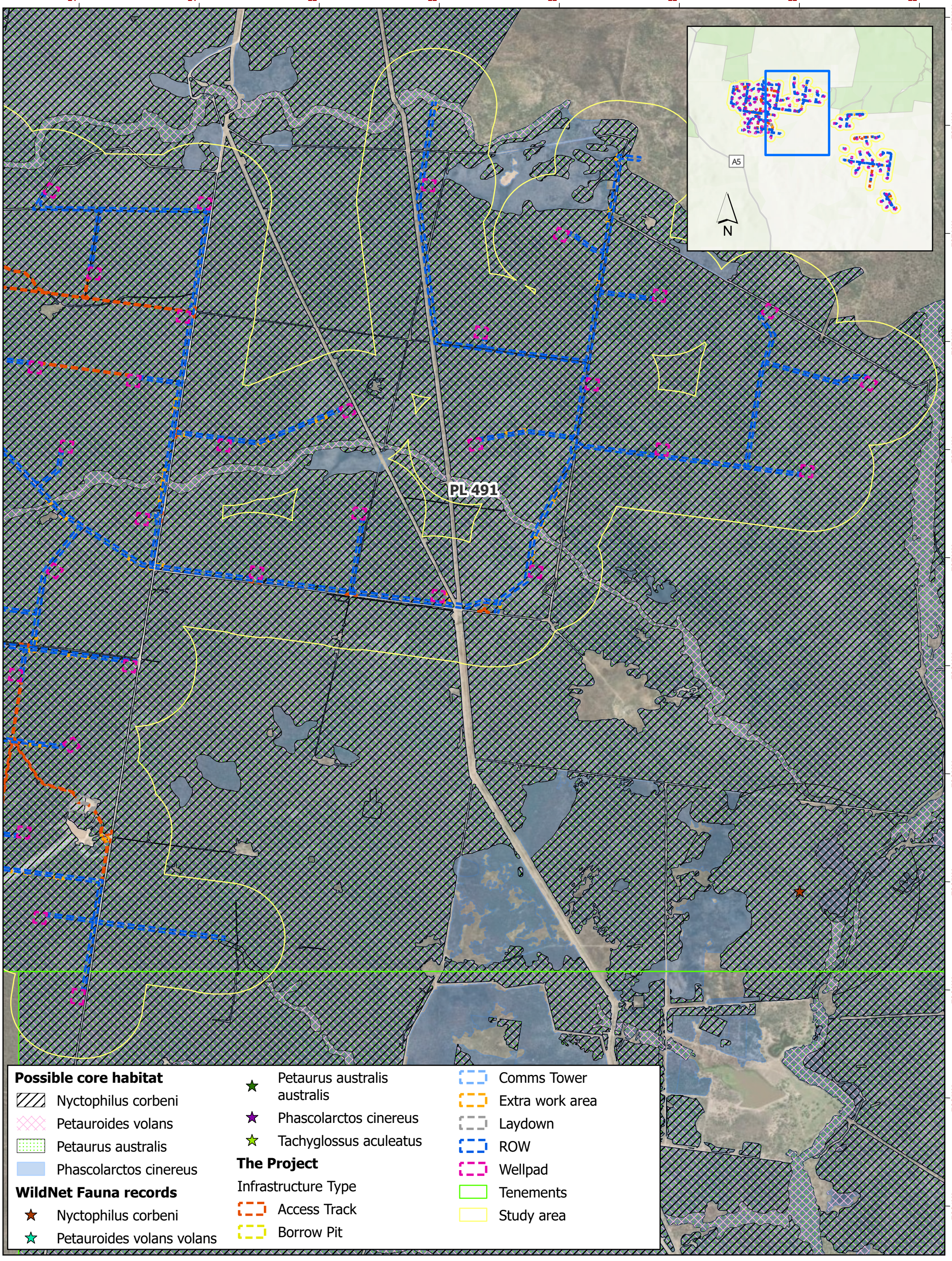
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Conservation-significant Mammalia that are known or likely to occur in the Study

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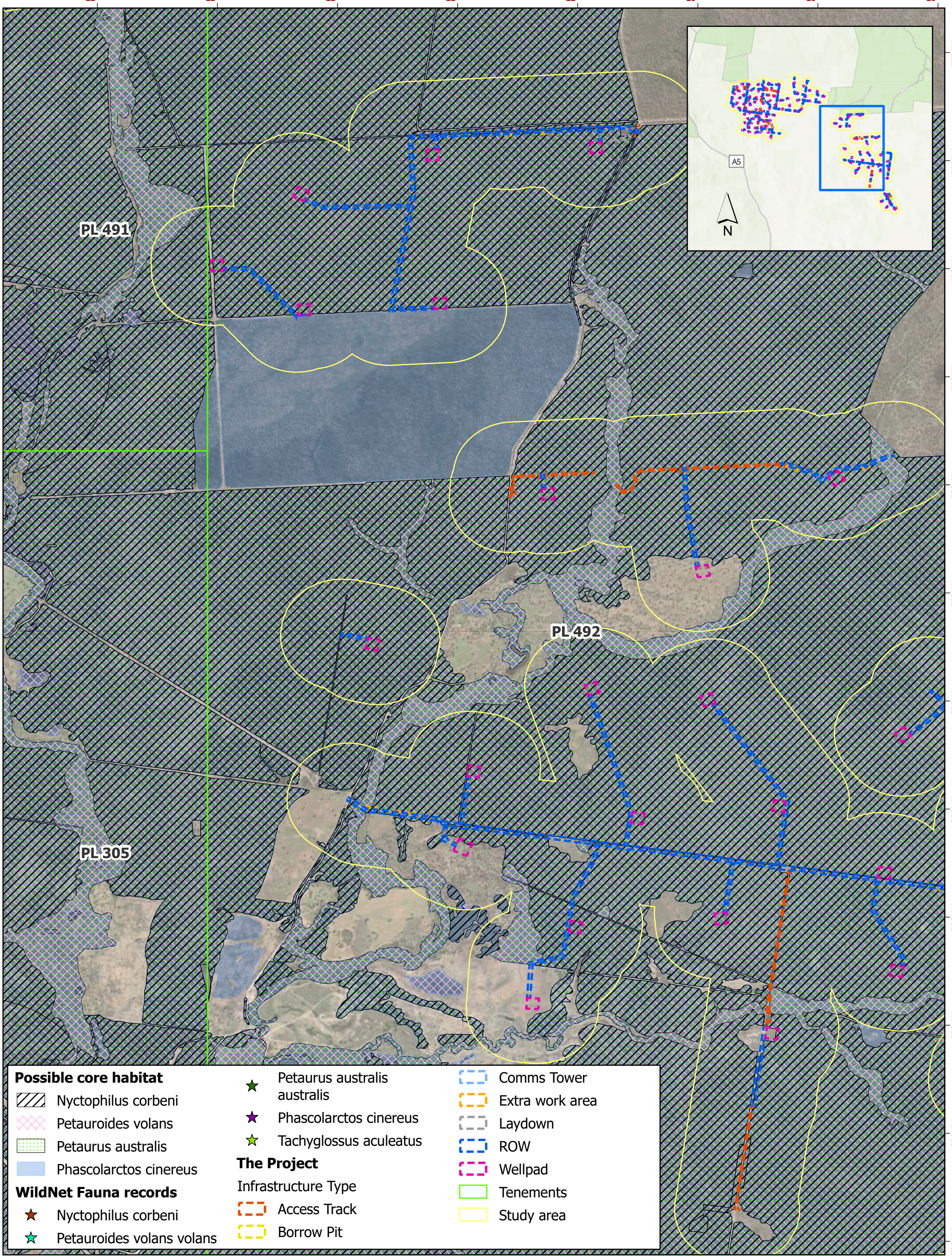
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Conservation-significant Mammalia that are known or likely to occur in the Study

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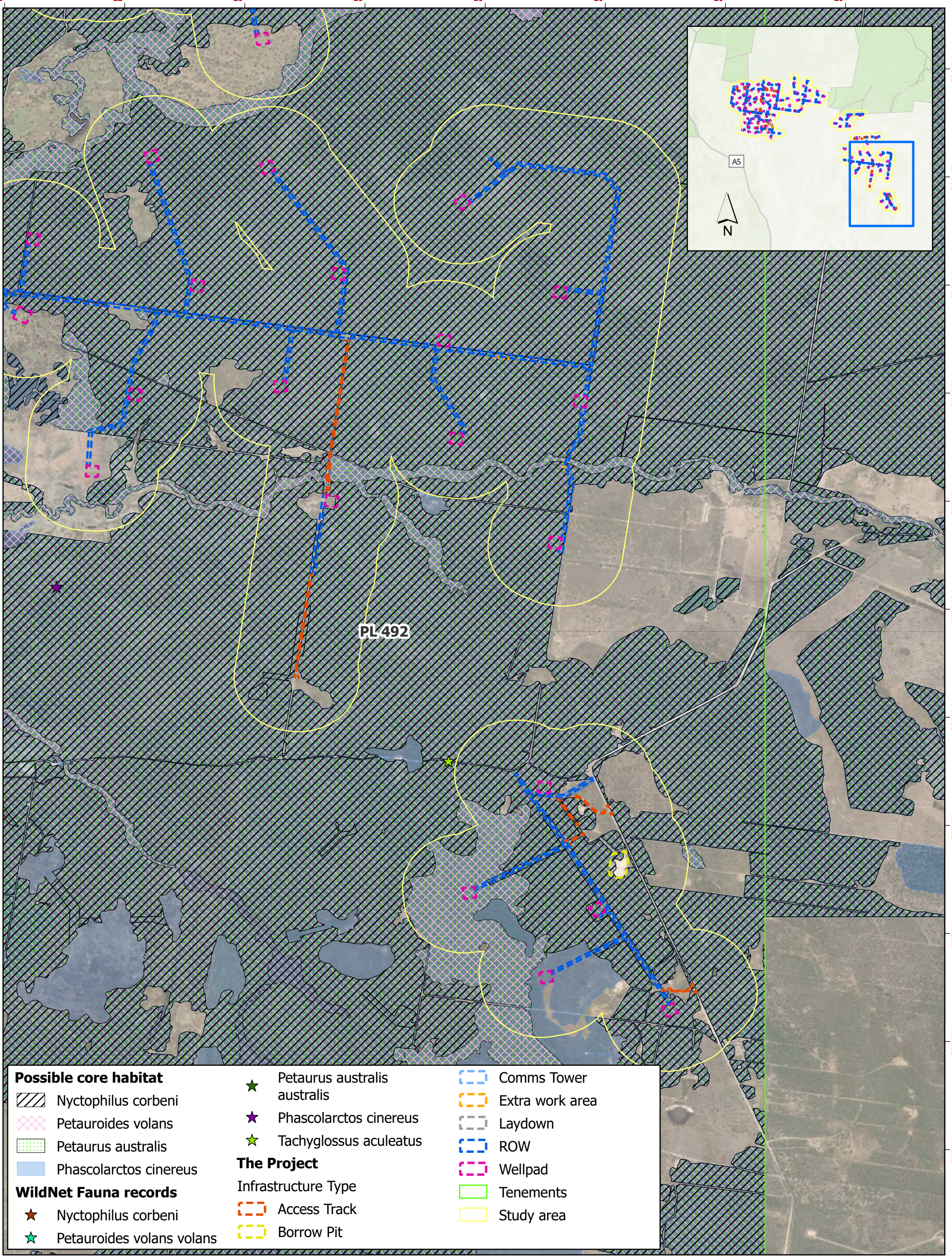
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Conservation-significant Mammalia that are known or likely to occur in the Study

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Conservation-significant Mammalia that are known or likely to occur in the Study

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3.3.3.1 *Adclarkia cameroni,* Stanisic, 2010 (Brigalow Woodland Snail)

The *Adclarkia cameroni* (family Camaenidae) is characterized by a moderately depressed shell morphology, featuring rounded, tightly coiled whorls, with the terminal whorl exhibiting a flared aperture (TSSC, 2016). This species is an obligate endemic to southeastern Queensland, specifically inhabiting fragmented patches of *Acacia harpophylla* (Brigalow) and eucalypt woodlands, often observed along road verges and riparian corridors within the Condamine River floodplain, particularly in the vicinities of Dalby and Chinchilla (TSSC, 2016).

The extant distribution of this species is severely fragmented. Historical Brigalow communities within the Condamine River floodplain (situated north of the Study area), which once formed a continuous expanse across the species' historical range, have undergone extensive anthropogenic clearing for agricultural and pastoral development (TSSC, 2016). Consequently, the current distribution along the floodplain (extending approximately 17 km south of Dalby to the vicinity of Miles) directly reflects this broad-scale habitat loss (TSSC, 2016).

ESE (2023) identified Brigalow communities on clay soils and most floodplain eucalypt woodlands as potentially suitable habitat for this species. Within the Study area, the following REs have been delineated as potentially suitable habitat for the *A. cameroni*: REs 11.3.2, 11.3.4, 11.3.25. Additionally, potentially suitable habitat encompasses other vegetation communities situated within a 1 km buffer zone surrounding documented species records.

This species is typically encountered in Brigalow and alluvial eucalypt woodlands characterized by dense ground cover and abundant coarse woody debris, including logs, deep leaf litter, accumulations of fallen bark, and flood-deposited detritus (TSSC, 2016). It has also been documented in highly disturbed and cleared environments, provided that adequate ground-level shelter (*E.*g., logs) is present.

Potentially suitable habitat and the spatial distribution of nearby records for this species are presented in **Figure 3.9**.

3.3.3.2 Adclarkia dulacca

While not previously recorded in the Study area, the presence of records approximately 20 km to the east of the Study area indicates that this species could occur. The species has been located in a variety of habitats including vine thicket and Brigalow (*A. harpophylla*) woodland with rock outcrops and Lancewood (*A. shirleyi*), ironbark and *E. woollsiana* woodlands on ridges with and without rock. In the SGP this habitat corresponds with REs 11.3.1, 11.3.17, 11.4.3, 11.4.3a, 11.9.5 and 11.9.10. It shelters in moist microhabitats under wood, rocks and other debris, as well as under bark at the base of trees. It has been found persisting in Brigalow regrowth but only where there is abundant suitable microhabitats (e.g. logs, dense leaf litter).

It tends to avoid areas susceptible to flooding and so is not prevalent on alluvial systems. Eggs are laid in suitable microhabitat locations during summer rains.

Potentially suitable habitat and the spatial distribution of nearby records for this species are presented in **Figure 3.9**.

3.3.3.3 *Jalmenus eubulus* Miskin, 1876 (Pale Imperial Hairstreak)

Jalmenus eubulus is restricted to the eastern Brigalow Belt Bioregion. The northern limit of its distribution appears to be around the latitude of Mackay and ranges south to around Boggabilla in northern NSW. The eastern limit of its distribution is roughly designated by the Great Dividing Range, being found near kroombit

Tops, Binjour Plateau, Bunya Mountains and Jondaryan (Eastwood et al. 2008). It may be found as far west as Carnarvon (Sands and New 2002).

The species is restricted to *A. harpophylla* dominated woodlands and open forests. Its core habitat is old-growth *A. harpophylla*, particularly those areas with *Casuarina cristata*, emergent eucalypts such as *Eucalyptus populnea* and understorey shrubs and adults are always observed in association with old-growth (remnant) *A. harpophylla* communities (Breitfuss and Hill, C. J. 2003; Eastwood et al. 2008). Being highly mobile, isolated patches may also provide suitable habitat.

It is likely that eggs enter diapause shortly after being laid. Emergence is triggered by summer rainfall, which may fall irregularly throughout the species' range, resulting in apparent different activity patterns between populations and years. Adults have been recorded between October and April, with peak activity in February and March. Peak activity appears to occur approximately two months after the wettest months of the year (December and January) (Eastwood et al. 2008).

Potentially suitable habitat and the spatial distribution of nearby records for this species are presented in **Figure 3.9**.

3.3.3.4 *Calyptorhynchus lathami lathami*, Temminck, 1807 (South-Eastern Glossy Black-Cockatoo)

Calyptorhynchus lathami exhibit a patchy distribution along Australia's east coast and ranges, extending south from near the Paluma Range to Gippsland, Victoria. Populations are uncommon and declining, particularly in southwestern range extents, with extinction recorded in mainland South Australia (Garnett and Baker 2021). Concerns have been raised regarding their status in the Southern Downs due to losses of feeding and nesting resources (EPA 2008).

The species occupies woodlands and forests supporting abundant *Allocasuarina* spp. and large hollow-bearing trees suitable for nesting. Many populations are confined to remnant vegetation in hills and gullies amid agricultural matrices (Higgins 1999); however, some traverse semi-urban landscapes, such as parks, gardens, and golf courses, to access food resources (Higgins 1999; M. Sanders pers. obs.). Proximity to waterbodies is essential, with daily visitation typical. Highly mobile, individuals travel substantial distances to isolated fragments for foraging, including advanced regrowth. Typically observed in small family parties, they are dietary specialists, consuming seeds exclusively from Allocasuarina (and occasionally Casuarina) spp., favouring species such as *A. torulosa*, *A. littoralis, A. distyla, A. diminuta, A. gymnanthera*, and *A. verticillata* (Chapman 2007). Local use of A. inophloia near Kumbarilla to Inglewood is documented via orts (feeding remnants), though *A. luehmannii,* despite being congeneric, is infrequently utilised due to small seeds. Infrequent observations on alternative taxa (e.g., Callitris, Banksia) likely reflect opportunistic switching during low Allocasuarina cone production (Chapman 2007). Preference is shown for productive trees with high seed/cone weight ratios, modulated by factors like proximity to water or hollows; thus, individual stands or trees hold disproportionate value, with losses potentially yielding outsized impacts (Clout and Clout 1989; Pepper et al. 2000; Crowley and Garnett 2001; Cameron and Cunningham 2006; Chapman and Paton 2006; Chapman 2007).

Breeding occurs primarily from April to July (extendable to March–August), with nests in large vertical hollows (1–2 m deep) that may be reused over years (Beruldsen 2004). Females incubate the single egg (hatching ~30 days) and tend the chick alone, supported by male provisioning; fledging follows ~60 days, with parental care extending another three months (Garnett and Baker 2021).

Potentially suitable habitat and the spatial distribution of nearby records for this species are presented in **Figure 3.10**.

3.3.3.5 *Hirundapus caudacutus,* Latham, 1801 (White-throated Needletail)

Numerous records of the *Hirundapus caudacutus* (White-throated Needletail) have been documented in the region surrounding the Study area, with the most proximate occurrences concentrated around Lake Broadwater, approximately 30 km south of the Study area (ALA, 202).

The *H. caudacutus* exhibits a widespread distribution across eastern and southeastern Australia, having been recorded in all coastal regions of Queensland and New South Wales. Its range extends inland to the western slopes of the Great Dividing Range and occasionally into the adjacent inland plains (TSSC, 2019).

The breeding distribution of this species is fragmented, with two recognized subspecies inhabiting distinct geographical areas in Asia. The nominate subspecies (*H. caudacutus nudipes*) breeds from southwestern China to northern Pakistan and is largely resident. Conversely, individuals observed in Australia exclusively belong to the *H. caudacutus* ssp. *caudacutus*, which are non-breeding migrants to the continent.

In Australia, the *H. caudacutus* is predominantly aerial, operating at altitudes ranging from less than 1 meter to over 1,000 meters (TSSC, 2019). While known to forage over most habitat types, they are most frequently observed above wooded areas, including open forests and rainforests. Records also indicate foraging activity over agricultural land, cleared pastures, plantations, and remnant vegetation at the periphery of paddocks.

Although this species spends the majority of its time in flight, it is known to roost in trees, utilizing dense canopy foliage or hollows. During the non-breeding season in Australia, the diet of this species has been observed to consist of a diverse array of insects.

The White-throated Needletail is highly likely to overfly all sections of the Study area during its migratory movements to and from Australia. All airspace above wooded habitats within the Study area are considered to represent potentially suitable foraging habitat. Given the species' almost exclusively aerial nature, impacts to terrestrial habitats are unlikely to significantly affect the availability of suitable foraging resources.

This species demonstrates a preference for dense roosting habitat (TSSC, 2019). The structural classification of REs, as outlined in the REDD, provides a useful proxy, with 'dense' REs indicating potential roosting sites. A review of ground-truthed REs within the Study area indicated an absence of suitably dense roosting habitat.

Potentially suitable habitat and the spatial distribution of nearby records for this species are presented in **Figure 3.10**.

3.3.3.6 *Stagonopleura guttata,* Shaw, 1796 (Diamond Firetail)

The *Stagonopleura guttata* occurs across southeastern Australia, from southeast Queensland to the Eyre Peninsula in South Australia (TSSC 2023b). It inhabits eucalypt woodlands, banksia shrublands, and cypress forests (Cooney and Watson 2005; McGuire and Kleindorfer 2007; Antos et al. 2008; Hodder 2019). Populations require remnant vegetation patches exceeding 200 ha for persistence (TSSC 2023b).

Records around the SGP are scattered, but public databases (Wildnet, ALA) lack precise locations, with ALA data rounded to 10 km grids. Site-specific surveys by this project and Arrow Energy have not detected the species. It is granivorous, primarily consuming grass seeds (native and introduced), supplemented by forbs; occasional *Allocasuarina* spp. seeds reflect diet switching during grass scarcity (Read 1994; Hodder 2019). Foraging occurs predominantly on the ground in open areas with low tree density, minimal fallen logs, and high grass/forb cover, including bare ground and moss (Ford et al. 1986; Antos and Bennett 2006; Antos et al. 2008).

Breeding spans August to February, with nests 4–5 m above ground in Eucalyptus, Banksia, *Allocasuarina* spp., or mistletoe, often adorned with flowers; clutch size averages 4–5 eggs (up to seven) (Cooney and

Watson 2005; McGuire and Kleindorfer 2007; Higgins et al. 2006). Maturity occurs within 10–20 weeks, with new nests typically built annually (McGuire and Kleindorfer 2007). No accurate records exist for habitat mapping; descriptive RE comparisons indicate potential use of forests/woodlands, though RE 11.7.5 and 11.7.2 likely have excessive density and reduced grass cover. A 200-ha patch threshold is applied per DCCEEW (2023h).

Potentially suitable habitat and the spatial distribution of nearby records for this species are presented in **Figure 3.10**.

3.3.3.7 Nyctophilus corbeni Parnaby, 2009 (Corben's Long-Eared bat)

N. corbeni was recorded from one location on Girrahween Station during Project surveys in 2013, and from two locations south of Myall Park Hookswood Road in 2016. In Queensland, *N. corbeni* inhabits a variety of vegetation types but is distinctly more common in box/ironbark/cypress pine woodland vegetation that occurs on the western slopes and plains of the Great Dividing Range. This species is considered naturally rare across its range and has been found to be more abundant in larger remnants with a well-developed understorey (TSSC, 2015). Summer roosts of male *Nyctophilus* spp. are typically under exfoliating bark, whereas the roosts of females, which form small maternity colonies, are typically in tree hollows. Law et al (2016) recorded capture of males up to 4 km from roost sites, with other studies recording males at foraging distances from roost of up to 7 km (TSSC, 2015).

All members of this genus have broad wing and tail membrane surface that allows slow, highly manoeuvrable flight with foraging usually undertaken within several kilometres of their roosting site (TSSC, 2015). These bats forage at a low height, close to vegetation and around tree trunks, and also glean invertebrates from surfaces. These features suggest that *Nyctophilus* spp. are generally associated with forests, woodlands and tall shrublands that contain an abundance of feeding substrates in the first few metres above the ground and hollow bearing trees that provide suitable roosting conditions. As such, *N. corbeni* is generally considered to be 'clutter-adapted' and forest-dependent (TSSC, 2015).

Of the nine accurate records available from which to derive habitat information, five fell within RE 11.5.1, three within polygons mapped as RE 11.7.5/11.7.7 and one within mapped RE11.7.4/11.7.7 (EcoSmart, 2023). RE 11.7.5 is low shrubland which is unlikely to be suitable habitat. Extrapolation based on BVG 12a and 18b suggests suitable habitat could also include RE 11.5.4. However, considering the low number of records from which to glean habitat data, other REs were considered based on habitat description. Studies have found the species preferring areas of abundant shrub layers and *Allocasuarina leuhmanii* (TSSC, 2015). REs within the broader SGP matching that description include 11.3.1, 11.3.14, 11.3.18, 11.4.3, 11.4.3a, 11.5.1, 11.5.1a, 11.5.4, 11.5.21, 11.7.4, 11.7.7, 11.9.5 and 11.9.10.

Suitable habitat and the location of nearby records for this species have been shown on **Figure 3.11**.

3.3.3.8 *Petauroides volans volans,* Kerr, 1792 (Greater glider)

Among Australia's gliding marsupials, *Petauroides volans* (Greater Glider) stands as the largest species within this ecological group. The species' natural range spans a considerable latitudinal gradient across eastern Australia, beginning from the Windsor Tableland region in northern Queensland and extending southward to reach the Wombat State Forest in central Victoria (Woinarski et al., 2014). Beyond this primary distribution corridor, the species maintains several geographically separated populations, including one documented within the Gregory Range located west of Townsville (Winter et al., 2004), and another population established in Queensland's Einasleigh Uplands bioregion (Vanderduys et al., 2012).

Within the SGP, researchers have documented *P. volans* occurrence across 23 separate localities. The spatial pattern of these records demonstrates a strong association with substantial remnant vegetation areas,

particularly those forest complexes that create connectivity between the Barakula, Binkey, and Gurulmundi State Forests, as well as vegetation networks linking the Condamine, Braemar, Vickery, and Kumbarilla State Forests. Notably, several occurrence records also originate from more fragmented landscape elements, specifically elongated, narrow vegetation corridors that follow the Wilkie and Condamine River systems.

The ecological requirements of this species centre on eucalyptus-dominated forest and woodland environments, with the highest population densities occurring in tall, montane, moisture-rich eucalyptus forests that support large, mature trees with abundant hollow availability (Andrews et al., 1994; Kavanagh, 2000; Eyre, 2004; van der Ree et al., 2004; Vanderduys et al., 2012). Nutritionally, *P. volans* maintains a highly specialized feeding strategy focused almost entirely on eucalyptus foliage, though supplementary food items including floral material and occasional consumption of Acacia phyllodes or mistletoe foliage have been documented (Lindenmayer, 2002; Kavanagh & Wheeler, 2004; Woinarski et al., 2014). Research has demonstrated selective feeding behaviours favouring young eucalyptus leaves and specific eucalyptus taxa, with these preferences appearing to correlate with foliar nutrient composition (Kavanagh & Lambert, 1990; Lindenmayer, 2002; Eyre, 2006).

Current understanding of feeding ecology within the southern Brigalow Belt remains limited, with only one comprehensive study documenting foraging behaviour patterns. *E. moluccana*, *E. fibrosa*, and *Corymbia citriodora* as the forest types most frequently utilized by foraging individuals (Smith et al., 2007; Eyre et al., 2022). Complementary research examining *P. volans* distribution across the broader southeastern Queensland region, encompassing portions of the Brigalow Belt Bioregion, has identified *E. tereticornis* and *E. citriodora* as key indicator species for *P. volans* presence in drier forest environments (Eyre, 2006). However, contrasting findings from Comport et al., (1996) documented a marked preference for *E. acmenoides* over other available eucalyptus species, including *E. tereticornis* and *C. citriodora*, despite these alternative species containing higher nutrient levels.

Synthesizing available research findings, *P. volans* populations within the southern Brigalow Belt demonstrate primary associations with forest communities dominated by *E. tereticornis*, *E. moluccana*, *E. fibrosa*, and *C. citriodora* (Eyre, 2006; Smith et al., 2007). RE analysis suggests that *E. crebra* and *E. melanophloia* forest types may also provide significant habitat value (Eyre et al., 2022). These forest associations align with Regional Ecosystem classifications 11.3.4, 11.3.25, 11.3.26, 11.3.27, 11.5.1, 11.5.20, 11.7.6, and 11.7.7, which warrant designation as core habitat areas for conservation planning purposes.

Based on available research, *P. volans* in the southern Brigalow Belt are primarily associated with forests dominated by *E. tereticornis*, *E. moluccana*, *E. fibrosa* and *C. citriodora* (Eyre 2006; Smith et al., 2007). *E. crebra* and *E. melanophloia* forests are also possibly important based on RE analysis (Eyre et al. 2022). These correspond with REs 11.3.4, 11.3.25, 11.3.26, 11.3.27, 11.5.1, 11.5.20, 11.7.6, 11.7.7 and they should be included as core habitat.

Potentially suitable habitat and the spatial distribution of nearby records for this species are presented in **Figure 3.11**.

3.3.3.1 *Petaurus australis australis,* Shaw, 1791 (Yellow-Bellied Glider)

The *Petaurus australis* inhabits coastal forests and mountain ranges from the Wet Tropics to Victoria, extending inland to Blackdown Tablelands and Carnarvon Gorge National Parks (Woinarski et al. 2014). It comprises two disjunct populations: a small Wet Tropics group and the widespread southeastern subspecies (*P. a. australis*) from Mackay, Queensland, to Victoria (Brown et al. 2007). Viable populations require large contiguous or near-contiguous forest patches exceeding 18,000 ha (180 km²) (Goldingay and Possingham 1995; TSSC 2022).

Records surround the SGP to the north, east, and west, with fewer southward. Abundant detections occur in adjacent Barakula and Gurulmundi State Forests, linked by SGP remnant vegetation into extensive contiguous forest; Braemar State Forest extends this southward to Kumbarilla State Forest. A late-2016 wildfire in Kumbarulla may have reduced southern habitat quality. Given surrounding records and suitable habitat, occurrence within the SGP is likely, though undetected to date.

Habitat includes tall, mature eucalypt forests in expansive reserves (thousands of hectares), with dry eucalypt associations in northern/central Australia and moist montane forests (>600 mm rainfall) in the south (Goldingay and Possingham 1995; Eyre 2007; Rees et al. 2007). Preferred features encompass smooth- and gum-barked trees (DBH >60 cm) bearing deep, narrow, high hollows and winter-flowering species (Goldingay 1987; Kavanagh 1987; Kambouris et al. 2013; Bilney et al. 2022; Craig 1985; Goldingay et al. 2018; Irish and Kavanagh 2011). Sap and nectar from select trees predominate in the diet, supplemented by insects (e.g., Coleoptera), accessed via diagnostic bark gouges; usage varies by location and phenology (Smith and Russell 1982; Craig 1985; Goldingay 1990; Kavanagh 1987; Goldingay and Kavanagh 1991; Carthew et al. 1999; Eyre and Goldingay 2005; Goldingay and Quin 2004; Jessup et al. 2020).

Breeding is opportunistic, producing one young from early winter to early summer, timed to resource availability (Craig 1985; Goldingay and Kavanagh 1991). Home ranges span 25–85 ha, with frequent den shifts (including nightly) among hollow-bearing trees; groups comprise stable family units—monogamous pairs (± offspring) or polygynous clusters up to six individuals (Craig 1985; Goldingay and Kavanagh 1990; Goldingay 1992; Brown et al. 2007).

Potentially suitable habitat and the spatial distribution of nearby records for this species are presented in **Figure 3.11**.

3.3.3.2 *Phascolarctos cinereus,* Goldfuss, 1817 (Koala)

The *Phascolarctos cinereus* (Koala) is commonly observed within the landscape surrounding the Study area. The species is well-represented in the broader SGP area, with over 700 records within a 50 km radius. None of them is within the Study area. Towards the western extent of their distribution, *P. cinereus* are frequently associated with watercourses, though their presence is not exclusively restricted to these features (DAWE, 2022). They exhibit limited territoriality, and individual home ranges frequently overlap. Home range sizes vary considerably, ranging from 1-2 hectares in optimal habitats to up to 135 hectares in semi-arid regions (DAWE, 2022). *P. cinereus* demonstrate notable mobility, capable of traversing substantial distances across anthropogenically modified (cleared) landscapes. There are no apparent limitations concerning patch size, and they are frequently observed in regrowth vegetation. The high abundance of records in non-remnant habitats likely reflects these behavioural adaptations, enabling individuals to utilize isolated trees within otherwise unsuitable environments.

P. cinereus are obligate folivores, primarily consuming Eucalyptus species, but exhibit dietary preferences influenced by geographical region and the specific tree species present. Within the Brigalow Belt, *P. cinereus* preferentially forage on at least 24 Eucalyptus species (Australian National University, 2021). Of these, the following species have been recorded in the broader SGPN Stage 5: *E. camaldulensis*, *E. chloroclada*, *E. coolabah*, *E. crebra*, *E. exserta*, *E. fibrosa*, *E. melanophloia*, *E. moluccana*, *E. ochrophloia*, *E. populnea*, and *E. tereticornis*.

Analysis of available spatially accurate recent (post-1975) records across the broader SGP indicates *P. cinereus* presence across a wide range of BVGs that correspond to many of the extant REs. While some identified REs may not explicitly describe the presence of eucalypts, a closer examination of the REDD often reveals the presence of emergent eucalypts. Based on the REDD, potential foraging trees are present in all remnants and regrowth RE types except RE 11.9.5 (ESE, 2023).

Potentially suitable habitat and the spatial distribution of nearby records for this species are presented in **Figure 3.11**.

3.3.3.3 *Tachyglossus aculeatus* Shaw, 1792 (Short-beaked Echidna)

The *T. aculeatus* is widely distributed across Australia, inhabiting a broad range of environments including forests, woodlands, heaths, grasslands, and arid zones (BHA, 2024). Given this extensive habitat tolerance, the species could potentially occur anywhere within the Study Area. However, because *T. aculeatus* is not closely associated with any particular regional ecosystem, its specific habitat within the Study Area is difficult to delineate.

Arrow delineates potential habitat for this species by integrating State-mapped wildlife habitat for Special Least Concern (SLC) species with buffered occurrence records from field surveys and WildNet data, following the Method for Mapping Matters of State Environmental Significance (Version 7; DESI, 2024).

Several records of *T. aculeatus* occur within the surrounding landscape, with the nearest record located approximately 1 km from the north part of Study Area (ALA, 2008). The Study Area itself lies within the State-mapped wildlife habitat for SLC species but has no confirmed records of the species.

3.3.4 Near Threatened fauna species

One (1) Near Threatened species under NC Act has been recorded and/or is considered Known to occur within the proposed impact area of the Project, based on current survey data and habitat assessments.

- *Strophurus taenicauda* (Golden-tailed gecko)

The presence or potential presence of near threatened species triggers obligations under the *Nature Conservation Act* (NC Act); however, these requirements are managed separately from the Environmental Authority (EA) approval process. Arrow holds an approved Species Management Program (SMP) (Doc. No. ORG-ARW-HSM-PLA-00070) for construction and maintenance activities, which addresses all necessary requirements under the NC Act.

Habitat for near threatened species is not designated as an Environmentally Sensitive Area (ESA) nor identified as a Prescribed Environmental Matter (PEM) under the *Environmental Offsets Act* (EO Act). Therefore, the presence or potential occurrence of near threatened species or their habitats does not necessitate modification of the study area boundaries.

3.3.5 Essential habitat mapping

The majority of mapped essential habitat within the Study Area is associated with records of the *S. taenicauda*, which is listed as NT under the NC Act. Accordingly, essential habitat mapped for this species does not constitute an ESA or a PEM for the purposes of the EA. Areas of essential habitat for threatened and near threatened fauna species include:

- Mapped essential habitat for *S. taenicauda* (NT) on lot plans 21au37, 31AU60 and 302RP897544;
- Mapped essential habitat for *N. corbeni* (V) on lot plans 31AU60 and 36AU35.

The Study area within the mapped boundaries of Essential Habitat is showing on **Figure 3.4**.

4 Impact Assessment

4.1 Planning and design

Arrow's development plans employ an iterative process for the placement of infrastructure to effectively manage the competing constraints associated with the location of surface infrastructure. This includes considerations of ecological values, landholder preferences, geological features, existing infrastructure, and pre-existing access tracks. The planning and management of surface activities and ground disturbance are guided by a set of hierarchical management principles aimed at avoiding, minimising, and mitigating impacts to environmental values. These principles are:

- **Avoid:** Arrow's primary approach is to avoid listed threatened ecological species and their habitats.
- **Minimise:** If avoidance is not possible due to competing constraints or the scale and location of species' habitat (e.g., long linear strips of *P. cinereus* habitat), Arrow will aim to minimise impacts by strategically positioning infrastructure. This includes crossing habitat at its narrowest or most degraded section or, where possible, positioning infrastructure along the edge of suitable habitat to avoid disrupting high-quality areas.
- **Mitigate:** Arrow will apply mitigation measures to further reduce both direct and indirect impacts on ecological values.
- **Remediate and rehabilitate:** Impacted areas will be actively remediated and rehabilitated to support long-term recovery and ecological health.
- **Offset:** Arrow will offset any unavoidable significant residual impacts in line with the SGP Offset Strategy (Arrow, 2019).

The Study area exhibits significant native vegetation remnants constituting 87% of the area. An additional 2.9% supports regrowth and 10% non-remnant vegetation. Consequently, development of the SGPN Stage 5 necessitates the removal of remnant vegetation. However, through the application of the mitigation hierarchy, the Project footprint's impact on remnant vegetation has been restricted to 3.3% (349.2 ha) of the total Study area.

4.1.1 Field development layout

The proposed field development configuration has been engineered in accordance with the management hierarchy detailed in **Section 4.1**. To minimise habitat fragmentation and reduce temporary construction impact, proposed flowlines and other linear infrastructure are primarily situated adjacent to existing infrastructure or within previously disturbed areas. Furthermore, the selection of infrastructure locations and the overall field layout were significantly influenced by various planning and access limitations, such as the presence the L Tree Creek, Warramoo, Hookswood Pelham, Tumba and Kowguran Roads.

4.1.2 Waterway crossing methodologies

Several methodologies are available for pipeline construction across watercourses, including conventional 'open cut' trenching, watercourse flow diversion, and trenchless technologies. A concise overview of each method, along with its respective advantages and disadvantages, is provided below:

- **Standard 'Open Cut' Trenching:** This technique involves excavating a trench directly within the watercourse using equipment such as excavators or backhoes, with excavated material temporarily stored away from the streambed. A pre-assembled pipe section is then positioned across the waterway, lowered into the trench, and the trench is immediately backfilled. This approach is commonly employed in dry or shallow, low-flow watercourses. It may also be suitable for environmentally sensitive watercourses where rapid execution is critical for mitigating environmental disturbance.

- **Watercourse Flow Diversion:** This method entails the establishment of temporary coffer dams both upstream and downstream of the crossing point, facilitating the diversion of water flow around the construction area. This creates a dry work zone between the dams. This technique is typically implemented at crossings where continuous water flow must be maintained for ecological, social, or engineering imperatives.
- **Horizontal Directional Drilling (HDD):** HDD, offer reduced surface disturbance and present a viable alternative when significant surface constraints preclude the use of standard open-cut trenching. However, HDD incurs substantially higher costs compared to conventional trenching. Furthermore, technical limitations and environmental risks, including potential HDD failure or inadvertent release of drilling fluids in unconsolidated geological formations, necessitate careful consideration. A cleared staging area equivalent to the length of the HDD bore is also required for pipe stringing (i.e., the assembly of pipe sections prior to pulling them through the bore). Additional technical factors, such as ground conditions and channel depth, are also pertinent.

The Project only intersect bed-level crossings of minor Department of Primary Industries (DPI) waterways (i.e. Low or Moderate categories). The impact on these waterways will be executed in adherence to the accepted development requirements stipulated by the waterway barrier self-assessable code or temporary code (DIP).

4.2 Overview of impacts

4.2.1 Vegetation clearing

The primary impact associated with the proposed development within the Study Area is the direct loss of vegetation resources resulting from construction of Project infrastructure. Specifically, impacts include:

- Approximately 3.3% of the native remnant vegetation within the Study Area.
- Regrowth vegetation representing approximately 0.3% of the native vegetation within the Study Area.
- Regrowth undifferentiated vegetation representing approximately 0.1% of the total vegetation within the Study Area.

Due to the extensive areas of native vegetation within the Study Area, landholder preferences influenced Arrow's application of hierarchical management principles (refer to **Section 4.1**). While the removal of remnant and regrowth vegetation is an unavoidable consequence of the Project's development, Arrow has adopted best environmental practices to minimise and, where possible, avoid environmental impacts.

Table 4.1 provides a summary of the Project's proposed impact area concerning various vegetation communities.

Table 4.1 – Proposed impact to vegetation communities for SGPN Stage 5

Vegetation community (VM status)	Vegetation within Study area (VMA) (ha)	Impact area (Arrow GTRE) (ha)
Remnant Of Concern		
11.3.2	189.3	-
11.3.4	-	1.0
Total of Remnant Of Concern		1.0
Remnant No concern at present		

11.3.14	129.5	0.50
11.3.25	-	0.7
11.3.26	-	1.5
11.5.1	1222.3	147.9
11.5.21	1379.6	41.2
11.5.4	-	1.6
11.7.2	-	8.8
11.7.4	6000	113.4
11.7.5	-	5.1
11.7.6	-	6.4
11.7.7	279.3	21.6
Total of Remnant No concern at present		348.7
Regrowth Of concern		
11.3.2	46	0.7
Total of Regrowth Of concern		0.7
Regrowth No concern at present		
11.3.14	0.68	0.4
11.5.1	28.7	3.6
11.7.4	142.9	13.4
11.7.7	0.3	2.7
Total of Regrowth No concern at present		20.1
Regrowth undifferentiated		
Regrowth undifferentiated Land Zone 5	-	1.2
Regrowth undifferentiated Land Zone 7	-	4.4
Total of Regrowth undifferentiated		5.6
Non-remnant		
Cleared	1091	7.3
Existing Road/Track		36
Pasture/Grazing		4.3
Total of non-remnant		47.6

4.2.2 Habitat fragmentation and landscape connectivity

Habitat fragmentation is defined as the process by which contiguous habitat expanses are divided into multiple smaller, isolated segments. This phenomenon comprises two interconnected elements: habitat reduction (i.e., a decrease in the total available habitat) and the actual fragmentation (i.e., the dissection of habitat, leading to amplified 'edge effects') (Bennet, 2006). The consequences of habitat fragmentation are contingent upon the spatial scale and may vary based on the specific species or ecological community under consideration. For instance, the removal of minor habitat areas that do not impede the movement of highly mobile species (e.g., raptors) could, conversely, pose a substantial dispersal barrier for less mobile or wide-ranging species (e.g., amphibians or small reptiles).

The vegetation removal for gas field developments within remnant areas is executed incrementally. Disturbance zones typically encompass approximately 20-40 meters width for linear corridors, while surrounding vegetation remains undisturbed. The Landscape Fragmentation and Connectivity (LFC) Tool analysed the Project area to identify possible cumulative impact areas. The LFC identified *no significant impacts* on connectivity within the Study area, based on Arrow's GTRE mapping and DETSI RE mapping. The connectivity impact values derived from the LFC tool analysis (**Appendix F**) refers to SGP North Stage 5. The values for the Project are presented in the PEMs table (refer to **Table 5.6**). The complete outputs from the LFC tool analysis are appended in **Appendix F**.

Loss of connectivity at the patch scale largely depends on the species under consideration; impacts associated with linear infrastructure corridors and waterway crossings are considered in further detail for individual threatened species (refer **Section 4.5**).

4.2.3 Impacts to hollow-bearing trees

The species *P. v. volans* and *P. a. australis* are assessed as Likely to Occur, consecutively, in the Study area and is associated with large, relatively old eucalyptus trees with hollows (Eyre, 2004; Eyre, 2007).

The project's layout and footprint have been engineered to mitigate vegetation impact wherever feasible. A significant focus has been placed on minimising disturbances to riparian vegetation through the reduction of RoW widths and by situating all temporary workspaces outside these sensitive zones.

The importance of riparian vegetation along the major creek systems in the Study area is discussed in **Section 3.3.2** and do represent habitats that are often less impacted by historical clearing and are more likely to contain large trees due to their position in the landscape. A discussion of the waterway crossing methodologies is presented in **Section 4.1.2**.

Large trees and hollows are captured on the EFS data sheets with counts of trees with hollows >30 cm and

>50 cm. This data allows the identification of *P. v. volans* and *P. a. australis* habitat which requires large hollows suitable for sheltering and nesting. Based on the EFS data (**Appendix E**) a significant proportion of the Study area does not contain large trees with hollows.

During construction, hollow-bearing trees located outside the essential clearing footprint, as identified by ecological survey data, are designated for retention. Exclusion zones are established around these trees to prevent potential impacts. When clearing of hollows is necessary, it is performed in accordance with the SMP. This permit authorises activities that may affect the breeding sites of protected animals, including the relocation of hollows if breeding fauna are observed.

4.2.4 Secondary and cumulative impacts

The Project's disturbance within the Study area may generate indirect effects on ecological values, which include the following:

- Edge effects resulting from the creation of smaller patches of vegetation with a greater edge to surface ratio, including increased exposure to weed invasion, light and wind penetration (which can alter microclimate features) potentially resulting in changes in community structure and composition over time;
- Dust generation during construction, which has the potential to smother plants, reducing photosynthesis and resulting in decreased vegetation health and condition;
- Increased noise from the vegetation clearing operations, the operation of machinery and vehicle traffic which may affect the behaviour of wildlife (typically limited to the construction period);
- Increased lighting during construction and operation, with the potential to disrupt the behaviour of nocturnal species; and
- Mortality resulting from vehicle collision.

Indirect impacts on the ecological values of the Study area will be managed in accordance with Arrow's existing Environmental Management Framework.

4.3 Impact on States Forest

The project will not be undertaken within the boundaries of State Forest land.

4.4 Impact on terrestrial flora values

4.4.1 Impacts on habitat for threatened or near threatened flora species

No threatened or near threatened flora species have been identified within the Study area. However, the Project's proposed infrastructure intersects a 'high-risk' trigger area on the Protected Plant Survey Trigger Map (see **Section 2.2.1.1**). The clearing impact area under a 'high-risk' area on the Protected Plant Survey Trigger Map (approx. 20 ha) will be surveyed according to the latest version of the Flora Survey Guideline – Protected Plants – *Nature Conservation Act 1992* (Current version 2.03. Feb 2025). The flora survey effort map (see **Figure 2.1**) shows the proposed disturbance footprint for the Project in relation to the 'high-risk' trigger mapping area.

4.4.2 Endangered RE by VM Class

No vegetation community classified as 'Endangered' have been identified within the Study area.

4.4.3 Of Concern REs by VM Class

Of concern REs within the Study area are restricted to alluvial systems, typically occurring as narrow linear remnants or small patches along waterways and drainage lines, limited impacts are associated with linear infrastructure crossings (see **Figure 3** and **Table 4.1**).

The impacts are associated with linear infrastructure crossings, including:

- RoW for gathering infrastructure through narrow linear remnants of 'Of concern' RE 11.3.4 associated with Dogwood creek.

4.4.4 Impacts on watercourses vegetation

The Project will disturb a regulated vegetation located within watercourse. However, these disturbances are within the existing approved limits specified in the EA. The impacts on this matter for SGPN Stage 5 are as follows: 0.3 ha of RE 11.3.14, 0.6 ha of RE 11.3.25, 0.7 ha of RE 11.3.4, 1.9 ha of RE 11.5.1, 1.9 ha of RE 11.5.21, 0.2 ha of RE 11.5.4, 2.3 ha of RE 11.7.4 and 0.6 ha of RE 11.7.7 (see **Table 5.3**).

As per the distance set out in Queensland Environmental Offset Policy (2025) following buffer distances for non-coastal bioregions have been defined to determine impacts on regulated vegetation within a defined distance from the defining banks of watercourses associated with the Project:

- Stream order 1 or 2 – 25 m
- Stream order 3 or 4 – 50 m
- Stream order 5 or greater – 100 m

In the absence of Project-specific data defining the actual spatial location of defining banks, the watercourse centre line has been used to calculate the GTRE mapped vegetation within the defined distance relevant to the watercourse. Impacts on watercourse vegetation associated with the Project are identified in **Table 5.3**. The majority of this vegetation is associated with minor waterways (stream order 1 or 2) that mean, these creek crossings are of minor waterways, which will be trenched outside the wet season in accordance with Arrow's standard crossing methodologies. A review of waterway crossing methods will be undertaken for all waterways that are stream order 4 or higher during the engineering design process. Refer to **Section 4.1.3**

for the crossing details on the major crossings at Bottle Tree Creek (stream order 5), and Dogwood Creek (stream order 5) and L Tree Creek (stream order 4).

4.5 Impacts on terrestrial fauna values

The Project will have an impact on protected wildlife habitat for the species known or considered likely to occur in the Study area listed in **Table 4.3**.

SRI Assessments have been undertaken in accordance with the SRI Guidelines (DEHP, 2014) for endangered, vulnerable and special least concern fauna species and are documented in the sections below. The SRI Guidelines provide an explanation of some key terms used in these impact assessments, which have been summarised below:

- **Habitat**: is the area occupied, or periodically or occasionally occupied, by any species, population or ecological community and includes all the different aspects (both biotic and abiotic) used by the species during the different stages of their life cycles.
- **Long-term decrease**: Any decline in a local population that is greater than which could be apparent without the action being present.
- **Population**: Defined as an occurrence of the species in a particular area. In relation to endangered, vulnerable and special least concern species, occurrences include but are not limited to:
  - ✓ A geographically distinct regional population, or collection of local populations; or
  - ✓ A population, or collection of local populations, that occurs within a particular bioregion.

Table 4.2 – Summary of Project impact on protected wildlife habitat

Scientific Name	Common Name	Area of impact (ha)
Habitat for animal listed as Endangered wildlife under NC Act		
Petauroides volans volans	Southern greater glider	357.5
Phascolarctos cinereus	Koala	372.8
Habitat for an animal that is Vulnerable wildlife under NC Act		
Calyptorhynchus lathami lathami	Glossy black-cockatoo (eastern)	1.6
Stagonopleura guttata	Diamond Firetail	356.4
Nyctophilus corbeni	Eastern long-eared bat	350.4
Petaurus australis australis	Yellow-bellied glider (southern subspecies)	357.5
Habitat for an animal that is special least concern wildlife		
Tachyglossus aculeatus	Short- beaked Echidna	2.9

4.5.1 Significant Residual Impact assessment for threatened fauna species identify as Known', 'Likely' and 'Possible' to Occur in the Study area

4.5.1.1 *Adclarkia cameroni* Stanisic, 2010

The Project will not impact suitable habitat for *A. cameroni*. An assessment undertaken in accordance with the SRI Guidelines (DEHP, 2014) for the *A. cameroni* has been provided in **Table 4.3**.

Table 4.3 – Significant Residual Impact Assessment for the Endangered *Adclarkia cameroni*

SRI Criteria	Project Response
Are impacts to suitable habitat likely to lead to a long-term decrease in the size of a local population?	**Unlikely** Our limited understanding of *A. cameroni* ecology makes determining population dynamics difficult. This species has been described from and is known to occur along the Condamine River floodplain. Numerous additional historical records have been identified within 25 km of the Project (ALA, 2025a). The occurrence of these records and the proximity of the Project to known populations suggests that a local population may occur within suitable alluvial plains habitat that has been identified within the Project area. No occurrence of records, no suitable habitat, no local populations have been identified within the Study area or vicinity. This species has extremely limited dispersal capabilities and the construction of the Project is therefore considered unlikely to lead to a long-term decrease in the size of a population.
Are impacts to suitable habitat likely to reduce the extent of occurrence of the species?	**Unlikely** The extent of occurrence is defined as "the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon on excluding cases of vagrancy" (IUCN, 2024). The estimated extent of occurrence for the *A. cameroni* is approximately 27,924 km2 (TSSC, 2016) The Project will not require the removal any suitable habitat confirmed for the *A. cameroni*. Considering that the Project is not disturbed suitable habitat known for *A. cameroni*, it is considered unlikely that the construction and ongoing operation of the Project will reduce the extent of occurrence for this species.
Are impacts to suitable habitat likely to fragment an existing population?	**Unlikely** The current distribution of the *A. cameroni* is already highly fragmented (TSSC, 2016). Suitable habitat for this species along the Condamine River floodplain that was once contiguous, have been extensively cleared for agriculture and farming to which, the Condamine River Floodplains are nowhere near the Project Area. For the purposes of this assessment, it has been assumed that each known record represents an isolated sub-population of the *A. cameroni*, as it is very unlikely that there is movement between these records. To facilitate the construction of the Project will impact minimum suitable habitat for this species. However, there is no record of the species in vicinity. It is therefore considered unlikely that the Project will contribute to the fragmentation experienced by local populations.

Are impacts to suitable habitat likely to result in genetically distinct populations forming as a result of habitat isolation?	**Unlikely** Population genetic studies are currently listed as one of the key research priorities for the *A. cameroni* suggesting that very little is known about the genetics of this species (TSSC, 2016). For the purposes of this assessment, it has been assumed that each known record represents an isolated (potentially genetically distinct) sub-population of *A. cameroni*, as it is very unlikely that there is movement between these records. No local records have been observed within the Project area and Study area. It is therefore considered unlikely that the construction of the Project will result in genetically distinct populations forming as a result of habitat isolation.
Are impacts to suitable habitat likely to result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?	**Unlikely** Several invasive species have been identified as conservation and management priorities for the *A. cameroni*, including *Cenchrus ciliaris*, *Sus scrofa* as well as introduced rat and mice species (TSSC, 2016). The occurrence of these pests and weed species has been well documented in the region surrounding the Project area. To help manage pest species across the Project, Arrow has developed an overarching pest management strategy and developed a Biosecurity Procedure for the broader SGP. This procedure will help to ensure that appropriate management strategies are implemented to control pest species that could occur within the Project footprint. This is supported by the Vehicle, Machinery, Equipment and Loads Hygiene Procedure to minimize the spread of *C. ciliaris* and other invasive species listed under the *Biosecurity Act 2014*. It is therefore considered unlikely that the Project will result in invasive species being established.
Are impacts to suitable habitat likely to introduce disease that may cause the population to decline?	**Unlikely** There are no known diseases listed as threatening processes for the *A. cameroni*. It is considered unlikely that the construction and ongoing operation of the Project will introduce any that could cause potential populations to decline.
Are impacts to suitable habitat likely to interfere with the recovery of the species?	**Unlikely** The Conservation Advice for the *A. cameroni* (TSSC, 2016), lists preventing clearing of brigalow habitat and in other areas where this species may occur within its range, retaining a buffer of native vegetation and leaf litter around records of the species and controlling *C. ciliaris* infestations as priority conservation and recovery objectives. Arrow has developed a Weed Management Plan (WMP) that has general vehicle hygiene requirements that will be followed during the construction and operational phases of the Project to help manage the spread of *C. ciliaris*.
Are impacts to suitable habitat likely to cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?	**Unlikely** It is assumed that each known record, or group of records, represents an isolated sub-population of the *A. cameroni*, as it is very unlikely that there is movement between these records. Additionally, the areas identified as suitable habitat for *A. cameroni* are regional ecosystems containing *A. harpophylla* which is a key requirement for the species, as described in the Conservation Advice (TSSC, 2016). Considering the absence of any local records of the *A. cameroni* within the Study area however, it is unlikely that the Project will disrupt any ecologically significant locations for this species.
It is considered UNLIKELY that the Project will have a significant residual impact on the *A. cameroni*.	

4.5.1.2 *Adclarkia dulacca* Stanisic, 1996

Construction of the Project will not result in the direct loss of potentially suitable habitat for the *A. dulacca*. An assessment undertaken in accordance with the SRI Guidelines (DEHP, 2014) for the *A. dulacca* has been provided in **Table 4.4.**

Table 4.4 - Significant Residual Impact Assessment for the Endangered *Adclarkia dulacca*

SRI Criteria	Project Response
Are impacts to suitable habitat likely to lead to a long-term decrease in the size of a local population?	**Unlikely** Publicly available records suggest the *A. dulacca* is restricted to the southern Brigalow Belt between Miles, Dulacca, Wandoan and Meandarra, though recent work has found the species west to the Yuleba area and east to the Chinchilla area (Eddie 2023). The species has been located in a variety of habitats including vine thicket and *A. harpophylla* woodland with rock outcrops and *A. shirleyi*, *E. woollsiana* woodlands on ridges with and without rock (TSSC 2016b). It shelters in moist microhabitats under wood, rocks and other debris, as well as under bark at the base of trees. It has been found persisting in brigalow regrowth but only where there are abundant suitable microhabitats (e.g., logs, dense leaf litter). Eggs are laid in suitable microhabitat locations during summer rains. No occurrence of records, no suitable habitat and / or local populations have been identified within the Study area or with vicinity. This species has extremely limited dispersal capabilities and the construction of the Project is therefore considered unlikely to lead to a long-term decrease in the size of a population.
Are impacts to suitable habitat likely to reduce the extent of occurrence of the species?	**Unlikely** The extent of occurrence is defined as “the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon on excluding cases of vagrancy” (IUCN, 2024). The extent of occurrence Extents of Occurrence (EOO) was calculated to be 27 924 km2, and the area of occupancy (AOO) 76 km2, based on locality records from 1976 to the present (DotE 2016). The Project will not require the removal any suitable habitat confirmed for the *A. dulacca*. It is considered unlikely that the construction and ongoing operation of the Project will reduce the extent of occurrence for this species.
Are impacts to suitable habitat likely to fragment an existing population?	**Unlikely** The Project will not require the removal any suitable habitat confirmed for the *A. dulacca*. The species has limited mobility. Recruitment is likely to be low, with recruitment events limited to periods of rainfall (TSSC 2016b). To facilitate the construction of the Project will impact no suitable habitat for this species and no record of the species in vicinity. It is therefore considered unlikely that the Project will contribute to the fragmentation experienced by local populations.
Are impacts to suitable habitat likely to result in genetically distinct populations forming as a result of habitat isolation?	**Unlikely** Although it is believed that there is very little gene flow among isolated and fragmented populations (DCCEEW, 2022), localised intra-population dispersal may still occur. Project infrastructure is unlikely to physically inhibit the dispersal of locally fragmented populations. Given the Project’s location any localised habitat fragmentation is unlikely to result in a genetically distinct population from forming.

Are impacts to suitable habitat likely to result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?	**Unlikely** Several invasive species have been identified as conservation and management priorities for the *A. dulacca*, including *Cenchrus ciliaris* as well as introduced rat and mice species (Stanisic, 2011; Miller et al., 2010). The occurrence of these pests and weed species has been well documented in the region surrounding the Project area. To help manage pest species across the Project, Arrow has developed an overarching pest management strategy and developed a Biosecurity Procedure for the broader SGP. This procedure will help to ensure that appropriate management strategies are implemented to control pest species that could occur within the Project footprint. This is supported by the Vehicle, Machinery, Equipment and Loads Hygiene Procedure to minimize the spread of *C. ciliaris* and other invasive species listed under the *Biosecurity Act 2014*. It is therefore considered unlikely that the Project will result in invasive species being established.
Are impacts to suitable habitat likely to introduce disease that may cause the population to decline?	**Unlikely** There are no known diseases listed as threatening processes for the *A. cameroni*. It is considered unlikely that the construction and ongoing operation of the Project will introduce any that could cause potential populations to decline.
Are impacts to suitable habitat likely to interfere with the recovery of the species?	**Unlikely** The conservation advice for *A. dulacca* (DCCEEW, 2022), lists protecting habitat from destruction and controlling invasive species as priority conservation and recovery objectives. Considering that the construction of the Project will not require the removal any know suitable habitat for the *A. dulacca*, it is therefore considered unlikely that this action could interfere with the recovery of the species.
Are impacts to suitable habitat likely to cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?	**Unlikely** It is assumed that each known record, or group of records, represents an isolated sub-population of the *A. dulacca*, as it is very unlikely that there is movement between these records. Additionally, the areas identified as suitable habitat for *A. dulacca* are regional ecosystems containing *Acacia harpophylla* which is a key requirement for the species, as described in the Conservation Advice (TSSC, 2016). Considering the absence of suitable habitat and any local records of the *A. dulacca* within the Study area however, it is unlikely that the Project will disrupt any ecologically significant locations for this species.
It is considered UNLIKELY that the Project will have a significant residual impact on the *A. dulacca*	

4.5.1.3 *Jalmenus eubulus* Moskin, 1876

Construction of the Project will not result in the direct loss of potentially suitable habitat for the *J. eubulus*. An assessment undertaken in accordance with the SRI Guidelines (DEHP, 2014) for the *J. eubulus* has been provided in **Table 4.5**.

Table 4.5 - Significant Residual Impact Assessment for the Vulnerable *Jalmenus eubulus*

SRI Criteria	Project Response
Are impacts to suitable habitat likely to lead to a long-term decrease in the size of a local population?	**Unlikely** The species is restricted to *Acacia harpophylla* dominated woodlands and open forests. Its core habitat is old-growth Brigalow, particularly those areas with *Casuarina cristata*, emergent eucalypts such as *Eucalyptus populnea* and understorey shrubs and adults are always observed in association with old-growth (remnant). The species has also been documented as feeding on other Acacia species (Sands and New 2002), but this has been discarded as erroneous in recent reviews (Eastwood et al. 2008). The absence of records in proximity of the Project area to known populations suggests that the occurrence of a local population within the suitable alluvial plain habitats identified in the Project area is unlikely. No records of occurrence or suitable habitats were identified in the study area or in vicinities. This species has limited dispersal capabilities, and the construction of the Project is therefore considered likely to lead to a long-term decrease in the size of a population.
Are impacts to suitable habitat likely to reduce the extent of occurrence of the species?	**Unlikely** The Project will not require the removal any suitable habitat confirmed for the *J. eubulus*. To facilitate the construction of the Project will impact no suitable habitat for this species and no record of the species in vicinity. It is therefore considered unlikely that the Project will contribute to the fragmentation experienced by local populations.
Are impacts to suitable habitat likely to fragment an existing population?	**Unlikely** Its core habitat is old-growth Brigalow, particularly those areas with *Casuarina cristata*, emergent eucalypts such as *Eucalyptus populnea* and understorey shrubs and adults are always observed in association with old-growth (remnant) *A. harpophylla* communities (Breitfuss and Hill, C. J. 2003; Eastwood et al. 2008). Being highly mobile, isolated patches (ESE, 2023). The Project will impact no suitable habitat for this species and no record of the species in vicinity. It is therefore considered unlikely that the Project will contribute to the fragmentation experienced by local populations.
Are impacts to suitable habitat likely to result in genetically distinct populations forming as a result of habitat isolation?	**Unlikely** Although it is believed that there is very little gene flow among isolated and fragmented populations, localised intra-population dispersal may still occur. Project infrastructure is unlikely to physically inhibit the dispersal of locally fragmented populations. Given the Project's location any localised habitat fragmentation is unlikely to result in a genetically distinct population from forming.

Are impacts to suitable habitat likely to result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?	**Unlikely** Whilst numerous invasive flora and fauna species have been observed across the broader SGP Project, there are currently no invasive species listed as threatening processes for the *J. eubulus*. Regardless of this, to help manage pest species across the Project, Arrow have developed an overarching pest management strategy and Pest Management Plan (PMP) for the broader SGP. This PMP will help to ensure that appropriate management strategies are implemented to control pest species that could occur within the Project footprint, including the Black Rat. It is therefore considered unlikely that the construction and ongoing operation of the Project will result in any invasive species becoming established.
Are impacts to suitable habitat likely to introduce disease that may cause the population to decline?	**Unlikely** There are no known diseases listed as threatening processes for the for *J. eubulus*. It is considered unlikely that the construction and ongoing operation of the Project will introduce any that could cause potential populations to decline.
Are impacts to suitable habitat likely to interfere with the recovery of the species?	**Unlikely** The conservation advice for *J. eubulus* lists protecting habitat from destruction and controlling invasive species as priority conservation and recovery objectives. Considering that the construction of the Project will not require the removal any know suitable habitat for the for *J. eubulus*, it is therefore considered unlikely that this action could interfere with the recovery of the species.
Are impacts to suitable habitat likely to cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?	**Unlikely** It is assumed that each known record, or group of records, represents an isolated sub-population of the *J. eubulus*, as it is very unlikely that there is movement between these records. Additionally, the areas identified as suitable habitat for *J. eubulus*, are regional ecosystems containing *Acacia harpophylla* which is a key requirement for the species, as described in the Conservation Advice (TSSC, 2016). Considering the absence of suitable habitat and any local records of the *J. eubulus*, within the Study area however, it is unlikely that the Project will disrupt any ecologically significant locations for this species.
It is considered UNLIKELY that the Project will have a significant residual impact on the *J. eubulus*	

4.5.1.4 *Calyptorhynchus lathami lathami* Temminch, 1807

Construction of the Project will result in direct loss of 1.6 ha of suitable habitat for the *C. l. lathami*. An assessment undertaken in accordance with the SRI Guidelines (DEHP, 2014) for the *C. l. lathami* has been provided in **Table 4.6**.

Table 4.6 – Significant Residual Impact Assessment for the Vulnerable *Calyptorhynchus lathami lathami*

SRI Criteria	Project Response
Are impacts to suitable habitat likely to lead to a long-term decrease in the size of a local population?	**Unlikely** There is no record of this species within the Project area. In general, area of north of the Warrego Highway contains less abundant *Allocasuarina littoralis* with habitat south of the Warrego Highway considered to contain more abundant foraging resources for *C. l. lathami* (ESE, 2023). As such, there are records have been buffered to indicate the area of potential habitat the only RE impacted that is considered as 'core habitat' for this species is RE11.5.4. The species is highly dispersive and any individuals using the Study area are likely to occupy a far greater range. It is therefore unlikely that any population would rely heavily on the Study area for the entirety of its resource needs. As such, the loss of 1.6 ha of potentially suitable habitat is unlikely to lead to a long-term decrease in the size of a local population.
Are impacts to suitable habitat likely to reduce the extent of occurrence of the species?	**Unlikely** The extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon (ALA, 2015). Given that the Project is located well within the known distribution of the *C. l. lathami*, it is considered unlikely that the Project will reduce the extent of occurrence of this species.
Are impacts to suitable habitat likely to fragment an existing population?	**Unlikely** While the *C. l. lathami* is susceptible to habitat fragmentation (DCCEEW,2022), being highly mobile, this species may travel considerable distances to isolated fragments in search of food. Given the highly vegetated nature of the surrounding area and adjoining State Forests, it is unlikely that the loss of 1.6 ha of potential habitat would result in a significant impact on connectivity for this species. Thus, impacts to suitable habitat are unlikely to create a barrier to movement for the species to fragment an existing population of *C. l. lathami.*
Are impacts to suitable habitat likely to result in genetically distinct populations forming as a result of habitat isolation?	**Unlikely** *C. l. lathami* is one of three recognised subspecies (along with the Kangaroo Island and northern subspecies). Within the south-eastern subspecies, though there was previously thought to be a separate Riverina population in western NSW, the subspecies is now considered to be a single main population (DCCEEW, 2022). The high mobility of this bird species suggests that fragmentation as a result of the Project is unlikely to provide a significant barrier to species movement. Thus, impacts to suitable habitat are unlikely to create a barrier to movement for the species to result in genetically distinct populations of Glossy Black-cockatoo forming.

Are impacts to suitable habitat likely to result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?	**Unlikely** Locally, fragmentation and the removal of hollow-bearing trees may increase predation of nestlings or alternatively result in higher competition for hollows by 'edge' species such as the Common Brushtail Possum (DCCEEW, 2022). However, the Project is not expected to introduce new invasive species to the Study area. Invasive weeds are a threat to Glossy Black-cockatoo due to their increased bushfire risk (DCCEEW, 2022). The Project is expected to provide improvement to bushfire risk in the Study area through the inclusion of a bushfire mitigation strategies. Thus, impacts to suitable habitat are considered unlikely to result in invasive species harmful to *C. l. lathami* becoming established in *C. l. lathami* habitat.
Are impacts to suitable habitat likely to introduce disease that may cause the population to decline?	**Unlikely** Psittacine Beak and Feather Disease (PBFD) is a potentially fatal disease caused by psittacine circovirus, typically transferred between adults, nestlings and contaminated nest hollows. Although south-eastern *C. l. lathami* are susceptible to PBFD, the threat level is relatively low compared to other threats (DCCEEW, 2022). While the loss of nest hollows can lead to greater competition, and thus an increased likelihood of transmission, the small total area (1.6 ha) of habitat to be impacted by the Project is unlikely to result in a significant loss of hollows, or to impinge on connectivity with surrounding habitat and hollows. Thus, impacts to suitable habitat are unlikely to introduce disease that may cause the population to decline.
Are impacts to suitable habitat likely to interfere with the recovery of the species?	**Unlikely** The Conservation Advice for *C. l. lathami* (DCCEEW, 2022) lists protecting, restoring and enhancing the quality of known suitable habitat, maintaining connectivity, increasing hollow availability and appropriate fire regimes as priority conservation and recovery objectives. The implementation of bushfire mitigation strategies across the Project will be undertaken in accordance with those already established for the broader SGP. These have been designed to account for both buried infrastructure and exposed vents/drains so that during the construction and operational phases of the Project, bushfire risks are mitigated. The removal of 1.6 ha of potential foraging resources for the *C. l. lathami*, is unlikely to interfere with the recovery of this species.
Are impacts to suitable habitat likely to cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?	**Possible** The *C. l. lathami* rely on nine species of *Allocasuarina* spp. and *Casuarina* spp. for feeding. In south-east Queensland, they show preference for *A. littoralis* and *A. torulosa*. They prefer *Eucalyptus crebra* for nesting hollows (DCCEEW, 2022). Impacted areas represent a potential foraging resource and the removal of hollow-bearing trees could result in the loss of nesting sites within the Study area. Considering that the construction of the Project will require the removal of 1.6 ha of potentially suitable habitat for the *C. l. lathami*, it is possible that the Project will disrupt ecologically significant locations for this species.
It is considered POSSIBLE that the Project will have a significant residual impact on the *C. l. lathami*	

4.5.1.5 *Hirundapus caudacutus* Latham, 1801

Construction of the Project will result in no direct loss of potentially suitable habitat for the *H. caudacutus*. An assessment undertaken in accordance with the SRI Guidelines (DEHP, 2014) for the *H. caudacutus* has been provided in **Table 4.7**.

Table 4.7 – Significant Residual Impact Assessment for the Vulnerable *Hirundapus caudacutus*

SRI Criteria	Project Response
Are impacts to suitable habitat likely to lead to a long-term decrease in the size of a local population?	**Unlikely** The occurrence of historical records indicates that the broader SGP Project is utilised by a portion of the population of *H. caudacutus* during their non-breeding season. The Project will require the removal vegetation within the Project area, these terrestrial impacts are unlikely to affect the availability of aerial foraging habitat for this species. The *H. caudacutus* has a preference for dense roosting habitat (TSSC, 2019b). The structural category of REs as listed in the Regional Ecosystem Description Database (REDD) provides a useful proxy, with 'dense' REs indicating potential roosting habitat. The Project footprint indicated that there is unlikely to be any suitable roosting habitat for this species. It is therefore considered unlikely that development of the Project will lead to a long-term decrease in the size of a local population.
Are impacts to suitable habitat likely to reduce the extent of occurrence of the species?	**Unlikely** The extent of occurrence is defined as "the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon excluding cases of vagrancy" (IUCN, 2024). The extent of occurrence for the *H. caudacutus* encompasses the entirety of Australia which is approximately 7.7 million km2 (TSSC, 2019; ALA, 2024). The Project will require the removal of vegetation, these terrestrial impacts are unlikely to affect the availability of aerial foraging habitat for this species. No suitable roosting habitat has been identified within the Study area. So, it is considered unlikely that the Projects' will reduce the extent of occurrence for this species.
Are impacts to suitable habitat likely to fragment an existing population?	**Unlikely** Considering the aerial nature of this species, terrestrial fragmentation is unlikely to affect the dispersal capabilities of this species as they move through the surrounding landscape. Whilst the construction and ongoing operation of the Project will contribute to the general terrestrial fragmentation of the surrounding landscape, no suitable roosting habitat for this species has been observed within the Study area. It is therefore considered unlikely that the construction and ongoing operation of the Project will fragment an existing population of *H. caudacutus*.
Are impacts to suitable habitat likely to result in genetically distinct populations forming as a result of habitat isolation?	**Unlikely** There are currently two recognised subspecies of *H. caudacutus* (*H. caudacutus nudipes* and *H. caudacutus caudacutus*) (TSSC, 2019). *H. caudacutus* spp. *caudacutus* is the only subspecies known to overwinter in Australia. Whilst extensive genetic studies have not yet been conducted on this species, it is believed that all individuals found in Australia belong to a single genetic population. Furthermore, no suitable roosting habitat for this species has been mapped within the Study area and terrestrial fragmentation resulting from the Project is unlikely to isolate any locally occurring populations. It is therefore considered

	unlikely that the construction and ongoing operation of the Project will result in genetically distinct populations forming
Are impacts to suitable habitat likely to result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?	**Unlikely** Whilst numerous invasive flora and fauna species have been observed across the broader SGP Project, there are currently no invasive species listed as threatening processes for the *H. caudacutus* (TSSC, 2019). Regardless of this, to help manage pest species across the Project, Arrow have developed an overarching pest management strategy and Pest Management Plan (PMP) for the broader SGP. This PMP will help to ensure that appropriate management strategies are implemented to control pest species that could occur within the Project footprint, including the Black Rat. It is therefore considered unlikely that the construction and ongoing operation of the Project will result in any invasive species becoming established.
Are impacts to suitable habitat likely to introduce disease that may cause the population to decline?	**Unlikely** The conservation advice does not list any diseases as threatening processes for the *H. caudacutus* (TSSC, 2019). It is therefore considered unlikely that the construction and ongoing operation of the Project will introduce any diseases that could cause this species to decline.
Are impacts to suitable habitat likely to interfere with the recovery of the species?	**Unlikely** There are currently no recovery or management objectives listed for the *H. caudacutus* in the conservation advice (TSSC, 2019) or the species profile (DoE, 2024a). Considering the aerial nature of this species, and the fact that they are a non-breeding migrant to Australia, it is conceivable that the protection of suitable roosting sites may become a recovery objective for this species. Given their aerial nature and ability to forage above most vegetated areas, it is unlikely that impacts to foraging habitat is likely to become a recovery objective for this species. No suitable roosting habitat for this species has been mapped within the Study area. Whilst the development of the Project will require the removal of terrestrial vegetation, these impacts are unlikely to impact the aerial foraging habitat above these communities. It is therefore considered unlikely that the construction and ongoing operation of the Project will interfere with the recovery of this species.
Are impacts to suitable habitat likely to cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?	**Unlikely** Considering the abundance of historical records both within and adjacent to the broader SGP Project, the Study area can be considered an ecologically significant location for the *H. caudacutus* as it supports and abundance foraging opportunities for this species. Given their aerial nature, terrestrial impacts to vegetation communities are unlikely to affect the foraging opportunities for this species. Furthermore, no suitable roosting habitat has been identified within the Study area. It is therefore considered unlikely that impacts to support the construction and ongoing operation of the Project will disrupt an ecologically significant location for the *H. caudacutus*.
It is considered UNLIKELY that the Project will have a significant residual impact on the *H. caudacutus*.	

4.5.1.6 *Stagonopleura guttata* Shaw, 1796

Construction of the Project will result in direct loss of 356.4 ha suitable habitat for the *S. guttata*. An assessment undertaken in accordance with the SRI Guidelines (DEHP, 2014) for the *S. guttata* has been provided in **Table 4.8**.

Table 4.8 – Significant Residual Impact Assessment for the Vulnerable *Stagonopleura guttata*

SRI Criteria	Project Response
Are impacts to suitable habitat likely to lead to a long-term decrease in the size of a local population?	**Unlikely** There are scattered (undated) records in the SGP North area and surrounds however, these have low spatial accuracy, and the species has not been detected in the broader SGP despite extensive survey effort. If a population is present, it is likely to be relatively low density, and an abundance of suitable habitat will remain unaffected. Given the availability of habitat surrounding the Study area, the direct loss of 356.4 ha of potentially suitable habitat for the *S. guttata* is unlikely to lead to a long-term decrease in the size of a local population.
Are impacts to suitable habitat likely to reduce the extent of occurrence of the species?	**Unlikely** The extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred, or projected sites of present occurrence of a taxon (ALA, 2015). Given that the Project is located well within the known distribution of the *S. guttata*, it is considered unlikely that the Project will reduce the extent of occurrence of this species.
Are impacts to suitable habitat likely to fragment an existing population?	**Unlikely** While the *S. guttata* is susceptible to habitat fragmentation and appears to be sedentary (DCCEEW, 2023), populations are known to move locally and, as birds, are capable of flight in long lines between shrubs and to/from the ground for feeding. Given the highly vegetated nature of the surrounding area and adjoining State Forests, it is unlikely that the loss of 0.68 ha of potential habitat would result in a significant impact on connectivity for this species. Thus, impacts to suitable habitat are unlikely to create a barrier to movement for the species to fragment an existing population of *S. guttata*.
Are impacts to suitable habitat likely to result in genetically distinct populations forming as a result of habitat isolation?	**Unlikely** *S. guttata* groups typically separate into small breeding colonies between August and January and build their nests into the base of birds-of-prey nests or the prickly foliage of shrubs (DCCEEW, 2023). The potential habitat loss of 0.68 ha is unlikely to restrict the movement of a population or restrict access to nesting resources to the extent that genetically distinct populations would form.
Are impacts to suitable habitat likely to result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?	**Unlikely** Listed threats for *S. guttata* include exotic annual grasses (e.g. *Eragrostis curvula*) as a major threat, increased territorial competition by *Manorina melanocephala* as a moderate threat and, predation by *Strepera graculina* and habitat degradation by *Oryctolagus cuniculus* as minor threats (DCCEEW, 2023). *M. melanocephala* usually benefit from landscape scale clearing and fragmentation of open woodland vegetation with limited shrubby understory (DCCEEW, 2023). *S. graculina* are also considered edge-specialist predators that benefit from increased fragmentation and edge effects in *S. guttata* habitat. However, neither species is considered likely to gain competitive advantage or increase predation as a result of Project development.

	Thus, impacts to suitable habitat are unlikely to result in invasive species that are harmful to *S. guttata* becoming established in *S. guttata* habitat.
Are impacts to suitable habitat likely to introduce disease that may cause the population to decline?	**Unlikely** Conservation Advice does not list any diseases amongst the threats for *S. guttata* (DCCEEW, 2023). Thus, impacts to suitable habitat are unlikely to introduce disease that may cause the population to decline.
Are impacts to suitable habitat likely to interfere with the recovery of the species?	**Possible** The Conservation Advice for *S. guttata* (DCCEEW, 2023) lists retaining and protecting suitable habitat from clearing, fragmentation and disturbance, reducing grazing intensity and removing weed species as priority conservation and recovery objectives. Development of the Project will result in the removal of 356.4 ha of potentially suitable habitat for the *S. guttata*, which will not interfere with the recovery of this species if indeed it is present.
Are impacts to suitable habitat likely to cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?	**Possible** The majority of the Study area represents potential foraging and roosting habitat for *S. guttata*, though there are no confirmed, dated and spatially accurate records confirming its presence. However, removal of 356.4ha is unlikely to impact on ecologically significant locations for this species if it is, in fact, present.
It is considered POSSIBLE that the Project will have a significant residual impact on the *S. guttata*	

4.5.1.1 *Nyctophilus corbeni* Parnaby, 2009

The Project will result in direct loss of 350.4 ha of potentially suitable habitat for *N. corbeni*. An assessment undertaken in accordance with the SRI Guidelines (DEHP, 2014) for the *N. corbeni*. has been provided in **Table 4.9**.

Table 4.9 - Significant Residual Impact Assessment for the Vulnerable *Nyctophilus corbeni*

SRI Criteria	Project Response
Are impacts to suitable habitat likely to lead to a long-term decrease in the size of a local population?	**Likely** There is no record for *N. corbeni* within the Study area, but two records very close to. Most species of *Nyctophilus* are thought to be sedentary and the slow, manoeuvrable flight that characterises this genus is not considered conducive to long distance flights. Foraging is generally undertaken within several kilometres of their roosting site (TSSC, 2015). As such, these records indicate the presence of a local population that is likely to use the Study area. The Project contains ironbark woodlands and stands of *Callitris* and *Allocasuarina luehmannii* that are likely to provide foraging resources and roosting habitat (in the form of tree hollows and exfoliating bark). While this clearing is not concentrated in a single location and an abundance of suitable habitat will remain in adjoining areas, the loss of these resources from 350.4 ha of potentially suitable habitat is likely to lead to a long-term decrease in the size of the local population.
Are impacts to suitable habitat likely to reduce the extent of occurrence of the species?	**Unlikely** The extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon (ALA, 2015). Given that the Project is located well within the known distribution of *N. corbeni*, it is considered unlikely that the Project will reduce the extent of occurrence of this species.
Are impacts to suitable habitat likely to fragment an existing population?	**Unlikely** *N. corbeni* is considered to be 'clutter-adapted' and forest-dependent, foraging at low height, close to vegetation and around tree trunks (Law et al, 2016). Habitat fragmentation is considered a primary factor contributing to the population decline of the species throughout its range. While individual bats are theoretically capable of negotiating low levels of fragmentation, their preference for larger tracts of vegetation is well-established (ESE, 2023) and it is likely that would avoid areas with limited cover. As such, the Project has the potential to fragment existing populations of *N. corbeni*.
Are impacts to suitable habitat likely to result in genetically distinct populations forming as a result of habitat isolation?	**Unlikely** While the Project will result in the creation of a potential barrier to east-west movement for this species through the Study area, it will not completely isolate any local population of *N. corbeni*. As such, the Project is unlikely to result in a genetically distinct population forming as a result of habitat isolation.

Are impacts to suitable habitat likely to result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?	**Unlikely** Predation by introduced species, such as the *Felis catus* and *Vulpes vulpes*, has not been observed for Corben's Long-eared Bat and therefore the risk to the species is unknown (TSSC, 2015). To help manage pest species across the Project, Arrow have developed an overarching pest management strategy and developed a SMP for the broader SGP. This PMP will help to ensure that appropriate management strategies are implemented to control pest species that could occur within the Project footprint. It is considered unlikely that the Project will result in the establishment of invasive flora and fauna species in the Project site.
Are impacts to suitable habitat likely to introduce disease that may cause the population to decline?	**Unlikely** There are no known diseases listed as threatening process for *N. corbeni*. Thus, impacts to suitable habitat are unlikely to introduce disease that may cause the population to decline.
Are impacts to suitable habitat likely to interfere with the recovery of the species?	**Likely** The Conservation Advice for *N. corbeni* (TSSC, 2015) lists habitat loss and fragmentation, fire, reduction in hollow availability and predation by feral animals as threats to the species. To help manage pest species across the Project, Arrow have developed an overarching pest management strategy and developed a SMP for the broader SGP. This SMP will help to ensure that appropriate management strategies are implemented to control pest species that could occur within the Project footprint. Despite this however, the Project will require the removal of 350.4 ha of potentially suitable habitat for the *N. corbeni*, which could interfere with the recovery of this species.
Are impacts to suitable habitat likely to cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?	**Likely** Impacted areas represent a potential foraging resource and the hollow trees could result in the loss of roosting sites within the Study area. As development of the Project will require the removal of 350.4.15 ha of potentially suitable habitat for the *N. corbeni*, it is likely that the Project will disrupt ecologically significant locations for this species.
It is considered LIKELY that the Project will have a significant residual impact on the *N. corbeni*	

4.5.1.2 *Petauroides volans volans* Kerr, 1792

The Project will result in direct loss of 357.5 ha of potentially suitable habitat for *P. volans* spp. *volans*. An assessment undertaken in accordance with the SRI Guidelines (DEHP, 2014) for the *P. v. volans*. has been provided in **Table 4.10**.

Table 4.10 - Significant Residual Impact Assessment for the Endangered *Petauroides volans volans*

SRI Criteria	Project Response
Are impacts to suitable habitat likely to lead to a long-term decrease in the size of a local population?	**Unlikely** The species is common in the surrounding area, however, there are no records within Study area. The closest high concentration of records is located northwest of the Study area (ALA, 2025). The low presence of *P. volans*, based on publish records, suggests that the Study area functions primarily as dispersal habitat. Population numbers are likely to be sparse given the nature of the available habitat in the Brigalow Belt (DCCEW, 2021). *P. v. volans*. distribution extends from the Windsor Tableland in north Queensland, south to Wombat State Forest in central Victoria (Woinarski et al. 2014). Most of these records within SGP and vicinity are associated with larger areas of remnant vegetation, in particular vegetation spanning between Barakula, Binkey and Gurulmundi State Forests, and vegetation associated with Condamine, Braemar, Vickery and Kumbarilla State Forests. However, a number of records fall in fragmented vegetation, usually long narrow linear strips associated with Wilkie and Condamine River (ESE, 2023). Clearing for establishment of the Project has direct loss of habitat containing known browse species for *P. v. volans*. The nature of coal seam gas infrastructure (which typically comprises clearing for up to 30 m wide for linear infrastructure) means this clearing will not be concentrated in a single location, rather it will be dispersed over a large area.
Are impacts to suitable habitat likely to reduce the extent of occurrence of the species?	**Unlikely** The extent of occurrence is defined as “the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon, excluding cases of vagrancy” (IUCN, 2024). The estimated extent of occurrence for the *P. volans* is approximately 1066,146 km² (DAWE, 2022). Given that the Project is located well within a region is already subject to localised habitat fragmentation, it is considered unlikely that the construction and ongoing operation of the Project will measurably reduce the extent of occurrence for this species.
Are impacts to suitable habitat likely to fragment an existing population?	**Unlikely** Whilst *P. volans* is considered to be particularly sensitive to habitat loss resulting from land clearing (DAWE, 2022), although responses vary according to landscape context and the extent of tree removal and retention (Kavanagh, 2000; Taylor et al., 2007). Whilst the construction of the Project will lead to some possible habitat loss, it is considered unlikely that these impacts will effectively fragment an existing population especially given region is already subject to localised habitat fragmentation.
Are impacts to suitable habitat likely to result in genetically distinct populations forming as a result of habitat isolation?	**Unlikely** Two subspecies are conventionally recognized: *P. volans minor* in north-east Queensland and *P. volans volans* in south-eastern Australia (DCCEW, 2022). Genetic research (McGregor et al., 2020) suggests that *P. volans* may be paraphyletic, comprising three closely related taxa.

	Some agencies and jurisdictions have accepted this work and now recognize *P. armillatus* (Central Greater Glider) as a separate species. However, this revised taxonomy has not been adopted in the recently published Mammals of Australia (Baker & Gynther, 2023). In the interest of taxonomic stability, we retain *P. volans* (southern and central populations) as a single species here (sensu lato), while acknowledging that this may change in the future. Given the linear nature of the proposed disturbance and the species' ability to disperse locally, it is considered unlikely that the construction and ongoing operation of the Project would result in the formation of a genetically distinct population through habitat fragmentation.
Are impacts to suitable habitat likely to result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?	**Unlikely** Whilst numerous invasive flora and fauna species have been observed across the broader SGP Project, there are currently no invasive species listed as threatening processes for the *P. volans* spp. *volans* (TSSC, 2019). Regardless of this, to help manage pest species across the Project, Arrow have developed an overarching pest management strategy and Pest Management Plan (PMP) for the broader SGP. This PMP will help to ensure that appropriate management strategies are implemented to control pest species that could occur within the Project. It is therefore considered unlikely that the construction and ongoing operation of the Project will result in any invasive species becoming established.
Are impacts to suitable habitat likely to introduce disease that may cause the population to decline?	**Unlikely** There are no known diseases listed as threatening processes for the *P. volans*. It is considered unlikely that the construction and ongoing operation of the Project will introduce any that could cause potential populations to decline.
Are impacts to suitable habitat likely to interfere with the recovery of the species?	**Possible** The conservation advice for the *P. volans* (DCCEEW, 2022) lists retaining and protecting forest from clearing and fragmentation as a key conservation objective for this species. Considering that the construction of the Project will removal of potentially suitable habitat for the *P. v. volans.*
Are impacts to suitable habitat likely to cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?	**Likely** *P. v. volans*. is predominately restricted to eucalypt forests and woodlands, and are most common in taller, montane, moist eucalypt forests with larger, relatively old trees and abundant hollows (Eyre 2004; van der Ree et al. 2004) *P. volans* require large old-growth trees with abundant large hollows for denning and its abundance is often linked to hollow density (ESE, 2023). Considering, the Study area is within the distribution area with habitat feature present for the species, it can be considered an ecologically significant location for the *P. volans* as has suitable habitat for this species. The Project will impact potential suitable habitat *P. v. volans.* Despite of this, the species has not been recorded within the Study area and has only been infrequently recorded in surrounding areas within approximately 20 km of Study area (ESE, 2023). This suggests that there are no active ecological significant locations within the Project area, however they cannot be discounted entirely. Therefore, whilst the Project may interfere with ecologically significant locations growth vegetation, these impacts are not considered to be significant for the broader population.
It is considered LIKELY that the Project will have a significant residual impact on the *P. v. volans*.	

4.5.1.3 *Petaurus australis australis* Shaw, 1791

The Project will result in direct loss of 357.5 has of potentially suitable habitat for *P. a. australis*. An assessment undertaken in accordance with the SRI Guidelines (DEHP, 2014) for the *P. a. australis* has been provided in **Table 4.11**.

Table 4.11 – Significant Residual Impact Assessment for the Vulnerable *Petauroides australis australis*

SRI Criteria	Project Response
Are impacts to suitable habitat likely to lead to a long-term decrease in the size of a local population?	**Possible** The *P. a. australis* is well represented in Gurulmundi State Forest to the west and Barakula State Forest to the east however, it is yet to be detected in the broader SGP area and has never been recorded from the Study area. There is approximately 9140.9 ha of RE potentially suitable habitat for the species mapped for the Study area. Only 357.5 ha of this area of the extent within the Study area is impacted by the Project. The *P. a. australis* are known to be sensitive to fragmentation and, given the history of clearing and land disturbance, it is likely that a significant proportion of this area does not contain trees of sufficient size (>50 cm DBH) to provide shelter for this hollow-dependent species. However, there are areas which contain trees mature enough to support *P. a. australis*, which means substantial hollows are likely to be present. The overall impact (357.5 ha) is cumulative and represents smaller areas of clearing across the Study area. As such, only a small proportion of vegetation will be removed in any one section of the corridor, with surrounding suitable habitat retained. Despite this, the overall reduction in potentially suitable habitat is significant and could lead to a decrease in the size of a local population of *P. a. australis*, if one is present.
Are impacts to suitable habitat likely to reduce the extent of occurrence of the species?	**Unlikely** The extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon (ALA, 2015). Given that the Project is located well within the known distribution of the *P. a. australis*, it is considered unlikely that the Project will reduce the extent of occurrence of this species.
Are impacts to suitable habitat likely to fragment an existing population?	**Possible** *P. a. australis* are known to be sensitive to habitat fragmentation (DAWE, 2022b). With an estimated average glide ratio of 2.0 and a low dispersal capability beyond their gliding distance, any ROWs >40 m wide is likely to provide a fragmenting effect wherever tree heights do not exceed 25 metres. Even when tall trees are present, the removal of this natural connectivity is likely to affect movement within the Study area. The fragmentation impacts of the combined north-south ROW with the Girrahween to Bellevue (G2B) pipeline are considered in the Biodiversity Assessment Report for that Project however, it is worth noting that this ROW would be expected to represent a barrier to east-west movement by *P. a. australis*, with tree height in unimpacted areas bordering the RoW being a key variable. Other areas where ROWs exceed 25 m in width also have the potential to fragment local populations of *P. a. australis*, if present.

Are impacts to suitable habitat likely to result in genetically distinct populations forming as a result of habitat isolation?	**Unlikely** The *P. a. australis* has already been split into two genetically distinct subpopulations (*Petaurus australis australis* (south-eastern subspecies) and *Petaurus australis brevirostrum* (northern subspecies)) which have clear geographical boundaries. The northern subspecies occurs in eucalypt forest in the Atherton region in Queensland, whilst the south-eastern subspecies occurs south-eastern Queensland to far south-eastern South Australia (DAWE, 2022b). The Project is located well within the known distribution of the south-eastern subspecies. While the Project may create barriers to localised movement for any population of *P. a. australis*, it is unlikely to result in complete habitat isolation or the formation of genetically distinct populations of this species.
Are impacts to suitable habitat likely to result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?	**Unlikely** Whilst numerous invasive flora and fauna species have been observed across the broader SGP Project, there are currently no invasive species listed as threatening processes for the *P. a. australis* (TSSC, 2019). Regardless of this, to help manage pest species across the Project, Arrow have developed an overarching pest management strategy and Pest Management Plan (PMP) for the broader SGP. This PMP will help to ensure that appropriate management strategies are implemented to control pest species that could occur within the Project. It is therefore considered unlikely that the construction and ongoing operation of the Project will result in any invasive species becoming established.
Are impacts to suitable habitat likely to introduce disease that may cause the population to decline?	**Unlikely** Conservation advice does not list any diseases amongst the threats for *P. a. australis* (DAWE, 2022b). Thus, impacts to suitable habitat are unlikely to introduce disease that may cause the population to decline.
Are impacts to suitable habitat likely to interfere with the recovery of the species?	**Possible** General, widespread fragmentation of *P. a. australis* habitat is listed as the primary cause of population decline (DAWE, 2022b) as this species has a strong preference for very large tracts of contiguous remnant habitat. As there is significant clearing to the east, west and south of the Study area and some linear clearing to the north, it is probably that the area already has reduced habitat value for *P. a. australis*. Overall, however, it is possible that the removal of 357.5 ha of potential habitat could interfere with the recovery of the species, if it is present in the Study area.
Are impacts to suitable habitat likely to cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?	**Possible** Habitat mapping based on RE associations (without accounting for tree size and hollow availability) is likely to overestimate the extent of suitable habitat in the Study area. However, if a population of *P. a. australis* is present it is possible that the Project would result in the disruption of breeding and foraging habitat for this species.
It is considered POSSIBLE that the Project will have a significant residual impact on the *P. a. australis*	

4.5.1.4 *Phascolarctos cinereus* Goldfuss, 1877

The Project will result in the direct loss of 372.8 ha of potentially suitable habitat for *P. cinereus*. An assessment undertaken in accordance with the SRI Guidelines (DEHP, 2014) for the *P. cinereus* has been provided in **Table 4.12**.

Table 4.12 – Significant Residual Impact Assessment for the Endangered *Phascolarctos cinereus*

SRI Criteria	Project Response
Are impacts to suitable habitat likely to lead to a long-term decrease in the size of a local population?	**Likely** The low presence of *P. cinereus* records within the Study area suggests that the Study area functions primarily as dispersal habitat. The higher concentration of records outside the Study area indicates that more suitable habitat likely occurs elsewhere to support the local population. Population numbers are likely to be sparse given the nature of the available habitat in the Brigalow Belt (DAWE, 2022). *P. cinereus* are reported to utilise more than 400 different species of tree for their food and habitat requirements (DAWE, 2022) resulting in all vegetated areas within the Study area being mapped as potential habitat for this species. Clearing for establishment of the Project will impact potentially habitat for *P. cinereus*. The Project infrastructure (which will comprises clearing for up to 30 m wide for linear infrastructure) means this clearing will not be concentrated in a single location, rather it will be dispersed over a large area. Despite this, impacts associated with the Project can have the potential to lead to a long-term decrease in the size of the local *P. cinereus* population.
Are impacts to suitable habitat likely to reduce the extent of occurrence of the species?	**Unlikely** The extent of occurrence is defined as "the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon, excluding cases of vagrancy" (IUCN, 2024). The estimated extent of occurrence for the *P. cinereus* is approximately 1,665,850 km² (DAWE, 2022). The Project will removal of potentially suitable habitat for this species, it is considered unlikely that the construction and ongoing operation of the Project will measurably reduce the extent of occurrence for this species.
Are impacts to suitable habitat likely to fragment an existing population?	**Unlikely** Whilst *P. cinereus* are known to be sensitive to habitat loss resulting from land clearing (DAWE, 2022) they are capable of dispersing between areas of suitable habitat and persisting in highly fragmented habitats for long periods of time (Youngentob, Marsh, & Skewes, 2021). In addition to regular movements across the ground between trees within their own home ranges, *P. cinereus*, particularly subadult males but also females, are known to disperse across distances of 1 to 3 km but sometimes over 10 km (Youngentob, Marsh, & Skewes, 2021). Whilst the construction of the Project will lead to some habitat fragmentation; it is considered unlikely that the Project will effectively fragment an existing population.
Are impacts to suitable habitat likely to result in genetically distinct populations forming as a result of habitat isolation?	**Unlikely** Conservation Advice for the Koala (DAWE, 2022) has identified four spatially distinct, genetic koala management units, including: ▪ QLD and NSW populations north of the Clarence River Valley, NSW; ▪ South of the Clarence River Valley, NSW to north of the Sydney Basin;

	▪ South of the Sydney Basin to approximately the NSW/VIC boarder; and ▪ VIC and SA populations. Given the Projects location within the QLD and NSW *P. cinereus* management unit, any localised habitat fragmentation is unlikely to result in a genetically distinct subpopulation from forming. There is also a broad recognition of the Koala's dispersal capabilities across cleared land (Youngentob, Marsh, & Skewes, 2021). It is therefore considered unlikely that the construction of the Project will result in genetically distinct populations from forming from habitat isolation.
Are impacts to suitable habitat likely to result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?	**Unlikely** Predation by Canis sp. is listed as a key threatening process for the *P. cinereus* (DAWE, 2022). It is considered unlikely that the construction and ongoing operation of the Project will result in these species becoming established in the area or exacerbate an existing occurrence of these pest species. To help manage pest species across the Project, Arrow have developed a PMP for the broader SGP. This PMP will help to ensure that appropriate management strategies are implemented to control pest species that could occur within the Project footprint. It is therefore considered unlikely that the Project will result in invasive species being established.
Are impacts to suitable habitat likely to introduce disease that may cause the population to decline?	**Unlikely** *P. cinereus* retrovirus and Chlamydia (*Chlamydia pecorum)* are known to be prevalent amongst Koala populations in northern Australia (DAWE, 2022). It is currently unknown whether these diseases are present within the local population of *P. cinereus* that have been identified in the vicinity of the Project, but it is considered unlikely that the construction and ongoing operation of the Project will introduce these diseases to local populations or exacerbate any pre-existing diseases that may already be present.
Are impacts to suitable habitat likely to interfere with the recovery of the species?	**Possible** Considering the high-profile nature of the *P. cinereus* there is an abundance of conservation advice and recovery objectives documented for this species. Both the National Recovery Plan for the *P. cinereus* (DAWE, 2022) and the South-East Queensland *P. cinereus* Conservation Strategy 2020-2025 (DES, 2020) lists increasing habitat protection and habitat restoration as priority conservation and recovery objectives. Considering that the construction of the Project will require the removal of potential suitable habitat for the *P. cinereus*, it is possible that this action could interfere with the recovery of the species.
Are impacts to suitable habitat likely to cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?	**Likely** *P. cinereus* are reported to utilise more than 400 different species of tree for their food and habitat requirements (DAWE, 2022) resulting in all vegetated areas within the Study area being mapped as potential habitat for this species. Breeding, feeding and resting sites for *P. cinereus* are not location-specific and will be dispersed across habitat throughout the Study area, though there is some evidence that *P. cinereus* have a preference for individual trees in any given area of habitat (DAWE, 2022). Development of the Project will result in the removal of potentially suitable habitat for the *P. cinereus*, and it is likely that the Project will disrupt ecologically significant locations for this species.
It is considered LIKELY that the Project will have a significant residual impact on the *P. cinereus*.	

4.5.1.5 *Tachyglossus aculeatus* Shaw, 1792

The Project will result in the direct loss of 2.9 ha of potentially suitable habitat for *T. aculeatus*. An assessment undertaken in accordance with the SRI Guidelines (DEHP, 2014) for the *T. aculeatus* has been provided in **Table 4.13**.

Table 4.13 – Significant Residual Impact Assessment for the Special least concern *Tachyglossus aculeatus*

SRI Criteria	Project Response
Are impacts to suitable habitat likely to lead to a long-term decrease in the size of a local population?	**Unlikely** The presence and abundance of *T. aculeatus* records in the region surrounding the Study area suggests that there is sufficient suitable habitat to support a local population of this species. The nearest record is approximately 1 km of impact area on Road reserve north of lot plan 87BWR294 (ALA 2008). Whilst the construction of the Project will result in 2.9 ha direct loss of potentially suitable habitat for this species, they are capable of utilising a broad range of habitats including forests and woodlands, heaths, grasslands and arid environments (BHA, 2024), suggesting that there is an abundance of suitable habitat in the surrounding landscape. Whilst designing the Project, Arrow have attempted to co-locate this linear infrastructure with other linear infrastructure and avoid vegetated areas wherever possible and to avoid further fragmentation of non-remnant habitat. Given the scale and type of disturbance associated with linear infrastructure, the construction and ongoing operation of the Project is not likely to permanently displace echidnas from the Study area. It is therefore unlikely that the Project will lead to a long-term decrease in the size of a local population.
Are impacts to suitable habitat likely to reduce the extent of occurrence of the species?	**Unlikely** The extent of occurrence is defined as “the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon excluding cases of vagrancy (IUCN, 2024). Whilst a formal assessment of the short-beaked echidna’s extent of occurrence hasn’t been undertaken, the EOO tool embedded in the ALA indicates that the extent of occurrence for this species is will cover the entire Australian landmass. Considering the distribution of this species throughout Australia and the localised habitat fragmentation already present within the broader Study area, it is considered unlikely that the construction and ongoing operation of the Project will reduce the extent of occurrence for this species.
Are impacts to suitable habitat likely to fragment an existing population?	**Unlikely** The *T. aculeatus* forages at ground level and it may travel considerable distances through fragmentated landscapes in search of food (BHA, 2024). Arrow collocated the Project RoW with other linear infrastructure to minimise the impact of the overall construction RoW wherever possible. Given the scale and type of impact required for this Project development at this location is not likely to impact dispersal of the echidna. Whilst dispersal opportunities may be impacted during the construction of the project (i.e. trenching and storage of infrastructure above ground), once constructed the project is not likely to physically inhibit the dispersal of the echidna throughout the Study area. It is therefore considered unlikely that the Project will fragment an existing population.

Are impacts to suitable habitat likely to result in genetically distinct populations forming as a result of habitat isolation?	**Unlikely** The short-beaked echidna is a very widespread species, colonising most of the Australian mainland. The development and ongoing operation of the Project does not completely dissect or isolate a population or populations, nor will it physically inhibit echidnas from travelling between fragmented areas of suitable habitat. It is unlikely that impacts to suitable habitat will isolate populations of the *T. aculeatus* to the extent that genetically distinct populations will be formed.
Are impacts to suitable habitat likely to result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?	**Unlikely** Whilst numerous invasive flora and fauna species have been observed across the broader SGP Project, there are currently no invasive species listed as threatening processes for the *T. aculeatus* (TSSC, 2019). Regardless of this, to help manage pest species across the Project, Arrow have developed an overarching pest management strategy and Pest Management Plan (PMP) for the broader SGP. This PMP will help to ensure that appropriate management strategies are implemented to control pest species that could occur within the Project. It is therefore considered unlikely that the construction and ongoing operation of the Project will result in any invasive species becoming established.
Are impacts to suitable habitat likely to introduce disease that may cause the population to decline?	**Unlikely** There are no known diseases listed as threatening processes for the *T. aculeatus.* It is considered unlikely that the construction and ongoing operation of the Project will introduce any that could cause potential populations to decline.
Are impacts to suitable habitat likely to interfere with the recovery of the species?	**Unlikely** The Conservation Advice for *T. aculeatus* (DCCEEW, 2023) lists retaining and protecting suitable habitat from clearing, fragmentation and disturbance, reducing grazing intensity and removing weed species as priority conservation and recovery objectives. Development of the Project will result in the removal of 2.9 ha of potentially suitable habitat for the *T. aculeatus*, which will not interfere with the recovery of this species if indeed it is present.
Are impacts to suitable habitat likely to cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?	**Unlikely** The *T. aculeatus* is widespread and occupies are a variety of vegetation types, allowing it to remain fairly non-specialised. A key requirement for this species is the availability of day shelters. Day shelters can consist of a variety of habitat structures, such as hollow logs, rabbit burrows, depressions in the ground under fallen trees or leaf litter, and various crevices and cavities (Wilkinson, Grigg, & Beard, 1998). Re-use of day shelters has also been observed (Wilkinson, Grigg, & Beard, 1998), indicating site recognition of particularly good shelters. Suitable habitat for the short-beaked echidna has been identified in accordance with the *Method for mapping matters of state environmental significance, Version 7* (DETSI, 2024). Whilst this habitat mapping is likely an underestimation of the actual extent of useable habitat for the species, it has been adopted for the purposes of this impact assessment. Based upon this approach, no suitable habitat for the echidna has been mapped within the Study area. It is considered unlikely that the construction and ongoing operation of the Project will impacts to suitable habitat likely to cause disruption to ecologically significant locations for the species.
It is considered UNLIKELY that the Project will have a significant residual impact on the *T. aculeatus*.	

5 Environmental Authority Amendment Application – Impact Summary

This BIA has assessed the proposed impact areas associated with the construction of the Project as a broader Study area. Details of the assessment area are provided below, along with the proposed conditions set out for EA0001399 amendment.

5.1 Environmental Sensitive Area

The current authorised disturbances to ESAs under the EA are specified in Biodiversity 8 and Biodiversity 9.

5.1.1 Assessment of ESA impacts on PLs 305, 491 and 492 for SGP North Stage 5

The proposed impacts on ESA and Protected Zones are described on **Table 5.1**. The Schedule F, Table 2 – Maximum ESA disturbance on EA0001399 is proposed to be updated, and an impact assessment against the revised conditions is presented in **Table 5.2.**

Table 5.1 - Additional ESA disturbance SGP North for Stage 5

ESA Type	Allowable activities	Vegetation community impacted	Proposed Activities	Impact area (ha)
SPZ Category B (within 300 m)				
Endangered RE	Only essential petroleum activities permitted.	11.7.7	ROW	0.22
		Pasture/Grazing		0.78
Total of disturbance in SPZ Category B				**1.00**
Category C				
Of Concern RE	Only low impact petroleum activities permitted	11.3.25	Extra work area	0.02
			ROW	0.49
		11.3.4	Access Track Only	0.03
			Extra work area	0.06
			ROW	0.83
Essential Habitat	Only low impact petroleum activities permitted	11.5.1	Access Track	0.25
			Extra Work Area	0.12
			Laydown	1.79
			ROW	12.10
			Well pad	2.00
		11.5.21	Extra Work Area	0.05
			ROW	4.38
		11.7.4 Regrowth	ROW	0.08
		11.7.5	ROW	0.05
		11.7.7	Access Track	0.49
			ROW	0.30
			Well pad	0.84
Total of disturbance in Of Concern and Essential Habitat ESA Category C				**23.91**
Protected Wildlife Habitat	Only essential petroleum activities permitted.	11.3.14	ROW	0.04
			Access track	0.08
		11.3.14 Regrowth	ROW	0.14
		11.3.25	ROW	0.04
		11.3.26	ROW	0.54
			Well pad	0.90
		11.5.1	Comms Tower	0.01
			ROW	65.01

			Well pad	25.04
			Access track	2.20
			Extra work area	0.85
		11.5.1 Regrowth	ROW	2.14
			Well pad	0.06
			Extra work area	0.06
		11.5.1a Regrowth	ROW	0.04
		11.5.21	ROW	15.17
			Well pad	6.48
			Access track	0.01
			Extra work area	0.95
		11.5.4	ROW	1.50
			Extra work area	0.05
		11.7.2	Comms Tower	0.49
			ROW	1.42
			Well pad	2.81
			Access track	0.28
			Extra work area	0.12
		11.7.4	Drill Pad	1.00
			Proposed Laydown	0.02
			ROW	62.20
			Well pad	19.13
			Access track	2.92
			Extra work area	1.34
		11.7.4 Regrowth	ROW	0.12
			Access track	0.01
		11.7.5	ROW	1.71
			Well pad	1.25
		11.7.6	Borrow Pit	0.16
			ROW	1.34
			Well pad	2.64
			Access track	0.16
		11.7.7	Drill Pad	1.90
			ROW	10.74
			Well pad	3.56
			Access track	0.99
			Extra work area	0.10
		11.7.7 Regrowth	ROW	1.78
			Access track	0.10
		Cleared	Borrow Pit	0.05
			ROW	0.22
			Well pad	1.28
			Access track	0.07
		Existing Road/Track	Drill Pad	0.10
			Proposed Laydown	1.37
			ROW	8.58
			Well pad	2.22
			Access track	1.76
			Extra work area	0.34
		Pasture/Grazing	ROW	0.05
		Regrowth Undifferentiated	ROW	0.41
			Well pad	0.05

			Access track	0.01
Total of disturbance in Protected Wildlife Habitat ESA Category C				**256.15**
Total of disturbance in ESA Category C				**280.05**
PPZ Category C (within 200 m)				
Of Concern	Only essential petroleum activities permitted.	11.3.14	Access Track	0.12
			Extra work area	0.04
			ROW	0.34
		11.3.25 Regrowth	ROW	0.04
		11.3.26	ROW	0.53
			Well pad	0.90
		11.5.1	Access Track	2.04
			Extra work area	0.26
			ROW	4.83
			Well pad	1.00
		11.5.1 Regrowth	Extra work area	0.06
			ROW	0.71
		11.5.21	Access Track	0.06
			Extra work area	0.53
			ROW	12.34
			Well pad	1.00
		11.5.4	Extra work area	0.05
			ROW	1.50
		11.7.4	Access Track	0.51
			Extra work area	0.10
			ROW	4.71
			Well pad	2.07
		11.7.5	Extra work area	0.10
			ROW	0.40
			Well pad	1.00
		11.7.7	Access Track	0.59
		Cleared	Access Track	0.01
			ROW	0.25
			Well pad	0.21
		Existing Road/Track	Access Track	2.03
			Extra work area	0.05
			ROW	5.47
			Well pad	1.06
		Pasture/Grazing	Well pad	0.85
		Regrowth Undifferentiated	ROW	0.35
Essential Habitat		11.3.25 Regrowth	ROW	0.10
		11.5.1	Access Track Only	0.09
			ROW	12.22
			Well pad	2.00
		11.5.21	ROW	4.62
		11.5.21 Regrowth	Well pad	0.99
		11.7.4 Regrowth	Access Track Only	1.20
			ROW	2.42
			Well pad	0.99
		Existing Road/Track	Access Track Only	0.07
			ROW	1.37
		Regrowth Undifferentiated	Access Track Only	0.04
		11.3.4 Regrowth	ROW	0.02

Government ESA Cat C		11.7.7	Access Track Only	0.06
			EWA	0.1
			ROW	1.46
		11.7.7 Regrowth	ROW	0.06
		Cleared	Access Track Only	0.53
			ROW	0.01
			Well pad	1.0
		Existing Road/Track	Access Track Only	0.12
			EWA	0.01
			ROW	0.04
		Pasture/Grazing	ROW	0.7
		Regrowth Undifferentiated	Access Track Only	0.15
			ROW	0.08
Protected Wildlife Habitat		11.3.14	Extra work area	0.01
		11.3.14 Regrowth	ROW	0.19
		11.3.2 Regrowth	Well pad	0.42
		11.3.25 Regrowth	ROW	0.49
			Extra work area	0.02
		11.3.4 Regrowth	ROW	0.55
			Access track	0.03
			Extra work area	0.06
		11.5.1	ROW	11.68
			Well pad	1.75
			Access track	1.48
			Extra work area	0.40
		11.5.1 Regrowth	ROW	0.63
		11.5.1a Regrowth	ROW	0.57
		11.5.21	ROW	0.64
			Well pad	0.94
			Access track	0.33
			Extra work area	0.05
		11.7.2	ROW	0.89
			Well pad	0.30
			Access track	0.53
			Extra work area	0.00
		11.7.4	Proposed Laydown	0.02
			ROW	5.34
			Well pad	1.72
			Access track	1.05
			Extra work area	0.01
		11.7.4 Regrowth	ROW	1.37
			Access track	0.00
		11.7.5	ROW	0.12
			Well pad	0.40
		11.7.6	Borrow Pit	0.39
			ROW	1.19
			Well pad	0.14
			Access track	0.28
			Extra work area	0.05
		11.7.7	ROW	1.70
			Well pad	0.57
			Access track	0.23
			Extra work area	0.07

		11.7.7 Regrowth	ROW	0.73
		Cleared	Borrow Pit	2.51
			ROW	0.39
			Well pad	0.58
			Access track	0.14
			Extra work area	0.03
		Existing Road/Track	Proposed Laydown	0.88
			ROW	8.46
			Well pad	0.06
			Access track	5.00
			Extra work area	0.01
		Pasture/Grazing	ROW	2.07
			Extra work area	0.10
		Regrowth Undifferentiated	ROW	1.17
			Well pad	0.06
			Access track	0.10
Total of disturbance in PPZ ESA Category C				**671.71**

Table 5.2 - Schedule F, Table 2 – Additional ESA disturbance SGP North for Stage 5

Activity(ies)	Maximum ESA disturbance Area (ha)	
Ground disturbance within a Category C Environmentally Sensitive Area 'Of Concern RE' (OCRE)	1.50	280.15
Ground disturbance within a Category C Environmentally Sensitive Area 'Mapped as 'Essential Habitat'	22.50	
Ground disturbance within a Category C Environmentally Sensitive Area 'Protected Wildlife Habitat' that is Category C on the RVMM2	256.15	
Ground disturbance within a Category B Environmentally Sensitive Area Primary Protection zones	To the extent they are required for authorised activities within the SGP North Stage 5 maximum boundary in Schedule F of the EA amendment, Figure 1 – SGP North Stage 1, 2, 3, 4 and 5 Maximum Boundary	
Ground disturbance within a Category B Environmentally Sensitive Area Secondary Protection zones		
Ground disturbance within a Category C Environmentally Sensitive Area Primary Protection zones		

5.2 Prescribed Environmental Matters

It is proposed to authorise impacts to the identified PEMs values via amendment to Schedule F, Table 3 — Authorised impacts to Prescribed Environmental Matters. These PEMs are based on the prescribed environmental matters are outlined in Schedule 2 of the EO Regulation and the impacts identified in **Section 4** of this report.

5.2.1 Prescribed environmental matters for SGP North Stage 5

Significant residual impact to prescribed environmental matters for PLs 491, 492 and 305 are set out in **Table 5.3**.

Table 5.3 - Proposed amendments to Protecting biodiversity values, Schedule F, Table 3 – Significant residual impacts to prescribed environmental matters for SGP North Stage 5

Prescribed Environmental Matter	SGP North Stage 5 Impacts amendments (ha)	Significant Residual Impact and Offset required (Yes/No/NA)
Regulated Vegetation		
Of concern Regional Ecosystem (not within an urban area)		
11.3.4	1	Yes
Regional Ecosystem (Not within an urban area) that intersect a wetland on the vegetation management wetland map		
-	-	NA
Regional Ecosystem (Not within an urban area) within the defined distance from the defining banks of a relevant watercourse on the vegetations management watercourse map.		
11.3.14	0.3	Yes
11.3.25	0.6	Yes
11.3.4	0.7	Yes
11.5.1	1.9	Yes
11.5.21	1.9	Yes
11.5.4	0.2	Yes
11.7.4	2.3	Yes
11.7.7	0.6	Yes
Essential Habitat (Not in and urban area) for Endangered Wildlife		
-	-	NA
Essential Habitat (Not in and urban area) for Vulnerable Wildlife		
Nyctophilus corbeni	8.1	MNES
Connectivity areas		
Connectivity area that is a reginal ecosystem (not in urban area)		
-	-	NA
Wetland and Watercourses		
A wetland in a wetland protection area shown on the map of referable wetlands		
-	-	NA
A wetland of high ecological significance shown on the Map of referable wetlands		
-	-	NA
Designated precincts in strategic environmental areas		
Designated precinct in a strategic environmental area		
-	-	NA
Protected Wildlife Habitat		

An area shown as a high-risk area on the flora survey trigger map that contains plants that are endangered or vulnerable wildlife		
-	-	NA
An area not shown as a high-risk area on the flora survey trigger map that contains plants that are endangered or vulnerable wildlife		
-	-	NA
A nonjuvenile koala habitat tree located in an area shown as a bushland habitat, high value rehabilitation habitat or medium value rehabilitation habitat in the 'Map of Assessable Development Area Koala Habitat Values'		
-	-	NA
Habitat from an animal that is Endangered wildlife		
Petauroides volans volans	357.50	Yes
Phascolarctos cinereus	372.80	Yes
Habitat for an animal that is vulnerable wildlife		
Calyptorhynchus lathami lathami	1.60	Yes
Stagonopleura guttata	356.40	Yes
Nyctophilus corbeni	350.40	MNES
Petaurus australis australis	357.50	Yes
Habitat for an animal that is special least concern wildlife		
Tachyglossus aculeatus	2.9	No
Protected Areas		
National Park		
-	-	NA
Regional Park		
-	-	NA
Nature refuge		
-	-	NA
Highly protected zones of State marine parks		
Conservation Park zone		
-	-	NA
Marine national park zone		
-	-	NA
Preservation zone		
-	-	NA
Other zones		
-	-	NA
Fish habitat areas		
A declared fish habitat area		
-	-	NA
Waterway providing for fish passage		
Fish passage (not in an urban area) – Condamine River and Wilkie Creek		
-	-	NA
Marine plants		
Marine plant (not in an urban area)		
-	-	NA
Legally secured offset area		
Legally secured offset area		
-	-	NA

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7 Document Administration

Revision history

Revision	Revision Summary	Author	Release Date
1.0	*Draft*	*Thiago Moura*	*27 February 2026*
2.0	*Draft*	*Thiago Moura*	*10 March 2026*
2.0	*Final*	*Thiago Moura*	*13 March 2026*

Acceptance and release
Author

Position	Incumbent	Release Date
Senior Ecologist	*Thiago Moura*	*27 February 2026*

Stakeholders and reviewers

Position	Incumbent	Review Date
Regulatory Approvals Specialist	*Jessica Burckhardt*	*06 March 2026*
Team Lead Ecology	*Paul Finn*	*06 March 2026*

Approver(s)

Position	Incumbent	Review Date
Manager Environmental Approval, Offsets and heritage	*Tyson Croll*	*20 March 2026*

Appendix A - Environmental Protection and Biodiversity Conservation Act 1999 approval 2010/5344

Approval

Surat Gas Expansion Project (EPBC 2010/5344)

This decision is made under sections 130(1) and 133 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

person to whom the approval is granted	Arrow Energy Pty Ltd
proponent's ABN	ABN: 73 078 521 936
proposed action	To expand coal seam gas operations in the Surat Basin, Queensland, as described in the referral received under the EPBC Act on 2 February 2010; and as described in the Surat Gas Project Environmental Impact Statement (March 2012) and Supplementary Report to the Environmental Impact Statement (June 2013).
decision	To approve the proposed action for each of the following controlling provisions: • Listed threatened species and communities (sections 18 and 18A) • Listed migratory species (sections 20 and 20A) • A water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E)
Conditions of approval	This approval is subject to the conditions specified below.
expiry date of approval	This approval has effect until **31 December 2080**.

Decision-maker	Greg Hunt
name and position	The Hon Greg Hunt MP Minister for the Environment
signature	
date of decision	19:12:2013

Conditions of approval

1. The **Minister** may determine that a plan, strategy or program approved by the Queensland Government satisfies a plan required under these conditions.

Disturbance Limits

2. For the purpose of the action, the **approval holder** must not take any action outside the **project area**.
3. The action is limited to a maximum of 6,500 coal seam gas production wells and associated infrastructure.
4. The **approval holder** must not undertake hydraulic fracturing.
5. To protect **EPBC listed species** and **EPBC communities** within the **project area** the maximum disturbance limits in Table 1 apply to the project. The **approval holder** must not exceed these disturbance limits.

Table 1: Whole of project maximum disturbance limits

Terrestrial species	**Maximum disturbance (hectares) to core habitat**
Curly-bark Wattle, *Acacia curranii*	1210
Hando's Wattle, *Acacia handonis*	1210
Belson's Panic, *Homopholis belsonii*	140
Lobed Blue Grass, *Bothriochloa biloba*	305
Kogan Waxflower, *Philotheca sporadica*	480
Prostanthera sp Dunmore	380
Small-leaved Denhamia, *Denhamia parvifolia*	50
Calytrix gurulmundensis	1210
Ooline, *Cadellia pentastylis*	No disturbance
Finger Panic Grass, *Digitaria porrecta*	174
Austral Toadflax, *Thesium australe*	160
Acacia lauta	990
Cobar Greenhood Orchid, *Pterostylis cobarensis*	2 170
Xerothamnella herbacea	110
Hawkweed, *Picris evae*	120
Austral Cornflower, *Rhaponticum australe*	160
Eucalyptus virens	170
King Blue-grass, *Dichanthium queenslandicum*	160
Queensland White-gum, *Eucalyptus argophloia*	10
Macrozamia machinii	No disturbance
South-eastern Long-eared Bat, *Nyctophilus corbeni*	4 080
Dunmall's Snake, *Furina dunmalli*	4 400
Five-clawed Worm-skink, *Anomalopus mackayi*	560
Squatter Pigeon (Southern), *Geophaps scripta scripta*	3261

Regent Honeyeater, *Anthochaera phrygia*	20
Collared Delma, *Delma torquata*	90
Yakka Skink, *Egernia rugosa*	310
Australian Painted Snipe, *Rostratula australis*	5
EPBC Communities	**Maximum disturbance (hectares)**
Brigalow (*Acacia harpophylla* dominant and co-dominant)	106
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	8
Weeping Myall Woodlands	1
Natural Grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	No disturbance
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	No disturbance
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	No disturbance

6. To protect **EPBC listed species and communities** within the **project area** the maximum disturbance limits in Table 2 apply to **Stage 1**. The **approval holder** must not exceed these disturbance limits.

Table 2: Maximum disturbance limits for Stage 1

Terrestrial species	**Maximum disturbance (hectares) to core habitat**
South-eastern Long-eared Bat, *Nyctophilus corbeni*	167
Dunmall's Snake, *Furina dunmalli*	66
Five-clawed Worm-skink, *Anomalopus mackayi*	2
Squatter Pigeon (Southern), *Geophaps scripta scripta*	203
Regent Honeyeater, *Anthochaera phrygia*	1
Collared Delma, *Delma torquata*	11
Yakka Skink, *Egernia rugosa*	19
EPBC Communities	**Maximum disturbance (hectares)**
Brigalow (*Acacia harpophylla* dominant and co-dominant)	39
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	8

EPBC Species Impact Management and Offset Plan

EPBC Species Impact Management and Offset Plan – Stage 1

7. An EPBC Species Impact Management and Offset Plan for **Stage 1** must be submitted for approval of the **Minister** at least 3 months prior to **commencement**, and must include:

    (a) measures to report the methodology and results of **pre-clearance surveys,** and quantification of actual impacts, in the annual reporting required by condition 28. **Pre-clearance surveys** must be undertaken in accordance with the **Department's survey guidelines** in effect at the time of the survey or other survey methodology approved by the **Department** in writing;

(b) a map of the location of each **EPBC listed threatened species** and its habitat or **EPBC community** in relation to infrastructure and proposed disturbance for **Stage 1**;

(c) potential threats and **impacts** to **EPBC listed species** and **EPBC communities** from **Stage 1**;

(d) a description of the measures that will be taken to avoid, mitigate and manage **impacts** to the **EPBC listed species** and its habitat, including to the **Murray Cod** and **Fitzroy River Turtle,** or an **EPBC community**;

(e) measures to report to the **Department** on the occurrence and circumstances of **EPBC listed species** deaths as a result of the action and actions taken to reduce the likelihood of any such circumstance reoccurring;

(f) a monitoring program to determine the success of mitigation and management measures and inform the next Stage of the EPBC Species Impact Management and Offset Plan to ensure adaptive management for the duration of the project approval;

(g) a discussion of relevant **conservation advice**, **recovery plans** and **threat abatement plans** and how the EPBC Species Impact Management and Offset Plan - **Stage 1** is consistent with these documents;

(h) details of the following minimum offset areas for **Stage 1** including, for each area, the location, tenure, site description and map of environmental values:

i. 112 hectares for Brigalow (*Acacia harpophylla* dominant and co-dominant);

ii. 30 hectares Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions;

iii. 80 hectares for Yakka Skink, *Egernia rugosa*;.

iv. 42 hectares for Collared Delma, *Delma torquata*;

v. 230 hectares for Dunmall's Snake, *Furina dunmalli*;

vi. 545 hectares for Squatter Pigeon (Southern), *Geophaps scripta scripta*;

vii. 6.5 hectares for Five-clawed Worm-skink, *Anomalopus mackayi*;

viii. 4 hectares for Regent Honeyeater, *Anthochaera phrygia*; and

ix. 765 hectares for South-eastern Long-eared Bat, *Nyctophilus corbeni.*

(i) a process for any significant **impact** to an **EPBC listed species** or **EPBC community** for **Stage 1**, where the species or community is not identified in Table 2, to be offset in accordance with the **EPBC Act Offsets Policy**;

(j) an offset area management plan for each offset area, which sets out management measures that will be implemented to improve the offset site for the respective **EPBC species** and/or **EPBC community**; and

(k) a timeline for when actions identified in the EPBC Species Impact Management and Offset Plan will be implemented and for legally securing offsets including, for each area, the proposed legal mechanism for securing the offset. Offsets for **Stage 1** must be legally secured prior to **commencement** of **Stage 2**.

8. The EPBC Species Impact Management and Offset Plan for **Stage 1** must be peer reviewed by a **suitably qualified ecologist** approved by the **Minister** in writing. The peer review must be submitted to the **Minister** together with the EPBC Species Impact Management and Offset Plan for **Stage 1** and a statement from the **suitably qualified ecologist** stating that they carried out the peer review and endorse the findings of the peer review.

9. The **approval holder** must not **commence** the action until the EPBC Species Impact Management and Offset Plan for **Stage 1** has been approved by the **Minister** in writing.

EPBC Species Impact Management and Offset Plan – Stages 2 to 4

10. The **approval holder** must update the EPBC Species Impact Management and Offset Plan for the next **development stage** (i.e. **Stage 2, Stage 3** and **Stage 4**) and submit for approval of the **Minister** at least 3 months prior to **commencement** of each **development stage**. Each updated plan must include:

    (a) the information required for the EPBC Species Impact Management and Offset Plan in conditions 7 (a) to (g) and conditions 7 (j) and 7 (k) for the respective **development stage**;

    (b) where **impacts** are unavoidable, an offset strategy to compensate for residual **impacts** to each **EPBC species** or **EPBC community** for that **development stage** in accordance with the **EPBC Act Offsets Policy**. The offset strategy must:

        i. demonstrate how the offset builds on offsets secured as part of the EPBC Species Impact Management and Offset Plan – **Stage 1** and any other **development stage** and, where possible, will contribute to a larger strategic offset for whole of project **impacts**;

        ii. identify land (including a map, site description and shapefile) that has or will be acquired and how it has been or will be legally secured;

        iii. include a detailed discussion of the quality, condition, site context and environmental values of the impact and offset site relevant to the **EPBC species** or **EPBC community** being offset;

        iv. include a description of potential risks to successful implementation of the offset, including a description of contingency measures that would be implemented to mitigate against these risks; and

        v. discuss connectivity of the offset area with other habitats and biodiversity corridors.

    (c) a reconciliation of **impacts** against whole of project disturbance limits. To incentivise avoidance, the **approval holder** is only required to offset realised **impacts**. Where the full **impact** from **Stage 1, Stage 2** or **Stage 3** that has been offset is not realised, the balance of the offset can be transferred to a future offset liability for a future **development stage** for this project.

11. The updated EPBC Species Impact Management and Offset Plan for each **development stage** must be peer reviewed by a **suitably qualified ecologist** approved by the **Minister** in writing. The peer review must be submitted to the **Minister** together with the EPBC Species Impact Management and Offset Plan for each **development stage** and a statement from the **suitably qualified ecologist** stating that they carried out the peer review and endorse the findings of the peer review.

12. The **approval holder** must not **commence Stage 2, Stage 3** or **Stage 4** until the EPBC Species Impact Management and Offset Plan for that **development stage** has been approved by the **Minister** in **writing**. The approved EPBC Species Impact Management and Offset Plan for each **development stage** must be implemented.

Note 1: The Minister may determine that a plan, strategy or program approved by the Queensland Government satisfies the requirements for the EPBC Species Impact Management and Offset Plan under these conditions.

Note 2: Offsets for some species may be accommodated within ecological communities or overlap State approval requirements or other species habitat requirements, as long as they meet the requirements of these conditions of approval in respect of each individual species being offset.

Coal Seam Gas Water Monitoring and Management Plan

Stage 1 CSG Water Monitoring and Management Plan

13. Prior to **commencement**, the proponent must submit a Stage 1 Coal Seam Gas Water Monitoring and Management Plan (Stage 1 CSG WMMP) for the approval of the **Minister,** who may seek the advice of an **expert panel**. The Stage 1 CSG WMMP must include:

    (a) an analysis of the results of the most recent **OGIA model** (built or endorsed by **OGIA**), relevant to all of the project's tenement areas;

    (b) a fit for purpose numerical simulation to assess potential impacts on water resources arising from the action in the project area, subsequent surface water-groundwater interactions in the Condamine Alluvium and impacts to dependent ecosystems;

    (c) an assessment of potential **impacts** from the action on non-spring based groundwater dependent ecosystems through potential changes to surface-groundwater connectivity and interactions with the sub-surface expression of groundwater;

    (d) an assessment of predicted project wide groundwater drawdown levels and pressures from the action, together with confidence levels;

    (e) parameters and a sampling regime to establish baseline data for surface and groundwater resources that may be impacted by the action, including: surface water quality and quantity in the **project area**, and upstream and downstream of potential impact areas; groundwater quality, levels and pressures for areas that may be **impacted** by the project; and for determining connectivity between surface water and groundwater that may be **impacted** by the project;

    (f) a best practice baseline monitoring network that will enable the identification of spatial and temporal changes to surface water and groundwater. This must include a proposal for aquifer connectivity studies and monitoring of relevant aquifers to determine hydraulic connectivity (including potential groundwater dependence of Long Swamp and Lake Broadwater) and must also enable monitoring of all aquatic ecosystems that may be **impacted** by the action;

    (g) a program to monitor subsidence **impacts** from the action, including trigger thresholds and reporting of monitoring results in annual reporting required by condition 28. If trigger thresholds are exceeded, the **approval holder** must develop and implement an action plan to address impacts within 90 calendar days of a trigger threshold being exceeded;

    (h) provisions to make monitoring results publicly available on the **approval holder's** website to facilitate a greater understanding of cumulative **impacts**;

    (i) a discussion on how the **approval holder** is contributing to the **Joint Industry Plan,** including its periodic review. The **approval holder** must contribute to the **Joint Industry Plan** and comply with any part of the **Joint Industry Plan**, or future iterations of the **Joint Industry Plan**, that applies to the **approval holder**;

    (j) a groundwater early warning monitoring system, including:

        i. groundwater drawdown limits for all consolidated aquifers potentially impacted by the action, excluding the Walloon Coal Measures;

        ii. for the Condamine Alluvium, appropriate triggers and groundwater limits and a rationale for their selection;

        iii. early warning indicators and trigger thresholds, including for Lake Broadwater, Long Swamp and other groundwater dependent ecosystems that may potentially be impacted by the action, including

those that may occur outside the **project area** and may be impacted by the action; and

iv. investigation, management and mitigation actions, including substitution and/or groundwater repressurisation, for both early warning indicators and trigger thresholds to address flux impacts on the Condamine Alluvium.

(k) early warning indicators and trigger thresholds, including corrective actions for both early warning indicators and trigger thresholds, for aquatic ecology and aquatic ecosystems;

(l) a CSG water management strategy for produced salt/brine, which discusses how co-produced water and brine will be managed for the action, including in the context of other coal seam gas activities in the Surat Basin;

(m) an analysis of how the **approval holder** will utilise beneficial use and/or groundwater repressurisation techniques to manage produced CSG water from the action, and how any potential adverse **impacts** associated with groundwater repressurisation will be managed;

(n) a discharge strategy, consistent with the recommendations and requirements of the Department of the Environment and Heritage Protection in its **Assessment Report** (pages 94 to 95 and pages 254 to 255) and that includes scenarios where discharge may be required, the quality of discharge water (including water treated by reverse osmosis), the number and location of monitoring sites (including upstream and downstream sites), frequency of monitoring and how the data from monitoring will be analysed and reported, including recommendations on any changes or remedial actions that would be required;

(o) a flood risk assessment for processing facilities and any raw co-produced water and brine dams, which addresses flood risks to the environment from the action in the case of a 1:1000 ARI event. The risk assessment should estimate the consequences if major project infrastructure was subject to such an event, including release of brine and chemicals into the environment;

(p) a cumulative **impact** assessment based on the outputs of the **OGIA model** which integrates groundwater model outputs with known and potential groundwater dependent ecosystems and presents the outputs in map form. Contribute to investigations coordinated through the OGIA to assess hydrological and ecological characteristics of **impacted** groundwater dependent ecosystems;

(q) details of performance measures; annual reporting to the **Department**; and publication of reports on the internet; and

(r) an explanation of how the Stage 1 CSG WMMP will contribute to work undertaken by other CSG proponents in the Surat Basin to understand cumulative **impacts**, including at the local and regional scale, and maximise environmental benefit.

14. The Stage 1 CSG WMMP must be peer reviewed by a **suitably qualified water resources expert/s** approved by the **Minister** in writing. The peer review must be submitted to the **Minister** together with the Stage 1 CSG WMMP and a statement from the **suitably qualified water resources expert/s** stating that they carried out the peer review and endorse the findings of the Stage 1 CSG WMMP.

15. The **approval holder** must not exceed the groundwater drawdown or groundwater limits for each aquifer specified in the Stage 1 CSG WMMP.

16. Unless otherwise agreed in writing by the **Minister**, the **approval holder** must not **commence** the action until the Stage 1 CSG WMMP is approved in writing by the **Minister**. The approved Stage 1 CSG WMMP must be implemented.

Note 3: to ensure efficiency the approval holder may prepare and align the Stage 1 WMMP with the requirements of the Queensland Government, as long as the relevant matters under the conditions of this approval are clearly and adequately addressed.

Stage 2 CSG Water Monitoring and Management Plan

17. Prior to **Stage 2** the **approval holder** must submit a Stage 2 Coal Seam Gas Water Monitoring and Management Plan (Stage 2 CSG WMMP) to the **Minister** for approval, who may seek the advice of an **expert panel.** The Stage 2 CSG WMMP must:

    (a) include all matters in the Stage 1 CSG WMMP, and discuss how the Stage 1 CSG WMMP is informing adaptive management for the Stage 2 CSG WMMP;

    (b) include any updated modelling for the project, including in respect of the **OGIA model** or any updates to the **OGIA model** by **OGIA**;

    (c) include an explanation of how the **approval holder** will contribute to the **Condamine Interconnectivity Research Project**. The Stage 2 CSG WMMP must present the findings of the Condamine Interconnectivity Research project and any modelling done by the **OGIA** to validate predicted drawdown and a review of trigger thresholds and corrective actions for the action;

    (d) report on the potential for flow reversal from the Condamine Alluvium to underlying aquifers, based on data obtained during the Stage 1 CSG WMMP;

    (e) review and update the monitoring network in Stage 1 WMMP to reflect changes in understanding of **impacts** to water resources, including from baseline monitoring and relevant research;

    (f) identify any predicted changes in stream connectivity due to groundwater drawdown from the action and assess potential impacts to groundwater dependent ecosystems due to any predicted changes in stream connectivity, including to water quality, quantity and ecology;

    (g) address any uncertainty in the groundwater-dependency of ecosystems and springs with supporting evidence from field-based investigations for any groundwater-dependent ecosystems and springs confirmed in the **OGIA model**;

    (h) provide details of an ongoing monitoring plan that:

        i. sets out the frequency of monitoring and rationale for the frequency;

        ii. includes continued collection of baseline data for each monitoring site over the life of the project;

        iii. outlines the approach to be taken to analyse the results including the methods to determine trends to indicate potential **impacts**; and

        iv. builds on the groundwater early warning system required at condition 13 (j) and sets out early warning indicators and trigger thresholds and limits for groundwater and surface water.

    (i) include a risk based exceedance response plan that details the actions the **approval holder** will take and the timeframes in which those actions will be undertaken if: early warning indicators and trigger threshold values contained in the Stage 2 CSG WMMP are exceeded, or there are any emergency discharges.

18. The Stage 2 CSG WMMP must be peer reviewed by a **suitably qualified water resources expert/s** approved by the **Minister** in writing. The peer review must be submitted to the **Minister** together with the Stage 2 CSG WMMP and a statement from the **suitably qualified water resources expert/s** stating that they carried out the peer review and endorse the findings of the Stage 2 CSG WMMP.

19. The **approval holder** must not exceed the groundwater drawdown or groundwater limits specified in the Stage 2 CSG WMMP.

20. The **Minister** may direct in writing that the **approval holder** cease water/gas extraction and/or water discharge or use if an early warning indicator, trigger threshold or limit is exceeded, and if the **Minister** is not satisfied that the action proposed or taken by the proponent will remedy the situation. The **Minister** may direct the proponent to implement alternative action at the expense of the proponent.

Note 4: The proponent will be provided with a reasonable opportunity to comment on any such direction before it is required to be implemented.

21. Unless otherwise agreed by the **Minister** in writing, the Stage 2 CSG WMMP must be approved in writing by the **Minister** prior to first extraction of gas. The approved Stage 2 CSG WMMP must be implemented. The Stage 1 CSG WMMP will apply until the commencement of the approved Stage 2 CSG WMMP.

Note 5: to ensure efficiency the approval holder may prepare and align the Stage 2 WMMP with the requirements of the Queensland Government, as long as the relevant matters under the conditions of this approval are clearly and adequately addressed.

Revision of the Stage 2 CSG WMMP

22. To ensure an adaptive management approach, the proponent must submit periodic revisions of the Stage 2 CSG WMMP for approval by the **Minister** in writing, who may seek the advice of an **expert panel**. Revisions must be submitted at least 3 months prior to planned **commencement** of each new **development stage** for the project. The revised CSG WMMP must take into account outcomes of the ongoing monitoring program in the Stage 2 CSG WMMP, groundwater model updates and any bioregional assessments.

23. If the **OGIA model** ceases to exist, then the **approval holder** must submit an alternate model to be used for the purpose of these conditions that replaces the **OGIA model** as referred to in these conditions. The alternate model must be approved by the **Minister** in writing before the next relevant stage of the CSG WMMP is submitted to the **Minister** for approval.

24. The **approval holder** must not **commence Stage 3** or **Stage 4** until a revised Stage 2 CSG WMMP is approved in writing by the **Minister** for that **development stage.** The approved revised Stage 2 CSG WMMP must be implemented.

25. The **Minister** may, by written request to the **approval holder**, require the Stage 1 or Stage 2 CSG WMMP to be revised, including to address expert advice. Any request must be acted on by the **approval holder** within the timeframe specified in the request.

Note 6: The Minister may throughout the life of the project life seek advice from experts, or an expert panel. As a consequence specific matters identified through such advice may need to be addressed in the CSG WMMP Plan. Where such advice is sought the approval holder would be provided with opportunity to submit information and respond to the specific matters identified, in order to ensure the CSG WMMP Plan is based on the best available information. Review requirements will facilitate adaptive management, align with Queensland Government approval requirements, and account for potential cumulative impacts as new scientific information becomes available over the life of the project.

General

26. Within 20 business days after the **commencement** of the action, the **approval holder** must advise the **Department** in writing of the actual date of **commencement.**

27. The **approval holder** must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement the management plans, reports or strategies required by this approval, and make them available upon request to the **Department**. The annual report (condition 28) must state all confirmed cases of non-compliance along with details of any remedial actions. Such records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the **EPBC Act,** or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the **Department's** website. The results of audits may also be publicised through the general media.

28. Within three months of every 12 month anniversary of the **commencement** of the action, the **approval holder** must publish a report on its website for the life of the approval outlining how they have been compliant with the conditions of this approval over the previous 12 months, including implementation of any management plans as specified in the conditions. The **approval holder** must also report against disturbance limits. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the **Department** at the same time as the compliance report is published.

29. The **approval holder** must notify the **Department** in writing of potential non-compliance with any condition of this approval as soon as practical and within no later than ten business days of becoming aware of the potential non-compliance. The notice provided to the **Department** under this condition must specify:

    a) the condition which the **approval holder** has potentially breached;

    b) the nature of the potential non-compliance;

    c) when and how the **approval holder** became aware of the non-compliance;

    d) how the non-compliance will affect the approved action;

    e) how the non-compliance will affect the anticipated **impacts** of the approved action, in particular how the non-compliance will affect the **impacts** on the matters of national environmental significance;

    f) the measures the approval holder will take to address the **impacts** of the non-compliance on the matters of national environmental significance and rectify the non-compliance; and

    g) the time by when the approval holder will rectify the non-compliance.

30. Upon the direction of the **Minister**, the **approval holder** must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the **Minister**. The independent auditor must be approved by the **Minister** prior to the commencement of the audit. Audit criteria must be agreed to by the **Minister** and the audit report must address the criteria to the satisfaction of the **Minister.**

31. If the **approval holder** wishes to carry out any activity other than in accordance with the management plans as specified in the conditions, the **approval holder** must submit to the **Department** for the **Minister's** written approval a revised version of that management plan. The approval holder must not **commence** the varied activity until the **Minister** has approved the varied management plan. The **Minister** will not approve a varied management plan unless the revised management plan would result in an equivalent or improved environmental outcome over time. If the **Minister** approves the revised management plan, that management plan must be implemented in place of the management plan originally approved.

32. If the **Minister** believes that it is necessary or convenient for the better protection of listed threatened species, listed migratory species or water resources to do so, the **Minister**

may request that the **approval holder** make specified revisions to the management plans specified in the conditions and submit the revised management plan for the **Minister's** written approval. The **approval holder** must comply with any such request within the timeframe specified by the **Minister**. The revised approved management plan must be implemented. Unless the **Minister** has approved the revised management plan, then the person taking the action must continue to implement the management plan originally approved, as specified in the conditions.

33. If, at any time after five years from the date of this approval, the **approval holder** has not **commenced** the action, then the **approval holder** must not **commence** the action without the written agreement of the **Minister.**

34. Unless otherwise agreed to in writing by the **Minister**, the **approval holder** must publish all management plans referred to in these conditions of approval on their website. Each management plan must be published on the website within 1 month of being approved and remain available on that website for the life of the approval.

Definitions

Approval holder: means the person to whom the approval is granted.

Assessment Report: means the Queensland Department of Environment and Heritage Protection's report under the *Environmental Protection and Biodiversity Conservation Act 1994* for the action.

Commenced/commencement: means any physical disturbance, including clearance of native vegetation, new road work and the establishment of well sites to develop the gas field project area. Commencement does not include:

a) minor physical disturbance necessary to undertake pre-clearance surveys or establish monitoring programs or geotechnical investigations; or

b) activities that are critical to commencement that are associated with mobilisation of plant and equipment, materials, machinery and personnel prior to the start of development only if such activities will have no adverse impact on matters of national environmental significance, and only if the proponent has notified the Department in writing before an activity is undertaken.

Core habitat: means core habitat known and core habitat possible as defined in the rules for habitat mapping for each individual species in the *Supplementary Report to the Surat Gas Project EIS (March 2012), Attachment 1 – Matters of National Environmental Significance.*

Conservation advice: means an approved conservation advice under the EPBC Act for an EPBC Act listed species or community.

Core habitat known: means habitat where a spatially accurate confirmed record of a particular species exists (e.g. Herbrecs or survey record). Core habitat known is attributed to the particular habitat polygon in which it occurs, based on either regional ecosystem (RE) mapping provided by the Queensland Department of Environment and Heritage Protection (or successor agency) or high resolution habitat mapping developed for a specific purpose. Core habitat known also means a 1 km buffer around all spatially accurate (< 400 metres accuracy) species records.

Condamine Interconnectivity Research Project: means the Condamine Interconnectivity Research Project being undertaken by the Queensland Office of Groundwater Impact Assessment as part of the implementation of the Surat Underground Water Impact Report (UWIR), which was prepared by the Queensland Water Commission (QWC) in 2012.

Core habitat possible: means an area where previous records of a particular species are not known to occur within a given area or habitat, although specific habitat features are present which are known to be favoured by the species and the habitat occurs within the species known geographic range.

Department: means the Australian Government Department administering the *Environment Protection and Biodiversity Conservation Act 1999.*

Department's survey guidelines: means:
Matters of National Environmental Significance, Significant Impact Guidelines 1.1, Environment Protection and Biodiversity Conservation Act 1999 - http://www.environment.gov.au/epbc/publications/nes-guidelines.html.

Survey Guidelines for Australia's Threatened Frogs, Threatened Birds, Threatened Fish, Threatened Mammals, Threatened Reptiles and Threatened Bats: http://www.environment.gov.au/epbc/guidelines-policies.html.

Development stage: means Stage 1, Stage 2, Stage 3 or Stage 4 of project development, as defined in these definitions.

EPBC/ EPBC Act: means the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).

EPBC Act Offsets Policy: means the *Environment Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy (October 2012) including the Offsets Assessment Guide.

EPBC community: means an endangered ecological community listed under the EPBC Act.

EPBC listed threatened species: means a threatened flora or fauna species listed under the EPBC Act.

Expert panel: means an expert panel appointed by the Minister.

Fitzroy River Turtle: means the Fitzroy River Turtle, *Rheodytes leukops*, listed as vulnerable under the EPBC Act.

General habitat: means where a species has not been recorded in a given location and habitat accounts for some of the features favoured by a particular species. The habitat occurs on the margins of a species known geographic range. Otherwise, the habitat is suitable for the species

Impact: has the definition assigned to it in section 527E of the EPBC Act.

Joint Industry Plan: means the *Joint Industry Plan for an Early Warning System for the Monitoring and Protection of EPBC Springs* established with other coal seam gas proponents operating within the Surat Cumulative Management Area.

Minister: means the Minister administering the *Environment Protection and Biodiversity Conservation Act 1999* and includes a delegate of the Minister.

Murray Cod: means the Murray Cod, *Maccullochella peelii*, listed as vulnerable under the EPBC Act.

OGIA: means the Office of Groundwater Impact Assessment or its successor body,

OGIA model: means the groundwater model developed by the Office of Groundwater Impact Assessment, or its successor body, for the Surat Cumulative Management Area.

Pre-clearance surveys: means surveys that are undertaken for EPBC species and EPBC communities for all areas of the project area that may be disturbed by project activities.

Project area: means the area identified as the project area in Attachment A.

Recovery plan: means an approved recovery plan under the EPBC Act for an EPBC listed species or EPBC community.

Stage 1: means year 1 to 3 (inclusive) of the action, starting at the date of commencement.

Stage 2: means year 4 to 11 (inclusive) of the action.

Stage 3: means year 12 to 20 (inclusive) of the action

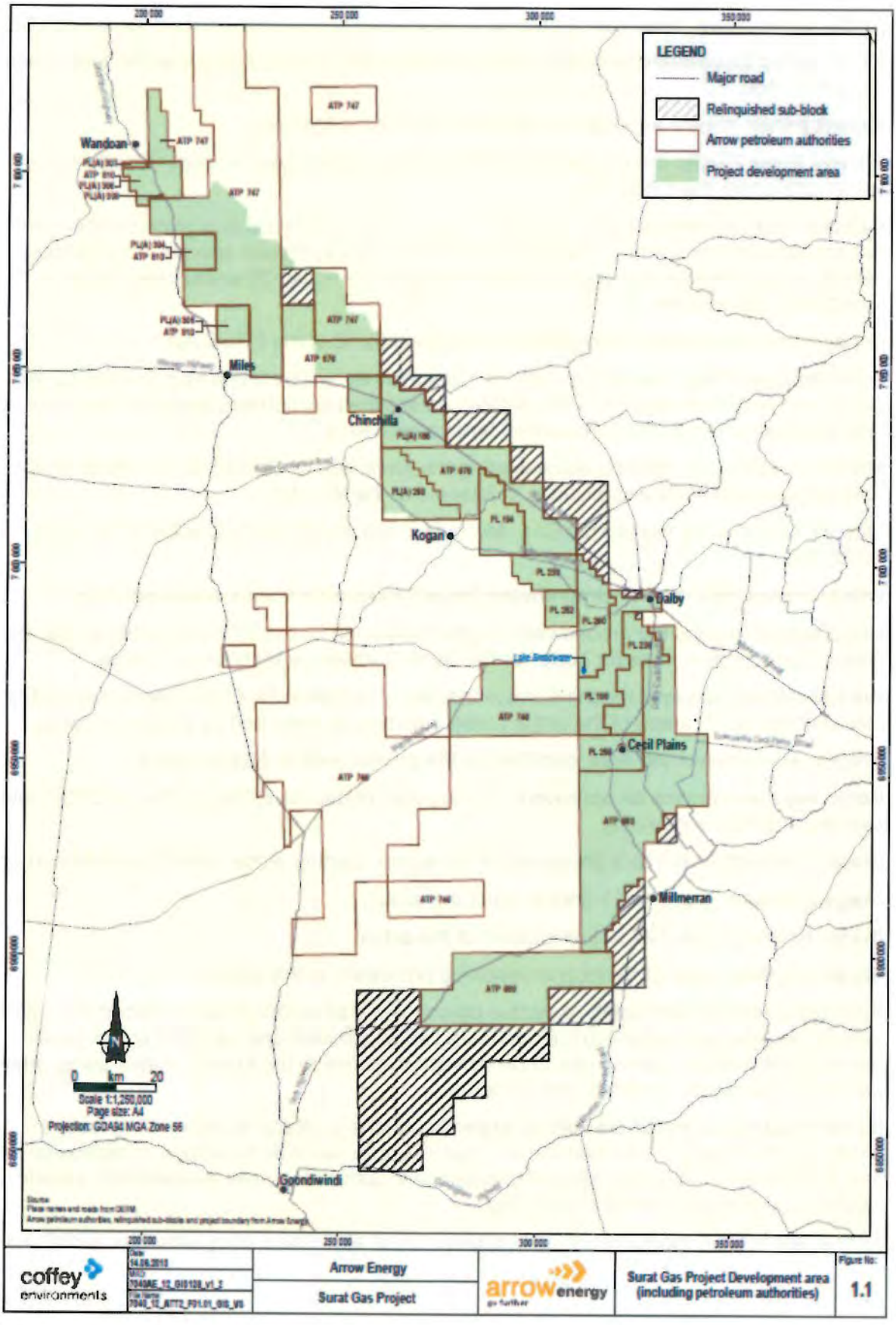
Stage 4: means year 21 to decommissioning (inclusive) of the action.

Suitably qualified ecologist: means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis to performance relative to the subject matter using relevant protocols, standards, methods and literature.

Suitably qualified water resources expert/s: means a natural person with at least a postgraduate degree (or equivalent) in a suitable area (such as hydrology or hydrogeology) and a minimum of 10 years relevant experience in water resources assessment, including at least one year of experience in Australia.

Threat abatement plan: means an approved threat abatement plan under the EPBC Act.

ATTACHMENT A



Appendix B – SGPN Stage 5 Environmental Authority

Permit

Environmental Protection Act 1994

Environmental authority

This environmental authority is issued by the administering authority under Chapter 5 of the Environmental Protection Act 1994.

Environmental authority number: EA0001399

Environmental authority takes effect on 28 January 2026.

Environmental authority holder(s)

Name(s)	Registered address
ARROW CSG (AUSTRALIA) PTY LTD	Level 39 111 Eagle Street BRISBANE CITY QLD 4000

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Schedule 3 - 03 - A petroleum activity that is likely to have a significant impact on a category A or B Environmentally Sensitive Area	PL304 PL305 PL491 PL492 PL494 PL1044
Schedule 3 - 06 - A petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam	PL304 PL305 PL491 PL492 PL494 PL1044
Schedule 3 - 08 - A petroleum or GHG storage activity, other than items 1 to 7, that includes an activity from Schedule 2 with an AES	PL304 PL305 PL491 PL492 PL494 PL1044
Ancillary 14 - Electricity generation - 1 - Generating electricity by using gas at a rated capacity of 10MW electrical or more	PL304 PL305 PL491

Queensland Government

Environmentally relevant activity/activities	Location(s)
	PL492 PL494 PL1044
Ancillary 15 - Fuel burning - Using fuel burning equipment that is capable of burning at least 500kg of fuel in an hour	PL304 PL305 PL491 PL492 PL494 PL1044
Ancillary 16 - Extraction and Screening - 2(b) - Extracting, other than by dredging, in a year, the following quantity of material - more than 100,000t but not more than 1,000,000t	PL304 PL305 PL491 PL492 PL494 PL1044
Ancillary 62 - Resource recovery and transfer facility operation - 1(c) - Operating a facility for receiving and sorting, dismantling, baling or temporarily storing category 2 regulated waste	PL304 PL305 PL491 PL492 PL494 PL1044
Ancillary 63 - Sewage Treatment - 1(a-i) - Operating sewage treatment works, other than no-release works, with a total daily peak design capacity of 21 to 100EP - if treated effluent is discharged from the works to an infiltration trench or through an irrigation scheme	PL304 PL305 PL491 PL492 PL494 PL1044
Ancillary 63 - Sewage Treatment - 1(b-i) - Operating sewage treatment works, other than no-release works, with a total daily peak design capacity of more than 100 but not more than 1500EP if treated effluent is discharged from the works to an infiltration trench or through an irrigation scheme	PL304 PL305 PL491 PL492 PL494 PL1044

Additional information for applicants

Environmentally relevant activities

The description of any environmentally relevant activity (ERA) for which an environmental authority (EA) is issued is a restatement of the ERA as defined by legislation at the time the EA is issued. Where there is any inconsistency between that description of an ERA and the conditions stated by an EA as to the scale, intensity or manner of carrying out an ERA, the conditions prevail to the extent of the inconsistency.

An EA authorises the carrying out of an ERA and does not authorise any environmental harm unless a condition stated by the EA specifically authorises environmental harm.

A person carrying out an ERA must also be a registered suitable operator under the *Environmental Protection Act 1994* (EP Act).

Mobile and temporary activities

If you operate a mobile and temporary environmentally relevant activity (ERA), other than regulated waste transport, you are required to maintain a work diary. You must:

- use the approved form for a work diary (ESR/2015/1696);
- keep the work diary records for 2 years after the last entry;
- inform the administering authority within 7 days of the work diary being lost or stolen;
- record the information required in the work diary for each location within 1 day of leaving the location.

Contaminated land

It is a requirement of the EP Act that an owner or occupier of land give written notice to the administering authority if they become aware of the following:

- the presence of, or happening of an event involving, a hazardous contaminant on the land that is causing, or is reasonably likely to cause, serious or material environmental harm (notice must be given within 24 hours); or
- if the land is contaminated land – a change in the condition of the land that is causing, or is reasonably likely to cause, serious or material environmental harm (notice must be given within 24 hours); or
- a notifiable activity (as defined in Schedule 3) having been carried out, or is being carried out, on the land (notice must be given within 20 business days).

For further information, including the form for giving written notice, refer to the Queensland Government website www.qld.gov.au, using the search term 'duty to notify'.

Take effect

Please note that, in accordance with section 200 of the EP Act, an EA has effect:

a) if the authority is for a prescribed ERA and it states that it takes effect on the day nominated by the holder of the authority in a written notice given to the administering authority – on the nominated day; or

b) if the authority states a day or an event for it to take effect – on the stated day or when the stated event happens; or

c) otherwise – on the day the authority is issued.

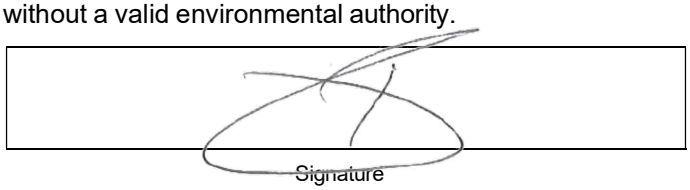
However, if the EA is authorising an activity that requires an additional authorisation (a relevant tenure for a resource activity, a development permit under the *Planning Act 2016* or an SDA Approval under the *State Development and Public Works Organisation Act 1971*), this EA will not take effect until the additional authorisation has taken effect.

If this EA takes effect when the additional authorisation takes effect, you must provide the administering authority written notice within 5 business days of receiving notification of the related additional authorisation taking effect.

The anniversary day of this environmental authority is the same day each year as the effective date. The payment of the annual fee will be due each year on this day. An annual return will be due each year on 01 April.

If you have incorrectly claimed that an additional authorisation is not required, carrying out the ERA without the additional authorisation is not legal and could result in your prosecution for providing false or misleading information or operating

without a valid environmental authority.



Signature

28 January 2026

Date

Tristan Roberts
Department of the Environment, Tourism, Science and Innovation
Delegate of the administering authority
Environmental Protection Act 1994

Enquiries:
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Email: EnergyandExtractive@detsi.qld.gov.au

Obligations under the *Environmental Protection Act 1994*

In addition to the requirements found in the conditions of this environmental authority, the holder must also meet their obligations under the EP Act, and the regulations made under the EP Act. For example, the holder must comply with the following provisions of the Act:

- general environmental duty (section 319)
- duty to notify environmental harm (section 320-320G)
- offence of causing serious or material environmental harm (sections 437-439)
- offence of causing environmental nuisance (section 440)
- offence of depositing prescribed water contaminants in waters and related matters (section 440ZG)
- offence to place contaminant where environmental harm or nuisance may be caused (section 443).

Other permits required

This permit only provides an approval under the *Environmental Protection Act 1994*. In order to lawfully operate you may also require permits / approvals from your local government authority, other business units within the department, and other State and Federal Government agencies prior to commencing any activity at the site. For example, this may include permits / approvals with your local Council (for planning approval), the Department of Transport and Main Roads (to access State controlled roads), the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development (to clear vegetation), and the Department of Primary Industries (to clear marine plants or to obtain a quarry material allocation).

Obligations under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

Matters of national environmental significance (MNES) are regulated under the Commonwealth EPBC Act rather than under state legislation. You may need to submit a referral if your project potentially impacts any matters protected under the EPBC Act. For more information on self-assessments, and referral and assessment processes please visit the Department of Climate Change, Energy, the Environment and Water webpage, https://www.dcceew.gov.au/environment/epbc/advice.

Obligations under the *Aboriginal Cultural Heritage Act 2003* and *Torres Strait Islander Cultural Heritage Act 2003* (the Cultural Heritage Acts)

The Cultural Heritage Acts require anyone who carries out a land-use activity to exercise a duty of care. This 'duty of care' means land users must take all reasonable and practicable measures to ensure their activity does not harm Aboriginal or Torres Strait Islander cultural heritage, and applies to any activity where Aboriginal or Torres Strait Islander cultural heritage is located. For more information on your obligations under this legislation, please visit the Department of Women, Aboriginal and Torres Strait Islander Partnerships and Multiculturalism webpage at, https://www.dwatsipm.qld.gov.au/.

SCHEDULES

SCHEDULES 6
Schedule A – General 8
Authorised resource activities 8
Notification 10
Contingency procedures for emergency environmental incidents 11
Plant and equipment operation and maintenance 11
Erosion and sediment control 12
Complaints 12
Documentation 12
Schedule B – Waste Management 14
General Waste Management 14
Pipeline wastewater 14
Authorised uses of produced water for petroleum activities 14
Use of produced water for irrigation activities 15
Schedule B, Table 1 — Assessment procedures for water quality criteria 16
Use of treated sewage or grey water for irrigation activities – Sewage treatment works between 100EP and 350EP16
Schedule B, Table 2 – Treated Sewage Effluent Release Limits to Land 17
Residual drilling material 17
Transfer of coal seam gas water to a third party 18
Schedule B, Table 3 – Water Contaminant Release Limits 18
Schedule C – Protecting Acoustic Values 20
Schedule C, Table 1 — Noise nuisance limits 20
Schedule C, Table 2 — Adjustments to be added to noise levels at sensitive receptors 20
Schedule D – Protecting Air Values 22
Venting and flaring 22
Fuel burning and combustion facilities – authorised point sources 22
Schedule D, Table 1 – Authorised point sources 22
Point source air monitoring 23
Schedule E – Protecting Land Values 24
General 24
Topsoil management 24
Land management 24
Acid sulfate soils 24
Chemical storage 24
Pipeline operation and maintenance 24
Pipeline reinstatement and revegetation 24
Schedule F – Protecting Biodiversity Values 26
Confirming biodiversity values 26

Planning for land disturbance 26
Planning for land disturbance – linear infrastructure 27
Authorised disturbance to Environmentally Sensitive Areas 27
Schedule F, Table 1 — Authorised petroleum activities in environmentally sensitive areas and their protection zones 27
Schedule F, Table 2 – Maximum ESA disturbance 28
Schedule F, Figure 1 – SGP North Stage 1, Stage 2, and Stage 3 Maximum Boundary 29
Planning for land disturbance – significant residual impacts 30
Schedule F, Table 3 — Authorised impacts to PEMs 30
Schedule G – Protecting Water Values 33
Contaminant release 33
Authorised impacts to wetlands 33
Authorised activities in waters 33
Schedule G, Table 1 — Release limits for construction or maintenance of linear infrastructure 34
Register of activities in wetlands and watercourses 34
Activities in floodplains 34
Seepage monitoring program 35
Seepage monitoring bore drill logs 36
Schedule H – Rehabilitation 37
Rehabilitation planning 37
Transitional rehabilitation 37
Final rehabilitation acceptance criteria 37
Final rehabilitation acceptance criteria in environmentally sensitive areas 38
Continuing conditions 38
Remaining dams 38
Schedule I – Well construction, maintenance, and stimulation activities 39
Drilling activities 39
Schedule J – Structures 40
Consequence category assessment 40
Notification of affected persons 40
Operation and maintenance of a regulated structure 40
Design storage allowance 40
Annual inspection report 41
Transfer arrangements 41
Register of Regulated Structures 42

Conditions of environmental authority

Schedule A – General

Authorised resource activities

(General 1) This environmental authority authorises the carrying out of the following resource activity(ies):

a) The petroleum activities[1] listed in **Schedule A, Table 1 – Authorised petroleum activities** to the extent they are carried out in accordance with the activity's corresponding scale and intensity (or both, where applicable);

b) The following specified environmentally relevant activities (ERAs):

i. Resource recovery and transfer facility operation – operating a facility for receiving and sorting, dismantling, baling, or temporarily storing (c) category 2 regulated waste;

ii. Electricity generation – generating electricity by using gas at a rated capacity of 10MW electrical or more;

iii. Fuel burning – using fuel burning equipment that is capable of burning at least 500kg of fuel in an hour;

iv. Extractive and screening activities - Extracting, other than by dredging, in a year, the following quantity of material – (b) more than 100,000t but not more than 1,000,000t;

v. Sewage treatment – operating sewage treatment works, other than no-release works, with a total daily peak design capacity of (a-i) 21 to 100EP and (b-i) more than 100 but not more than 1,500, if treated effluent is discharged from the works to an infiltration trench or through an irrigation scheme.

c) For the specified relevant activities listed in General (1)(b) above, another activity where Schedule 2 of the *Environmental Protection Regulation 2019* (the Regulation) provides exemption for the activity, but only to the extent of the circumstances stated in Schedule 2 of the Regulation; and

d) Incidental activities that are not otherwise specified relevant activities.

Schedule A, Table 1 – Authorised petroleum activities[1]

Activity(ies)	Total scale of petroleum activities / infrastructure	Scale / Intensity
Total Coal Seam Gas (CSG) wells	588 wells[2]: PL304 – 95 wells PL305 – 86 wells PL491 – 192 wells PL492 – 151 wells PL494 – 27 wells PL1044 - 37 wells	1.5 ha maximum per single well pads 2.5 ha maximum per multi-well pads
Existing wells[3]	56 wells	N/A
Petroleum activities carried out on a site containing a regulated structure[2] (high or significant consequence category dam)	PL304 – Kedron Dam PL305 – Castledean Dam PL1044 – Punchbowl Dam	Kedron Dam – One (1) dam / 20 ha Castledean Dam – One (1) dam / 14 ha Punchbowl Dam – One (1) dam / 35 ha

Activity(ies)	Total scale of petroleum activities / infrastructure	Scale / Intensity
Central gas processing facility (Field Compression Station) and a power station, and a multi-point ground flare, and a water transfer station	PL305	One (1) facility / 23 ha
Communication towers	PL305 – One (1) Comms tower PL491 – Three (3) Comms towers PL492 – One (1) Comms tower	Five (5) Comms towers / 5 ha
Sewage treatment plants (STPs)	PL492 – Two (2) facilities PL305 – Four (4) facilities	Six (6) facilities / Less than 100EP (each)
	PL305 - One (1) facility	One (1) facility / 100 to 350EP
Gravel pit (s)	Optional[4] (one of two options): Option 1: PL491 – One (1) facility **or** Option 2: PL305 & PL491 – One (1) facility and PL492 – Two (2) facilities	Three (3) gravel pits / 37 ha
Solar farm	PL491	One (1) facility / 30.1 ha

[1] The petroleum activities are authorised petroleum activities for the purposes of the *Petroleum and Gas (Production and Safety) Act 2004* and *the Petroleum Act 1923*.

[2] A well variation of 10% per tenure is permitted, provide the overall well count does not exceed 588 wells.

[3] Existing wells from appraisal activities.

[4] One of the two gravel pit options will be developed.

(General 2) This environmental authority does not authorise environmental harm unless a condition contained in this environmental authority explicitly authorises that harm. Where there is no condition, the lack of a condition shall not be construed as authorising harm.

(General 3) All monitoring must be undertaken by a suitably qualified person.

(General 4) If requested by the administering authority in relation to investigating a complaint, monitoring must be commenced within 10 business days.

(General 5) All laboratory analyses and tests must be undertaken by a laboratory that has NATA accreditation for such analyses and tests.

(General 6) Notwithstanding condition (General 5), where there are no NATA accredited laboratories for a specific analyte or substance, then duplicate samples must be sent to at least two separate laboratories for independent testing or evaluation.

(General 7) Monitoring and sampling[1] must be carried out in accordance with the requirements of the following documents (as relevant to the sampling being undertaken), as amended from time to time:

(a) for waters and aquatic environments, the Queensland Government's Monitoring and Sampling Manual 2018 – *Environmental Protection (Water) Policy 2009*;

(b) for groundwater, Groundwater Sampling and Analysis – A Field Guide (2009:27 GeoCat #6890.1);

(c) for noise, the *Environmental Protection Regulation 2019*;

(d) for air, the Queensland Air Quality Sampling Manual and/or Australian Standard 4323.1:1995 Stationary source emissions method 1: Selection of sampling positions, as appropriate for the relevant measurement;

(e) for soil, the Guidelines for Surveying Soil and Land Resources, 2nd edition (McKenzie et al. 2008), and/or the Australian Soil and Land Survey Handbook, 3rd edition (National Committee on Soil and Terrain, 2009 or subsequent versions);

(f) for dust, Australian Standard AS3580.

Notification

(General 8) In addition to the requirements under Chapter 7, Part 1, Division 2 of the *Environmental Protection Act 1994*, the administering authority must be notified through the Pollution Hotline and in writing, as soon as possible, but within 48 hours of becoming aware of any of the following events:

(a) any unauthorised significant disturbance to land;

(b) potential or actual loss of structural or hydraulic integrity of a dam;

(c) when the level of the contents of any regulated dam reaches the mandatory reporting level;

(d) when a regulated dam will not have available storage to meet the design storage allowance on 1 November of any year;

(e) likely or actual loss of well integrity;

(f) when the seepage trigger action response procedure required under condition (Water 13(g)) is or should be implemented;

(g) unauthorised releases of any volume of prescribed contaminants to waters;

(h) unauthorised releases of volumes of contaminants, in any mixture, to land greater than:

i. 200 L of hydrocarbons; or

ii. 200 L of stimulation additives; or

iii. 500 L of stimulation fluids; or

iv. 1,000 L of brine; or

[1] Where monitoring and/or sampling cannot safely be undertaken due to an exceptional circumstance (such as a flood event) preventing a timeframe being met, safe access shall be re-established as soon as practicable and the monitoring and/or sampling shall be subsequently undertaken as soon as possible.

v. 5,000 L of untreated coal seam gas water; or

vi. 5,000 L of raw sewage; or

vii. 10,000 L of treated sewage effluent.

(i) the use of restricted stimulation fluids;

(j) groundwater monitoring results from a landholder's active groundwater bore monitored under the stimulation impact monitoring program which is a 10% or greater increase from a previous baseline value for that bore and which renders the water unfit for its intended use;

(k) monitoring results where two out of any five consecutive samples do not comply with the relevant limits in the environmental authority.

Contingency procedures for emergency environmental incidents

(General 9) Petroleum activities involving significant disturbance to land cannot commence until the development of written contingency procedures for emergency environmental incidents which include, but are not necessarily limited to:

(a) a clear definition of what constitutes an environmental emergency incident or near miss for the petroleum activity;

(b) consideration of the risks caused by the petroleum activity including the impact of flooding and other natural events on the petroleum activity;

(c) response procedures to be implemented to prevent or minimise the risks of environmental harm occurring;

(d) the practices and procedures to be employed to restore the environment or mitigate any environmental harm caused;

(e) procedures to investigate causes and impacts including impact monitoring programs for releases to waters and/or land;

(f) training of staff to enable them to effectively respond to environmental emergency incidents;

(g) procedures to notify the administering authority, local government, and any potentially impacted landholder.

Plant and equipment operation and maintenance

(General 10) All plant and equipment must be maintained and operated in their proper and effective condition.

(General 11) The following infrastructure must be signed with a unique reference name or number in such a way that it is clearly observable:

(a) regulated dams and low consequence dams;

(b) exploration, appraisal, and development wells;

(c) water treatment facilities;

(d) brine encapsulation facilities;

(e) landfill cells;

(f) sewage treatment facilities;

(g) specifically authorised discharge points to air and waters;

(h) any chemical storage facility associated with the environmentally relevant activity of chemical storage;

(i) field compressor stations;

(j) central compressor stations;

(k) gas processing facilities; and

(l) pipeline compressor stations.

(General 12) Measures to prevent fauna being harmed from entrapment must be implemented during the construction, operation, and decommissioning of well infrastructure, dams, pipelines, pipeline trenches, and incidental infrastructure.

Erosion and sediment control

(General 13) For activities involving significant disturbance to land, control measures that are commensurate to the site-specific risk of erosion, and risk of sediment release to waters must be implemented to:

(a) allow stormwater to pass through the site in a controlled manner and at non-erosive flow velocities

(b) minimise soil erosion resulting from wind, rain, and flowing water

(c) minimise the duration that disturbed soils are exposed to the erosive forces of wind, rain, and flowing water

(d) minimise work-related soil erosion and sediment runoff; and

(e) minimise negative impacts to land or properties adjacent to the activities (including roads).

Complaints

(General 14) Petroleum activities must not cause environmental nuisance at a sensitive place, other than where an alternative arrangement is in place.

Documentation

(General 15) A certification must be prepared by a suitably qualified person within 30 business days of completing every plan, procedure, program, and report required to be developed under this environmental authority, which demonstrates that:

a) relevant material, including current published guidelines (where available) have been considered in the written document;

b) the content of the written document is accurate and true; and

c) the document meets the requirements of the relevant conditions of the environmental authority.

(General 16) All plans, procedures, programs, reports, and methodologies required under this environmental authority must be written and implemented.

(General 17) All documents required to be developed under this environmental authority must be kept for five years.

(General 18) All documents required to be prepared, held, or kept under this environmental authority must be provided to the administering authority upon written request within the requested timeframe.

(General 19) A record of all complaints must be kept including the date, complainant's details, source, reason for the complaint, description of investigations and actions undertaken in resolving the complaint.

(General 20) All vegetation clearing activities must be undertaken under the direction of a suitably qualified fauna spotter-catcher to identify, relocate and minimise impacts to native fauna.

(General 21) A record must be kept detailing the name, location, condition and number of any protected wildlife encountered under condition (General 20), other than those identified as having a significant residual impact in *Schedule F, Table 3 — Authorised impacts to PEMs*.

Schedule B – Waste Management

General Waste Management

(Waste 1) Measures must be implemented so that waste is managed in accordance with the waste) resource management hierarchy and the waste and resource management principles.

(Waste 2) Waste, including waste fluids, but excluding waste used in closed-loop systems, must be transported off-site for lawful re-use, remediation, recycling, or disposal, unless the waste is specifically authorised to be disposed of or used on site under this environmental authority.

(Waste 3) Waste fluids, other than flare precipitant stored in flare pits, or residual drilling material or drilling fluids stored in sumps, must be contained in either:

a) an above ground container; or

b) a structure which contains the wetting front.

(Waste 4) Green waste may be used on-site for either rehabilitation or sediment and erosion control, or both.

(Waste 5) Vegetation waste may be burned if it relates to a state forest, timber reserve or forest entitlement area administered by the *Forestry Act 1959* and a permit has been obtained under the *Fire and Rescue Service Act 1990*.

Pipeline wastewater

(Waste 6) Pipeline wastewater, may be released to land provided that it:

a) can be demonstrated it meets the acceptable standards for release to land; and

b) is released in a way that does not result in visible scouring or erosion or pooling or run-off or vegetation die-off.

Authorised uses of produced water for petroleum activities

(Waste 7) Produced water may be re-used in:

a) drilling and well hole activities; or

b) stimulation activities.

(Waste 8) Produced water may be used for dust suppression provided the following criteria are met:

a) the amount applied does not exceed the amount required to effectively suppress dust; and

b) the application:

i. does not cause on-site ponding or runoff;

ii. is directly applied to the area being dust suppressed;

iii. does not harm vegetation surrounding the area being dust suppressed; and

iv. does not cause visible salting.

(Waste 9) Produced water may be used for construction and operational purposes provided the use:

(a) does not result in negative impacts on the composition and structure of soil or subsoils;

(b) is not directly or indirectly released to waters;

(c) does not result in runoff from the construction site; and

(d) does not harm vegetation surrounding the construction site.

(Waste 10) If there is any indication that any of the circumstances in condition (Waste 8(b)(i)) to (Waste 8(b)(iv)) or (Waste 9)(a) to (Waste 9(d)) is occurring the use must cease immediately and the affected area must be remediated without delay.

Use of produced water for irrigation activities

(Waste 11) Irrigation of produced water is authorised providing it ensures:

(a) that soil structure, stability and productive capacity can be maintained or improved;

(b) toxic effects to crops do not result; and

(c) yields and produce quality are maintained or improved.

(Waste 12) Irrigation of produced water is authorised providing a written report is provided to the chief executive which:

(a) certifies that the outcomes in condition (Waste 11) will be achieved;

(b) states water quality criteria, which has been determined in accordance with the assessment procedures outlined in **Schedule B, Table 1 — Assessment procedures for water quality criteria**; and

(c) includes a water monitoring program to monitor that the outcomes listed in condition (Waste 11) are being achieved.

Schedule B, Table 1 — Assessment procedures for water quality criteria

Water quality criteria	Assessment procedure
electrical conductivity sodium adsorption ratio pH	*Salinity Management Handbook*, with reference to Chapter 11; and/or *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, with reference to Volume 1 Chapter 4 and Volume 3 Chapter 9. The assessment should consider: • soil properties within the root zone to be irrigated (e.g., clay content, cation exchange capacity, exchangeable sodium percentage) • water quality of the proposed resource (e.g., salinity, sodicity) • climate conditions (e.g., rainfall) • leaching fractions • average root zone salinity (calculated) • crop salt tolerance (e.g., impact threshold and yield decline) • management practices and objectives (e.g., irrigation application rate, amelioration techniques) • broader landscape issues (e.g., land use, depth to groundwater) • any additional modelling and tests undertaken to support the varied water quality parameters.
heavy metals	Australian and New Zealand Guidelines for Fresh and Marine Water Quality, with reference to Volume 1 Chapters 3 and 4 and Volume 3 Chapter 9.
	The assessment should aim to derive site specific trigger values (e.g., cumulative contaminant loading limit) based on the methodology provided in the above-mentioned procedure.

Use of treated sewage or grey water for irrigation activities – Sewage treatment works less than 50EP

(Waste 13) Treated sewage effluent or greywater from a treatment system with a daily peak design capacity of less than 50EP may be released to land provided it:

(a) is to a fenced and signed contaminant release area(s);

(b) does not result in pooling or run-off or aerosols or spray drift or vegetation die-off;

(c) minimises deep drainage below the root zone of any vegetation;

(d) does not adversely affect the quality of shallow aquifers;

(e) does not adversely impact soil quality; and

(f) is to a contaminant release area(s) that is kept vegetated with groundcover, that is:

i. not a declared pest species;

ii. kept in a viable state for transpiration and nutrient uptake; and

iii. grazed or harvested and removed from the contaminant release area as needed, but not less than every three months.

Use of treated sewage or grey water for irrigation activities – Sewage treatment works between 100EP and 350EP

(Waste 14) Sewage pump stations must be fitted with:

(a) a stand-by pump; and

(b) a visible or audible high-level alarm to warn of imminent pump station overflow, that operates without mains power or with a back-up power source that starts automatically in

the event of a power failure.

(Waste 15) All nominated locations and minimum contaminant release areas for sewage treatment works with a daily peak design capacity of greater than 100EP must be determined using the Model for Effluent Disposal using Land Irrigation (MEDLI) program or recognised equivalent by a suitably qualified person.

(Waste 16) A copy of the MEDLI program (or recognised equivalent) required in condition (Waste 15) must be available upon request by the administering authority.

(Waste 17) All treated sewage effluent or greywater released to land from a treatment system with a daily peak design capacity of greater than 100 EP must be in accordance with the contaminant release limits and monitored at the frequency as stated in *Schedule B, Table 2 – Treated Sewage Effluent Release Limits to Land* and the conditions of this environmental authority.

Schedule B, Table 2 – Treated Sewage Effluent Release Limits to Land

Quality Characteristic / Contaminant	Sampling and *in situ* measurement point location	Unit	Limit Type	Release Limit	Frequency
5-day Biochemical oxygen demand (BOD)	Release pipe from sewage treatment plant	mg/L	maximum	20	Quarterly
Total Suspended Solids (TSS)		mg/L	maximum	30	
E. coli		CFU[1] /100 mL	80th percentile[2]	1,000	
		CFU/100 mL	maximum	10,000	
Electrical Conductivity (EC)		µS/cm	maximum	1,600	Monthly in-situ monitoring
Total nitrogen		mg/L	maximum	30	
Total phosphorous		mg/L	maximum	20	
pH		pH unit	range	6.0 – 8.5	

[1] CFU = Colony Forming Units.

[2] Based on at least five (5) samples with not less than 30 minutes between samples.

(Waste 18) If the water quality assessment required by condition (Waste 17) demonstrates that the water is not suitable for release to land, then water must be collected and disposed of at an appropriate facility.

Residual drilling material

(Waste 19) If sumps are used to store residual drilling material or drilling fluids, they must only be used for the duration of drilling activities.

(Waste 20) Residual drilling material can only be disposed of on-site:

(a) by mix-bury-cover method if the residual drilling material meets the approved quality criteria; or

(b) if it is certified by a suitably qualified third party as being of acceptable quality for disposal to land by the proposed method and that environmental harm will not result from the proposed disposal.

(Waste 21) Records must be kept to demonstrate compliance with condition (Waste 19) and (Waste 20).

Transfer of coal seam gas water to a third party

(Waste 22) Coal seam gas water may be transferred to a third party to be used for the following purposes subject to compliance with conditions (Waste 22(a)-(d)), (Waste 23) and (Waste 24):

(a) dust suppression if the coal seam gas water quality complies with the limits specified in *Schedule B, Table 3 – Water Contaminant Release Limits*;

(b) construction and operational purposes if the coal seam gas water quality complies with the limits specified in *Schedule B, Table 3 – Water Contaminant Release Limits*;

(c) irrigation and livestock watering purposes;

(d) the following industrial purposes:

i. coal washing;

ii. power stations; and

iii. water treatment facilities.

Schedule B, Table 3 – Water Contaminant Release Limits

Water Quality Characteristics	Unit	Limit	Limit Type
pH	pH units	6.0 to 9.0	Range
Sodium Adsorption Ratio	ratio	6	80th Percentile
		12	Maximum
Total Dissolved Solids (TDS)	mg/L	1500	Maximum
Total Petroleum Hydrocarbons (TPH)	mg/L	10	Maximum

(Waste 23) Any coal seam gas water supplied to a third party for irrigation and/or livestock watering purposes in accordance with Condition (Waste 22)(c) must comply with the relevant trigger values contained in ANZECC and ARMCANZ Water Quality Guidelines 2000, or subsequent versions thereof.

(Waste 24) If the responsibility of coal seam gas water is given or transferred to a third party in accordance with Condition (Waste 22), the holder of this environmental authority must ensure that:

(a) the responsibility of the coal seam gas water is given or transferred in accordance with a written agreement (the third party agreement); and

(b) the third party is made aware of the General Environmental Duty under section 319 of the *Environmental Protection Act 1994*.

Schedule C – Protecting Acoustic Values

(Noise 1) Notwithstanding condition (General 14), emission of noise from the petroleum activity(ies) at levels less than those specified in **Schedule C, Table 1 — Noise nuisance limits** are not considered to be environmental nuisance.

Schedule C, Table 1 — Noise nuisance limits

Time period	Time of Day	Metric	Short term noise event[1] (dBA)	Medium term noise event[1] (dBA)	Long term noise event[1] (dBA)
6:00am — 7:00am	Morning	$L_{Aeq,adj,1\ 5\ min}$	40	38	35
7:00am — 6:00pm	Day	$L_{Aeq,adj,1\ 5\ min}$	45	43	40
6:00pm — 10:00pm	Evening	$L_{Aeq,adj,1\ 5\ min}$	40	38	35
10:00pm — 6:00am	Night	$L_{Aeq,adj,1\ 5\ min}$	28	28	28
		Max $L_{pA,\ 15\ mins}$	55	55	55
Drilling activities undertaken from 10:00 pm – 7:00 am[2]		$L_{Aeq,\ adj,\ 15\ min}$	28 (measured indoors) 33 (measured outdoors)		

1 The noise limits in Schedule C, Table 1 have been set based on the following deemed background noise levels (LABG)*:*

6:00am—7:00 am: 30 dBA

7:00am—6:00 pm: 35 dBA

6:00pm—10:00 pm: 30 dBA

10:00pm—6:00 am: 25 dBA

2 *Drilling activities undertaken from 10:00 pm – 7:00 am* must be temporary and mobile in nature, and must not contribute to long-term background noise creep.

(Noise 2) If the noise subject to a valid complaint is tonal or impulsive, the adjustments detailed in **Schedule C, Table 2 — Adjustments to be added to noise levels at sensitive receptors** are to be added to the measured noise level(s) to derive $L_{Aeq,\ adj,\ 15\ min}$.

Schedule C, Table 2 — Adjustments to be added to noise levels at sensitive receptors

Noise characteristic	Adjustment to noise
Tonal characteristic is just audible	+ 2 dBA
Tonal characteristic is clearly audible	+ 5 dBA
Impulsive characteristic is just audible	+ 2 dBA
Impulsive characteristic is clearly audible	+ 5 dBA

(Noise 3) Notwithstanding condition (Noise 1), emission of any low frequency noise must not exceed either (Noise 3(a)) and (Noise 3(b)), or (Noise 3(c)) and (Noise 3(d)) in the event of a valid complaint about low frequency noise being made to the administering authority:

(a) 60 dB(C) measured outside the sensitive receptor; and

(b) the difference between the external A-weighted and C-weighted noise levels is no greater than 20 dB; or

(c) 50 dB(Z) measured inside the sensitive receptor; and

(d) the difference between the internal A-weighted and Z-weighted (Max $L_{pZ,\ 15\ min}$) noise levels is no greater than 15 dB.

Schedule D – Protecting Air Values

Venting and flaring

(Air 1) Unless venting is authorised under the *Petroleum and Gas (Production and Safety) Act 2004* or the *Petroleum Act 1923*, waste gas must be flared in a manner that complies with all of (Air 1(a)) and (Air 1(b)) and (Air 1(c)), or with (Air 1(d)):

(a) an automatic ignition system is used, and

(b) a flame is visible at all times while the waste gas is being flared, and

(c) there are no visible smoke emissions other than for a total period of no more than 5 minutes in any 2 hours, or

(d) it uses an enclosed flare.

Fuel burning and combustion facilities – authorised point sources

(Air 2) A fuel burning, or combustion facility must not be operated unless it is listed in **Schedule D, Table 1 – Authorised point sources**.

(Air 3) If a fuel burning or combustion facility is listed in **Schedule D, Table 1—Authorised point sources**, the fuel burning or combustion facility must be operated so that the releases to air do not exceed the limits specified in **Schedule D, Table 1—Authorised point sources** at the specified release point reference.

Schedule D, Table 1 – Authorised point sources

Resource Authority Tenure	Facility	Release point reference	Unit description	Minimum release height (m)	Minimum efflux velocity [a] (m/sec)	NOx as Nitrogen dioxide (NO_2)	
						Maximum concentration [a] (mg/Nm^3,5% O_2)	Maximum mass emission rate [a] (g/sec)
PL305	SGP North Field Compression Station (FCS) power station	A1	Generator Stack 1	5.5	12	500	0.8
		A2	Generator Stack 2	5.5	12	500	0.8
		A3	Generator Stack 3	5.5	12	500	0.8
		A4	Generator Stack 4	5.5	12	500	0.8
		A5	Generator Stack 5	5.5	12	500	0.8
		A6	Generator Stack 6	5.5	12	500	0.8
		A7	Generator Stack 7	5.5	12	500	0.8
		A8	Generator Stack 8	5.5	12	500	0.8
		A9	Generator Stack 9	5.5	12	500	0.8
		A10	Generator Stack 10	5.5	12	500	0.8
		A11	Generator Stack 11	5.5	12	500	0.8

Resource Authority Tenure	Facility	Release point reference	Unit description	Minimum release height (m)	Minimum efflux velocity [a] (m/sec)	NOx as Nitrogen dioxide (NO_2)	
						Maximum concentration [a] (mg/Nm^3,5% O_2)	Maximum mass emission rate [a] (g/sec)
		A12	Generator Stack 12	5.5	12	500	0.8
		A13	Generator Stack 13	5.5	12	500	0.8
		A14	Generator Stack 14	5.5	12	500	0.8
		A15	Generator Stack 15	5.5	12	500	0.8
		A16	Generator Stack 16	5.5	12	500	0.8
		A17	Generator Stack 17	5.5	12	500	0.8
		A18	Generator Stack 18	5.5	12	500	0.8

a: Minimum efflux velocity, maximum mass emission and maximum concentration limits relate to plant maximum continuous ratings.

Point source air monitoring

(Air 4) Point source air monitoring for each fuel burning or combustion facility listed in **Schedule D, Table 1—Authorised point sources** must:

(a) be undertaken once:

i. in the first three months after first commissioned; and then

ii. every year thereafter (for 16 of 18 listed release points (rotated annually)).

(b) be carried out when each unit the subject of the sampling is operating under maximum operating conditions for the annual period; and

(c) demonstrate compliance with the limits listed in **Schedule D, Table 1—Authorised point sources** at each release point reference.

Schedule E – Protecting Land Values

General

(Land 1) Contaminants must not be directly or indirectly released to land except as permitted under this environmental authority.

Topsoil management

(Land 2) Topsoil must be managed in a manner that preserves its biological and chemical properties.

Land management

(Land 3) Land that has been significantly disturbed by the petroleum activities must be managed to ensure that mass movement, gully erosion, rill erosion, sheet erosion and tunnel erosion do not occur on that land.

Acid sulfate soils

(Land 4) Acid sulfate soils must be treated and managed in accordance with the latest edition of the *Queensland Acid Sulfate Soil Technical Manual*.

Chemical storage

(Land 5) Chemicals and fuels stored, must be effectively contained and where relevant, meet Australian Standards, where such a standard is applicable.

Pipeline operation and maintenance

(Land 6) Pipeline operation and maintenance must be in accordance, to the greatest practicable extent, with the relevant section of the *APGA Code of Environmental Practice: Onshore Pipelines* (2013 or more recent editions).

Pipeline reinstatement and revegetation

(Land 7) Pipeline trenches must be backfilled and topsoils reinstated within three months after pipe laying.

(Land 8) Reinstatement and revegetation of the pipeline right of way must commence within 6 months after cessation of petroleum activities for the purpose of pipeline construction.

(Land 9) Backfilled, reinstated, and revegetated pipeline trenches and right of ways must be:

(a) a stable landform;

(b) re-profiled to a level consistent with surrounding soils;

(c) re-profiled to original contours and established drainage lines; and

(d) vegetated with groundcover which includes suitable native species of vegetation for the location and not a declared pest species, and which is established and growing.

Schedule F – Protecting Biodiversity Values

Confirming biodiversity values

(Biodiversity 1) Prior to undertaking activities that result in significant disturbance to land in areas of native vegetation, confirmation of on-the-ground biodiversity values of the native vegetation communities at that location must be undertaken by a suitably qualified person.

(Biodiversity 2) A suitably qualified person must develop and certify a methodology so that condition (Biodiversity 1) can be complied with, and which is appropriate to confirm on-the-ground biodiversity values.

(Biodiversity 3) For conditions (Biodiversity 5) to (Biodiversity 10), where mapped biodiversity values differ from those confirmed under conditions (Biodiversity 1) and (Biodiversity 2), petroleum activities may proceed in accordance with the conditions of the environmental authority based on the confirmed on-the-ground biodiversity value.

(Biodiversity 4) Spatial records must be kept for the life of the environmental authority that are sufficient to demonstrate compliance with the following conditions:

(a) Condition (Biodiversity 8) and (Biodiversity 9) relating to ESA and PPZ impacts within the disturbance footprint;

(b) Condition (Biodiversity 11) relating to prescribed environmental matters impacts; and

(c) Condition (Biodiversity 12) relating to record keeping of prescribed environmental matters impacts.

For clarity, this includes mapped biodiversity values, confirmed on-the-ground biodiversity values (including key habitat features), location of the activity, environmentally sensitive areas and their protection zones, prescribed environmental matters and impacts to prescribed environmental matters.

Planning for land disturbance

(Biodiversity 5) The location of the petroleum activity(ies) must be selected in accordance with the following site planning principles:

(a) maximise the use of areas of pre-existing disturbance;

(b) in order of preference, avoid, minimise, or mitigate any impacts, including cumulative impacts, on areas of native vegetation or other areas of ecological value;

(c) minimise disturbance to land that may result in land degradation;

(d) in order of preference, avoid then minimise isolation, fragmentation, edge effects or dissection of tracts of native vegetation; and

(e) in order of preference, avoid then minimise clearing of native mature trees.

Planning for land disturbance – linear infrastructure

(Biodiversity 6) Linear infrastructure construction corridors must:

(a) maximise co-location

(b) be minimised in width to the greatest practicable extent; and

(c) for linear infrastructure that is an essential petroleum activity authorised in an environmentally sensitive area or its protection zone, be no greater than 40m in total width.

Authorised disturbance to Environmentally Sensitive Areas

(Biodiversity 7) Extra work areas (EWAs) are authorised in areas clear of native vegetation, including primary protection zones (PPZ) and secondary protection zones (SPZ).

(Biodiversity 8) Where petroleum activities are to be carried out in environmentally sensitive areas or their protection zones, the petroleum activities must be carried out in accordance with **Schedule F, Table 1 — Authorised petroleum activities in environmentally sensitive areas and their protection zones**.

Schedule F, Table 1 — Authorised petroleum activities in environmentally sensitive areas and their protection zones

Environmentally Sensitive Area (ESA)	Within the ESA	Primary protection zone of the ESA	Secondary protection zone of the ESA
Category A ESAs	No petroleum activities permitted.	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted.
Category B ESAs that are other than 'endangered' regional ecosystems	Only low impact petroleum activities permitted.		Only essential petroleum activities permitted.
Category B ESAs that are 'endangered' regional ecosystems	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted.	Only essential petroleum activities permitted.
Category C ESAs that are on the 'essential habitat map, or are 'of concern' regional ecosystems	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted.	-
Category C ESAs that are 'protected wildlife habitat'	Only essential petroleum activities permitted.		-
Category C ESAs that are 'regional parks' (previously known as 'resources reserves')	Only essential petroleum activities permitted.		-
Category C ESAs that are 'state forests' or 'timber reserves'	Only essential petroleum activities permitted.	Petroleum activities permitted.	-
Areas of vegetation that are 'critically limited'	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted.	-

(Biodiversity 9) Despite condition (Biodiversity 8), petroleum activities are permitted in ESAs, as well as their primary protection zones (PPZs) and secondary protection zones (SPZs), if they satisfy the following:

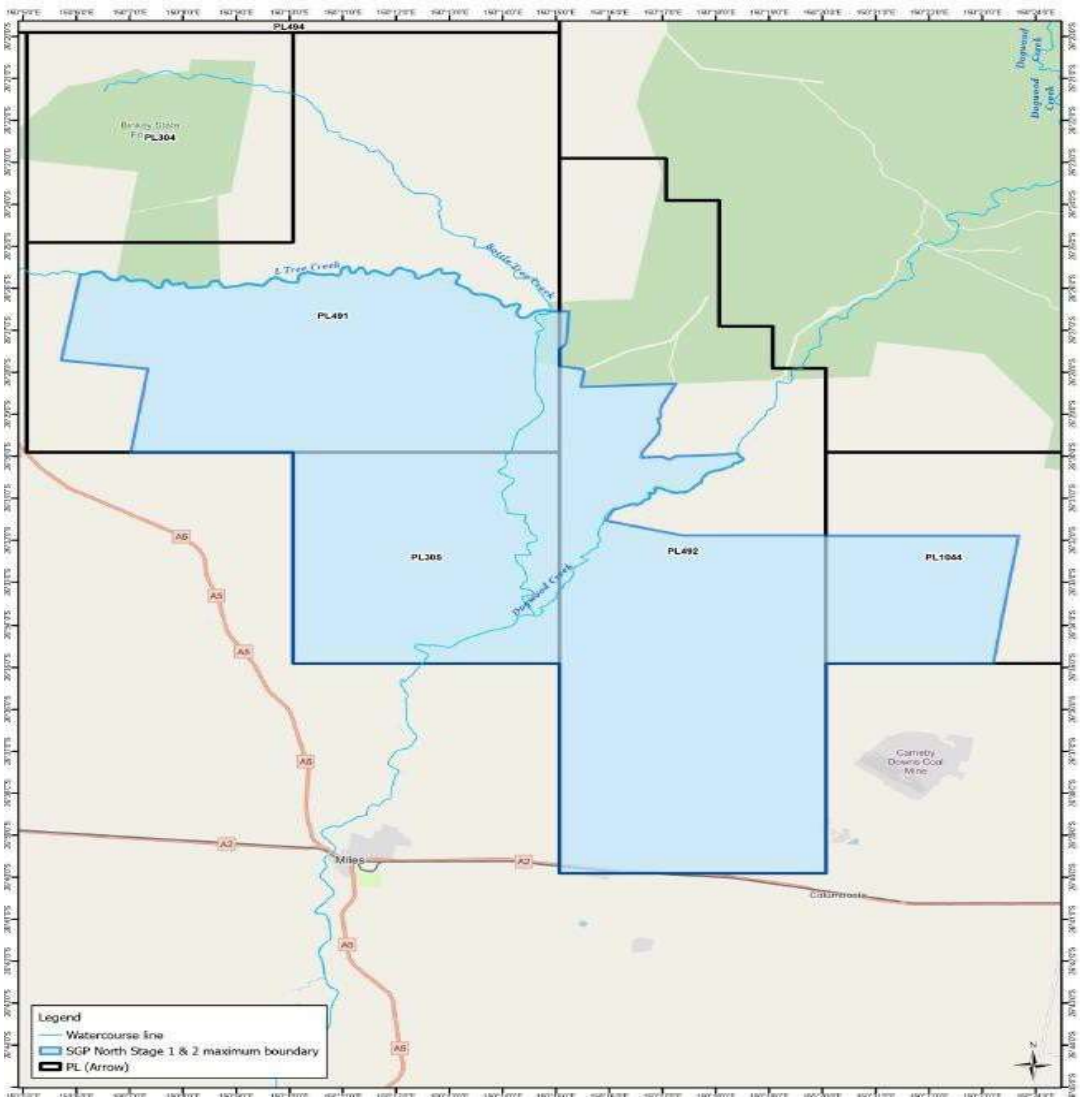
a) Do not exceed the maximum area for each environmentally sensitive area as shown in **Schedule F, Table 2 – Maximum ESA disturbance areas***;* and

b) are undertaken within the footprint prescribed in **Schedule F, Figure 1 – SGP North Stage 1, 2 and 3 Maximum Boundary Maximum Boundary**.

Schedule F, Table 2 – Maximum ESA disturbance

<table>
<tr><th>Activity(ies)</th><th colspan="2">Maximum ESA disturbance Area</th></tr>
<tr><td>Ground disturbance within a Category C Environmentally Sensitive Area 'Of Concern RE' (OCRE)</td><td>2.5 ha</td><td rowspan="3">464.5 ha</td></tr>
<tr><td>Ground disturbance within a Category C Environmentally Sensitive Area 'Mapped as 'Essential Habitat'</td><td>24.6 ha</td></tr>
<tr><td>Ground disturbance within a Category C Environmentally Sensitive Area 'Protected Wildlife Habitat' that is Category C on the RVMM[2]</td><td>437.4 ha</td></tr>
<tr><td>Ground disturbance within a Category C Environmentally Sensitive Area Primary Protection zones</td><td colspan="2" rowspan="3">To the extent they are required for authorised activities within the SGP North Stage 1 & 2 maximum boundary in Schedule F, Figure 1 – SGP North Stage 1, Stage 2, and Stage 3 Maximum Boundary</td></tr>
<tr><td>Ground disturbance within a Category B Environmentally Sensitive Area Primary Protection zones</td></tr>
<tr><td>Ground disturbance within a Category B Environmentally Sensitive Area Secondary Protection zones</td></tr>
</table>

[2] Regulated Vegetation Management Map



Schedule F, Figure 1 – SGP North Stage 1, 2, 3 and 4 Maximum Boundary

(Biodiversity 10) A report must be prepared for each annual return period for all petroleum activities that involved clearing of any environmentally sensitive area or protection zone which includes:

(a) records able to demonstrate compliance with conditions (Biodiversity 5), (Biodiversity 6), (Biodiversity 8) and (Biodiversity 9)

(b) a description of the works

(c) a description of the area and its pre-disturbance values (which may include maps or photographs, but must include GPS coordinates for the works); and

(d) based on the extent of environmentally sensitive areas and primary protection zones on the relevant resource authority(ies), the proportion of native vegetation cleared per environmentally sensitive area and primary protection zone, including regional ecosystem type, over the annual return period.

Planning for land disturbance – significant residual impacts

(Biodiversity 11) Unless authorised by an existing authority issued before the commencement of the *Environmental Offsets Act 2014*, impacts to Prescribed Environmental Matters (PEMs) are only authorised for the maximum extent of impact and within the relevant stage boundary stated in **Schedule F, Table 3 – Authorised impacts to PEMs.**

Schedule F, Table 3 — Authorised impacts to PEMs

Prescribed environmental matter	Significant Residual Impact (SRI) and Offset required? (Yes/No)	Total area of impact	Limited to within the *SGP North Stage 1 & 2 maximum boundary according to Schedule F, Figure 1*			
			Total area of impact – Stage 1	Total area of impact – Stage 2	Total area of impact – Stage 3	Total area of impact – Stage 4*
REGULATED VEGETATION						
Of concern regional ecosystem (not within an urban area)						
RE 11.3.2	Yes	5 ha	0.4 ha	0 ha	0 ha	0 ha
RE 11.3.4	Yes	20 ha	1.0 ha	0 ha	0 ha	0 ha
Regional ecosystems (not within an urban area) within the **defined** distance from the defining banks of a relevant **watercourse** on the vegetation management watercourse map						
RE 11.3.2 (17a)	Yes	1 ha	0.2 ha	0 ha	0 ha	0 ha
RE 11.3.4 (16c)		7 ha	0.5 ha	0 ha	0 ha	0 ha
RE 11.3.14 (18a)		6 ha	0 ha	0 ha	0 ha	0 ha
RE 11.3.25 (16a)		12 ha	0.4 ha	0 ha	0.5 ha	0 ha
RE 11.5.1 (18b)		20 ha	1.8 ha	0 ha	1.8 ha	0 ha
RE 11.5.4 (18b)		3 ha	0 ha	0 ha	0 ha	0 ha
RE 11.5.20 (13d)		1 ha	0.2 ha	0 ha	0 ha	0 ha
RE 11.5.21 (18a)		12 ha	0 ha	0 ha	0 ha	0 ha
RE 11.7.2. (24a)		0.2 ha	0.2 ha	0 ha	0 ha	0 ha
RE 11.7.4 (12a)		8 ha	0.6 ha	0 ha	0.8 ha	0 ha
RE 11.7.5 (29b)		1 ha	<0.1 ha	0 ha	0.1 ha	0 ha
RE 11.7.6 (10a)		5 ha	0 ha	0 ha	0.3 ha	0 ha
RE 11.7.7 (12a)		10 ha	1.1 ha	0 ha	1.5 ha	0 ha
Essential habitat						
Essential habitat - (not in an urban area) on the essential habitat map for **endangered wildlife** (plant or animal)						
Phascolarctos cinereus (Koala)	Yes	8.6 ha	0 ha	8.6 ha	0 ha	0 ha
Essential habitat - (not in an urban area) for **vulnerable wildlife** (plant or animal)						
Nyctophilus corbeni (South-eastern Long-eared Bat)	Yes	16.0 ha	16.0 ha	0 ha	0 ha	0 ha
CONNECTIVITY AREAS						
Connectivity area that is a regional ecosystem (not in urban area)						
Connectivity areas	Yes	500.4 ha	302.1 ha	151.98 ha	46.32 ha	0 ha

Prescribed environmental matter	Significant Residual Impact (SRI) and Offset required? (Yes/No)	Total area of impact	Limited to within the *SGP North Stage 1 & 2 maximum boundary according to Schedule F, Figure 1*			
			Total area of impact – Stage 1	Total area of impact – Stage 2	Total area of impact – Stage 3	Total area of impact – Stage 4*
PROTECTED WILDLIFE HABITAT						
Habitat for an animal that is **endangered wildlife**						
Petauroides volans volans (Greater Glider)	Yes	503.1 ha	269.3 ha	168.22 ha	35.48 ha	30.1 ha*
Phascolarctos cinereus (Koala)	Yes	591.9 ha	325.5 ha	198.65 ha	37.65 ha	30.1 ha*
Habitat for an animal that is **vulnerable wildlife**						
Adclarkia cameroni, (Brigalow Woodland Snail)	Yes	2.5 ha	1.9 ha	0.6 ha	0 ha	0 ha
Calyptorhynchus lathami lathami (Glossy Black Cockatoo)	Yes	27.7 ha	7.9 ha	0 ha	0 ha	19.8 ha*
Stagonopleura guttata, (Diamond Firetail)	Yes	497.4 ha	263.6 ha	168.22 ha	35.48 ha	30.1 ha*
Nyctophilus corbeni (South-eastern Long-eared Bat)	Yes	498.7 ha	267.4 ha	165.72 ha	35.48 ha	30.1 ha*
Petaurus australis australis, Yellow-bellied Glider (south- eastern)	Yes	503.1 ha	269.3 ha	168.22 ha	35.48 ha	30.1 ha*
Habitat for an animal that is **special least concern wildlife**						
Tachyglossus aculeatus (Short- beaked Echidna)	Yes	35.4 ha	0 ha	10.7 ha	0 ha	0 ha
WATERWAY PROVIDING FOR FISH PASSAGE						
Fish passage (not in an urban area)	Yes	18.5 ha	1.9 ha	0 ha	1.5 ha	0 ha
Staged offset made in accordance with condition (Biodiversity 14)			Yes Financial offset provided on 06/02/2025	No	No	No

Notes: (*) Impacts to these species for Stage 4 have been assessed under EPBC Act approval EPBC 2024/10002 for the SGP North Solar Farm project.

(Biodiversity 12) Records demonstrating compliance with condition (Biodiversity 11) must be:

(a) completed by an appropriately qualified person; and

(b) kept for the life of the environmental authority.

(Biodiversity 13) An environmental offset made in accordance with the Environmental Offsets Act 2014 and Queensland Environmental Offsets Policy, as amended from time to time, must be undertaken for the total area of impact of impact for each stage for each prescribed environmental matter per stage authorised for staged impacts specified in Schedule F, Table 3 – Authorised Impacts to PEMs. Unless the administering authority confirms that the impact to the prescribed environmental matter is as follows:

(a) the same, or substantially the same, impact; and

(b) the same, or substantially the same, prescribed environmental matter; and

(c) has been assessed under a relevant Commonwealth Act.

(Biodiversity 14) The significant residual impacts to a prescribed environmental matter authorised in condition (Biodiversity 11) for which an environmental offset is required by condition (Biodiversity 13) may be carried out in stages. An environmental offset can be delivered for each stage of the impacts to prescribed environmental matters.

(Biodiversity 15) A notice of election for the environmental offset if applicable, must be provided to the administering authority, for each stage, no less than three months before the proposed commencement of the significant residual impacts for which the environmental offset is required, unless a lesser timeframe has been agreed to in writing by the administering authority.

(Biodiversity 16) Within six months from the completion of the final stage of the project, a report completed by an appropriately qualified person, that includes the following matters must be provided to the administering authority:

(a) an analysis of the actual impacts on prescribed environmental matters resulting from the final stage; and

(b) if applicable, a notice of election to address any outstanding offset debits for the authorised impacts.

Schedule G – Protecting Water Values

Contaminant release

(Water 1) Contaminants must not be directly or indirectly released to any waters.

Authorised impacts to wetlands

(Water 2) The extraction of groundwater as part of the petroleum activity(ies) from underground aquifers must not directly or indirectly cause environmental harm to a wetland.

Authorised activities in waters

(Water 3) Petroleum activities must not occur in or within 200m of a:

(a) wetland of high ecological significance;

(b) Great Artesian Basin Spring;

(c) subterranean cave GDE.

(Water 4) Only construction or maintenance of linear infrastructure is permitted in or within any wetland of other environmental value or in a watercourse.

(Water 5) The construction or maintenance of linear infrastructure in a wetland of other environmental value must not result in the:

(a) clearing of riparian vegetation outside of the minimum area practicable to carry out the works; or

(b) ingress of saline water into freshwater aquifers; or

(c) draining or filling of the wetland beyond the minimum area practicable to carry out the works.

(Water 6) After the construction or maintenance works for linear infrastructure in a wetland of other environmental value are completed, the linear infrastructure must not:

(a) drain or fill the wetland;

(b) prohibit the flow of surface water in or out of the wetland;

(c) lower or raise the water table and hydrostatic pressure outside the bounds of natural variability that existed before the activities commenced;

(d) result in ongoing negative impacts to water quality;

(e) result in bank instability; or

(f) result in fauna ceasing to use adjacent areas for habitat, feeding, roosting, or nesting.

(Water 7) The construction or maintenance of linear infrastructure activities in a watercourse must be conducted in the following preferential order:

(a) firstly, in times where there is no water present

(b) secondly, in times of no flow

(c) thirdly, in times of flow, providing a bankfull situation is not expected and that flow is maintained.

(Water 8) The construction or maintenance of linear infrastructure authorised under condition (Water 4) must comply with the water quality limits as specified in **Schedule G, Table 1 — Release limits for construction or maintenance of linear infrastructure**.

Schedule G, Table 1 — Release limits for construction or maintenance of linear infrastructure

Water quality parameters	Units	Water quality limits
Turbidity	Nephelometric Turbidity Units (NTU)	For a wetland of other environmental value, if background water turbidity is above 45 NTU, no greater than 25% above background water turbidity measured within a 50m radius of the construction or maintenance activity. For a watercourse, if background water turbidity is above 45 NTU, no greater than 25% above background water turbidity measured within 50m downstream of the construction or maintenance activity.
		For a wetland of other environmental value, if background water turbidity is equal to, or below 45 NTU, a turbidity limit of no greater than 55 NTU applies, measured within a 50m radius of the construction or maintenance activity. For a watercourse, if background water turbidity is equal to, or below 45 NTU, a turbidity limit of no greater than 55 NTU applies, measured within 50m downstream of the construction or maintenance activity.
Hydrocarbons	-	For a wetland of other environmental value, or watercourse, no visible sheen or slick

(Water 9) Monitoring must be undertaken at a frequency that is appropriate to demonstrate compliance with condition (Water 8).

Register of activities in wetlands and watercourses

(Water 10) A register must be kept of all linear infrastructure construction and maintenance activities in a wetland of other environmental value and watercourses, which must include:

(a) location of the activity (e.g., GPS coordinates (GDA2020) and watercourse name);

(b) estimated flow rate of surface water at the time of the activity;

(c) duration of works, and

(d) results of impact monitoring carried out under condition (Water 9).

Activities in floodplains

(Water 11) Petroleum activity(ies) on floodplains must be carried out in a way that does not:

(a) concentrate flood flows in a way that will or may cause or threaten a negative

environmental impact; or

(b) divert flood flows from natural drainage paths and alter flow distribution; or

(c) increase the local duration of floods; or

(d) increase the risk of detaining flood flows.

Seepage monitoring program

(Water 12) A seepage monitoring program must be developed by a suitably qualified person which is commensurate with the site-specific risks of contaminant seepage from containment facilities, and which requires and plans for detection of any seepage of contaminants to groundwater as a result of storing contaminants by 15 November 2018.

(Water 13) The seepage monitoring program required by condition (Water 12) must include but not necessarily be limited to:

(a) identification of the containment facilities for which seepage will be monitored;

(b) identification of trigger parameters that are associated with the potential or actual contaminants held in the containment facilities;

(c) identification of trigger concentration levels that are suitable for early detection of contaminant releases at the containment facilities;

(d) installation of background seepage monitoring bores where groundwater quality will not have been affected by the petroleum activities authorised under this environmental authority to use as reference sites for determining impacts;

(e) installation of seepage monitoring bores that:

i. are within formations potentially affected by the containment facilities authorised under this environmental authority (i.e., within the potential area of impact)

ii. provide for the early detection of negative impacts prior to reaching groundwater dependent ecosystems, landholder's active groundwater bores, or water supply bores;

iii. provide for the early detection of negative impacts prior to reaching migration pathways to other formations (i.e., faults, areas of unconformities known to connect two or more formations).

(f) monitoring of groundwater at each background and seepage monitoring bores for the trigger parameters identified in condition (Water 13(b)) at a frequency determined by a suitably qualified person and:

i. at least once every two years where baseline data has been established; or

ii. at least every six months for two years to establish baseline data for any impact to groundwaters, after which time monitoring may continue at the frequency according to condition (Water 13(f)(i)).

(g) seepage trigger action response procedures for when trigger parameters and trigger levels identified in conditions (Water 13(b)) and (Water 13(c)) trigger the early detection of seepage, or upon becoming aware of any monitoring results that indicate potential groundwater contamination;

(h) a rationale detailing the program conceptualisation including assumptions, determinations, monitoring equipment, sampling methods and data analysis; and

(i) provides for annual updates to the program for new containment facilities constructed in each annual return period.

Seepage monitoring bore drill logs

(Water 14) A bore drill log must be completed for each seepage monitoring bore in condition (Water 13) which must include:

(a) bore identification reference and geographical coordinate location;

(b) specific construction information including but not limited to depth of bore, depth and length of casing, depth and length of screening and bore sealing details;

(c) standing groundwater level and water quality parameters including physical parameter and results of laboratory analysis for the possible trigger parameters;

(d) lithological data, preferably a stratigraphic interpretation to identify the important features including the identification of any aquifers; and

(e) target formation of the bore.

Schedule H – Rehabilitation

Rehabilitation planning

(Rehabilitation 1) A Rehabilitation Plan must be developed by a suitably qualified person and must include the:

(a) rehabilitation goals; and

(b) procedures to be undertaken for rehabilitation that will:

i. achieve the requirements of conditions (Rehabilitation 2) to (Rehabilitation 6), inclusive; and

ii. provide for appropriate monitoring and maintenance.

Transitional rehabilitation

(Rehabilitation 2) Significantly disturbed areas that are no longer required for the on-going petroleum activities must be rehabilitated within 12 months (unless an exceptional circumstance in the area to be rehabilitated (e.g., a flood event) prevents this timeframe being met) and be maintained to meet the following acceptance criteria:

(a) contaminated land resulting from petroleum activities is remediated and rehabilitated;

(b) the areas are:

i. non-polluting;

ii. a stable landform;

iii. re-profiled to contours consistent with the surrounding landform.

(c) surface drainage lines are re-established, consistent with natural flow patterns and self-sustaining;

(d) topsoil is reinstated; and

(e) either:

i. groundcover, that includes suitable native species of vegetation for the location and not a declared pest species, is growing; or

ii. an alternative soil stabilisation methodology that achieves effective stabilisation is implemented and maintained.

Final rehabilitation acceptance criteria

(Rehabilitation 3) All significantly disturbed areas caused by petroleum activities which are not being or intended to be utilised by the landholder or overlapping tenure holder, must be rehabilitated to meet the following final acceptance criteria measured either against the highest ecological value adjacent land use or the pre-disturbed land use:

(a) greater than or equal to 70% of native ground cover species richness;

(b) greater than or equal to the total per cent of ground cover;

(c) less than or equal to the per cent species richness of declared plant pest species; and

(d) where the adjacent land use contains, or the pre-clearing land use contained, one or more regional ecosystem(s), then at least one regional ecosystem(s) from the same broad vegetation group, and with the equivalent biodiversity status or a biodiversity status with a higher conservation value as any of the regional ecosystem(s) in either the adjacent land or pre-disturbed land, must be present.

Final rehabilitation acceptance criteria in environmentally sensitive areas

(Rehabilitation 4) Where significant disturbance to land has occurred in an environmentally sensitive area, the following final rehabilitation criteria as measured against the pre-disturbance biodiversity values assessment (required by conditions (Biodiversity 1) and (Biodiversity 2)) must be met:

(a) greater than or equal to 70% of native ground cover species richness;

(b) greater than or equal to the total per cent ground cover;

(c) less than or equal to the per cent species richness of declared plant pest species;

(d) greater than or equal to 50% of organic litter cover;

(e) greater than or equal to 50% of total density of coarse woody material; and

(f) all predominant species in the ecologically dominant layer, that define the pre-disturbance regional ecosystem(s) are present.

Continuing conditions

(Rehabilitation 5) Conditions (Rehabilitation 2), (Rehabilitation 3), and (Rehabilitation 4) continue to apply after this environmental authority has ended or ceased to have effect.

Remaining dams

(Rehabilitation 6) Where there is a dam (including a low consequence dam) that is being or intended to be utilised by the landholder or overlapping tenure holder, the dam must be decommissioned to no longer accept inflow from the petroleum activity(ies) and the contained water must be of a quality suitable for the intended ongoing uses(s) by the landholder or overlapping tenure holder.

Schedule I – Well construction, maintenance, and stimulation activities

Drilling activities

(Well activities 1) Oil based or synthetic based drilling muds must not be used in the carrying out of the petroleum activity(ies).

(Well activities 2) Drilling activities must not result in the connection of the target gas producing formation and another aquifer.

(Well activities 3) Practices and procedures must be in place to detect, as soon as practicable, any fractures that:

a) have or may result in the connection of a target formation and another aquifer as a result of drilling activities; or

b) cause the connection of a target gas producing formation and another aquifer.

Schedule J – Structures

Consequence category assessment

(J1) The consequence category of any structure must be assessed by a suitably qualified and experienced person in accordance with the *Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933)* at the following times:

(a) prior to the design and construction of the structure, if it is not an existing structure; or

(b) prior to any change in its purpose or the nature of its stored contents.

(J2) A consequence assessment report and certification must be prepared for each structure assessed and the report may include a consequence assessment for more than one structure.

(J3) Certification must be provided by the suitably qualified and experienced person who undertook the assessment, in the form set out in the *Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933)*.

Notification of affected persons

(J4) All affected persons must be provided with a copy of the emergency action plan in place for each regulated structure

(a) for existing structures that are regulated structures, within 10 business days of this condition taking effect;

(b) prior to the operation of the new regulated structure; and

(c) if the emergency action plan is amended, within 5 business days of it being amended.

Operation and maintenance of a regulated structure

(J5) For existing structures that are regulated structures:

(a) where the existing structure that is a regulated structure is to be managed as part of an integrated containment system for the purpose of sharing the DSA volume across the system, the holder must submit to the administering authority within 12 months of the commencement of this condition a copy of the certified system design plan including that structure; and

(b) there must be a current operational plan for the existing structures.

(J6) Each regulated structure must be maintained and operated, for the duration of its operational life until decommissioned and rehabilitated, in compliance with the current operational plan and, if applicable, the current design plan and associated certified ‘as constructed’ drawings.

Design storage allowance

(J7) The holder must assess the performance of each regulated dam or linked containment system over the preceding November to May period based on actual observations of the available storage in each regulated dam or linked containment system taken prior to 1 July of each year.

(J8) By 1 November of each year, storage capacity must be available in each regulated dam (or network of linked containment systems with a shared DSA volume), to meet the Design Storage Allowance (DSA) volume for the dam (or network of linked containment systems).

(J9) The holder must, as soon as practicable but within forty-eight (48) hours of becoming aware that the regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, notify the administering authority.

(J10) The holder must, immediately on becoming aware that a regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, act to prevent the occurrence of any unauthorised discharge from the regulated dam or linked containment systems.

Annual inspection report

(J11) Each regulated structure must be inspected each calendar year by a suitably qualified and experienced person.

(J12) At each annual inspection, the condition and adequacy of all components of the regulated structure must be assessed and a suitably qualified and experienced person must prepare an annual inspection report containing details of the assessment and include a recommendations section, with any recommended actions to ensure the integrity of the regulated structure or a positive statement that no recommendations are required.

(J13) The suitably qualified and experienced person who prepared the annual inspection report must certify the report in accordance with the *Manual for assessing consequence categories and hydraulic performance of structures* (ESR/2016/1933).

(J14) The holder must within 20 business days of receipt of the annual inspection report, provide to the administering authority:

(a) The recommendations section of the annual inspection report; and

(b) If applicable, any actions being taken in response to those recommendations; and

(c) If, following receipt of the recommendations and (if applicable) recommended actions, the administering authority requests a copy of the annual inspection report from the holder, provide this to the administering authority within 10 business days of receipt of the request.

Transfer arrangements

(J15) The holder must provide a copy of any reports, documentation and certifications prepared under this authority, including but not limited to any Register of Regulated Structures, consequence assessment, design plan and other supporting documentation, to a new holder on transfer of this authority.

Register of Regulated Structures

(J16) A Register of Regulated Structures must be established and maintained by the holder of this environmental authority for each regulated structure.

(J17) The holder of this environmental authority must ensure that the information contained in the Register of Regulated Structures is current and complete on any given day.

(J18) All entries in the Register of Regulated Structures must be approved by the chief executive officer for the holder of this authority, or their delegate, as being accurate and correct.

(J19) The holder of this environmental authority must, at the same time as providing the annual return, supply to the administering authority a copy of the records contained in the Register of Regulated Structures, in the electronic format required by the administering authority.

Definitions

Key terms and/or phrases used in this document are defined in this section. Where a term is not defined, the definition in the *Environmental Protection Act 1994*, its regulations or environmental protection policies must be used. If a word remains undefined it has its ordinary meaning.

Word or term	Definition
acceptable standards for release to land	means wastewater of the following quality as determined by monitoring results or by characterisation: (a) electrical conductivity (EC) not exceeding 3000µS/cm (b) sodium adsorption ratio (SAR) not exceeding 8 (c) pH between 6.0 and 9.0 (d) heavy metals (measured as total) meet the respective short term trigger value in section 4.2.6, Table 4.2.10—Heavy metals and metalloids in Australian and New Zealand Guidelines for Fresh and Marine Water Quality (e) does not contain biocides.
acid sulfate soil(s)	means a soil or soil horizon which contains sulfides, or an acid soil horizon affected by oxidation of sulfides.
adjacent land use(s)	means the ecosystem function adjacent to an area of significant disturbance, or where there is no ecosystem function, the use of the land. An adjacent land use does not include an adjacent area that shows evidence of edge effect.
administering authority	means: (a) for a matter, the administration and enforcement of which has been devolved to a local government under section 514 of the Environmental Protection Act 1994—the local government; or (b) for all other matters—the Chief Executive of the Department of Environment, Tourism, Science, and Innovation; or (c) another State Government Department, Authority, Storage Operator, Board or Trust, (d) whose role is to administer provisions under other enacted legislation.
affected person	is someone whose drinking water can potentially be impacted as a result of discharges from a dam, or their life or property can be put at risk due to dwellings or workplaces being in the path of a dam break flood.
alternative arrangement	means a written agreement about the way in which a particular environmental nuisance impact will be dealt with at a sensitive place and may include an agreed period of time for which the arrangement is in place. An alternative arrangement may include, but is not limited to, a range of nuisance abatement measures to be installed at the sensitive place, or provision of alternative accommodation for the duration of the relevant nuisance impact.
analogue site(s)	means an area of land which contains values and characteristics representative of an area to be rehabilitated prior to disturbance. Such values must encompass land use, topographic, soil, vegetation, vegetation community attributes and other ecological characteristics. Analogue sites can be the pre-disturbed site of interest where significant surveying effort has been undertaken to establish benchmark parameters.
annual exceedance	the probability that at least one event in excess of a particular magnitude will occur in any given year.

Word or term	Definition
probability or AEP	
annual inspection report	means an assessment prepared by a suitably qualified and experienced person containing details of the assessment against the most recent consequence assessment report and design plan (or system design plan); (a) against recommendations contained in previous annual inspections reports; (b) against recognised dam safety deficiency indicators; (c) for changes in circumstances potentially leading to a change in consequence category; (d) for conformance with the conditions of this authority; (e) for conformance with the 'as constructed' drawings; (f) for the adequacy of the available storage in each regulated dam, based on an actual observation or observations taken after 31 May each year but prior to 1 November of that year of accumulated sediment, state of the containment barrier and the level of liquids in the dam (or network of linked containment systems); (g) for evidence of conformance with the current operational plan.
annual return period	means the most current 12-month period between two anniversary dates.
appraisal well	means a petroleum well to test the potential of one (1) or more natural underground reservoirs for producing or storing petroleum. For clarity, an appraisal well does not include an exploration well.
appropriately qualified person/suitably qualified person	means a person who has professional qualifications, training or skills or experience relevant to the nominated subject matters and can give authoritative assessment, advice, and analysis about performance relevant to the subject matters using relevant protocols, standards, methods, or literature.

<table>
<tr><th>Word or term</th><th>Definition</th></tr>
<tr><td>Approved quality criteria</td><td>for the purposes of residual drilling materials, means the residual drilling material meet the following quality standards:

Part A In all cases:

<table>
<tr><th></th><th></th></tr>
<tr><td>pH</td><td>6 – 10.5 (range)</td></tr>
<tr><td>Electrical Conductivity</td><td>20 dS/m (20,000 µS/cm)</td></tr>
<tr><td>Chloride</td><td>8,000 mg/L</td></tr>
</table>
*Chloride analysis is only required if an additive containing chloride was used in the drilling process. The limits in Part A must be measured in the clarified filtrate of oversaturated solids prior to mixing.

Part B If any of the following metals are a component of the drilling fluids, then for that metal:

<table>
<tr><th></th><th></th></tr>
<tr><td>Arsenic</td><td>20 mg/Kg</td></tr>
<tr><td>Selenium</td><td>5 mg/Kg</td></tr>
<tr><td>Boron</td><td>100 mg/Kg</td></tr>
<tr><td>Cadmium</td><td>3 mg/Kg</td></tr>
<tr><td>Chromium (total)</td><td>400 mg/Kg</td></tr>
<tr><td>Copper</td><td>100 mg/Kg</td></tr>
<tr><td>Lead</td><td>600 mg/Kg</td></tr>
</table>
The limits in Part B and Part C refer to the post soil/by-product mix.

Part C If a hydrocarbon sheen is visible, the following hydrocarbon fractions:

<table>
<tr><th>TPH</th><th>Maximum Concentration</th></tr>
<tr><td>C6-C10</td><td>170 mg/kg</td></tr>
<tr><td>C10-C16</td><td>150 mg/kg</td></tr>
<tr><td>C16-C34</td><td>1,300 mg/kg</td></tr>
<tr><td>C34-C40</td><td>5,600 mg/kg</td></tr>
<tr><td>Total Polycyclic Aromatic Hydrocarbons (PAHs)</td><td>20 mg/kg</td></tr>
<tr><td>Phenols (halogenated)</td><td>1 mg/kg</td></tr>
<tr><td>Phenols (non-halogenated)</td><td>30 mg/kg</td></tr>
</table>
</td></tr>
</table>

Word or term	Definition
	<table><tr><td>Monocyclic aromatic hydrocarbons (Total sum of benzene, toluene, ethyl benzene, xylenes (includes ortho, para and meta xylenes) and styrene)</td><td>7 mg/kg</td></tr><tr><td>Benzene</td><td>1 mg/kg</td></tr></table>
areas of pre-existing disturbance	means areas where environmental values have been negatively impacted as a result of anthropogenic activity and these impacts are still evident. Areas of pre-disturbance may include areas where legal clearing, logging, timber harvesting, or grazing activities have previously occurred, where high densities of weed or pest species are present which have inhibited re-colonisation of native regrowth, or where there is existing infrastructure (regardless of whether the infrastructure is associated with the

Word or term	Definition
	authorised petroleum activities). The term 'areas of pre- disturbance' does not include areas that have been impacted by wildfire/s, controlled burning, flood, or natural vegetation die-back.
assessed or assessment	by a suitably qualified and experienced person in relation to a consequence assessment of a dam, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit of the assessment: (a) exactly what has been assessed and the precise nature of that determination; (b) the relevant legislative, regulatory, and technical criteria on which the assessment has been based; (c) the relevant data and facts on which the assessment has been based, the source of that material, and the efforts made to obtain all relevant data and facts; and (d) the reasoning on which the assessment has been based using the relevant data and facts, and the relevant criteria.
associated water	means underground water taken or interfered with, if the taking or interference happens during the course of, or results from, the carrying out of another authorised activity under a petroleum authority, such as a petroleum well, and includes waters also known as produced formation water. The term includes all contaminants suspended or dissolved within the water.
associated works	in relation to a dam, means: (a) operations of any kind and all things constructed, erected, or installed for that dam; and (b) any land used for those operations.
Australian Standard 3580	means any of the following publications: • AS3580.10.1 Methods for sampling and analysis of ambient air—Determination of particulate matter—Deposited matter—Gravimetric method. • AS3580.9.6 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—PM10 high volume sampler with size-selective inlet—Gravimetric method. • AS3580.9.9 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter— PM10 low volume sampler—Gravimetric sampler.
authority	means an environmental authority or a development approval.
background noise level	means the sound pressure level, measured in the absence of the noise under investigation, as the $L_{A90,T}$ being the A-weighted sound pressure level exceeded for 90% of the measurement time period T of not less than 15 minutes (or $\underline{L_{A\ 90,\ adj,\ 15\ mins}}$), using Fast response.
bankfull	means the channel flow rate that exists when the water is at the elevation of the channel bank above which water begins to spill out onto the floodplain. The term describes the condition of the channel relative to its banks (e.g., overbank, in-bank, bankfull, low banks, high bank).
bed	of any waters, has the meaning in Schedule 19 of the *Environmental Protection Regulation 2019* and— (a) includes an area covered, permanently or intermittently, by tidal or non-tidal waters; but (b) does not include land adjoining or adjacent to the bed that is from time to time (c) covered by floodwater.

Word or term	Definition
being or intended to be utilised by the landholder or overlapping tenure holder	for significantly disturbed land, means there is a written agreement (e.g., land and compensation agreement) between the landholder or the overlapping tenure holder and the holder of the environmental authority identifying that the landholder, or the overlapping tenure holder has a preferred use of the land such that rehabilitation standards for revegetation by the holder of the environmental authority are not required. For dams, means there is a written agreement (e.g., land and compensation agreement) between the landholder or the overlapping tenure holder and the holder of the environmental authority identifying that the landholder, or the overlapping tenure holder has a preferred use for the dam such that rehabilitation standards for revegetation by the holder of the environmental authority are not required.
biodiversity values	for the purposes of this environmental authority, means environmentally sensitive areas, prescribed environmental matters and wetlands.
BTEX	means benzene, toluene, ethylbenzene, ortho-xylene, para-xylene, meta-xylene, and total xylene.
Category A environmentally sensitive area	means any area listed in Schedule 19, Section 3 of the Environmental Protection Regulation 2019.
Category B environmentally sensitive area	means any area listed in Schedule 19, Section 3 of the Environmental Protection Regulation 2019.
Category C environmentally sensitive area	means any of the following areas: • nature refuges as defined in the conservation agreement for that refuge under the *Nature Conservation Act 1992* Guideline Streamlined model conditions for petroleum activities • state forests or timber reserves as defined under the Forestry Act 1959 • Resources Reserve under the Nature Conservation Act 1992; • an area validated as from ground-truthing surveys as 'essential habitat' on the Queensland Government Essential Habitat Map in accordance with section 20AC of the *Vegetation Management Act 1999* for a species of wildlife listed as critically endangered, endangered, vulnerable under the *Nature Conservation Act 1992* • an area validated from ground-truthing surveys as 'protected wildlife habitat' that is category A, B or C on the Regulated Vegetation Management Map, in accordance with section 20A of the Vegetation Management Act 1992, for a species of wildlife listed as critically endangered, endangered or vulnerable under the *Nature Conservation Act 1992* 'of concern regional ecosystems' that are remnant vegetation and identified in the database called 'RE description database' containing regional ecosystem numbers and descriptions.
certify, certified, certifying or certification	in relation to any matter other than a design plan, as constructed' drawings or an annual report regarding dams means, a Statutory Declaration by a suitably qualified person or suitably qualified third party accompanying the written document stating: • the person's qualifications and experience relevant to the function • that the person has not knowingly included false, misleading, or incomplete information in the document • that the person has not knowingly failed to reveal any relevant information or document to the

Word or term	Definition
	administering authority • that the document addresses the relevant matters for the function and is factually correct; and • that the opinions expressed in the document are honestly and reasonably held. In the guideline *Structures which are dams or levees constructed as part of environmentally relevant activities* (ESR/2016/1937) – means assessment and approval must be undertaken by a suitably qualified and experienced person in relation to any assessment or documentation required by this Manual, including design plans, 'as constructed' drawings and specifications, construction, operation or an annual report regarding regulated structures, undertaken in accordance with the Board of Professional Engineers of Queensland Policy Certification by RPEQs (ID: 1.4 (2A)).
clearing	has the meaning in the dictionary of the *Vegetation Management Act 2000* and for vegetation— (a) means remove, cut down, ringbark, push over, poison or destroy in any way including by burning, flooding, or draining; but (b) does not include destroying standing vegetation by stock, or lopping a tree.
closed-loop systems	means using waste on site in a way that does not release waste or contaminants in the waste to the environment.
construction or constructed	in relation to a dam includes building a new dam and modifying or lifting an existing dam, but does not include investigations and testing necessary for the purpose of preparing a design plan.
consequence	in relation to a structure as defined, means the potential for environmental harm resulting from the collapse or failure of the structure to perform its primary purpose of containing, diverting, or controlling flowable substances.
consequence category	means a category, either low, significant, or high, into which a dam is assessed as a result of the application of tables and other criteria in the *Manual for assessing consequence categories and hydraulic performance of structures* (ESR/2016/1933).
control measure	has the meaning in section 31(b) of the *Environmental Protection Regulation 2019* and means a device, equipment, structure, or management strategy used to prevent or control the release of a contaminant or waste to the environment.
critically limited regional ecosystem	means the regional ecosystems defined and listed in Appendix 5 of the *Queensland Biodiversity Offset Policy*.
coal seam gas water	means underground water brought to the surface of the earth, or moved underground in connection with exploring for, or producing coal seam gas.
daily peak design capacity	for sewage treatment works, has the meaning in Schedule 2, section 63(4) of the *Environmental Protection Regulation 2019* as the higher equivalent person (EP) for the works calculated using each of the formulae found in the definition for EP.
dam(s)	means a land-based structure or a void that contains, diverts, or controls flowable substances, and includes any substances that are thereby contained, diverted, or controlled by that land- based structure or void and associated works.
dam crest volume	means the volume of material (liquids and/or solids) that could be within the walls of a dam at any time when the upper level of that material is at the crest level of that dam. That is, the instantaneous maximum volume within the walls, without regard to flows entering or leaving (for example, via

Word or term	Definition
	spillway).
declared pest species	means a 'prohibited matter' or 'restricted matter' species under the Biosecurity Act 2014; or 'Weeds of National Significance' under the Australian Weeds Strategy 2017–2027.
design plan	is a document setting out how all identified consequence scenarios are addressed in the planned design and operation of a regulated structure.
designated precinct	has the meaning in Part 5 section 15(3) of the *Regional Planning Interests Regulation 2014* and means: • for a strategic environmental area mentioned in section 4(1) – the area identified as a designated precinct on the strategic environmental area map for the strategic environmental are; or • if a strategic environmental area is shown on a map in a regional plan – the area identified on the map as a designated precinct for the strategic environmental area.
design storage allowance or DSA	means an available volume, estimated in accordance with the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)*, published by the administering authority, as amended from time to time, that must be provided in a dam to an annual exceedance probability specified in that Manual.
designer	for the purposes of a regulated dam, means the certifier of the design plan for the regulated dam.
development approval	means a development approval under the *Planning Act 2016* (or under the repealed Sustainable Planning Act 2009 or Integrated Planning Act 1997) in relation to a matter that involves an environmentally relevant activity under the Environmental Protection Act 1994.
development wells	means a petroleum well which produces or stores petroleum. For clarity, a development well does not include an appraisal well.
document	has the meaning in the *Acts Interpretation Act 1954* and means: • any paper or other material on which there is writing; and • any paper or other material on which there are marks; and • figures, symbols, or perforations having a meaning for a person qualified to interpret them; and any disc, tape or other article or any material from which sounds, images, writings or messages are capable of being produced or reproduced (with or without the aid of another article or device).
ecologically dominant layer	has the meaning in the *Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Version 5.1 March 2020) and means the layer making the greatest contribution to the overall biomass of the site and the vegetation community (National Land and Water Resources Audit (NLWRA) 2001). This is also referred to as the ecologically dominant stratum or the predominant canopy in woody ecosystems.
ecosystem function	means the interactions between and within living and nonliving components of an ecosystem and generally correlates with the size, shape, and location of the vegetation community.
emergency action	means documentation forming part of the operational plan held by the holder or a nominated

Word or term	Definition
plan	responsible officer, that identifies emergency conditions that sets out procedures and actions that will be followed and taken by the dam owner and operating personnel in the event of an emergency. The actions are to minimise the risk and consequences of failure and ensure timely warning to affected persons and the implementation of protection measures. The plan must require dam owners to annually review and update contact information where required.
enclosed flare	means a device where the residual gas is burned in a cylindrical or rectilinear enclosure that includes a burning system and a damper where air for the combustion reaction is admitted.
environmental harm	has the meaning in section 14 of the *Environmental Protection Act 1994* and means any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration, or frequency) on an environmental value, and includes environmental nuisance. Environmental harm may be caused by an activity— (a) whether the harm is a direct or indirect result of the activity; or (b) whether the harm results from the activity alone or from the combined effects of the activity and other activities or factors.
environmental nuisance	has the meaning in section 15 of the *Environmental Protection Act 1994* and means unreasonable interference or likely interference with an environmental value caused by — (a) aerosols, fumes, light, noise, odour, particles, or smoke; or (b) an unhealthy, offensive, or unsightly condition because of contamination; or another way prescribed by regulation.
environmental offset	has the meaning in section 7 of the *Environmental Offsets Act 2014*.
environmentally sensitive area or ESA	means Category A, B or C environmentally sensitive areas (ESAs).
equivalent person (s) or EP	has the meaning under section 3 of the Planning Guidelines For Water Supply and Sewerage, 2005, published by the Queensland Government. It is calculated in accordance with Schedule 2, Section 63(4) of the *Environmental Protection Regulation 2019* where: • EP = V/200 where V is the volume, in litres, of the average dry weather flow of sewage that can be treated at the works in a day; or EP = M/2.5 where M is the mass, in grams, of phosphorus in the influent that the works are designed to treat as the inlet load in a day.
essential petroleum activities	means activities that are essential to bringing the resource to the surface and are only the following: • low impact petroleum activities • geophysical, geotechnical, geological, topographic, and cadastral surveys (including seismic, sample /test / geotechnical pits, core holes) • single well sites not exceeding 1.1 hectare disturbance and multi-well sites not exceeding 1.5 hectare disturbance • well sites with monitoring equipment (including monitoring bores): o for single well sites, not exceeding 1.25 hectares disturbance

Word or term	Definition
	○ for multi-well sites, not exceeding 1.75 hectares disturbance • well sites with monitoring equipment (including monitoring bores) and tanks (minimum 1 ML) for above ground fluid storage: ○ for single well sites, not exceeding 1.5 hectares disturbance ○ for multi-well sites, not exceeding 2.0 hectares disturbance • associated infrastructure located on a well site necessary for the construction and operations of wells: ○ water pumps and generators ○ flare pits ○ chemical / fuel storages ○ sumps for residual drilling material and drilling fluids ○ tanks, or dams which are not significant or high consequence dams to contain wastewater (e.g., stimulation flow back waters, produced water) ○ pipe laydown areas ○ soil and vegetation stockpile areas ○ a temporary camp associated with a drilling rig that may involve sewage treatment works that are no release works ○ temporary administration sites and warehouses ○ dust suppression activities using water that meets the quality and operational standards approved under the environmental authority • communication and power lines that are necessary for the undertaking of petroleum activities and that are located within well sites, well pads and pipeline right of ways without increasing the disturbance area of petroleum activities • On-site disposal of Residual Drilling Material communication tower pads and collocated access tracks and fibre optic cable, not exceeding 1.0 hectares disturbance • supporting access tracks • gathering / flow pipelines from a well head to the initial compression facility • activities necessary to achieve compliance with the conditions of the environmental authority in relation to another essential petroleum activity (e.g., sediment and erosion control measures, rehabilitation).
existing authority	has the meaning in section 94 of the *Environmental Offsets Act 2014*.
existing structure	means a structure that prior to 26 July 2018 meets any or both of the following, a structure: (a) with a design that is in accordance with the ESR/2016/1933 version 5.00 *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures* and that is considerably in progress; (b) that is under considerable construction or that is constructed.

Word or term	Definition
exploration well	means a petroleum well that is drilled to: • explore for the presence of petroleum or natural underground reservoirs suitable for storing petroleum; or • obtain stratigraphic information for the purpose of exploring for petroleum. For clarity, an exploration well does not include an appraisal or development well.
extreme storm storage	means a storm storage allowance determined in accordance with the criteria in the *Manual for assessing consequence categories and hydraulic performance of structures* (ESR/2016/1933) published by the administering authority.
flare pit	has the meaning in the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures* (EM635), and means containment area where any hydrocarbon that is discovered in an over-pressured reservoir during a drilling operation is diverted to, and combusted. The flare pit is only used during the drilling and work over process on a petroleum well.
flare precipitant	means waste fluids which result from the operation of a flare.
floodplains	has the meaning in the *Water Act 2000* and means an area of reasonably flat land adjacent to a watercourse that— • is covered from time to time by floodwater overflowing from the watercourse; and • does not, other than in an upper valley reach, confine floodwater to generally follow the path of the watercourse; and • has finer sediment deposits than the sediment deposits of any bench, bar, or in-stream island of the watercourse.
flowable substance	means matter or a mixture of materials which can flow under any conditions potentially affecting that substance. Constituents of a flowable substance can include water, other liquids fluids or solids, or a mixture that includes water and any other liquids fluids or solids either in solution or suspension.
fuel burning or combustion facility	means a permanent fuel burning or combustion equipment which in isolation, or combined in operation, or which are interconnected, is, or are capable of burning more than 500 kg of fuel in an hour.
GDA	means Geocentric Datum of Australia.
Great Artesian Basin (GAB) spring	means an area protected under the Environment Protection and Biodiversity Conservation Act 1999 because it is considered to be a Matter of National Environmental Significance and identified as a: • community of native species dependent on natural discharge of groundwater from the Great Artesian Basin; or • Great Artesian Basin spring; or • Great Artesian Basin discharge spring wetland. A GAB spring includes a spring vent, spring complex or watercourse spring and includes the land to which water rises naturally from below the ground and the land over which the water then flows. Note: The Australian Government's Protected Matters Search Tool should be used to get an indication of whether the area of interest may contain an MNES spring.

Word or term	Definition
	Note: The GAB springs dataset can be requested from the Queensland Government Herbarium
green waste	means waste that is grass cuttings, trees, bushes, shrubs, material lopped from trees, untreated timber or other waste that is similar in nature but does not include pest species.
greywater	means wastewater generated from domestic activities such as laundry, dishwashing, and bathing. Greywater does not include sewage.
groundwater dependent ecosystem (GDE)	means ecosystems which require access to groundwater on a permanent or intermittent basis to meet all or some of their water requirements so as to maintain their communities of plants and animals, ecological processes, and ecosystem services. For the purposes of the environmental authority, groundwater dependent ecosystems do not include those mapped as "unknown".
growing	means to increase by natural development, as any living organism or part thereof by assimilation of nutriment; increase in size or substance.
holder	means: (a) where this document is an environmental authority, any person who is the holder of, or is acting under, that environmental authority; or (b) where this document is a development approval, any person who is the registered (c) operator for that development approval.
hydraulic integrity	refers to the capacity of a dam to contain or safely pass flowable substances based on its design.
hydraulic performance	means the capacity of a regulated dam to contain or safely pass flowable substances based on the design criteria specified for the relevant consequence category in the *Manual for assessing consequence categories and hydraulic performance of structures* (ESR/2016/1933).
impulsive (for noise)	means sound characterised by brief excursions of sound pressure (acoustic impulses) that significantly exceed the background sound pressure. The duration of a single impulsive sound is usually less than one second.
incidental activity	means an activity that is not a specified relevant activity and is necessary to carry out the activities listed in Schedule A, Table 1 – Scale and Intensity for the Activities.
LA 90, adj, 15 mins	means the A-weighted sound pressure level, adjusted for tonal character that is equal to or exceeded for 90% of any 15 minutes sample period equal, using Fast response.
Laeq, adj, 15 mins	means the A-weighted sound pressure level of a continuous steady sound, adjusted for tonal character, that within any 15 minute period has the same square sound pressure as a sound level that varies with time.
land degradation	has the meaning in the *Vegetation Management Act 1999* and means the following: • soil erosion • rising water tables • the expression of salinity • mass movement by gravity of soil or rock

Word or term	Definition
	• ream bank instability • a process that results in declining water quality.
landholder's active groundwater bore	means bores that are able to continue to provide a reasonable yield of water in terms of quantity for the bores authorised purpose or use. This term does not include monitoring bores owned by the administering authority of the *Water Act 2000*.
levee	means an embankment that only provides for the containment and diversion of stormwater or flood flows from a contributing catchment, or containment and diversion of flowable materials resulting from releases from other works, during the progress of those stormwater or flood flows or those releases; and does not store any significant volume of water or flowable substances at any other times.
linear infrastructure	means powerlines, pipelines, flowlines, roads, and access tracks.
liquid	means a substance which is flowing and offers no permanent resistance to changes of shape.
long term noise event	means a noise exposure, when perceived at a sensitive receptor, persists for a period of greater than five (5) days, even when there are respite periods when the noise is inaudible within those five (5) days.
low consequence dam	means any dam that is not classified as high or significant as assessed using the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures*, published by the administering authority, as amended from time to time.
low impact petroleum activities	means petroleum activities which do not result in the clearing of native vegetation, cause disruption to soil profiles through earthworks or excavation or result in significant disturbance to land which cannot be rehabilitated immediately using hand tools after the activity is completed. Examples of such activities include but are not necessarily limited to soil surveys (excluding test pits), topographic surveys, cadastral surveys, and ecological surveys, may include installation of monitoring equipment provided that it is within the meaning of low impact and traversing land by car or foot via existing access tracks or routes or in such a way that does not result in permanent damage to vegetation.
mandatory reporting level or MRL	means a warning and reporting level determined in accordance with the criteria in the *Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933)* published by the administering authority.
manual	means the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933) published by the administering authority, as amended from time to time.
map of referable wetlands	has the meaning in Schedule 12 of the *Environmental Protection Regulation 2008* and means the 'Map of referable wetlands', a document approved by the chief executive on 4 November 2011 and published by the department, as amended from time to time by the chief executive under section 144D.
max LpA, 15 min	means the absolute maximum instantaneous A-weighted sound pressure level, measured over 15 minutes.
max LpZ, 15 min	means the maximum value of the Z-weighted sound pressure level measured over 15 minutes.
maximum extent of impact	means the total, cumulative, residual extent, and duration of impact to a prescribed environmental matter that will occur over a project's life after all reasonable avoidance and reasonable on-site mitigation measures have been, or will be, undertaken.
medium term noise event	is a noise exposure, when perceived at a sensitive receptor, persists for an aggregate period not greater than five (5) days and does not re-occur for a period of at least four (4) weeks. Re- occurrence is deemed to apply where a noise of comparable level is observed at the same receptor location for a

Word or term	Definition
	period of one hour or more, even if it originates from a different source or source location.
methodology	means the science of method, especially dealing with the logical principles underlying the organisation of the various special sciences, and the conduct of scientific inquiry.
mix-bury-cover method	means the stabilisation of residual drilling solids in the bottom of a sump by mixing with subsoil and which occurs in accordance with the following methodology: • the base of the subsoil and residual solid mixture must be separated from the groundwater table by at least one metre of a continuous layer of impermeable subsoil material (kw=10–8m/s) or subsoil with a clay content of greater than 20%; and • the residual solids is mixed with subsoil in the sump and cover; and • the subsoil and residual solids is mixed at least three parts subsoil to one part waste (v/v); and • a minimum of one metre of clean subsoil must be placed over the subsoil and residual solids mixture; and • topsoil is replaced.
modification or modifying	see definition of 'construction'
month	has the meaning in the Acts Interpretation Act 1954 and means a calendar month and is a period starting at the beginning of any day of one (1) of the 12 named months and ending— • immediately before the beginning of the corresponding day of the next named month; or • if there is no such corresponding day—at the end of the next named month.
NATA accreditation	means accreditation by the National Association of Testing Authorities Australia.
notice of election	has the meaning in section 18(2) *Environmental Offsets Act 2014*.
operational plan	includes: (a) normal operating procedures and rules (including clear documentation and definition of process inputs in the DSA); (b) contingency and emergency action plans including operating procedures designed to avoid and/or minimise environmental impacts including threats to human life resulting (c) from any overtopping or loss of structural integrity of the regulated structure.
pipeline wastewater	means hydrostatic testing water, flush water, or water from low point drains.
Pre-disturbed land use	means the function or use of the land as documented prior to significant disturbance occurring at that location.
predominant species	has the meaning in the Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Version 5.1 March 2020) and means a species that contributes most to the overall above-ground biomass of a particular stratum.
prescribed	has the meaning in section 440ZD of the *Environmental Protection Act 1994*.

Word or term	Definition
contaminants	
prescribed environmental matters	has the meaning in section 10 of the *Environmental Offsets Act 2014*, limited to the matters of State environmental significant listed in schedule 2 of the *Environmental Offsets Regulation2014*.
primary protection zone	means an area within 200m from the boundary of any Category A, B or C ESA.
produced water	has the meaning in Section 15A of the Petroleum and Gas (Production and Safety) Act 2004 and means CSG water or associated water for a petroleum tenure.
protected wildlife	means: a) any fauna and/or flora that are critically endangered wildlife, endangered wildlife, vulnerable wildlife defined under the *Nature Conservation Act 1992*; and b) when relevant to prescribed environmental matters, any special least concern animal defined under the Environmental Offsets Regulation 2014.
protection zone	means the primary protection zone of any Category A, B or C ESA or the secondary protection zone of any Category A or B ESA.
regional ecosystem	has the meaning in the Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Version 5.1 March 2020) and means a vegetation community in a bioregion that is consistently associated with a particular combination of geology, landform, and soil. Regional ecosystems of Queensland were originally described in Sattler and Williams (1999). The Regional Ecosystem Description Database (Queensland Herbarium 2013) is maintained by Queensland Herbarium and contains the current descriptions of regional ecosystems.
register of regulated structures	includes**:** (a) Date of entry in the register; (b) Name of the structure, its purpose, and intended/actual contents; (c) The consequence category of the dam as assessed using the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933); (d) Dates, names, and reference for the design plan plus dates, names, and reference numbers of all document(s) lodged as part of a design plan for the dam; (e) Name and qualifications of the suitably qualified and experienced person who certified the design plan and 'as constructed' drawings; (f) For the regulated dam, other than in relation to any levees – i. The dimensions (metres) and surface area (hectares) of the dam measured at the footprint of the dam; ii. Coordinates (latitude and longitude in GDA94) within five metres at any point from the outside of the dam including its storage area iii. Dam crest volume (megalitres); iv. Spillway crest level (metres AHD). v. Maximum operating level (metres AHD);

Word or term	Definition
	vi. Storage rating table of stored volume versus level (metres AHD); vii. Design storage allowance (megalitres) and associated level of the dam (metres AHD); viii. Mandatory reporting level (metres AHD); (g) The design plan title and reference relevant to the dam; (h) The date construction was certified as compliant with the design plan; (i) The name and details of the suitably qualified and experienced person who certified that the constructed dam was compliant with the design plan; (j) Details of the composition and construction of any liner; (k) The system for the detection of any leakage through the floor and sides of the dam; (l) Dates when the regulated dam underwent an annual inspection for structural and operational adequacy, and to ascertain the available storage volume for 1 November of any year; (m) Dates when recommendations and actions arising from the annual inspection were provided to the administering authority; (n) Dam water quality as obtained from any monitoring required under this authority as at 1 November of each year.
regulated dam	means any dam in the significant or high consequence category as assessed using the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)*, published by the administering authority, as amended from time to time.
regulated structure	means any structure in the significant or high consequence category as assessed using the *Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933)* published by the administering authority. A regulated structure does not include: • a fabricated or manufactured tank or container, designed and constructed to an Australian Standard that deals with strength and structural integrity of that tank or container; • a sump or earthen pit used to store residual drilling material and drilling fluid only for the duration of drilling and well completion activities; • a flare pit.
rehabilitation or rehabilitated	means the process of reshaping and revegetating land to restore it to a stable landform and in accordance with acceptance criteria and, where relevant, includes remediation of contaminated land. For the purposes of pipeline rehabilitation, rehabilitation includes reinstatement, revegetation, and restoration.
reinstate or reinstatement	for pipelines, means the process of bulk earth works and structural replacement of pre- existing conditions of a site (i.e., soil surface typography, watercourses, culverts, fences and gates and other landscape(d) features) and is detailed in the Australian Pipeline Industry Association (APIA) Code of Environmental Practice: Onshore Pipelines (2013).
reporting limit	means the lowest concentration that can be reliably measured within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes, the reporting limit is selected as the lowest non-zero standard in the calibration curve. Results that fall below the reporting limit will be reported as “less than” the value of the reporting limit. The reporting limit is also referred to as the practical quantitation limit or the limit of quantitation. For polycyclic aromatic hydrocarbons, the

Word or term	Definition
	reporting limit must be based on super-ultra trace methods and, depending on the specific polycyclic aromatic hydrocarbon, will range between 0.005 ug/L–0.02 ug/L.
residual drilling material	means waste drilling materials including muds and cuttings or cement returns from well holes, and which have been left behind after the drilling fluids are pumped out.
restoration	means the replacement of structural habitat complexity, ecosystem processes, services, and function from a disturbed or degraded site to that of a pre-determined or analogue site. For the purposes of pipelines, restoration applies to final rehabilitation after pipeline decommissioning.
restricted stimulation fluids	has the meaning in section 206 of the *Environmental Protection Act 1994* and means fluids used for the purpose of stimulation, including fracturing, that contain the following chemicals in more than the maximum amount prescribed under a regulation— (a) petroleum hydrocarbons containing benzene, ethylbenzene, toluene, or xylene (b) chemicals that produce, or are likely to produce, benzene, ethylbenzene, toluene, or xylene as the chemical breaks down in the environment.
revegetation or revegetating or revegetate	means to actively re-establish vegetation through seeding or planting techniques in accordance with site specific management plans.
Secondary protection zone	in relation to a Category A or Category B ESA means an area within 100 metres from the boundary of the primary protection zone.
sensitive place	means: • a dwelling (including residential allotment, mobile home or caravan park, residential marina or other residential premises, motel, hotel, or hostel) • a library, childcare centre, kindergarten, school, university, or other educational institution • a medical centre, surgery, or hospital • a protected area • a public park or garden that is open to the public (whether or not on payment of money) for use other than for sport or organised entertainment • a workplace used as an office or for business or commercial purposes, which is not part of the petroleum activity(ies) and does not include employee's accommodation or public roads • for noise, a place defined as a sensitive receptor for the purposes of the Environmental Protection (Noise) Policy 2008.
sensitive receptor	is defined in Schedule 2 of the Environmental Protection (Noise) Policy 2008, and means an area or place where noise is measured.
short term noise event	is a noise exposure, when perceived at a sensitive receptor, persists for an aggregate period not greater than eight hours and does not re-occur for a period of at least seven (7) days. Re- occurrence is deemed to apply where a noise of comparable level is observed at the same receptor location for a period of one hour or more, even if it originates from a different source or source location.
significant residual impact	has the meaning in section 8 *Environmental Offsets Act 2014*.

Word or term	Definition
significantly disturbed or significant disturbance or significant disturbance to land or areas	has the meaning in Schedule 12, section 4 of the *Environmental Protection Regulation 2008*. Land is significantly disturbed if— (a) it is contaminated land ; or (b) it has been disturbed and human intervention is needed to rehabilitate it – (i) to a condition required under the relevant environmental authority; or (ii) if the environmental authority does not require the land to be rehabilitated to a particular condition—to the condition it was in immediately before the disturbance.
species richness	means the number of different species in a given area.
spillway	means a weir, channel, conduit, tunnel, gate, or other structure designed to permit discharges form the dam, normally under flood conditions or in anticipation of flood conditions.
stable	has the meaning in Schedule 5 of the *Environmental Protection Regulation 2008* and, for a site, means the rehabilitation and restoration of the site is enduring or permanent so that the site is unlikely to collapse, erode or subside.
statement of compliance	for a condition in an environmental authority has the meaning in section 208 of the Environmental Protection Act 1994 and is a condition that requires the holder to give the administering authority a statement of compliance about a document or work relating to a relevant activity. The condition must also state— (a) the criteria (the compliance criteria) the document or work must comply with; and (b) that the statement of compliance must state whether the document or work complies with the compliance criteria; and (c) the information (the supporting information) that must be provided to the administering authority to demonstrate compliance with the compliance criteria; and (d) when the statement of compliance and supporting information must be given to the administering authority
stimulation	means a technique used to increase the permeability of natural underground reservoir that is undertaken above the formation pressure and involves the addition of chemicals. It includes hydraulic fracturing / hydrofraccing, fracture acidizing and the use of proppant treatments. Explanatory note: This definition is restricted from that in the Petroleum and Gas (Production and Safety) Act 2004 in order to only capture the types of stimulation activities that pose a risk to environmental values of water quality in aquifers.
stimulation fluid	means the fluid injected underground to increase permeability. For clarity, the term stimulation fluid only applies to fluid injected down well post-perforation.
stimulation impact zone	means a 100m maximum radial distance from the stimulation target location within a gas producing formation.
strategic environmental area	has the meaning in section 11(1) of the *Regional Planning Interest Act 2014*.
structure	means a dam or levee.

Word or term	Definition
subterranean cave GDE	• means an area identified as a subterranean cave in the mapping produced by the Queensland Government and identified in the Queensland Government Information System, as amended from time to time; and • means a cave ecosystem which requires access to groundwater on a permanent or intermittent basis to meet all or some of their water requirements so as to maintain its communities of plants and animals, ecological processes, and ecosystem services. Subterranean cave GDEs are caves dependent on the subterranean presence of groundwater. Subterranean cave GDEs have some degree of groundwater connectivity and are indicated by either high moisture levels or the presence of stygofauna, or both, referred to in the Queensland Government Wetlands Info mapping program, as amended from time to time. Note: the Subterranean GDE (caves) dataset can be displayed through the Queensland Government Wetland Info mapping program. Note: the Subterranean GDE (caves) dataset can be obtained from the Queensland Government Information System.
suitably qualified and experienced person	in relation to regulated structures means a person who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the *Professional Engineers Act 2002*, and has demonstrated competency and relevant experience: • for regulated dams, an RPEQ who is a civil engineer with the required qualifications in dam safety and dam design • for regulated levees, an RPEQ who is a civil engineer with the required qualifications in the design of flood protection embankments. Note: It is permissible that a suitably qualified and experienced person obtain subsidiary certification from an RPEQ who has demonstrated competence and relevant experience in either geomechanics, hydraulic design or engineering hydrology.
suitably qualified person	means a person who has professional qualifications, training or skills or experience relevant to the nominated subject matters and can give authoritative assessment, advice, and analysis about performance relevant to the subject matters using relevant protocols, standards, methods, or literature.
suitably qualified third party	means a person who: (a) has qualifications and experience relevant to performing the function including but not limited to: i. a bachelor's degree in science or engineering; and ii. 3 years' experience in undertaking soil contamination assessments; and (b) is a member of at least one organisation prescribed in Schedule 14 of the *Environmental Protection Regulation 2019*; and (c) not be an employee of, nor have a financial interest or any involvement which would lead to a conflict of interest with the holder(s) of the environmental authority.
sump	means a pit in which waste residual drilling material or drilling fluids are stored only for the duration of drilling activities.
synthetic based	means a mud where the base fluid is a synthetic oil, consisting of chemical compounds which are

Word or term	Definition
drilling mud	artificially made or synthesised by chemically modifying petroleum components or other raw materials rather than the whole crude oil.
system design plan	means a plan that manages an integrated containment system that shares the required DSA and/or ESS volume across the integrated containment system.
topsoil	means the surface (top) layer of a soil profile, which is more fertile, darker in colour, better structured and supports greater biological activity than underlying layers. The surface layer may vary in depth depending on soil forming factors, including parent material, location, and slope, but generally is not greater than about 300mm in depth from the natural surface.
total density of coarse woody material	means the total length of logs on the ground greater than or equal to 10cm diameter per hectare and number of logs on the ground greater than or equal to 10cm diameter per hectare.
transmissivity	means the rate of flow of water through a vertical strip of aquifer which is one unit wide and which extends the full saturated depth of the aquifer.
valid complaint	means all complaints unless considered by the administering authority to be frivolous, vexatious, or based on mistaken belief.
void	means any constructed, open excavation in the ground.
waste and resource management hierarchy	has the meaning provided in section 9 of the *Waste Reduction and Recycling Act 2011* and is the following precepts, listed in the preferred order in which waste and resource management options should be considered— (a) AVOID unnecessary resource consumption (b) REDUCE waste generation and disposal (c) RE-USE waste resources without further manufacturing (d) RECYCLE waste resources to make the same or different products (e) RECOVER waste resources, including the recovery of energy (f) TREAT waste before disposal, including reducing the hazardous nature of waste (g) DISPOSE of waste only if there is no viable alternative.
waste and resource management principles	has the meaning provided in section 4(2)(b) of the *Waste Reduction and Recycling Act 2011* and means the (a) polluter pays principle (b) user pays principle (c) proximity principle (d) product stewardship principle
waste fluids	has the meaning in section 13 of the *Environmental Protection Act 1994* in conjunction with the common meaning of "fluid" which is "a substance which is capable of flowing and offers no permanent resistance to changes of shape". Accordingly, to be a waste fluid, the waste must be a substance which is capable of flowing and offers no permanent resistance to changes of shape.
watercourse	has the meaning in Schedule 4 of the *Environmental Protection Act 1994* and means:

Word or term	Definition
	1) a river, creek or stream in which water flows permanently or intermittently— a) in a natural channel, whether artificially improved or not; or b) in an artificial channel that has changed the course of the watercourse. 2) watercourse includes the bed and banks and any other element of a river, creek or stream confining or containing water.
waters	includes all or any part of a creek, river, stream, lake, lagoon, swamp, wetland, spring, unconfined surface water, unconfined water in natural or artificial watercourses, bed and bank of any waters, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and underground water.
water year	means the 12-month period from 1 July to 30 June.
well integrity	the ability of a well to contain the substances flowing through it.
wet season	means the time of year, covering one or more months, when most of the average annual rainfall in a region occurs. For the purposes of DSA determination this time of year is deemed to extend from 1 November in one year to 31 May in the following year inclusive.
wetland	for the purpose of this environmental authority, wetland means: • areas shown on the Map of referable wetlands which is a document approved by the chief executive on 4 November 2011 and published by the department, as amended from time to time by the chief executive under section 144D of the Environmental Protection Regulation 2008; and • areas defined under the Queensland Wetlands Program as permanent or periodic / intermittent inundation, with water that is static or flowing fresh, brackish, or salt, including areas of marine water, the depth of which at low tide does not exceed six (6) metres, and possess one or more of the following attributes: o at least periodically, the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle, or o the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or o the substratum is not soil and is saturated with water, or covered by water at some time. The term wetland includes riverine, lacustrine, estuarine, marine, and palustrine wetlands; and it does not include a Great Artesian Basin Spring or a subterranean wetland that is a cave or aquifer.
wetland of high ecological significance (HES)	means a wetland that meets the definition of a wetland and that is shown as a wetland of 'high ecological significance' or wetland of 'high ecological value' on the Map of referable wetlands.
wetland of other environmental value	means a wetland that meets the definition of a wetland and that is shown as a wetland of 'general environmental significance' or wetland of 'other environmental value' on the 'Map of referable wetlands'.

END OF ENVIRONMENTAL AUTHORITY

Appendix C – Desktop survey

Australian Government

Department of Climate Change, Energy, the Environment and Water

EPBC Act Protected Matters Report

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

Report created: 06-Feb-2026

Summary

Details

- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat

Acknowledgements

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	40
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	17
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	9
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)	[Resource Information]
Ramsar Site Name	Proximity
Banrock station wetland complex	1200 - 1300km upstream from Ramsar site
Narran lake nature reserve	400 - 500km upstream from Ramsar site
Riverland	1200 - 1300km upstream from Ramsar site
The coorong, and lakes alexandrina and albert wetland	1400 - 1500km upstream from Ramsar site

Listed Threatened Ecological Communities	[Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community may occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area
Weeping Myall Woodlands	Endangered	Community likely to occur within area

Listed Threatened Species	[Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Aphelocephala leucopsis		
Southern Whiteface [529]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat may occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
[Rostratula australis](#) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
[Stagonopleura guttata](#) Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area
[Turnix melanogaster](#) Black-breasted Button-quail [923]	Vulnerable	Species or species habitat may occur within area
FISH		
[Bidyanus bidyanus](#) Silver Perch, Bidyan [76155]	Endangered	Species or species habitat may occur within area
[Maccullochella peelii](#) Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area
MAMMAL		
[Chalinolobus dwyeri](#) Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat may occur within area
[Dasyurus hallucatus](#) Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat may occur within area
[Nyctophilus corbeni](#) Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat known to occur within area
[Petauroides volans](#) Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area
[Petaurus australis australis](#) Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area
PLANT		
Acacia curranii		
Curly-bark Wattle [3908]	Vulnerable	Species or species habitat may occur within area
Cadellia pentastylis		
Ooline [9828]	Vulnerable	Species or species habitat likely to occur within area
Calytrix gurulmundensis		
[24241]	Vulnerable	Species or species habitat known to occur within area
Dichanthium setosum		
bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
Homopholis belsonii		
Belson's Panic [2406]	Vulnerable	Species or species habitat may occur within area
Homoranthus decumbens		
a shrub [55186]	Endangered	Species or species habitat likely to occur within area
Lepidium monoplocoides		
Winged Pepper-cress [9190]	Endangered	Species or species habitat may occur within area
Polianthion minutiflorum		
[82772]	Vulnerable	Species or species habitat may occur within area
Thesium australe		
Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
Xerothamnella herbacea		
[4146]	Endangered	Species or species habitat may occur within area
REPTILE		

Scientific Name	Threatened Category	Presence Text
Anomalopus mackayi		
Five-clawed Worm-skink, Long-legged Worm-skink [25934]	Vulnerable	Species or species habitat may occur within area
Delma torquata		
Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Egernia rugosa		
Yakka Skink [1420]	Vulnerable	Species or species habitat known to occur within area
Furina dunmalli		
Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Hemiaspis damelii		
Grey Snake [1179]	Endangered	Species or species habitat likely to occur within area
SNAIL		
Adclarkia cameroni		
Brigalow Woodland Snail [83886]	Endangered	Species or species habitat may occur within area
Adclarkia dulacca		
Dulacca Woodland Snail [83885]	Endangered	Species or species habitat may occur within area

Listed Migratory Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus		
Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus		
White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii		
Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata		
Magpie Goose [978]		Species or species habitat may occur within area overfly marine area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area overfly marine area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat may occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area

Extra Information

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Construction of the Central Surat Rail Project	2013/6729		Completed
Controlled action			
Cameby Downs Coal Mine Expansion	2009/4966	Controlled Action	Completed
Construct and operate 447km high pressure gas transmission pipeline	2009/4976	Controlled Action	Post-Approval
Construction of a high pressure buried gas pipeline, Kogan to Gladstone, QLD	2009/5029	Controlled Action	Post-Approval
Expansion of Coal Seam Gas Fields	2009/4974	Controlled Action	Post-Approval
Expansion Of Coal Seam Gas Operations	2010/5344	Controlled Action	Post-Approval
Wandoan Coal Project - Coal Seam Methane Water Supply South	2008/4287	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Cameby Downs Continued Operations Project, Qld	2018/8304	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed

Bioregional Assessments

[Resource Information]

SubRegion	BioRegion	Website
Maranoa-Balonne-Condamine	Northern Inland Catchments	BA website

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

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

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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WildNet Records
Species List

For the selected area of interest 7667.55 PL: 305
Current as at 03/03/2026 WildNetSpeciesList

Summary Information
The following table provides an overview of the area of interest: PL: 305

Table 1. Area of interest details

Size (ha)	
7,667.55	
Local Government(s)	
Western Downs Regional	
Catchment(s)	
Balonne-Condamine	
Bioregion(s)	**Subregion(s)**
Brigalow Belt	Barakula

Protected Area(s)
No estates or reserves are located within the area of interest.

World Heritage Area(s)
No World Heritage Areas are located within the area of interest.

Ramsar Area(s)
No Ramsar Areas are located within the area of interest.

Introduction
This WildNet report is derived from a spatial layer that is generated from the WildNet database, managed by the Department of the Environment, Tourism, Science and Innovation. The layer, which is generated weekly, contains a subset of WildNet wildlife records that are not classed as erroneous or duplicate, that have a location precision equal to or less than 10000 metres and do not have a count of zero. It does not include aspatial data such as some baseline species lists created for some protected areas.

The WildNet dataset is constantly being enhanced and the taxonomic and status information revised. If a species is not listed in this report, it does not mean it doesn't occur there and listed species may also no longer inhabit the area. It is recommended that you also access other internal and external data sources for species information in your area of interest.

The WildNet Application may provide additional information on species occurence within your area of interest.

Species data

Contextual location information is presented in Map 1.

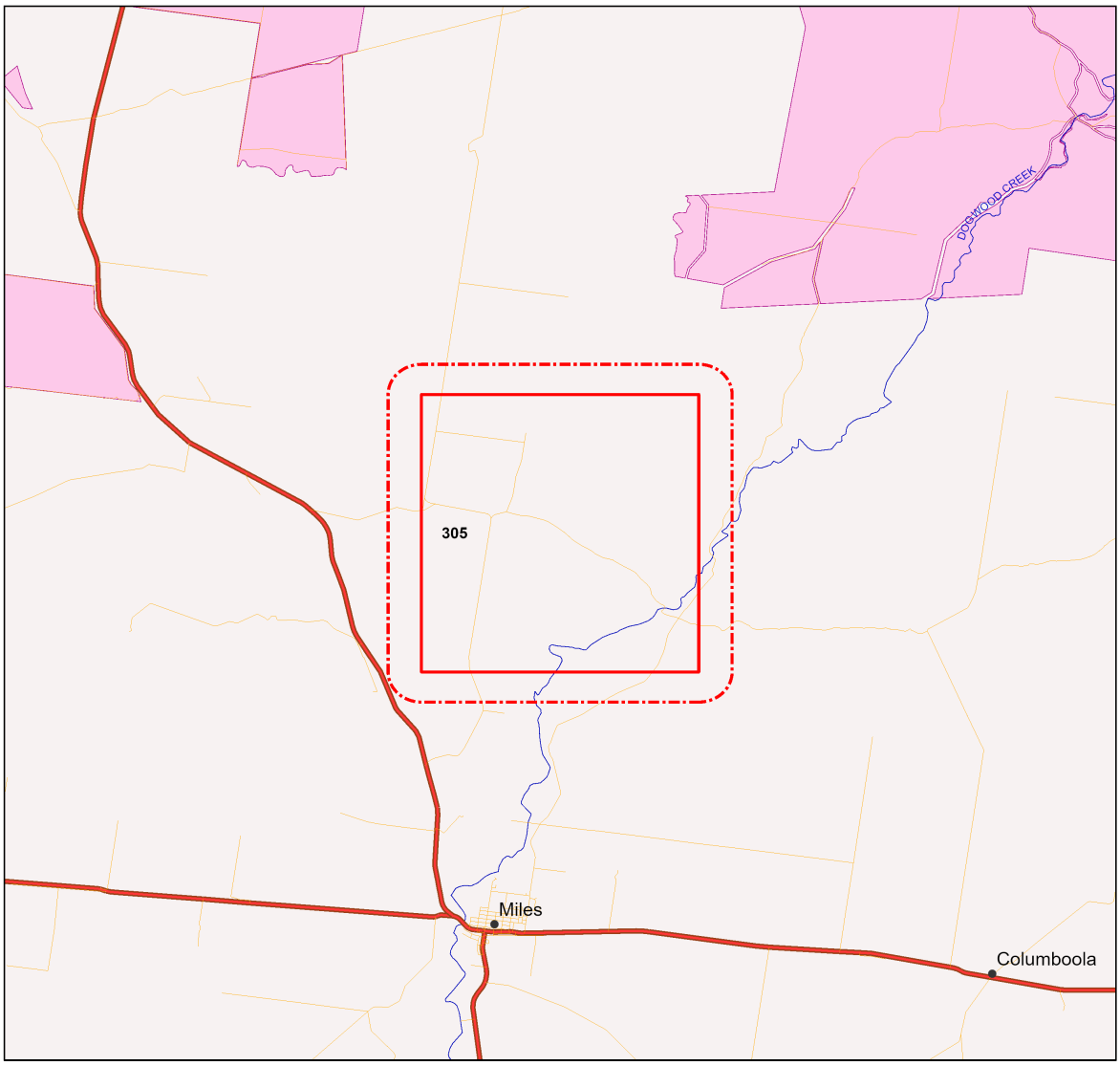
Table 2 lists the animals recorded within the area of interest and its one kilometre buffer.

Table 3 lists the plants recorded within the area of interest and its one kilometre buffer.

Table 4 lists the fungi recorded within the area of interest and its one kilometre buffer.

Table 5 lists the other species recorded within the area of interest and its one kilometre buffer.

Map 1. Locality Map

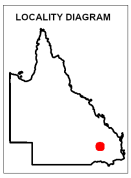


Locality Map

Legend

- Towns
- Freeways/Highways
- Connector
- Street/Local Road
- Lakes and reservoirs
- National Park
- National Park (Scientific)
- National Park (CYPAL)
- National Park (Aboriginal Land)
- Conservation Park
- Resources Reserve
- Forest Reserve
- State Forest
- Timber Reserve
- Nature Refuges
- Coordinated Conservation Areas
- Major rivers/creeks
- Queensland
- Selected Petroleum Lease (PL)
- 1 kilometre buffer

LOCALITY DIAGRAM



N

0 1000 2000 3000 4000 5000 m

This product is displayed in GDA2020

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Table 2. Animals recorded within the area of interest and its one kilometre buffer

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
26896	Actinopterygii	Ambassidae	*Ambassis agassizii*	Agassiz's glassfish			0	2	22/02/2013
26941	Actinopterygii	Clupeidae	*Nematalosa erebi*	bony bream			0	4	23/02/2013
19545	Actinopterygii	Cyprinidae	*Carassius auratus*	goldfish			0	1	22/02/2013
26943	Actinopterygii	Cyprinidae	*Cyprinus carpio*	European carp			0	1	22/02/2013
26956	Actinopterygii	Eleotridae	*Hypseleotris klunzingeri*	western carp gudgeon			0	2	22/02/2013
33897	Actinopterygii	Eleotridae	*Hypseleotris sp.*				0	5	23/02/2013
26957	Actinopterygii	Eleotridae	*Hypseleotris species 1*	Midgley's carp gudgeon			0	6	23/02/2013
27025	Actinopterygii	Melanotaeniidae	*Melanotaenia fluviatilis*	Murray River rainbowfish			0	4	23/02/2013
27041	Actinopterygii	Percichthyidae	*Maccullochella peelii*	Murray cod		V	0	1	23/02/2013
27042	Actinopterygii	Percichthyidae	*Macquaria ambigua*	golden perch			0	1	22/02/2013
27048	Actinopterygii	Plotosidae	*Neosilurus hyrtlii*	Hyrtl's catfish			0	2	22/02/2013
27053	Actinopterygii	Plotosidae	*Porochilus rendahli*	Rendahl's catfish			0	1	22/02/2013
27055	Actinopterygii	Poeciliidae	*Gambusia holbrooki*	mosquitofish			0	5	23/02/2013
27061	Actinopterygii	Retropinnidae	*Retropinna semoni*	Australian smelt			0	4	23/02/2013
27089	Actinopterygii	Terapontidae	*Leiopotherapon unicolor*	spangled perch			0	5	23/02/2013
716	Amphibia	Bufonidae	*Rhinella marina*	cane toad			0	14	1/02/2019
624	Amphibia	Hylidae	*Cyclorana alboguttata*	greenstripe frog	C		0	7	15/02/2015
620	Amphibia	Hylidae	*Cyclorana novaehollandiae*	eastern snapping frog	C		2	2	22/12/2021
627	Amphibia	Hylidae	*Litoria caerulea*	common green treefrog	C		3	15	22/12/2021
608	Amphibia	Hylidae	*Litoria fallax*	eastern sedgefrog	C		0	2	5/02/2015
614	Amphibia	Hylidae	*Litoria latopalmata*	broad palmed rocketfrog	C		3	10	22/12/2021
596	Amphibia	Hylidae	*Litoria peronii*	emerald spotted treefrog	C		0	2	24/02/2013
600	Amphibia	Hylidae	*Litoria rubella*	ruddy treefrog	C		0	2	1/02/2019

679	Amphibia	Limnodynastidae	*Limnodynastes fletcheri*	barking frog	C		0	1	23/02/2013
682	Amphibia	Limnodynastidae	*Limnodynastes salmini*	salmon striped frog	C		1	2	11/11/2021
673	Amphibia	Limnodynastidae	*Limnodynastes terraereginae*	scarlet sided pobblebonk	C		0	7	1/02/2019
667	Amphibia	Limnodynastidae	*Neobatrachus sudellae*	meeowing frog	C		0	2	24/02/2013
680	Amphibia	Limnodynastidae	*Platyplectrum ornatum*	ornate burrowing frog	C		3	14	22/12/2021
696	Amphibia	Myobatrachidae	*Crinia parinsignifera*	beeping froglet	C		0	1	1/02/2019
659	Amphibia	Myobatrachidae	*Pseudophryne major*	great brown broodfrog	C		0	1	22/02/2013
1418	Aves	Acanthizidae	*Acanthiza apicalis*	inland thornbill	C		0	6	1/02/2019
1419	Aves	Acanthizidae	*Acanthiza chrysorrhoa*	yellow-rumped thornbill	C		0	5	1/02/2019
1422	Aves	Acanthizidae	*Acanthiza nana*	yellow thornbill	C		0	10	1/02/2019
1423	Aves	Acanthizidae	*Acanthiza pusilla*	brown thornbill	C		0	1	1/02/2019
1425	Aves	Acanthizidae	*Acanthiza reguloides*	buff-rumped thornbill	C		0	3	1/02/2019
1412	Aves	Acanthizidae	*Acanthiza uropygialis*	chestnut-rumped thornbill	C		0	2	20/02/2013
1407	Aves	Acanthizidae	*Gerygone fusca*	western gerygone	C		0	1	23/02/2013
1396	Aves	Acanthizidae	*Gerygone olivacea*	white-throated gerygone	C		0	4	1/02/2019
1403	Aves	Acanthizidae	*Pyrrholaemus sagittatus*	speckled warbler	C		0	7	1/02/2019
1371	Aves	Acanthizidae	*Smicrornis brevirostris*	weebill	C		0	18	1/02/2019
1729	Aves	Accipitridae	*Accipiter fasciatus*	brown goshawk	C		0	1	1/02/2019
1732	Aves	Accipitridae	*Aquila audax*	wedge-tailed eagle	C		0	1	1/02/2019
1718	Aves	Accipitridae	*Haliaeetus leucogaster*	white-bellied sea-eagle	C		0	2	23/02/2013
1707	Aves	Accipitridae	*Haliastur sphenurus*	whistling kite	C		0	2	1/02/2019
1714	Aves	Accipitridae	*Milvus migrans*	black kite	C		0	1	1/02/2019
1973	Aves	Aegothelidae	*Aegotheles cristatus*	Australian owlet-nightjar	C		0	2	1/02/2019
1767	Aves	Alcedinidae	*Dacelo novaeguineae*	laughing kookaburra	C		0	7	1/02/2019

1762	Aves	Alcedinidae	*Todiramphus sanctus*	sacred kingfisher	C		0	3	1/02/2019
1998	Aves	Anatidae	*Anas superciliosa*	Pacific black duck	C		0	2	1/02/2019
1279	Aves	Anhingidae	*Anhinga novaehollandiae*	Australasian darter	C		0	2	23/02/2013
1965	Aves	Apodidae	*Apus pacificus*	fork-tailed swift	SL		0	1	1/02/2019
1971	Aves	Apodidae	*Hirundapus caudacutus*	white-throated needletail	V	V	0	2	1/02/2019
1658	Aves	Artamidae	*Artamus cinereus*	black-faced woodswallow	C		0	1	1/02/2019
1660	Aves	Artamidae	*Artamus leucorynchus*	white-breasted woodswallow	C		0	1	1/02/2019
1647	Aves	Artamidae	*Artamus personatus*	masked woodswallow	C		0	1	1/02/2019
1648	Aves	Artamidae	*Artamus sp.*		C		0	1	23/02/2013
1649	Aves	Artamidae	*Artamus superciliosus*	white-browed woodswallow	C		0	5	1/02/2019
1654	Aves	Artamidae	*Cracticus nigrogularis*	pied butcherbird	C		0	6	1/02/2019
1656	Aves	Artamidae	*Cracticus torquatus*	grey butcherbird	C		0	18	1/02/2019
1644	Aves	Artamidae	*Gymnorhina tibicen*	Australian magpie	C		0	6	1/02/2019
1645	Aves	Artamidae	*Strepera graculina*	pied currawong	C		0	5	1/02/2019
1956	Aves	Burhinidae	*Burhinus grallarius*	bush stone-curlew	C		0	1	23/02/2013
1191	Aves	Cacatuidae	*Cacatua galerita*	sulphur-crested cockatoo	C		0	2	1/02/2019
1194	Aves	Cacatuidae	*Cacatua sanguinea*	little corella	C		0	1	1/02/2019
1171	Aves	Cacatuidae	*Calyptorhynchus lathami*	glossy black-cockatoo	V		0	1	20/02/2013
1193	Aves	Cacatuidae	*Eolophus roseicapilla*	galah	C		0	6	1/02/2019
1173	Aves	Cacatuidae	*Nymphicus hollandicus*	cockatiel	C		0	4	23/02/2013
1635	Aves	Campephagidae	*Coracina maxima*	ground cuckoo-shrike	C		0	1	1/02/2019
1636	Aves	Campephagidae	*Coracina novaehollandiae*	black-faced cuckoo-shrike	C		0	5	1/02/2019
1637	Aves	Campephagidae	*Coracina papuensis*	white-bellied cuckoo -shrike	C		0	1	1/02/2019
1639	Aves	Campephagidae	*Edolisoma tenuirostre*	common cicadabird	C		0	6	1/02/2019

1642	Aves	Campephagidae	*Lalage tricolor*	white-winged triller	C		0	1	1/02/2019
1940	Aves	Charadriidae	*Elseyornis melanops*	black-fronted dotterel	C		0	2	23/02/2013
27774	Aves	Charadriidae	*Vanellus miles*	masked lapwing	C		0	1	23/02/2013
1933	Aves	Charadriidae	*Vanellus miles novaehollandiae*	masked lapwing (southern subspecies)	C		0	1	1/02/2019
1809	Aves	Columbidae	*Geopelia cuneata*	diamond dove	C		0	1	1/02/2019
1810	Aves	Columbidae	*Geopelia humeralis*	bar-shouldered dove	C		0	4	1/02/2019
18323	Aves	Columbidae	*Geopelia placida*	peaceful dove	C		0	4	1/02/2019
1785	Aves	Columbidae	*Geophaps scripta scripta*	squatter pigeon (southern subspecies)	V	V	0	1	1/02/2019
1793	Aves	Columbidae	*Ocyphaps lophotes*	crested pigeon	C		0	1	1/02/2019
1795	Aves	Columbidae	*Phaps chalcoptera*	common bronzewing	C		0	3	1/02/2019
1779	Aves	Coraciidae	*Eurystomus orientalis*	dollarbird	C		0	1	23/02/2013
1603	Aves	Corcoracidae	*Corcorax melanorhamphos*	white-winged chough	C		0	2	26/02/1991
1605	Aves	Corcoracidae	*Struthidea cinerea*	apostlebird	C		0	4	1/02/2019
1608	Aves	Corvidae	*Corvus coronoides*	Australian raven	C		0	9	1/02/2019
1609	Aves	Corvidae	*Corvus orru*	Torresian crow	C		0	11	1/02/2019
1750	Aves	Cuculidae	*Cacomantis pallidus*	pallid cuckoo	C		0	1	1/02/2019
1743	Aves	Cuculidae	*Cacomantis variolosus*	brush cuckoo	C		0	1	1/02/2019
1751	Aves	Cuculidae	*Centropus phasianinus*	pheasant coucal	C		0	2	1/02/2019
1744	Aves	Cuculidae	*Chalcites basalis*	Horsfield's bronze-cuckoo	C		0	2	1/02/2019
1745	Aves	Cuculidae	*Chalcites lucidus*	shining bronze-cuckoo	C		0	1	1/02/2019
1747	Aves	Cuculidae	*Chalcites osculans*	black-eared cuckoo	C		0	2	22/02/2013
1740	Aves	Cuculidae	*Scythrops novaehollandiae*	channel-billed cuckoo	C		0	1	1/02/2019
1611	Aves	Dicaeidae	*Dicaeum hirundinaceum*	mistletoebird	C		0	5	1/02/2019
1355	Aves	Estrildidae	*Stagonopleura guttata*	diamond firetail	V	V	0	1	1/02/2019

1342	Aves	Estrildidae	*Taeniopygia bichenovii*	double-barred finch	C		0	4	1/02/2019
1949	Aves	Eurostopodidae	*Eurostopodus mystacalis*	white-throated nightjar	C		0	2	1/02/2019
1716	Aves	Falconidae	*Falco berigora*	brown falcon	C		0	1	1/02/2019
1704	Aves	Falconidae	*Falco cenchroides*	nankeen kestrel	C		0	1	1/02/2019
1573	Aves	Hirundinidae	*Petrochelidon nigricans*	tree martin	C		0	1	1/02/2019
1291	Aves	Locustellidae	*Cincloramphus cruralis*	brown songlark	C		0	1	1/02/2019
1292	Aves	Locustellidae	*Cincloramphus mathewsi*	rufous songlark	C		0	1	24/02/2013
1570	Aves	Maluridae	*Malurus cyaneus*	superb fairy-wren	C		0	3	1/02/2019
18458	Aves	Maluridae	*Malurus lamberti*	variegated fairy-wren	C		0	1	1/02/2019
1556	Aves	Maluridae	*Malurus lamberti sensu lato*	variegated fairy-wren			0	3	23/02/2013
1558	Aves	Maluridae	*Malurus melanocephalus*	red-backed fairy-wren	C		0	1	1/02/2019
1552	Aves	Meliphagidae	*Acanthagenys rufogularis*	spiny-cheeked honeyeater	C		0	4	1/02/2019
1523	Aves	Meliphagidae	*Caligavis chrysops*	yellow-faced honeyeater	C		0	10	1/02/2019
1539	Aves	Meliphagidae	*Entomyzon cyanotis*	blue-faced honeyeater	C		0	5	1/02/2019
1521	Aves	Meliphagidae	*Grantiella picta*	painted honeyeater	V	V	0	1	1/02/2019
1517	Aves	Meliphagidae	*Lichenostomus melanops*	yellow-tufted honeyeater	C		0	1	23/02/2013
1497	Aves	Meliphagidae	*Lichmera indistincta*	brown honeyeater	C		0	4	1/02/2019
1500	Aves	Meliphagidae	*Manorina melanocephala*	noisy miner	C		0	5	1/02/2019
1502	Aves	Meliphagidae	*Manorina sp.*		C		0	2	23/02/2013
1507	Aves	Meliphagidae	*Melithreptus albogularis*	white-throated honeyeater	C		0	3	1/02/2019
1508	Aves	Meliphagidae	*Melithreptus brevirostris*	brown-headed honeyeater	C		0	4	1/02/2019
1483	Aves	Meliphagidae	*Melithreptus gularis*	black-chinned honeyeater	C		0	1	23/02/2013
1489	Aves	Meliphagidae	*Myzomela sanguinolenta*	scarlet honeyeater	C		0	3	22/02/2013
1516	Aves	Meliphagidae	*Nesoptilotis leucotis*	white-eared honeyeater	C		0	21	1/02/2019

1493	Aves	Meliphagidae	*Philemon citreogularis*	little friarbird	C		0	2	1/02/2019
1494	Aves	Meliphagidae	*Philemon corniculatus*	noisy friarbird	C		0	11	1/02/2019
1471	Aves	Meliphagidae	*Plectorhyncha lanceolata*	striped honeyeater	C		0	15	1/02/2019
1518	Aves	Meliphagidae	*Ptilotula penicillata*	white-plumed honeyeater	C		0	1	22/02/2013
1764	Aves	Meropidae	*Merops ornatus*	rainbow bee-eater	C		0	3	1/02/2019
1589	Aves	Monarchidae	*Grallina cyanoleuca*	magpie-lark	C		0	7	1/02/2019
1600	Aves	Monarchidae	*Myiagra inquieta*	restless flycatcher	C		0	1	23/02/2013
1586	Aves	Monarchidae	*Myiagra rubecula*	leaden flycatcher	C		0	8	1/02/2019
1455	Aves	Motacillidae	*Anthus novaeseelandiae*	Australasian pipit	C		0	2	1/02/2019
1453	Aves	Neosittidae	*Daphoenositta chrysoptera*	varied sittella	C		0	3	1/02/2019
1442	Aves	Oriolidae	*Oriolus sagittatus*	olive-backed oriole	C		0	2	1/02/2019
1449	Aves	Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush	C		0	10	1/02/2019
1437	Aves	Pachycephalidae	*Pachycephala rufiventris*	rufous whistler	C		0	18	1/02/2019
1392	Aves	Pardalotidae	*Pardalotus striatus*	striated pardalote	C		0	10	1/02/2019
1347	Aves	Petroicidae	*Eopsaltria australis*	eastern yellow robin	C		0	4	1/02/2019
1339	Aves	Petroicidae	*Microeca fascinans*	jacky winter	C		0	3	1/02/2019
1329	Aves	Petroicidae	*Petroica goodenovii*	red-capped robin	C		0	4	1/02/2019
1699	Aves	Phasianidae	*Coturnix pectoralis*	stubble quail	C		0	1	22/02/2013
1955	Aves	Podargidae	*Podargus strigoides*	tawny frogmouth	C		0	1	1/02/2019
1318	Aves	Pomatostomidae	*Pomatostomus temporalis*	grey-crowned babbler	C		0	8	1/02/2019
1182	Aves	Psittaculidae	*Aprosmictus erythropterus*	red-winged parrot	C		0	3	1/02/2019
1147	Aves	Psittaculidae	*Parvipsitta pusilla*	little lorikeet	C		0	2	1/02/2019
1136	Aves	Psittaculidae	*Platycercus adscitus*	pale-headed rosella	C		0	5	1/02/2019
1124	Aves	Psittaculidae	*Trichoglossus chlorolepidotus*	scaly-breasted lorikeet	C		0	4	1/02/2019

1125	Aves	Psittaculidae	*Trichoglossus moluccanus*	rainbow lorikeet	C		0	2	1/02/2019
1674	Aves	Rallidae	*Tribonyx ventralis*	black-tailed native-hen	C		0	1	23/02/2013
1575	Aves	Rhipiduridae	*Rhipidura albiscapa*	grey fantail	C		0	13	1/02/2019
1576	Aves	Rhipiduridae	*Rhipidura leucophrys*	willie wagtail	C		0	4	1/02/2019
1102	Aves	Strigidae	*Ninox boobook*	southern boobook	C		0	2	1/02/2019
1314	Aves	Sturnidae	*Acridotheres tristis*	common myna			0	1	1/02/2019
1108	Aves	Tytonidae	*Tyto javanica*	eastern barn owl	C		0	1	26/07/2011
1276	Aves	Zosteropidae	*Zosterops lateralis*	silvereye	C		0	1	1/02/2019
930	Mammalia	Acrobatidae	*Acrobates pygmaeus*	feathertail glider	C		0	1	27/02/2013
1068	Mammalia	Canidae	*Canis familiaris (dingo)*	dingo			0	1	26/02/1991
1069	Mammalia	Canidae	*Canis sp.*				0	3	1/02/2019
793	Mammalia	Dasyuridae	*Sminthopsis murina*	common dunnart	C		0	1	12/06/2015
1006	Mammalia	Emballonuridae	*Saccolaimus flaviventris*	yellow-bellied sheathtail bat	C		0	3	23/02/2013
834	Mammalia	Leporidae	*Oryctolagus cuniculus*	rabbit			0	1	1/02/2019
901	Mammalia	Macropodidae	*Macropus giganteus*	eastern grey kangaroo	C		0	3	1/02/2019
904	Mammalia	Macropodidae	*Notamacropus rufogriseus*	red-necked wallaby	C		0	2	1/02/2019
989	Mammalia	Molossidae	*Austronomus australis*	white-striped freetail bat	C		0	1	22/02/2013
998	Mammalia	Molossidae	*Mormopterus lumsdenae*	northern free-tailed bat	C		0	1	22/02/2013
22060	Mammalia	Molossidae	*Mormopterus petersi*	inland free-tailed bat	C		0	4	24/02/2013
22061	Mammalia	Molossidae	*Mormopterus ridei*	eastern free-tailed bat	C		0	3	23/02/2013
859	Mammalia	Phalangeridae	*Trichosurus vulpecula*	common brushtail possum	C		0	1	26/02/2013
860	Mammalia	Phascolarctidae	*Phascolarctos cinereus*	koala	E	E	0	1	31/12/1988
862	Mammalia	Potoroidae	*Aepyprymnus rufescens*	rufous bettong	C		0	1	1/02/2019
972	Mammalia	Vespertilionidae	*Chalinolobus gouldii*	Gould's wattled bat	C		0	4	23/02/2013

948	Mammalia	Vespertilionidae	*Chalinolobus picatus*	little pied bat	C		0	4	24/02/2013
939	Mammalia	Vespertilionidae	*Nyctophilus corbeni*	eastern long-eared bat	V	V	0	1	24/02/2013
936	Mammalia	Vespertilionidae	*Nyctophilus gouldi*	Gould's long-eared bat	C		0	1	24/02/2013
938	Mammalia	Vespertilionidae	*Nyctophilus sp.*		C		0	2	23/02/2013
931	Mammalia	Vespertilionidae	*Scotorepens greyii*	little broad-nosed bat	C		0	9	24/02/2013
929	Mammalia	Vespertilionidae	*Vespadelus vulturnus*	little forest bat	C		0	8	7/09/2013
567	Reptilia	Agamidae	*Diporiphora australis*	tommy roundhead	C		0	3	1/02/2019
554	Reptilia	Agamidae	*Intellagama lesueurii*	eastern water dragon	C		0	1	24/02/2013
556	Reptilia	Agamidae	*Pogona barbata*	bearded dragon	C		0	4	1/02/2019
62	Reptilia	Chelidae	*Chelodina expansa*	broad-shelled river turtle	C		0	1	21/02/2013
63	Reptilia	Chelidae	*Chelodina longicollis*	eastern snake-necked turtle	C		0	1	22/02/2013
36205	Reptilia	Diplodactylidae	*Amalosia hinesi*	Nandewar zigzag gecko	C		1	1	13/03/2017
404	Reptilia	Diplodactylidae	*Amalosia rhombifer sensu lato*	zigzag velvet gecko			0	1	1/02/2019
391	Reptilia	Diplodactylidae	*Amalosia robusta*	robust velvet gecko	C		0	1	1/02/2019
429	Reptilia	Diplodactylidae	*Diplodactylus vittatus*	wood gecko	C		0	2	1/02/2019
368	Reptilia	Diplodactylidae	*Strophurus taenicauda*	golden-tailed gecko	NT		0	16	1/02/2019
460	Reptilia	Elapidae	*Brachyurophis australis*	coral snake	C		0	1	1/02/2019
457	Reptilia	Elapidae	*Cryptophis nigrescens*	eastern small-eyed snake	C		0	2	12/06/2015
493	Reptilia	Elapidae	*Demansia psammophis*	yellow-faced whipsnake	C		0	1	1/02/2019
432	Reptilia	Gekkonidae	*Gehyra catenata*	chain-backed dtella	C		0	1	1/02/2019
420	Reptilia	Gekkonidae	*Gehyra dubia*	dubious dtella	C		0	15	30/06/2015
410	Reptilia	Gekkonidae	*Gehyra versicolor*		C		0	1	17/10/2013
413	Reptilia	Gekkonidae	*Heteronotia binoei*	Bynoe's gecko	C		0	5	23/06/2015
325	Reptilia	Pygopodidae	*Lialis burtonis*	Burton's legless lizard	C		0	2	21/11/2014

304	Reptilia	Scincidae	*Anomalopus leuckartii*	two-clawed worm-skink	C		0	1	19/02/2013
277	Reptilia	Scincidae	*Carlia vivax*	tussock rainbow-skink	C		0	1	1/02/2019
31897	Reptilia	Scincidae	*Cryptoblepharus metallicus*	metallic snake-eyed skink	C		0	2	23/02/2013
31898	Reptilia	Scincidae	*Cryptoblepharus pulcher pulcher*	elegant snake-eyed skink	C		0	6	1/02/2019
263	Reptilia	Scincidae	*Ctenotus allotropis*	brown-blazed wedgesnout ctenotus	C		0	1	23/02/2013
240	Reptilia	Scincidae	*Ctenotus spaldingi*	straight-browed ctenotus	C		0	4	12/06/2015
167	Reptilia	Scincidae	*Lerista fragilis*	eastern mulch slider	C		0	3	1/02/2019
150	Reptilia	Scincidae	*Lygisaurus foliorum*	tree-base litter-skink	C		0	5	1/02/2019
127	Reptilia	Scincidae	*Menetia greyii*	common dwarf skink	C		0	1	1/02/2019
78	Reptilia	Varanidae	*Varanus gouldii*	sand monitor	C		0	1	1/02/2019
60	Reptilia	Varanidae	*Varanus tristis*	black-tailed monitor	C		0	2	1/02/2019
61	Reptilia	Varanidae	*Varanus varius*	lace monitor	C		0	2	1/02/2019

Table 3. Plants recorded within the area of interest and its one kilometre buffer

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
15150	Equisetopsida	Apiaceae	*Platysace ericoides*	heath platysace	C		1	1	28/11/2022
8398	Equisetopsida	Asteraceae	*Chrysocephalum apiculatum*	yellow buttons	C		1	1	25/06/2019
33050	Equisetopsida	Asteraceae	*Flaveria trinervia*				1	1	4/01/2010
8365	Equisetopsida	Asteraceae	*Ozothamnus diotophyllus*		C		1	1	28/11/2003
3809	Equisetopsida	Lamiaceae	*Prostanthera cryptandroides subsp. euphrasioides*		C		1	1	7/08/2025
14963	Equisetopsida	Lamiaceae	*Westringia cheelii*		C		1	1	12/08/2021
14063	Equisetopsida	Leguminosae	*Acacia debilis*		C		1	1	9/03/2020
15799	Equisetopsida	Leguminosae	*Acacia falcata*	sickle wattle	C		1	1	17/03/2020
15747	Equisetopsida	Leguminosae	*Acacia flexifolia*		C		1	1	7/08/2025
6372	Equisetopsida	Leguminosae	*Acacia juncifolia*		C		1	1	18/04/2020
15529	Equisetopsida	Leguminosae	*Chorizema parviflorum*	eastern flame pea	C		1	1	28/11/2003
11443	Equisetopsida	Leguminosae	*Labichea digitata*		C		1	1	3/04/2019
15191	Equisetopsida	Leguminosae	*Mirbelia pungens*		C		1	1	7/12/2018
16960	Equisetopsida	Malvaceae	*Hibiscus sturtii*		C		1	1	28/11/2003
22199	Equisetopsida	Malvaceae	*Sida sp. (Musselbrook M.B.Thomas+ MRS437)*		C		1	1	16/09/2010
30502	Equisetopsida	Myrtaceae	*Eucalyptus elegans*		C		1	1	24/06/2020
14441	Equisetopsida	Myrtaceae	*Leptospermum polygalifolium*	tantoon	C		2	2	17/09/2020
17012	Equisetopsida	Proteaceae	*Hakea purpurea*		C		3	3	15/06/2023
13244	Equisetopsida	Sapindaceae	*Dodonaea biloba*		C		1	1	7/08/2025
17377	Equisetopsida	Sapindaceae	*Dodonaea peduncularis*		C		2	2	27/07/2021
13530	Equisetopsida	Solanaceae	*Solanum ferocissimum*		C		1	1	8/12/2022

Table 4. Fungi recorded within the area of interest and its one kilometre buffer

No species found within the area of interest and its one kilometre buffer.

Table 5. Other species recorded within the area of interest and its one kilometre buffer

No species found within the area of interest and its one kilometre buffer.

Species table headings and codes
Taxon Id: Unique identifier of the taxon from the WildNet database.
NCA: Queensland conservation status of the taxon under the *Nature Conservation Act 1992* (Least Concern (C), Critically Endangered (CR), Endangered (E), Extinct (EX), Near Threatened (NT), Extinct in the Wild (PE), Special Least Concern (SL), and Vulnerable (V)).
EPBC: Australian conservation status of the taxon under the *Environment Protection and Biodiversity Conservation Act 1999* (Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Vulnerable (V), and Extinct in the Wild (XW)).
Specimens: The number of specimen-backed records of the taxon.
Records: The total number of records of the taxon.
Last record: Date of most recent record of the taxon.

Links and Support

Other sites that deliver species information from the WildNet database include:

- WildNet Application - public interface to find species information and species lists generated from the WildNet database.
- Biomaps - view biodiversity information, including WildNet records approved for publication, and generate reports
- Queensland Globe - view spatial information, including WildNet records approved for publication
- Qld WildNet Data API - access WildNet species information approved for publication such as notes, images and records etc.
- Wetland*Maps* - view species records, survey locations etc. approved for publication
- Wetland*Summary* - view wildlife statistics, species lists for a range of area types, and access WildNet species profiles
- WildNet wildlife records - published - Queensland - spatial layer of WildNet records approved for publication generated weekly
- Generalised distribution and densities of Queensland wildlife - Queensland species distributions and densities generalised to a 10 km grid resolution
- Conservation status of Queensland wildlife - access current lists of priority species for Queensland including nomenclature and status information
- Queensland Confidential Species - the list of species flagged as confidential in the WildNet database.

Please direct queries about this report to the WildNet Team WildNet@detsi.qld.gov.au.

Other useful sites for accessing Queensland biodiversity data include:

- Useful wildlife resources
- Queensland Government Data
- Atlas of Living Australia (ALA)
- Online Zoological Collections of Australian Museums (OZCAM)
- Australasian Virtual Herbarium (AVH)
- Protected Matters Search Tool

Disclaimer

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WildNet Records
Species List

For the selected area of interest 23024.56 PL: 491
Current as at 03/03/2026 WildNetSpeciesList

Summary Information
The following table provides an overview of the area of interest: PL: 491

Table 1. Area of interest details

Size (ha)	
23,024.56	
Local Government(s)	
Western Downs Regional	
Catchment(s)	
Balonne-Condamine	
Bioregion(s)	**Subregion(s)**
Brigalow Belt	Barakula
Brigalow Belt	Taroom Downs
Brigalow Belt	Southern Downs

Protected Area(s) The following estates and/or reserves are located in the area of interest:

Barakula State Forest

Binkey State Forest 1

World Heritage Area(s)

No World Heritage Areas are located within the area of interest.

Ramsar Area(s)

No Ramsar Areas are located within the area of interest.

Introduction
This WildNet report is derived from a spatial layer that is generated from the WildNet database, managed by the Department of the Environment, Tourism, Science and Innovation. The layer, which is generated weekly, contains a subset of WildNet wildlife records that are not classed as erroneous or duplicate, that have a location precision equal to or less than 10000 metres and do not have a count of zero. It does not include aspatial data such as some baseline species lists created for some protected areas.

The WildNet dataset is constantly being enhanced and the taxonomic and status information revised. If a species is not listed in this report, it does not mean it doesn't occur there and listed species may also no longer inhabit the area. It is recommended that you also access other internal and external data sources for species information in your area of interest.

The WildNet Application may provide additional information on species occurence within your area of interest.

Species data

Contextual location information is presented in Map 1.

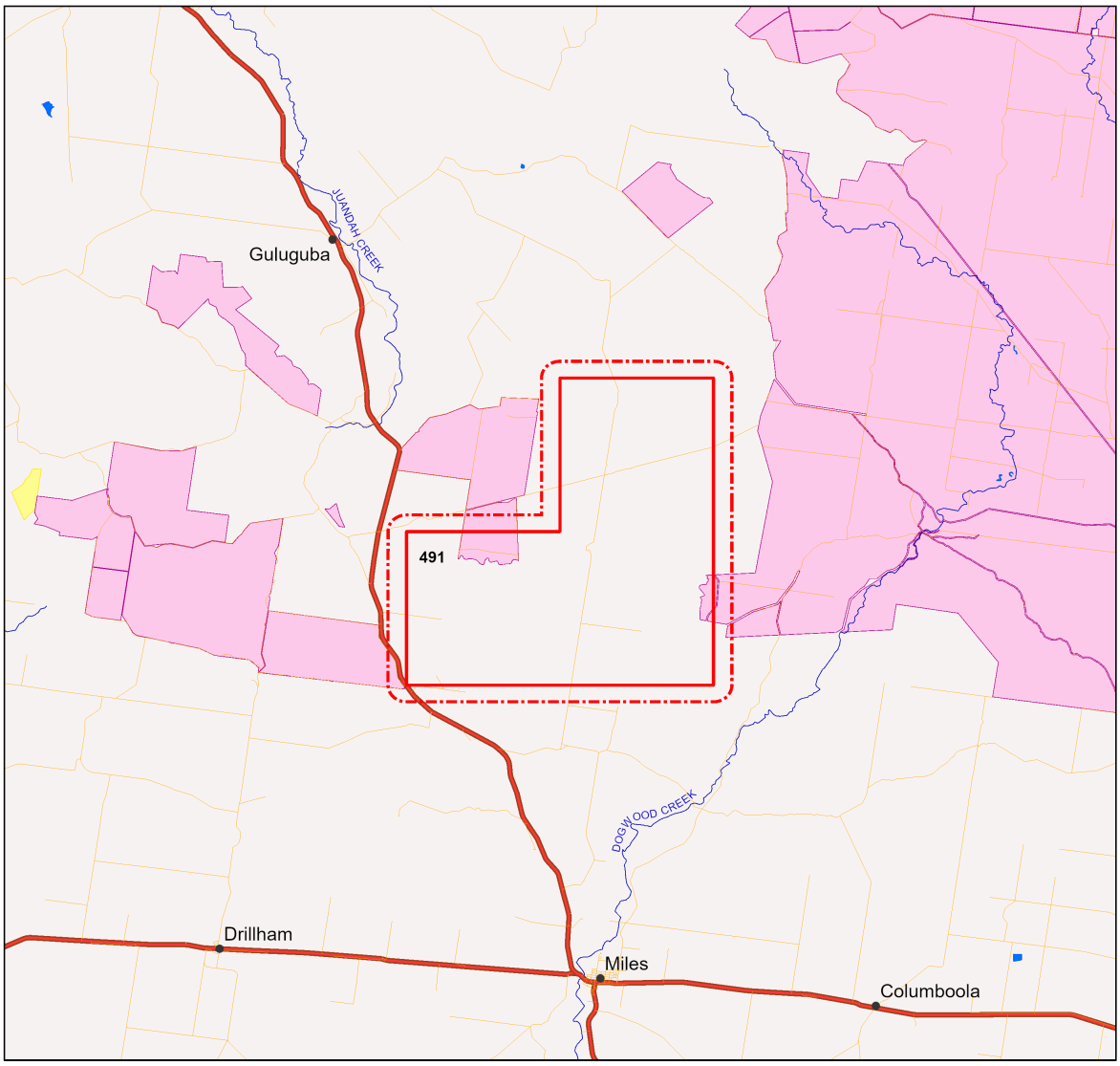
Table 2 lists the animals recorded within the area of interest and its one kilometre buffer.

Table 3 lists the plants recorded within the area of interest and its one kilometre buffer.

Table 4 lists the fungi recorded within the area of interest and its one kilometre buffer.

Table 5 lists the other species recorded within the area of interest and its one kilometre buffer.

Map 1. Locality Map

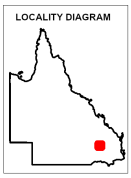


Locality Map

Legend

- Towns
- Freeways/Highways
- Connector
- Street/Local Road
- Lakes and reservoirs
- National Park
- National Park (Scientific)
- National Park (CYPAL)
- National Park (Aboriginal Land)
- Conservation Park
- Resources Reserve
- Forest Reserve
- State Forest
- Timber Reserve
- Nature Refuges
- Coordinated Conservation Areas
- Major rivers/creeks
- Queensland
- Selected Petroleum Lease (PL)
- 1 kilometre buffer

LOCALITY DIAGRAM



N

0 3000 6000 9000 12000 15000 m

This product is displayed in GDA2020

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Table 2. Animals recorded within the area of interest and its one kilometre buffer

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
19545	Actinopterygii	Cyprinidae	*Carassius auratus*	goldfish			0	1	21/02/2013
33897	Actinopterygii	Eleotridae	*Hypseleotris sp.*				0	2	21/02/2013
26957	Actinopterygii	Eleotridae	*Hypseleotris species 1*	Midgley's carp gudgeon			0	2	21/02/2013
27025	Actinopterygii	Melanotaeniidae	*Melanotaenia fluviatilis*	Murray River rainbowfish			0	2	21/02/2013
27055	Actinopterygii	Poeciliidae	*Gambusia holbrooki*	mosquitofish			0	2	21/02/2013
27061	Actinopterygii	Retropinnidae	*Retropinna semoni*	Australian smelt			0	1	21/02/2013
27089	Actinopterygii	Terapontidae	*Leiopotherapon unicolor*	spangled perch			0	2	21/02/2013
716	Amphibia	Bufonidae	*Rhinella marina*	cane toad			0	22	1/02/2019
624	Amphibia	Hylidae	*Cyclorana alboguttata*	greenstripe frog	C		0	4	24/02/2013
620	Amphibia	Hylidae	*Cyclorana novaehollandiae*	eastern snapping frog	C		1	6	22/12/2021
627	Amphibia	Hylidae	*Litoria caerulea*	common green treefrog	C		1	20	22/12/2021
608	Amphibia	Hylidae	*Litoria fallax*	eastern sedgefrog	C		0	2	23/02/2013
614	Amphibia	Hylidae	*Litoria latopalmata*	broad palmed rocketfrog	C		1	11	22/12/2021
596	Amphibia	Hylidae	*Litoria peronii*	emerald spotted treefrog	C		0	4	23/02/2014
600	Amphibia	Hylidae	*Litoria rubella*	ruddy treefrog	C		0	8	1/02/2019
679	Amphibia	Limnodynastidae	*Limnodynastes fletcheri*	barking frog	C		0	1	23/02/2013
682	Amphibia	Limnodynastidae	*Limnodynastes salmini*	salmon striped frog	C		0	2	23/02/2014
684	Amphibia	Limnodynastidae	*Limnodynastes tasmaniensis*	spotted grassfrog	C		1	11	17/05/2023
673	Amphibia	Limnodynastidae	*Limnodynastes terraereginae*	scarlet sided pobblebonk	C		0	19	1/02/2019
667	Amphibia	Limnodynastidae	*Neobatrachus sudellae*	meeowing frog	C		0	1	24/02/2013
680	Amphibia	Limnodynastidae	*Platyplectrum ornatum*	ornate burrowing frog	C		1	52	22/12/2021
696	Amphibia	Myobatrachidae	*Crinia parinsignifera*	beeping froglet	C		1	3	17/05/2023
659	Amphibia	Myobatrachidae	*Pseudophryne major*	great brown broodfrog	C		2	3	17/05/2023

635	Amphibia	Myobatrachidae	*Uperoleia laevigata*	eastern gungan	C		0	1	24/02/2014
639	Amphibia	Myobatrachidae	*Uperoleia rugosa*	chubby gungan	C		0	7	20/02/2015
1418	Aves	Acanthizidae	*Acanthiza apicalis*	inland thornbill	C		0	8	1/02/2019
1419	Aves	Acanthizidae	*Acanthiza chrysorrhoa*	yellow-rumped thornbill	C		0	8	1/02/2019
1421	Aves	Acanthizidae	*Acanthiza lineata*	striated thornbill	C		0	2	25/04/2007
1422	Aves	Acanthizidae	*Acanthiza nana*	yellow thornbill	C		0	16	1/02/2019
1423	Aves	Acanthizidae	*Acanthiza pusilla*	brown thornbill	C		0	3	1/02/2019
1425	Aves	Acanthizidae	*Acanthiza reguloides*	buff-rumped thornbill	C		0	6	10/09/2021
1412	Aves	Acanthizidae	*Acanthiza uropygialis*	chestnut-rumped thornbill	C		0	3	20/02/2013
1407	Aves	Acanthizidae	*Gerygone fusca*	western gerygone	C		0	3	23/02/2013
1396	Aves	Acanthizidae	*Gerygone olivacea*	white-throated gerygone	C		0	12	10/09/2021
1403	Aves	Acanthizidae	*Pyrrholaemus sagittatus*	speckled warbler	C		0	14	10/09/2021
1371	Aves	Acanthizidae	*Smicrornis brevirostris*	weebill	C		0	40	10/09/2021
1729	Aves	Accipitridae	*Accipiter fasciatus*	brown goshawk	C		0	1	1/02/2019
1732	Aves	Accipitridae	*Aquila audax*	wedge-tailed eagle	C		0	4	1/02/2019
1723	Aves	Accipitridae	*Circus assimilis*	spotted harrier	C		0	1	31/05/2004
1718	Aves	Accipitridae	*Haliaeetus leucogaster*	white-bellied sea-eagle	C		0	2	23/02/2013
1707	Aves	Accipitridae	*Haliastur sphenurus*	whistling kite	C		0	2	1/02/2019
1714	Aves	Accipitridae	*Milvus migrans*	black kite	C		0	1	1/02/2019
1973	Aves	Aegothelidae	*Aegotheles cristatus*	Australian owlet-nightjar	C		0	9	1/02/2019
1767	Aves	Alcedinidae	*Dacelo novaeguineae*	laughing kookaburra	C		0	26	10/09/2021
1761	Aves	Alcedinidae	*Todiramphus pyrrhopygius*	red-backed kingfisher	C		0	2	6/02/2002
1762	Aves	Alcedinidae	*Todiramphus sanctus*	sacred kingfisher	C		0	6	10/08/2021
1993	Aves	Anatidae	*Anas gracilis*	grey teal	C		0	3	10/05/2021

1998	Aves	Anatidae	*Anas superciliosa*	Pacific black duck	C		0	7	10/05/2021
1999	Aves	Anatidae	*Aythya australis*	hardhead	C		0	1	31/10/1945
2003	Aves	Anatidae	*Chenonetta jubata*	Australian wood duck	C		0	3	10/09/2021
2005	Aves	Anatidae	*Cygnus atratus*	black swan	C		0	1	31/10/1945
1977	Aves	Anatidae	*Dendrocygna arcuata*	wandering whistling-duck	C		0	1	31/10/1945
1279	Aves	Anhingidae	*Anhinga novaehollandiae*	Australasian darter	C		0	3	23/02/2013
1965	Aves	Apodidae	*Apus pacificus*	fork-tailed swift	SL		0	1	1/02/2019
1971	Aves	Apodidae	*Hirundapus caudacutus*	white-throated needletail	V	V	0	2	1/02/2019
1829	Aves	Ardeidae	*Ardea alba modesta*	eastern great egret	C		0	1	31/10/1945
1831	Aves	Ardeidae	*Ardea intermedia*	intermediate egret	C		0	1	31/10/1945
1832	Aves	Ardeidae	*Ardea pacifica*	white-necked heron	C		0	1	31/10/1945
1826	Aves	Ardeidae	*Egretta novaehollandiae*	white-faced heron	C		0	2	26/05/2003
1818	Aves	Ardeidae	*Nycticorax caledonicus*	nankeen night-heron	C		0	2	24/02/2013
1658	Aves	Artamidae	*Artamus cinereus*	black-faced woodswallow	C		0	1	1/02/2019
1660	Aves	Artamidae	*Artamus leucorynchus*	white-breasted woodswallow	C		0	2	1/02/2019
1647	Aves	Artamidae	*Artamus personatus*	masked woodswallow	C		0	5	10/08/2021
1648	Aves	Artamidae	*Artamus sp.*		C		0	1	23/02/2013
1649	Aves	Artamidae	*Artamus superciliosus*	white-browed woodswallow	C		0	14	10/08/2021
1654	Aves	Artamidae	*Cracticus nigrogularis*	pied butcherbird	C		0	16	10/09/2021
1656	Aves	Artamidae	*Cracticus torquatus*	grey butcherbird	C		0	50	30/04/2022
1644	Aves	Artamidae	*Gymnorhina tibicen*	Australian magpie	C		0	10	1/02/2019
1645	Aves	Artamidae	*Strepera graculina*	pied currawong	C		0	19	1/02/2019
1956	Aves	Burhinidae	*Burhinus grallarius*	bush stone-curlew	C		0	3	10/05/2021
1191	Aves	Cacatuidae	*Cacatua galerita*	sulphur-crested cockatoo	C		0	15	30/04/2022

1194	Aves	Cacatuidae	*Cacatua sanguinea*	little corella	C		0	4	10/05/2021
1196	Aves	Cacatuidae	*Calyptorhynchus banksii*	red-tailed black-cockatoo	C		0	1	31/05/2004
1171	Aves	Cacatuidae	*Calyptorhynchus lathami*	glossy black-cockatoo	V		0	1	20/02/2013
1193	Aves	Cacatuidae	*Eolophus roseicapilla*	galah	C		0	20	30/04/2022
1173	Aves	Cacatuidae	*Nymphicus hollandicus*	cockatiel	C		0	7	23/02/2013
1185	Aves	Cacatuidae	*Zanda funerea*	yellow-tailed black-cockatoo	C		0	1	31/12/1979
1635	Aves	Campephagidae	*Coracina maxima*	ground cuckoo-shrike	C		0	1	1/02/2019
1636	Aves	Campephagidae	*Coracina novaehollandiae*	black-faced cuckoo-shrike	C		0	18	10/09/2021
1637	Aves	Campephagidae	*Coracina papuensis*	white-bellied cuckoo -shrike	C		0	4	10/08/2021
1639	Aves	Campephagidae	*Edolisoma tenuirostre*	common cicadabird	C		0	12	1/02/2019
1642	Aves	Campephagidae	*Lalage tricolor*	white-winged triller	C		0	3	1/02/2019
1089	Aves	Casuariidae	*Dromaius novaehollandiae*	emu	C		0	1	24/02/2014
1940	Aves	Charadriidae	*Elseyornis melanops*	black-fronted dotterel	C		0	2	23/02/2013
27774	Aves	Charadriidae	*Vanellus miles*	masked lapwing	C		0	2	23/02/2013
1933	Aves	Charadriidae	*Vanellus miles novaehollandiae*	masked lapwing (southern subspecies)	C		0	2	1/02/2019
18143	Aves	Charadriidae	*Vanellus tricolor*	banded lapwing	C		0	1	31/10/1945
1617	Aves	Climacteridae	*Cormobates leucophaea*	white-throated treecreeper	C		0	1	22/02/2014
18293	Aves	Climacteridae	*Cormobates leucophaea metastasis*	white-throated treecreeper (southern)	C		0	1	22/02/2013
1804	Aves	Columbidae	*Columba livia*	rock dove			0	1	25/04/2007
1809	Aves	Columbidae	*Geopelia cuneata*	diamond dove	C		0	2	1/02/2019
1810	Aves	Columbidae	*Geopelia humeralis*	bar-shouldered dove	C		0	7	10/05/2021
18323	Aves	Columbidae	*Geopelia placida*	peaceful dove	C		0	25	30/04/2022
1785	Aves	Columbidae	*Geophaps scripta scripta*	squatter pigeon (southern subspecies)	V	V	0	1	1/02/2019
1793	Aves	Columbidae	*Ocyphaps lophotes*	crested pigeon	C		0	9	1/02/2019

1795	Aves	Columbidae	*Phaps chalcoptera*	common bronzewing	C		0	4	1/02/2019
1779	Aves	Coraciidae	*Eurystomus orientalis*	dollarbird	C		0	5	23/02/2013
1603	Aves	Corcoracidae	*Corcorax melanorhamphos*	white-winged chough	C		0	6	10/05/2021
1605	Aves	Corcoracidae	*Struthidea cinerea*	apostlebird	C		0	13	10/08/2021
1607	Aves	Corvidae	*Corvus bennetti*	little crow	C		0	1	12/09/2005
1608	Aves	Corvidae	*Corvus coronoides*	Australian raven	C		0	19	30/04/2022
1609	Aves	Corvidae	*Corvus orru*	Torresian crow	C		0	19	30/04/2022
1754	Aves	Cuculidae	*Cacomantis flabelliformis*	fan-tailed cuckoo	C		0	2	30/04/2022
1750	Aves	Cuculidae	*Cacomantis pallidus*	pallid cuckoo	C		0	7	10/09/2021
1743	Aves	Cuculidae	*Cacomantis variolosus*	brush cuckoo	C		0	1	1/02/2019
1751	Aves	Cuculidae	*Centropus phasianinus*	pheasant coucal	C		0	3	1/02/2019
1744	Aves	Cuculidae	*Chalcites basalis*	Horsfield's bronze-cuckoo	C		0	4	1/02/2019
1745	Aves	Cuculidae	*Chalcites lucidus*	shining bronze-cuckoo	C		0	3	10/08/2021
1747	Aves	Cuculidae	*Chalcites osculans*	black-eared cuckoo	C		0	2	22/02/2013
1740	Aves	Cuculidae	*Scythrops novaehollandiae*	channel-billed cuckoo	C		0	3	1/02/2019
1611	Aves	Dicaeidae	*Dicaeum hirundinaceum*	mistletoebird	C		0	13	1/02/2019
1355	Aves	Estrildidae	*Stagonopleura guttata*	diamond firetail	V	V	0	1	1/02/2019
1342	Aves	Estrildidae	*Taeniopygia bichenovii*	double-barred finch	C		0	12	10/09/2021
1343	Aves	Estrildidae	*Taeniopygia guttata*	zebra finch	C		0	1	26/05/2003
1949	Aves	Eurostopodidae	*Eurostopodus mystacalis*	white-throated nightjar	C		0	5	1/02/2019
1716	Aves	Falconidae	*Falco berigora*	brown falcon	C		0	2	1/02/2019
1704	Aves	Falconidae	*Falco cenchroides*	nankeen kestrel	C		0	1	1/02/2019
1693	Aves	Falconidae	*Falco subniger*	black falcon	C		0	1	31/05/2004
1585	Aves	Hirundinidae	*Petrochelidon ariel*	fairy martin	C		0	1	31/10/1945

1573	Aves	Hirundinidae	*Petrochelidon nigricans*	tree martin	C		0	2	1/02/2019
1919	Aves	Laridae	*Chlidonias hybrida*	whiskered tern	C		0	1	31/10/1945
1291	Aves	Locustellidae	*Cincloramphus cruralis*	brown songlark	C		0	1	1/02/2019
1292	Aves	Locustellidae	*Cincloramphus mathewsi*	rufous songlark	C		0	3	31/05/2004
18459	Aves	Maluridae	*Malurus assimilis*	purple-backed fairy-wren	C		0	2	10/05/2021
1570	Aves	Maluridae	*Malurus cyaneus*	superb fairy-wren	C		0	6	1/02/2019
18458	Aves	Maluridae	*Malurus lamberti*	variegated fairy-wren	C		0	1	1/02/2019
1556	Aves	Maluridae	*Malurus lamberti sensu lato*	variegated fairy-wren			0	10	30/07/2013
1558	Aves	Maluridae	*Malurus melanocephalus*	red-backed fairy-wren	C		0	3	1/02/2019
1552	Aves	Meliphagidae	*Acanthagenys rufogularis*	spiny-cheeked honeyeater	C		0	7	1/02/2019
1523	Aves	Meliphagidae	*Caligavis chrysops*	yellow-faced honeyeater	C		0	16	10/09/2021
1539	Aves	Meliphagidae	*Entomyzon cyanotis*	blue-faced honeyeater	C		0	16	10/08/2021
1521	Aves	Meliphagidae	*Grantiella picta*	painted honeyeater	V	V	0	1	1/02/2019
1517	Aves	Meliphagidae	*Lichenostomus melanops*	yellow-tufted honeyeater	C		0	3	23/02/2013
1497	Aves	Meliphagidae	*Lichmera indistincta*	brown honeyeater	C		0	6	10/05/2021
1499	Aves	Meliphagidae	*Manorina flavigula*	yellow-throated miner	C		0	1	22/02/2013
1500	Aves	Meliphagidae	*Manorina melanocephala*	noisy miner	C		0	24	30/04/2022
1502	Aves	Meliphagidae	*Manorina sp.*		C		0	4	23/02/2013
1507	Aves	Meliphagidae	*Melithreptus albogularis*	white-throated honeyeater	C		0	3	1/02/2019
1508	Aves	Meliphagidae	*Melithreptus brevirostris*	brown-headed honeyeater	C		0	12	10/09/2021
1483	Aves	Meliphagidae	*Melithreptus gularis*	black-chinned honeyeater	C		0	1	23/02/2013
1485	Aves	Meliphagidae	*Melithreptus lunatus*	white-naped honeyeater	C		0	3	10/09/2021
1489	Aves	Meliphagidae	*Myzomela sanguinolenta*	scarlet honeyeater	C		0	1	31/05/2004
1516	Aves	Meliphagidae	*Nesoptilotis leucotis*	white-eared honeyeater	C		0	44	30/04/2022

1493	Aves	Meliphagidae	*Philemon citreogularis*	little friarbird	C		0	6	1/02/2019
1494	Aves	Meliphagidae	*Philemon corniculatus*	noisy friarbird	C		0	31	30/04/2022
1471	Aves	Meliphagidae	*Plectorhyncha lanceolata*	striped honeyeater	C		0	28	10/08/2021
1764	Aves	Meropidae	*Merops ornatus*	rainbow bee-eater	C		0	8	10/08/2021
1589	Aves	Monarchidae	*Grallina cyanoleuca*	magpie-lark	C		0	19	30/04/2022
1600	Aves	Monarchidae	*Myiagra inquieta*	restless flycatcher	C		0	1	23/02/2013
1586	Aves	Monarchidae	*Myiagra rubecula*	leaden flycatcher	C		0	8	10/09/2021
1455	Aves	Motacillidae	*Anthus novaeseelandiae*	Australasian pipit	C		0	4	1/02/2019
1453	Aves	Neosittidae	*Daphoenositta chrysoptera*	varied sittella	C		0	5	1/02/2019
1442	Aves	Oriolidae	*Oriolus sagittatus*	olive-backed oriole	C		0	11	10/08/2021
1680	Aves	Otididae	*Ardeotis australis*	Australian bustard	C		0	1	12/09/2005
1449	Aves	Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush	C		0	30	10/09/2021
1436	Aves	Pachycephalidae	*Pachycephala pectoralis*	golden whistler	C		0	2	12/09/2005
1437	Aves	Pachycephalidae	*Pachycephala rufiventris*	rufous whistler	C		0	42	10/05/2021
1389	Aves	Pardalotidae	*Pardalotus punctatus*	spotted pardalote	C		0	7	30/04/2022
1392	Aves	Pardalotidae	*Pardalotus striatus*	striated pardalote	C		0	32	30/04/2022
1284	Aves	Pelecanidae	*Pelecanus conspicillatus*	Australian pelican	C		0	1	31/10/1945
1347	Aves	Petroicidae	*Eopsaltria australis*	eastern yellow robin	C		0	19	30/04/2022
1339	Aves	Petroicidae	*Microeca fascinans*	jacky winter	C		0	13	10/09/2021
1329	Aves	Petroicidae	*Petroica goodenovii*	red-capped robin	C		0	4	1/02/2019
1332	Aves	Petroicidae	*Petroica rosea*	rose robin	C		0	1	31/05/2004
1261	Aves	Phalacrocoracidae	*Microcarbo melanoleucos*	little pied cormorant	C		0	1	31/10/1945
1699	Aves	Phasianidae	*Coturnix pectoralis*	stubble quail	C		0	1	22/02/2013
1955	Aves	Podargidae	*Podargus strigoides*	tawny frogmouth	C		0	3	1/02/2019

1249	Aves	Podicipedidae	*Tachybaptus novaehollandiae*	Australasian grebe	C		0	1	31/10/1945
1318	Aves	Pomatostomidae	*Pomatostomus temporalis*	grey-crowned babbler	C		0	21	10/08/2021
22463	Aves	Pomatostomidae	*Pomatostomus temporalis temporalis*	grey-crowned babbler (eastern)	C		0	1	11/03/2019
1180	Aves	Psittaculidae	*Alisterus scapularis*	Australian king-parrot	C		0	8	10/05/2021
1182	Aves	Psittaculidae	*Aprosmictus erythropterus*	red-winged parrot	C		0	6	1/02/2019
1147	Aves	Psittaculidae	*Parvipsitta pusilla*	little lorikeet	C		0	1	1/02/2019
1136	Aves	Psittaculidae	*Platycercus adscitus*	pale-headed rosella	C		0	24	10/09/2021
1118	Aves	Psittaculidae	*Psephotus haematonotus*	red-rumped parrot	C		0	1	16/11/1999
1124	Aves	Psittaculidae	*Trichoglossus chlorolepidotus*	scaly-breasted lorikeet	C		0	21	10/09/2021
1125	Aves	Psittaculidae	*Trichoglossus moluccanus*	rainbow lorikeet	C		0	3	1/02/2019
1673	Aves	Rallidae	*Gallinula tenebrosa*	dusky moorhen	C		0	1	31/10/1945
1674	Aves	Rallidae	*Tribonyx ventralis*	black-tailed native-hen	C		0	1	23/02/2013
1893	Aves	Recurvirostridae	*Himantopus leucocephalus*	pied stilt	C		0	1	31/10/1945
1575	Aves	Rhipiduridae	*Rhipidura albiscapa*	grey fantail	C		0	27	1/02/2019
1576	Aves	Rhipiduridae	*Rhipidura leucophrys*	willie wagtail	C		0	19	10/09/2021
1102	Aves	Strigidae	*Ninox boobook*	southern boobook	C		0	5	1/02/2019
1314	Aves	Sturnidae	*Acridotheres tristis*	common myna			0	1	1/02/2019
1303	Aves	Sturnidae	*Sturnus vulgaris*	common starling			0	1	31/10/1945
1823	Aves	Threskiornithidae	*Platalea regia*	royal spoonbill	C		0	1	31/10/1945
1812	Aves	Threskiornithidae	*Threskiornis molucca*	Australian white ibis	C		0	3	17/06/2007
1800	Aves	Threskiornithidae	*Threskiornis spinicollis*	straw-necked ibis	C		0	2	8/08/2008
1082	Aves	Turnicidae	*Turnix velox*	little button-quail	C		0	1	21/04/2012
1108	Aves	Tytonidae	*Tyto javanica*	eastern barn owl	C		0	1	1/02/2002
1096	Aves	Tytonidae	*Tyto novaehollandiae*	masked owl	C		0	1	22/02/2013

1098	Aves	Tytonidae	*Tyto sp.*		C		0	1	22/02/2013
1276	Aves	Zosteropidae	*Zosterops lateralis*	silvereye	C		0	4	1/02/2019
35081	Insecta	Aeshnidae	*Anax papuensis*	Australian Emperor			0	1	20/03/2014
35129	Insecta	Corduliidae	*Hemicordulia tau*	tau emerald			0	1	20/03/2014
35199	Insecta	Libellulidae	*Diplacodes bipunctata*	wandering percher			0	2	20/03/2014
35200	Insecta	Libellulidae	*Diplacodes haematodes*	scarlet percher			0	1	20/03/2014
35219	Insecta	Libellulidae	*Orthetrum caledonicum*	blue skimmer			0	2	20/03/2014
19172	Insecta	Nymphalidae	*Junonia villida villida*	meadow argus			0	1	21/04/2012
19086	Insecta	Pieridae	*Eurema hecabe*	large grass-yellow			0	1	21/04/2012
33583	Malacostraca	Parastacidae	*Cherax destructor*	common yabbie			0	2	20/03/2014
930	Mammalia	Acrobatidae	*Acrobates pygmaeus*	feathertail glider	C		0	1	27/02/2013
1067	Mammalia	Canidae	*Canis familiaris*	dog			0	1	6/02/2002
1069	Mammalia	Canidae	*Canis sp.*				0	3	1/02/2019
811	Mammalia	Dasyuridae	*Planigale maculata*	common planigale	C		0	1	22/02/2013
793	Mammalia	Dasyuridae	*Sminthopsis murina*	common dunnart	C		0	1	24/02/2014
1006	Mammalia	Emballonuridae	*Saccolaimus flaviventris*	yellow-bellied sheathtail bat	C		0	4	23/02/2013
834	Mammalia	Leporidae	*Oryctolagus cuniculus*	rabbit			0	1	1/02/2019
901	Mammalia	Macropodidae	*Macropus giganteus*	eastern grey kangaroo	C		0	1	1/02/2019
914	Mammalia	Macropodidae	*Notamacropus dorsalis*	black-striped wallaby	C		1	1	8/09/1968
904	Mammalia	Macropodidae	*Notamacropus rufogriseus*	red-necked wallaby	C		0	3	1/02/2019
885	Mammalia	Macropodidae	*Wallabia bicolor*	swamp wallaby	C		0	1	21/04/2012
989	Mammalia	Molossidae	*Austronomus australis*	white-striped freetail bat	C		0	1	22/02/2013
998	Mammalia	Molossidae	*Mormopterus lumsdenae*	northern free-tailed bat	C		0	1	22/02/2013
22060	Mammalia	Molossidae	*Mormopterus petersi*	inland free-tailed bat	C		0	4	24/02/2013

22061	Mammalia	Molossidae	*Mormopterus ridei*	eastern free-tailed bat	C		0	3	23/02/2013
764	Mammalia	Muridae	*Mus musculus*	house mouse			0	3	24/02/2014
859	Mammalia	Phalangeridae	*Trichosurus vulpecula*	common brushtail possum	C		0	1	26/02/2013
862	Mammalia	Potoroidae	*Aepyprymnus rufescens*	rufous bettong	C		0	2	1/02/2019
972	Mammalia	Vespertilionidae	*Chalinolobus gouldii*	Gould's wattled bat	C		0	5	23/02/2013
948	Mammalia	Vespertilionidae	*Chalinolobus picatus*	little pied bat	C		0	6	24/02/2013
939	Mammalia	Vespertilionidae	*Nyctophilus corbeni*	eastern long-eared bat	V	V	0	2	24/02/2013
935	Mammalia	Vespertilionidae	*Nyctophilus geoffroyi*	lesser long-eared bat	C		0	3	24/02/2014
936	Mammalia	Vespertilionidae	*Nyctophilus gouldi*	Gould's long-eared bat	C		0	3	24/02/2013
938	Mammalia	Vespertilionidae	*Nyctophilus sp.*		C		0	2	23/02/2013
931	Mammalia	Vespertilionidae	*Scotorepens greyii*	little broad-nosed bat	C		0	8	24/02/2013
933	Mammalia	Vespertilionidae	*Scotorepens sp.*		C		0	4	2/02/2002
929	Mammalia	Vespertilionidae	*Vespadelus vulturnus*	little forest bat	C		0	9	24/02/2013
567	Reptilia	Agamidae	*Diporiphora australis*	tommy roundhead	C		0	3	1/02/2019
554	Reptilia	Agamidae	*Intellagama lesueurii*	eastern water dragon	C		0	2	20/03/2014
556	Reptilia	Agamidae	*Pogona barbata*	bearded dragon	C		1	4	1/02/2019
62	Reptilia	Chelidae	*Chelodina expansa*	broad-shelled river turtle	C		0	1	21/02/2013
404	Reptilia	Diplodactylidae	*Amalosia rhombifer sensu lato*	zigzag velvet gecko			0	1	1/02/2019
391	Reptilia	Diplodactylidae	*Amalosia robusta*	robust velvet gecko	C		0	1	1/02/2019
429	Reptilia	Diplodactylidae	*Diplodactylus vittatus*	wood gecko	C		0	4	1/02/2019
368	Reptilia	Diplodactylidae	*Strophurus taenicauda*	golden-tailed gecko	NT		0	9	1/02/2019
460	Reptilia	Elapidae	*Brachyurophis australis*	coral snake	C		1	2	1/02/2019
457	Reptilia	Elapidae	*Cryptophis nigrescens*	eastern small-eyed snake	C		0	2	20/02/2013
493	Reptilia	Elapidae	*Demansia psammophis*	yellow-faced whipsnake	C		0	3	1/02/2019

432	Reptilia	Gekkonidae	*Gehyra catenata*	chain-backed dtella	C		0	1	1/02/2019
420	Reptilia	Gekkonidae	*Gehyra dubia*	dubious dtella	C		0	3	22/02/2014
413	Reptilia	Gekkonidae	*Heteronotia binoei*	Bynoe's gecko	C		0	6	20/02/2015
304	Reptilia	Scincidae	*Anomalopus leuckartii*	two-clawed worm-skink	C		0	1	19/02/2013
294	Reptilia	Scincidae	*Carlia munda*	shaded-litter rainbow-skink	C		0	4	24/02/2014
34646	Reptilia	Scincidae	*Carlia pectoralis*	open-litter rainbow skink	C		0	2	22/02/2014
297	Reptilia	Scincidae	*Carlia pectoralis sensu lato*				1	3	6/02/2002
277	Reptilia	Scincidae	*Carlia vivax*	tussock rainbow-skink	C		0	3	1/02/2019
31898	Reptilia	Scincidae	*Cryptoblepharus pulcher pulcher*	elegant snake-eyed skink	C		0	4	1/02/2019
263	Reptilia	Scincidae	*Ctenotus allotropis*	brown-blazed wedgesnout ctenotus	C		0	3	24/02/2014
240	Reptilia	Scincidae	*Ctenotus spaldingi*	straight-browed ctenotus	C		0	9	18/02/2015
243	Reptilia	Scincidae	*Ctenotus taeniolatus*	copper-tailed skink	C		0	3	21/02/2013
190	Reptilia	Scincidae	*Eulamprus quoyii*	eastern water skink	C		0	1	24/02/2013
167	Reptilia	Scincidae	*Lerista fragilis*	eastern mulch slider	C		0	11	1/02/2019
155	Reptilia	Scincidae	*Lerista timida*	timid slider	C		0	2	16/08/2014
150	Reptilia	Scincidae	*Lygisaurus foliorum*	tree-base litter-skink	C		0	5	1/02/2019
127	Reptilia	Scincidae	*Menetia greyii*	common dwarf skink	C		0	2	1/02/2019
132	Reptilia	Scincidae	*Pygmaeascincus timlowi*	dwarf litter-skink	C		0	1	1/02/2002
91	Reptilia	Typhlopidae	*Anilios ligatus*	robust blind snake	C		0	1	25/02/2014
78	Reptilia	Varanidae	*Varanus gouldii*	sand monitor	C		0	1	1/02/2019
74	Reptilia	Varanidae	*Varanus panoptes*	yellow-spotted monitor	C		0	2	23/02/2014
71	Reptilia	Varanidae	*Varanus sp.*	goanna	C		0	1	6/02/2002
60	Reptilia	Varanidae	*Varanus tristis*	black-tailed monitor	C		0	3	1/02/2019
61	Reptilia	Varanidae	*Varanus varius*	lace monitor	C		0	5	1/02/2019

Table 3. Plants recorded within the area of interest and its one kilometre buffer

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
16256	Equisetopsida	Acanthaceae	*Rostellularia adscendens var. adscendens*		C		0	1	20/03/2014
15150	Equisetopsida	Apiaceae	*Platysace ericoides*	heath platysace	C		0	1	20/03/2014
14984	Equisetopsida	Araliaceae	*Trachymene ochracea*	white parsnip	C		1	1	3/04/2019
16770	Equisetopsida	Asparagaceae	*Lomandra filiformis subsp. filiformis*		C		0	1	11/10/2001
12407	Equisetopsida	Asparagaceae	*Lomandra leucocephala*		C		0	1	11/10/2001
16774	Equisetopsida	Asparagaceae	*Lomandra leucocephala subsp. leucocephala*		C		0	1	20/03/2014
16776	Equisetopsida	Asparagaceae	*Lomandra longifolia*		C		0	1	20/03/2014
42307	Equisetopsida	Asteraceae	*Brachyscome stenoloba*		C		1	1	2/07/2024
8398	Equisetopsida	Asteraceae	*Chrysocephalum apiculatum*	yellow buttons	C		0	2	20/03/2014
29576	Equisetopsida	Asteraceae	*Coronidium oxylepis subsp. lanatum*		C		1	1	27/05/2020
22237	Equisetopsida	Asteraceae	*Cyanthillium cinereum*		C		0	1	12/12/2013
26777	Equisetopsida	Asteraceae	*Leiocarpa semicalva subsp. tenuifolia*		C		1	1	16/09/2024
42101	Equisetopsida	Asteraceae	*Olearia minor*		C		1	1	21/06/2023
8366	Equisetopsida	Asteraceae	*Ozothamnus diosmifolius*	white dogwood	C		1	1	7/12/2018
15103	Equisetopsida	Asteraceae	*Rutidosis murchisonii*		C		1	2	12/12/2013
18909	Equisetopsida	Byblidaceae	*Byblis liniflora*		SL		2	3	11/04/2024
18011	Equisetopsida	Casuarinaceae	*Allocasuarina inophloia*		C		0	16	1/12/2001
18013	Equisetopsida	Casuarinaceae	*Allocasuarina luehmannii*	bull oak	C		0	3	20/03/2014
17175	Equisetopsida	Convolvulaceae	*Evolvulus alsinoides var. decumbens*		C		0	1	20/03/2014
17757	Equisetopsida	Cupressaceae	*Callitris endlicheri*	black cypress pine	C		1	6	3/05/2018
8221	Equisetopsida	Cupressaceae	*Callitris glaucophylla*	white cypress pine	C		0	5	20/03/2014
17107	Equisetopsida	Cyperaceae	*Fimbristylis dichotoma*	common fringe-rush	C		0	2	20/03/2014
17078	Equisetopsida	Cyperaceae	*Gahnia aspera*		C		0	1	12/12/2013

11902	Equisetopsida	Cyperaceae	*Schoenus kennyi*		C		0	1	12/12/2013
9452	Equisetopsida	Dilleniaceae	*Hibbertia stricta*		C		0	1	20/03/2014
16947	Equisetopsida	Dilleniaceae	*Hibbertia stricta var. stricta*		C		0	1	11/10/2001
17345	Equisetopsida	Droseraceae	*Drosera burmanni*		SL		0	1	16/02/2002
35068	Equisetopsida	Droseraceae	*Drosera finlaysoniana*		SL		0	1	16/02/2002
30299	Equisetopsida	Ericaceae	*Agiortia pleiosperma*		C		1	2	20/03/2014
6414	Equisetopsida	Ericaceae	*Brachyloma daphnoides subsp. daphnoides*		C		0	1	11/10/2001
13593	Equisetopsida	Ericaceae	*Melichrus adpressus*		C		0	1	11/10/2001
6299	Equisetopsida	Ericaceae	*Melichrus sp. (Isla Gorge P.Sharpe+ 601)*		C		0	1	11/10/2001
16662	Equisetopsida	Ericaceae	*Melichrus urceolatus*	honey gorse	C		0	1	20/03/2014
41515	Equisetopsida	Ericaceae	*Styphelia mitchellii*		C		0	1	11/10/2001
42342	Equisetopsida	Ericaceae	*Styphelia sparsa*		C		0	1	20/03/2014
5309	Equisetopsida	Euphorbiaceae	*Euphorbia dallachyana*		C		1	1	19/05/2023
14675	Equisetopsida	Goodeniaceae	*Dampiera adpressa*		C		0	2	20/03/2014
11018	Equisetopsida	Goodeniaceae	*Goodenia delicata*		C		0	1	12/12/2013
10696	Equisetopsida	Haloragaceae	*Gonocarpus urceolatus*		C		1	1	16/12/2014
17464	Equisetopsida	Hemerocallidaceae	*Dianella caerulea*		C		0	1	11/10/2001
41035	Equisetopsida	Lamiaceae	*Coleus australis*		C		0	1	20/03/2014
14963	Equisetopsida	Lamiaceae	*Westringia cheelii*		C		1	1	12/08/2021
16859	Equisetopsida	Laxmanniaceae	*Laxmannia gracilis*	slender wire lily	C		0	1	12/12/2013
14900	Equisetopsida	Leguminosae	*Acacia burbidgeae*		C		2	2	27/02/2020
15784	Equisetopsida	Leguminosae	*Acacia caroleae*		C		0	5	20/03/2014
14932	Equisetopsida	Leguminosae	*Acacia conferta*		C		0	6	20/03/2014
15792	Equisetopsida	Leguminosae	*Acacia crassa subsp. crassa*		C		0	1	20/03/2014

15793	Equisetopsida	Leguminosae	*Acacia crassa subsp. longicoma*		C		1	1	6/03/2020
15747	Equisetopsida	Leguminosae	*Acacia flexifolia*		C		1	1	20/05/2020
14937	Equisetopsida	Leguminosae	*Acacia floribunda*	white sally wattle	C		0	1	1/12/2001
14916	Equisetopsida	Leguminosae	*Acacia ixiophylla*		C		0	1	1/12/2001
7558	Equisetopsida	Leguminosae	*Acacia julifera subsp. julifera*		C		1	1	18/04/2020
14066	Equisetopsida	Leguminosae	*Acacia leiocalyx subsp. leiocalyx*		C		0	1	20/03/2014
14082	Equisetopsida	Leguminosae	*Acacia semilunata*	crescent-leaved wattle	C		0	3	1/12/2001
14083	Equisetopsida	Leguminosae	*Acacia sparsiflora*		C		0	1	12/12/2013
14891	Equisetopsida	Leguminosae	*Acacia spectabilis*	pilliga wattle	C		0	1	20/03/2014
15708	Equisetopsida	Leguminosae	*Acacia triptera*		C		1	1	8/05/2020
34542	Equisetopsida	Leguminosae	*Bossiaea concolor*		C		1	1	7/07/2022
15529	Equisetopsida	Leguminosae	*Chorizema parviflorum*	eastern flame pea	C		0	1	12/12/2013
14625	Equisetopsida	Leguminosae	*Daviesia filipes*		C		0	1	20/03/2014
14630	Equisetopsida	Leguminosae	*Daviesia villifera*	prickly daviesia	C		0	1	20/03/2014
15309	Equisetopsida	Leguminosae	*Hardenbergia violacea*		C		1	2	23/07/2025
15260	Equisetopsida	Leguminosae	*Jacksonia scoparia*		C		0	1	20/03/2014
15189	Equisetopsida	Leguminosae	*Mirbelia aotoides*		C		1	1	7/07/2022
15191	Equisetopsida	Leguminosae	*Mirbelia pungens*		C		1	1	7/12/2018
17998	Equisetopsida	Myrtaceae	*Angophora floribunda*	rough-barked apple	C		0	1	20/03/2014
17999	Equisetopsida	Myrtaceae	*Angophora leiocarpa*	rusty gum	C		0	2	20/03/2014
42433	Equisetopsida	Myrtaceae	*Blakella bloxsomei*		C		0	70	20/03/2014
42249	Equisetopsida	Myrtaceae	*Blakella citriodora*		C		0	1	20/03/2014
17762	Equisetopsida	Myrtaceae	*Calytrix gurulmundensis*		V	V	0	2	12/12/2013
17766	Equisetopsida	Myrtaceae	*Calytrix tetragona*	fringe myrtle	C		0	1	11/10/2001

17249	Equisetopsida	Myrtaceae	*Eucalyptus chloroclada*	Baradine red gum	C		1	4	13/06/2020
17252	Equisetopsida	Myrtaceae	*Eucalyptus crebra*	narrow-leaved red ironbark	C		0	6	1/12/2001
17254	Equisetopsida	Myrtaceae	*Eucalyptus crebra x Eucalyptus populnea*		C		0	1	11/10/2001
30502	Equisetopsida	Myrtaceae	*Eucalyptus elegans*		C		0	1	20/03/2014
17262	Equisetopsida	Myrtaceae	*Eucalyptus exserta*	Queensland peppermint	C		0	2	12/12/2013
17220	Equisetopsida	Myrtaceae	*Eucalyptus longirostrata*		C		0	2	20/03/2014
17203	Equisetopsida	Myrtaceae	*Eucalyptus tenuipes*	narrow-leaved white mahogany	C		0	2	2/12/2009
17204	Equisetopsida	Myrtaceae	*Eucalyptus tereticornis*		C		0	1	20/03/2014
13609	Equisetopsida	Myrtaceae	*Eucalyptus viridis*		C		0	1	12/12/2013
9020	Equisetopsida	Myrtaceae	*Homoranthus melanostictus*		C		0	3	11/10/2001
16918	Equisetopsida	Myrtaceae	*Homoranthus papillatus*	mouse bush	CR		0	1	1/12/2001
14480	Equisetopsida	Myrtaceae	*Kunzea opposita*		C		0	3	20/03/2014
18863	Equisetopsida	Myrtaceae	*Kunzea opposita var. opposita*		C		1	2	17/07/2021
14441	Equisetopsida	Myrtaceae	*Leptospermum polygalifolium*	tantoon	C		0	4	20/03/2014
16744	Equisetopsida	Myrtaceae	*Lysicarpus angustifolius*	budgeroo	C		0	29	20/03/2014
18707	Equisetopsida	Myrtaceae	*Micromyrtus gracilis*		C		1	1	17/07/2021
16653	Equisetopsida	Myrtaceae	*Micromyrtus leptocalyx*		C		0	1	1/12/2001
16654	Equisetopsida	Myrtaceae	*Micromyrtus sessilis*		C		0	1	12/12/2013
31824	Equisetopsida	Orchidaceae	*Cyanicula caerulea*		SL		1	1	6/08/2015
16473	Equisetopsida	Phyllanthaceae	*Phyllanthus virgatus*		C		0	1	12/12/2013
16505	Equisetopsida	Picrodendraceae	*Petalostigma pubescens*	quinine tree	C		0	1	1/12/2001
18437	Equisetopsida	Poaceae	*Amphipogon caricinus*		C		0	1	12/12/2013
13707	Equisetopsida	Poaceae	*Aristida calycina*		C		0	1	12/12/2013
15650	Equisetopsida	Poaceae	*Aristida caput-medusae*		C		0	1	12/12/2013

15652	Equisetopsida	Poaceae	*Aristida holathera var. holathera*		C		1	1	27/08/2019
9349	Equisetopsida	Poaceae	*Aristida jerichoensis*		C		1	2	28/08/2019
15655	Equisetopsida	Poaceae	*Aristida jerichoensis var. jerichoensis*		C		0	1	11/10/2001
11517	Equisetopsida	Poaceae	*Aristida jerichoensis var. subspinulifera*		C		0	1	11/10/2001
9957	Equisetopsida	Poaceae	*Aristida leichhardtiana*		C		1	1	14/09/2019
9661	Equisetopsida	Poaceae	*Aristida ramosa*	purple wiregrass	C		0	2	12/12/2013
15634	Equisetopsida	Poaceae	*Arundinella nepalensis*	reedgrass	C		0	1	20/03/2014
15531	Equisetopsida	Poaceae	*Chrysopogon fallax*		C		0	1	12/12/2013
15498	Equisetopsida	Poaceae	*Cleistochloa subjuncea*		C		1	1	24/11/2019
15485	Equisetopsida	Poaceae	*Cymbopogon refractus*	barbed-wire grass	C		0	3	20/03/2014
33749	Equisetopsida	Poaceae	*Dimorphochloa rigida*		C		1	1	17/11/2019
15411	Equisetopsida	Poaceae	*Entolasia stricta*	wiry panic	C		0	1	12/12/2013
15390	Equisetopsida	Poaceae	*Eragrostis brownii*	Brown's lovegrass	C		0	1	12/12/2013
14587	Equisetopsida	Poaceae	*Eragrostis pubescens*		C		0	1	1/12/2001
15373	Equisetopsida	Poaceae	*Eragrostis sororia*		C		0	1	20/03/2014
15380	Equisetopsida	Poaceae	*Eremochloa bimaculata*	poverty grass	C		1	3	26/04/2020
10729	Equisetopsida	Poaceae	*Eriachne mucronata*		C		0	1	1/12/2001
7143	Equisetopsida	Poaceae	*Eriachne mucronata forma (Alpha C.E.Hubbard 7882)*		C		0	1	11/10/2001
15386	Equisetopsida	Poaceae	*Eriachne pallescens*		C		0	1	12/12/2013
15336	Equisetopsida	Poaceae	*Eulalia aurea*	silky browntop	C		1	1	4/11/2020
15290	Equisetopsida	Poaceae	*Imperata cylindrica*	blady grass	C		0	1	20/03/2014
9599	Equisetopsida	Poaceae	*Panicum decompositum*		C		0	1	12/12/2013
18424	Equisetopsida	Poaceae	*Panicum simile*		C		0	1	12/12/2013
14345	Equisetopsida	Poaceae	*Paspalidium distans*	shotgrass	C		0	1	12/12/2013

15147	Equisetopsida	Poaceae	*Phragmites australis*	common reed	C		0	1	20/03/2014
15056	Equisetopsida	Poaceae	*Schizachyrium fragile*	firegrass	C		2	2	11/03/2020
15001	Equisetopsida	Poaceae	*Sporobolus creber*		C		0	1	20/03/2014
14974	Equisetopsida	Poaceae	*Themeda triandra*	kangaroo grass	C		0	2	20/03/2014
14978	Equisetopsida	Poaceae	*Thyridolepis xerophila*		C		1	1	4/01/2022
9342	Equisetopsida	Poaceae	*Triodia mitchellii*	buck spinifex	C		1	3	15/12/2019
18396	Equisetopsida	Poaceae	*Triodia scariosa*		C		0	1	20/03/2014
14995	Equisetopsida	Poaceae	*Tripogon loliiformis*	five minute grass	C		0	1	12/12/2013
38659	Equisetopsida	Poaceae	*Urochloa trichopus*				0	1	20/03/2014
18877	Equisetopsida	Proteaceae	*Grevillea floribunda*		C		0	1	1/12/2001
17030	Equisetopsida	Proteaceae	*Grevillea floribunda subsp. floribunda*		C		0	1	20/03/2014
17012	Equisetopsida	Proteaceae	*Hakea purpurea*		C		0	4	20/03/2014
16500	Equisetopsida	Proteaceae	*Persoonia sericea*	silky geebung	C		1	1	6/08/2015
15892	Equisetopsida	Proteaceae	*Xylomelum cunninghamianum*		C		0	2	20/03/2014
17679	Equisetopsida	Pteridaceae	*Cheilanthes distans*	bristly cloak fern	C		0	1	20/03/2014
8916	Equisetopsida	Pteridaceae	*Cheilanthes sieberi*		C		0	1	12/12/2013
11100	Equisetopsida	Pteridaceae	*Cheilanthes tenuifolia*	rock fern	C		0	1	1/12/2001
9659	Equisetopsida	Rhamnaceae	*Alphitonia excelsa*	soap tree	C		1	1	18/07/2022
29777	Equisetopsida	Rhamnaceae	*Cryptandra ciliata*		NT		1	1	25/11/2022
41636	Equisetopsida	Rutaceae	*Cyanothamnus occidentalis*		C		0	1	12/12/2013
17419	Equisetopsida	Sapindaceae	*Dodonaea boroniifolia*		C		0	1	20/03/2014
13655	Equisetopsida	Sapindaceae	*Dodonaea macrossanii*		C		0	1	20/03/2014
17383	Equisetopsida	Sapindaceae	*Dodonaea triangularis*		C		1	2	10/07/2023
13538	Equisetopsida	Solanaceae	*Solanum cleistogamum*		C		1	1	28/05/2020

29813	Equisetopsida	Solanaceae	*Solanum jucundum*		C		2	2	8/12/2022
16438	Equisetopsida	Thymelaeaceae	*Pimelea linifolia subsp. linifolia*		C		0	1	11/10/2001
15934	Equisetopsida	Xanthorrhoeaceae	*Xanthorrhoea johnsonii*		SL		0	11	20/03/2014

Table 4. Fungi recorded within the area of interest and its one kilometre buffer

No species found within the area of interest and its one kilometre buffer.

Table 5. Other species recorded within the area of interest and its one kilometre buffer

No species found within the area of interest and its one kilometre buffer.

Species table headings and codes
Taxon Id: Unique identifier of the taxon from the WildNet database.
NCA: Queensland conservation status of the taxon under the *Nature Conservation Act 1992* (Least Concern (C), Critically Endangered (CR), Endangered (E), Extinct (EX), Near Threatened (NT), Extinct in the Wild (PE), Special Least Concern (SL), and Vulnerable (V)).
EPBC: Australian conservation status of the taxon under the *Environment Protection and Biodiversity Conservation Act 1999* (Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Vulnerable (V), and Extinct in the Wild (XW)).
Specimens: The number of specimen-backed records of the taxon.
Records: The total number of records of the taxon.
Last record: Date of most recent record of the taxon.

Links and Support

Other sites that deliver species information from the WildNet database include:

- WildNet Application - public interface to find species information and species lists generated from the WildNet database.
- Biomaps - view biodiversity information, including WildNet records approved for publication, and generate reports
- Queensland Globe - view spatial information, including WildNet records approved for publication
- Qld WildNet Data API - access WildNet species information approved for publication such as notes, images and records etc.
- Wetland*Maps* - view species records, survey locations etc. approved for publication
- Wetland*Summary* - view wildlife statistics, species lists for a range of area types, and access WildNet species profiles
- WildNet wildlife records - published - Queensland - spatial layer of WildNet records approved for publication generated weekly
- Generalised distribution and densities of Queensland wildlife - Queensland species distributions and densities generalised to a 10 km grid resolution
- Conservation status of Queensland wildlife - access current lists of priority species for Queensland including nomenclature and status information
- Queensland Confidential Species - the list of species flagged as confidential in the WildNet database.

Please direct queries about this report to the WildNet Team WildNet@detsi.qld.gov.au.

Other useful sites for accessing Queensland biodiversity data include:

- Useful wildlife resources
- Queensland Government Data
- Atlas of Living Australia (ALA)
- Online Zoological Collections of Australian Museums (OZCAM)
- Australasian Virtual Herbarium (AVH)
- Protected Matters Search Tool

Disclaimer

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WildNet Records
Species List

For the selected area of interest 23003.02 PL: 492
Current as at 03/03/2026 WildNetSpeciesList

Summary Information
The following table provides an overview of the area of interest: PL: 492

Table 1. Area of interest details

Size (ha)	
23,003.02	
Local Government(s)	
Western Downs Regional	
Catchment(s)	
Balonne-Condamine	
Bioregion(s)	**Subregion(s)**
Brigalow Belt	Barakula

Protected Area(s) The following estates and/or reserves are located in the area of interest:

Barakula State Forest

World Heritage Area(s)

No World Heritage Areas are located within the area of interest.

Ramsar Area(s)

No Ramsar Areas are located within the area of interest.

Introduction
This WildNet report is derived from a spatial layer that is generated from the WildNet database, managed by the Department of the Environment, Tourism, Science and Innovation. The layer, which is generated weekly, contains a subset of WildNet wildlife records that are not classed as erroneous or duplicate, that have a location precision equal to or less than 10000 metres and do not have a count of zero. It does not include aspatial data such as some baseline species lists created for some protected areas.

The WildNet dataset is constantly being enhanced and the taxonomic and status information revised. If a species is not listed in this report, it does not mean it doesn't occur there and listed species may also no longer inhabit the area. It is recommended that you also access other internal and external data sources for species information in your area of interest.

The WildNet Application may provide additional information on species occurence within your area of interest.

Species data

Contextual location information is presented in Map 1.

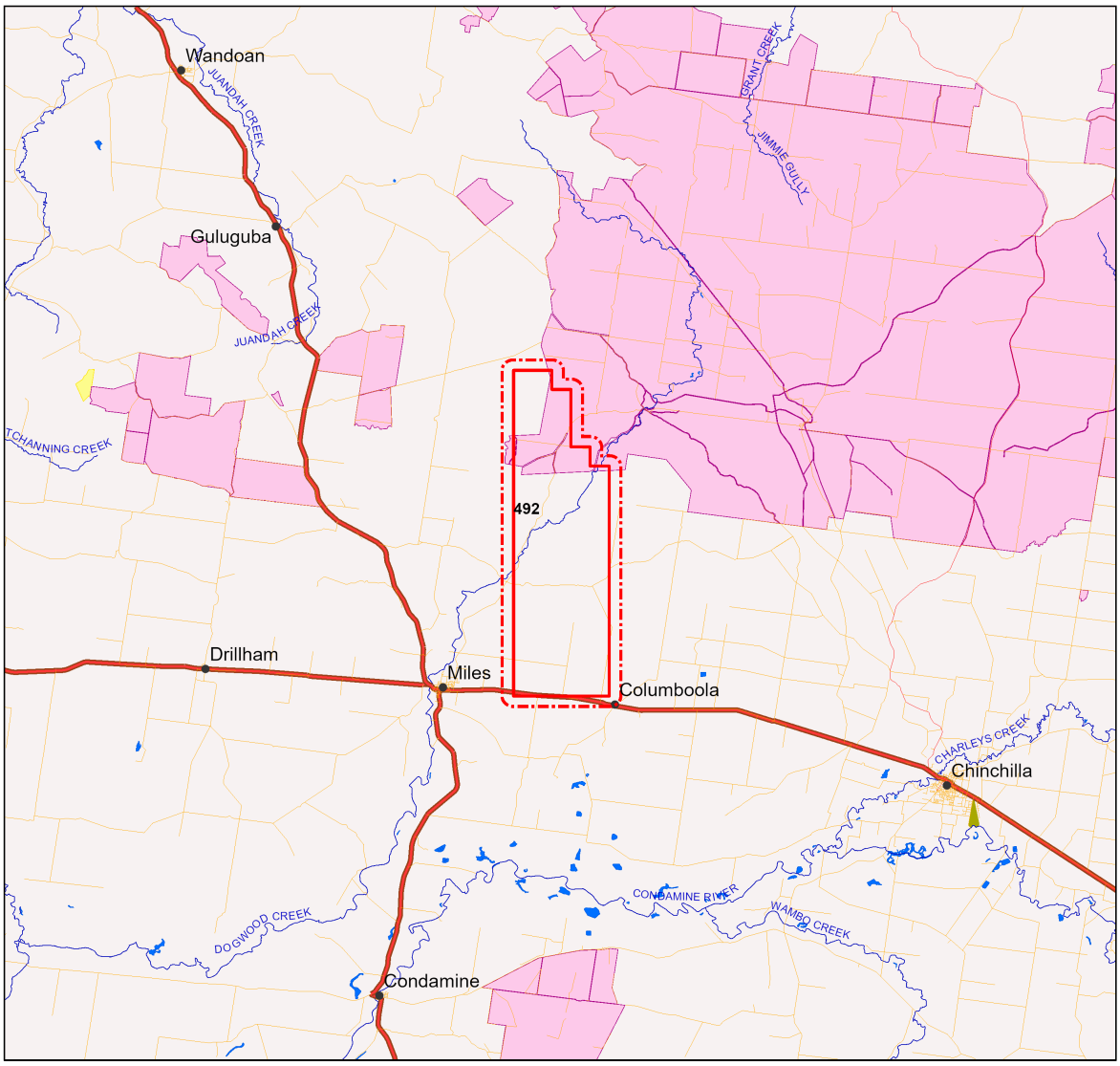
Table 2 lists the animals recorded within the area of interest and its one kilometre buffer.

Table 3 lists the plants recorded within the area of interest and its one kilometre buffer.

Table 4 lists the fungi recorded within the area of interest and its one kilometre buffer.

Table 5 lists the other species recorded within the area of interest and its one kilometre buffer.

Map 1. Locality Map

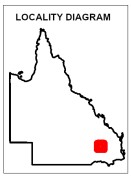


Locality Map

Legend

- Towns
- Freeways/Highways
- Connector
- Street/Local Road
- Lakes and reservoirs
- National Park
- National Park (Scientific)
- National Park (CYPAL)
- National Park (Aboriginal Land)
- Conservation Park
- Resources Reserve
- Forest Reserve
- State Forest
- Timber Reserve
- Nature Refuges
- Coordinated Conservation Areas
- Major rivers/creeks
- Queensland
- Selected Petroleum Lease (PL)
- 1 kilometre buffer

LOCALITY DIAGRAM



N

0 5000 10000 15000 20000 25000 m

This product is displayed in GDA2020

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Table 2. Animals recorded within the area of interest and its one kilometre buffer

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
26941	Actinopterygii	Clupeidae	*Nematalosa erebi*	bony bream			0	1	23/02/2013
33897	Actinopterygii	Eleotridae	*Hypseleotris sp.*				0	1	23/02/2013
26957	Actinopterygii	Eleotridae	*Hypseleotris species 1*	Midgley's carp gudgeon			0	1	23/02/2013
27025	Actinopterygii	Melanotaeniidae	*Melanotaenia fluviatilis*	Murray River rainbowfish			0	1	23/02/2013
27041	Actinopterygii	Percichthyidae	*Maccullochella peelii*	Murray cod		V	0	1	23/02/2013
27055	Actinopterygii	Poeciliidae	*Gambusia holbrooki*	mosquitofish			0	1	23/02/2013
27061	Actinopterygii	Retropinnidae	*Retropinna semoni*	Australian smelt			0	1	23/02/2013
27089	Actinopterygii	Terapontidae	*Leiopotherapon unicolor*	spangled perch			0	1	23/02/2013
716	Amphibia	Bufonidae	*Rhinella marina*	cane toad			0	15	5/11/2016
624	Amphibia	Hylidae	*Cyclorana alboguttata*	greenstripe frog	C		0	4	1/05/2014
620	Amphibia	Hylidae	*Cyclorana novaehollandiae*	eastern snapping frog	C		0	2	22/02/2013
627	Amphibia	Hylidae	*Litoria caerulea*	common green treefrog	C		0	13	5/11/2016
608	Amphibia	Hylidae	*Litoria fallax*	eastern sedgefrog	C		0	3	5/11/2016
614	Amphibia	Hylidae	*Litoria latopalmata*	broad palmed rocketfrog	C		0	5	5/11/2016
596	Amphibia	Hylidae	*Litoria peronii*	emerald spotted treefrog	C		0	3	5/11/2016
600	Amphibia	Hylidae	*Litoria rubella*	ruddy treefrog	C		0	8	5/11/2016
679	Amphibia	Limnodynastidae	*Limnodynastes fletcheri*	barking frog	C		0	2	5/11/2016
682	Amphibia	Limnodynastidae	*Limnodynastes salmini*	salmon striped frog	C		0	6	5/11/2016
684	Amphibia	Limnodynastidae	*Limnodynastes tasmaniensis*	spotted grassfrog	C		0	7	5/11/2016
673	Amphibia	Limnodynastidae	*Limnodynastes terraereginae*	scarlet sided pobblebonk	C		0	8	25/02/2013
668	Amphibia	Limnodynastidae	*Notaden bennettii*	holy cross frog	C		0	3	7/05/2014
680	Amphibia	Limnodynastidae	*Platyplectrum ornatum*	ornate burrowing frog	C		0	24	5/11/2016
695	Amphibia	Myobatrachidae	*Crinia deserticola*	chirping froglet	C		0	1	2/11/2005

696	Amphibia	Myobatrachidae	*Crinia parinsignifera*	beeping froglet	C		5	7	12/08/2020
659	Amphibia	Myobatrachidae	*Pseudophryne major*	great brown broodfrog	C		4	5	17/05/2023
639	Amphibia	Myobatrachidae	*Uperoleia rugosa*	chubby gungan	C		0	3	5/11/2016
1418	Aves	Acanthizidae	*Acanthiza apicalis*	inland thornbill	C		0	10	5/11/2016
1419	Aves	Acanthizidae	*Acanthiza chrysorrhoa*	yellow-rumped thornbill	C		0	6	5/11/2016
1421	Aves	Acanthizidae	*Acanthiza lineata*	striated thornbill	C		0	1	5/11/2016
1422	Aves	Acanthizidae	*Acanthiza nana*	yellow thornbill	C		0	12	5/11/2016
1423	Aves	Acanthizidae	*Acanthiza pusilla*	brown thornbill	C		0	3	30/01/2010
1425	Aves	Acanthizidae	*Acanthiza reguloides*	buff-rumped thornbill	C		0	2	20/09/2002
1412	Aves	Acanthizidae	*Acanthiza uropygialis*	chestnut-rumped thornbill	C		0	1	5/01/2005
1407	Aves	Acanthizidae	*Gerygone fusca*	western gerygone	C		0	2	2/11/2005
1396	Aves	Acanthizidae	*Gerygone olivacea*	white-throated gerygone	C		0	10	5/11/2016
1403	Aves	Acanthizidae	*Pyrrholaemus sagittatus*	speckled warbler	C		0	5	5/11/2016
1371	Aves	Acanthizidae	*Smicrornis brevirostris*	weebill	C		0	31	5/11/2016
1729	Aves	Accipitridae	*Accipiter fasciatus*	brown goshawk	C		0	2	5/11/2016
1732	Aves	Accipitridae	*Aquila audax*	wedge-tailed eagle	C		0	6	5/11/2016
1721	Aves	Accipitridae	*Aviceda subcristata*	Pacific baza	C		0	3	2/11/2005
1707	Aves	Accipitridae	*Haliastur sphenurus*	whistling kite	C		0	2	22/02/2013
1710	Aves	Accipitridae	*Hieraaetus morphnoides*	little eagle	C		0	1	5/11/2016
1714	Aves	Accipitridae	*Milvus migrans*	black kite	C		0	1	2/09/2003
1973	Aves	Aegothelidae	*Aegotheles cristatus*	Australian owlet-nightjar	C		0	9	25/02/2013
1652	Aves	Alaudidae	*Mirafra javanica*	Horsfield's bushlark	C		0	1	5/11/2016
1767	Aves	Alcedinidae	*Dacelo novaeguineae*	laughing kookaburra	C		0	19	5/11/2016
1762	Aves	Alcedinidae	*Todiramphus sanctus*	sacred kingfisher	C		0	8	5/11/2016

1993	Aves	Anatidae	*Anas gracilis*	grey teal	C		0	2	5/11/2016
1998	Aves	Anatidae	*Anas superciliosa*	Pacific black duck	C		0	5	14/05/2007
2003	Aves	Anatidae	*Chenonetta jubata*	Australian wood duck	C		0	8	5/11/2016
1279	Aves	Anhingidae	*Anhinga novaehollandiae*	Australasian darter	C		0	5	2/11/2005
1971	Aves	Apodidae	*Hirundapus caudacutus*	white-throated needletail	V	V	0	1	5/01/2005
1832	Aves	Ardeidae	*Ardea pacifica*	white-necked heron	C		0	3	5/11/2016
1826	Aves	Ardeidae	*Egretta novaehollandiae*	white-faced heron	C		0	4	5/11/2016
1660	Aves	Artamidae	*Artamus leucorynchus*	white-breasted woodswallow	C		0	5	2/11/2005
1646	Aves	Artamidae	*Artamus minor*	little woodswallow	C		0	1	12/04/1999
1647	Aves	Artamidae	*Artamus personatus*	masked woodswallow	C		0	1	23/02/2013
1649	Aves	Artamidae	*Artamus superciliosus*	white-browed woodswallow	C		0	6	23/02/2013
1654	Aves	Artamidae	*Cracticus nigrogularis*	pied butcherbird	C		0	22	5/11/2016
1656	Aves	Artamidae	*Cracticus torquatus*	grey butcherbird	C		0	22	5/11/2016
1644	Aves	Artamidae	*Gymnorhina tibicen*	Australian magpie	C		0	15	5/11/2016
1645	Aves	Artamidae	*Strepera graculina*	pied currawong	C		0	12	5/11/2016
1191	Aves	Cacatuidae	*Cacatua galerita*	sulphur-crested cockatoo	C		0	10	5/11/2016
1194	Aves	Cacatuidae	*Cacatua sanguinea*	little corella	C		0	1	2/09/2003
22494	Aves	Cacatuidae	*Calyptorhynchus lathami lathami*	glossy black-cockatoo (eastern)	V	V	0	2	5/11/2016
1193	Aves	Cacatuidae	*Eolophus roseicapilla*	galah	C		0	19	5/11/2016
1173	Aves	Cacatuidae	*Nymphicus hollandicus*	cockatiel	C		0	10	23/02/2013
1185	Aves	Cacatuidae	*Zanda funerea*	yellow-tailed black-cockatoo	C		0	1	31/12/1979
1635	Aves	Campephagidae	*Coracina maxima*	ground cuckoo-shrike	C		0	1	5/11/2016
1636	Aves	Campephagidae	*Coracina novaehollandiae*	black-faced cuckoo-shrike	C		0	9	5/11/2016
1637	Aves	Campephagidae	*Coracina papuensis*	white-bellied cuckoo -shrike	C		0	4	5/11/2016

1639	Aves	Campephagidae	*Edolisoma tenuirostre*	common cicadabird	C		0	12	5/11/2016
1642	Aves	Campephagidae	*Lalage tricolor*	white-winged triller	C		0	3	2/11/2005
1089	Aves	Casuariidae	*Dromaius novaehollandiae*	emu	C		0	3	5/11/2016
1940	Aves	Charadriidae	*Elseyornis melanops*	black-fronted dotterel	C		0	1	5/11/2016
27774	Aves	Charadriidae	*Vanellus miles*	masked lapwing	C		0	1	2/11/2005
1933	Aves	Charadriidae	*Vanellus miles novaehollandiae*	masked lapwing (southern subspecies)	C		0	1	2/11/2005
1820	Aves	Ciconiidae	*Ephippiorhynchus asiaticus*	black-necked stork	C		0	1	12/12/1995
18293	Aves	Climacteridae	*Cormobates leucophaea metastasis*	white-throated treecreeper (southern)	C		0	1	22/02/2013
1804	Aves	Columbidae	*Columba livia*	rock dove			0	2	2/09/2003
1810	Aves	Columbidae	*Geopelia humeralis*	bar-shouldered dove	C		0	10	23/02/2013
18323	Aves	Columbidae	*Geopelia placida*	peaceful dove	C		0	11	5/11/2016
1793	Aves	Columbidae	*Ocyphaps lophotes*	crested pigeon	C		0	12	5/11/2016
1795	Aves	Columbidae	*Phaps chalcoptera*	common bronzewing	C		0	2	5/11/2016
1779	Aves	Coraciidae	*Eurystomus orientalis*	dollarbird	C		0	7	5/11/2016
1603	Aves	Corcoracidae	*Corcorax melanorhamphos*	white-winged chough	C		0	2	5/11/2016
1605	Aves	Corcoracidae	*Struthidea cinerea*	apostlebird	C		0	12	5/11/2016
1607	Aves	Corvidae	*Corvus bennetti*	little crow	C		0	1	19/08/1998
1608	Aves	Corvidae	*Corvus coronoides*	Australian raven	C		0	9	5/11/2016
1609	Aves	Corvidae	*Corvus orru*	Torresian crow	C		0	32	5/11/2016
1610	Aves	Corvidae	*Corvus sp.*		C		0	2	17/07/2001
1750	Aves	Cuculidae	*Cacomantis pallidus*	pallid cuckoo	C		0	7	5/11/2016
1743	Aves	Cuculidae	*Cacomantis variolosus*	brush cuckoo	C		0	9	5/11/2016
1744	Aves	Cuculidae	*Chalcites basalis*	Horsfield's bronze-cuckoo	C		0	2	22/02/2013
1747	Aves	Cuculidae	*Chalcites osculans*	black-eared cuckoo	C		0	1	5/01/2005

1738	Aves	Cuculidae	*Eudynamys orientalis*	eastern koel	C		0	4	5/11/2016
1740	Aves	Cuculidae	*Scythrops novaehollandiae*	channel-billed cuckoo	C		0	2	2/09/2003
1611	Aves	Dicaeidae	*Dicaeum hirundinaceum*	mistletoebird	C		0	19	5/11/2016
1369	Aves	Estrildidae	*Neochmia modesta*	plum-headed finch	C		0	1	12/04/1999
1342	Aves	Estrildidae	*Taeniopygia bichenovii*	double-barred finch	C		0	4	5/11/2016
1343	Aves	Estrildidae	*Taeniopygia guttata*	zebra finch	C		0	2	14/05/2007
1949	Aves	Eurostopodidae	*Eurostopodus mystacalis*	white-throated nightjar	C		0	3	5/11/2016
1716	Aves	Falconidae	*Falco berigora*	brown falcon	C		0	5	5/11/2016
1704	Aves	Falconidae	*Falco cenchroides*	nankeen kestrel	C		0	7	5/11/2016
1692	Aves	Falconidae	*Falco peregrinus macropus*	Australian peregrine falcon	C		0	1	5/11/2016
1678	Aves	Gruidae	*Antigone rubicunda*	brolga	C		0	2	5/11/2016
1572	Aves	Hirundinidae	*Hirundo neoxena*	welcome swallow	C		0	3	5/11/2016
1585	Aves	Hirundinidae	*Petrochelidon ariel*	fairy martin	C		0	3	5/11/2016
1573	Aves	Hirundinidae	*Petrochelidon nigricans*	tree martin	C		0	1	31/10/1997
1292	Aves	Locustellidae	*Cincloramphus mathewsi*	rufous songlark	C		0	3	5/11/2016
1570	Aves	Maluridae	*Malurus cyaneus*	superb fairy-wren	C		0	8	2/11/2005
1556	Aves	Maluridae	*Malurus lamberti sensu lato*	variegated fairy-wren			0	7	23/02/2013
1558	Aves	Maluridae	*Malurus melanocephalus*	red-backed fairy-wren	C		0	1	5/11/2016
1552	Aves	Meliphagidae	*Acanthagenys rufogularis*	spiny-cheeked honeyeater	C		0	8	5/11/2016
1523	Aves	Meliphagidae	*Caligavis chrysops*	yellow-faced honeyeater	C		0	11	5/11/2016
1539	Aves	Meliphagidae	*Entomyzon cyanotis*	blue-faced honeyeater	C		0	15	5/11/2016
1517	Aves	Meliphagidae	*Lichenostomus melanops*	yellow-tufted honeyeater	C		0	4	23/02/2013
1497	Aves	Meliphagidae	*Lichmera indistincta*	brown honeyeater	C		0	8	5/11/2016
1499	Aves	Meliphagidae	*Manorina flavigula*	yellow-throated miner	C		0	14	5/11/2016

1500	Aves	Meliphagidae	*Manorina melanocephala*	noisy miner	C		0	18	5/11/2016
1502	Aves	Meliphagidae	*Manorina sp.*		C		0	4	23/02/2013
1507	Aves	Meliphagidae	*Melithreptus albogularis*	white-throated honeyeater	C		0	1	5/11/2016
1508	Aves	Meliphagidae	*Melithreptus brevirostris*	brown-headed honeyeater	C		0	9	5/11/2016
1483	Aves	Meliphagidae	*Melithreptus gularis*	black-chinned honeyeater	C		0	2	5/11/2016
1489	Aves	Meliphagidae	*Myzomela sanguinolenta*	scarlet honeyeater	C		0	3	5/11/2016
1516	Aves	Meliphagidae	*Nesoptilotis leucotis*	white-eared honeyeater	C		0	24	5/11/2016
1493	Aves	Meliphagidae	*Philemon citreogularis*	little friarbird	C		0	13	5/11/2016
1494	Aves	Meliphagidae	*Philemon corniculatus*	noisy friarbird	C		0	19	5/11/2016
1471	Aves	Meliphagidae	*Plectorhyncha lanceolata*	striped honeyeater	C		0	27	5/11/2016
1518	Aves	Meliphagidae	*Ptilotula penicillata*	white-plumed honeyeater	C		0	2	5/01/2005
1764	Aves	Meropidae	*Merops ornatus*	rainbow bee-eater	C		0	4	5/11/2016
1589	Aves	Monarchidae	*Grallina cyanoleuca*	magpie-lark	C		0	21	5/11/2016
1599	Aves	Monarchidae	*Myiagra cyanoleuca*	satin flycatcher	C		0	1	5/11/2016
1600	Aves	Monarchidae	*Myiagra inquieta*	restless flycatcher	C		0	1	14/05/2007
1586	Aves	Monarchidae	*Myiagra rubecula*	leaden flycatcher	C		0	11	5/11/2016
1455	Aves	Motacillidae	*Anthus novaeseelandiae*	Australasian pipit	C		0	5	5/11/2016
1453	Aves	Neosittidae	*Daphoenositta chrysoptera*	varied sittella	C		0	5	24/02/2013
1442	Aves	Oriolidae	*Oriolus sagittatus*	olive-backed oriole	C		0	4	2/11/2005
1680	Aves	Otididae	*Ardeotis australis*	Australian bustard	C		0	5	5/11/2016
1449	Aves	Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush	C		0	21	5/11/2016
1436	Aves	Pachycephalidae	*Pachycephala pectoralis*	golden whistler	C		0	2	18/08/2005
1437	Aves	Pachycephalidae	*Pachycephala rufiventris*	rufous whistler	C		0	42	5/11/2016
1389	Aves	Pardalotidae	*Pardalotus punctatus*	spotted pardalote	C		0	3	5/11/2016

1390	Aves	Pardalotidae	*Pardalotus rubricatus*	red-browed pardalote	C		0	1	15/07/2001
1392	Aves	Pardalotidae	*Pardalotus striatus*	striated pardalote	C		0	24	5/11/2016
1284	Aves	Pelecanidae	*Pelecanus conspicillatus*	Australian pelican	C		0	2	5/11/2016
1347	Aves	Petroicidae	*Eopsaltria australis*	eastern yellow robin	C		0	6	5/11/2016
1339	Aves	Petroicidae	*Microeca fascinans*	jacky winter	C		0	9	23/02/2013
1329	Aves	Petroicidae	*Petroica goodenovii*	red-capped robin	C		0	4	5/01/2005
1261	Aves	Phalacrocoracidae	*Microcarbo melanoleucos*	little pied cormorant	C		0	2	5/01/2005
1275	Aves	Phalacrocoracidae	*Phalacrocorax carbo*	great cormorant	C		0	1	31/10/1997
1263	Aves	Phalacrocoracidae	*Phalacrocorax sulcirostris*	little black cormorant	C		0	1	2/09/2003
1687	Aves	Phasianidae	*Synoicus ypsilophorus*	brown quail	C		0	1	20/09/2002
1955	Aves	Podargidae	*Podargus strigoides*	tawny frogmouth	C		0	7	5/11/2016
1249	Aves	Podicipedidae	*Tachybaptus novaehollandiae*	Australasian grebe	C		0	1	5/01/2005
1318	Aves	Pomatostomidae	*Pomatostomus temporalis*	grey-crowned babbler	C		0	20	5/11/2016
22463	Aves	Pomatostomidae	*Pomatostomus temporalis temporalis*	grey-crowned babbler (eastern)	C		0	1	2/11/2005
1182	Aves	Psittaculidae	*Aprosmictus erythropterus*	red-winged parrot	C		0	12	5/11/2016
1145	Aves	Psittaculidae	*Glossopsitta concinna*	musk lorikeet	C		0	2	5/11/2016
1130	Aves	Psittaculidae	*Northiella haematogaster*	blue bonnet	C		0	1	31/03/1978
1136	Aves	Psittaculidae	*Platycercus adscitus*	pale-headed rosella	C		0	17	5/11/2016
21976	Aves	Psittaculidae	*Platycercus adscitus palliceps*	pale-headed rosella (southern form)	C		0	1	2/11/2005
1118	Aves	Psittaculidae	*Psephotus haematonotus*	red-rumped parrot	C		0	3	5/11/2016
1124	Aves	Psittaculidae	*Trichoglossus chlorolepidotus*	scaly-breasted lorikeet	C		0	13	5/11/2016
1125	Aves	Psittaculidae	*Trichoglossus moluccanus*	rainbow lorikeet	C		0	12	5/11/2016
1673	Aves	Rallidae	*Gallinula tenebrosa*	dusky moorhen	C		0	1	2/09/2003
1575	Aves	Rhipiduridae	*Rhipidura albiscapa*	grey fantail	C		0	24	5/11/2016

1576	Aves	Rhipiduridae	*Rhipidura leucophrys*	willie wagtail	C		0	15	5/11/2016
22467	Aves	Rhipiduridae	*Rhipidura leucophrys leucophrys*	willie wagtail (southern)	C		0	1	2/11/2005
1102	Aves	Strigidae	*Ninox boobook*	southern boobook	C		0	1	31/10/1997
1314	Aves	Sturnidae	*Acridotheres tristis*	common myna			0	1	5/11/2016
1822	Aves	Threskiornithidae	*Platalea flavipes*	yellow-billed spoonbill	C		0	1	5/11/2016
1812	Aves	Threskiornithidae	*Threskiornis molucca*	Australian white ibis	C		0	4	2/11/2005
1800	Aves	Threskiornithidae	*Threskiornis spinicollis*	straw-necked ibis	C		0	1	12/04/1999
1108	Aves	Tytonidae	*Tyto javanica*	eastern barn owl	C		0	3	5/11/2016
1096	Aves	Tytonidae	*Tyto novaehollandiae*	masked owl	C		0	1	22/02/2013
1098	Aves	Tytonidae	*Tyto sp.*		C		0	1	22/02/2013
1067	Mammalia	Canidae	*Canis familiaris*	dog			0	1	2/11/2005
811	Mammalia	Dasyuridae	*Planigale maculata*	common planigale	C		0	1	22/02/2013
793	Mammalia	Dasyuridae	*Sminthopsis murina*	common dunnart	C		0	1	5/11/2016
1006	Mammalia	Emballonuridae	*Saccolaimus flaviventris*	yellow-bellied sheathtail bat	C		0	11	5/11/2016
834	Mammalia	Leporidae	*Oryctolagus cuniculus*	rabbit			0	2	5/11/2016
901	Mammalia	Macropodidae	*Macropus giganteus*	eastern grey kangaroo	C		0	3	5/11/2016
906	Mammalia	Macropodidae	*Macropus sp.*		C		0	4	5/11/2016
904	Mammalia	Macropodidae	*Notamacropus rufogriseus*	red-necked wallaby	C		0	2	5/11/2016
885	Mammalia	Macropodidae	*Wallabia bicolor*	swamp wallaby	C		0	4	5/11/2016
989	Mammalia	Molossidae	*Austronomus australis*	white-striped freetail bat	C		0	3	5/11/2016
998	Mammalia	Molossidae	*Mormopterus lumsdenae*	northern free-tailed bat	C		0	4	5/11/2016
22060	Mammalia	Molossidae	*Mormopterus petersi*	inland free-tailed bat	C		0	3	23/02/2013
22061	Mammalia	Molossidae	*Mormopterus ridei*	eastern free-tailed bat	C		0	6	5/11/2016
988	Mammalia	Molossidae	*Mormopterus sp.*		C		0	1	5/11/2016

767	Mammalia	Muridae	*Hydromys chrysogaster*	water rat	C		0	1	2/11/2005
36762	Mammalia	Petauridae	*Petaurus notatus*	Krefft's glider	C		0	3	5/11/2016
859	Mammalia	Phalangeridae	*Trichosurus vulpecula*	common brushtail possum	C		0	5	5/11/2016
860	Mammalia	Phascolarctidae	*Phascolarctos cinereus*	koala	E	E	0	3	2/11/2005
862	Mammalia	Potoroidae	*Aepyprymnus rufescens*	rufous bettong	C		0	5	5/11/2016
838	Mammalia	Tachyglossidae	*Tachyglossus aculeatus*	short-beaked echidna	SL		0	3	5/11/2016
972	Mammalia	Vespertilionidae	*Chalinolobus gouldii*	Gould's wattled bat	C		0	7	5/11/2016
948	Mammalia	Vespertilionidae	*Chalinolobus picatus*	little pied bat	C		0	4	5/11/2016
946	Mammalia	Vespertilionidae	*Nyctophilus bifax*	northern long-eared bat	C		0	1	5/11/2016
938	Mammalia	Vespertilionidae	*Nyctophilus sp.*		C		0	5	5/11/2016
945	Mammalia	Vespertilionidae	*Scotorepens balstoni*	inland broad-nosed bat	C		0	2	5/11/2016
931	Mammalia	Vespertilionidae	*Scotorepens greyii*	little broad-nosed bat	C		0	17	5/11/2016
929	Mammalia	Vespertilionidae	*Vespadelus vulturnus*	little forest bat	C		0	7	5/11/2016
560	Reptilia	Agamidae	*Amphibolurus muricatus*	jacky lizard	C		0	1	2/11/2005
556	Reptilia	Agamidae	*Pogona barbata*	bearded dragon	C		0	10	5/11/2016
544	Reptilia	Agamidae	*Pogona vitticeps*	central bearded dragon	C		0	1	2/11/2005
537	Reptilia	Boidae	*Antaresia maculosa*	spotted python	C		0	2	7/09/2014
512	Reptilia	Colubridae	*Dendrelaphis punctulatus*	green tree snake	C		0	3	5/11/2016
391	Reptilia	Diplodactylidae	*Amalosia robusta*	robust velvet gecko	C		0	1	20/06/2015
429	Reptilia	Diplodactylidae	*Diplodactylus vittatus*	wood gecko	C		0	10	18/02/2015
368	Reptilia	Diplodactylidae	*Strophurus taenicauda*	golden-tailed gecko	NT		2	31	20/06/2015
460	Reptilia	Elapidae	*Brachyurophis australis*	coral snake	C		0	1	5/11/2016
455	Reptilia	Elapidae	*Cryptophis boschmai*	Carpentaria whip snake	C		0	1	16/05/2014
457	Reptilia	Elapidae	*Cryptophis nigrescens*	eastern small-eyed snake	C		0	2	8/05/2014

493	Reptilia	Elapidae	*Demansia psammophis*	yellow-faced whipsnake	C		0	2	5/11/2016
482	Reptilia	Elapidae	*Denisonia devisi*	De Vis' banded snake	C		0	1	5/11/2016
474	Reptilia	Elapidae	*Pseudechis guttatus*	spotted black snake	C		0	1	30/04/1986
441	Reptilia	Elapidae	*Suta suta*	myall snake	C		0	2	5/11/2016
444	Reptilia	Elapidae	*Vermicella annulata*	bandy-bandy	C		0	1	24/04/2014
420	Reptilia	Gekkonidae	*Gehyra dubia*	dubious dtella	C		0	24	5/11/2016
413	Reptilia	Gekkonidae	*Heteronotia binoei*	Bynoe's gecko	C		0	18	5/11/2016
327	Reptilia	Pygopodidae	*Paradelma orientalis*	brigalow scaly-foot	C		0	2	23/02/2013
26886	Reptilia	Pygopodidae	*Pygopus schraderi*	eastern hooded scaly-foot	C		0	1	22/02/2013
294	Reptilia	Scincidae	*Carlia munda*	shaded-litter rainbow-skink	C		0	4	5/11/2016
34646	Reptilia	Scincidae	*Carlia pectoralis*	open-litter rainbow skink	C		0	2	23/02/2013
31898	Reptilia	Scincidae	*Cryptoblepharus pulcher pulcher*	elegant snake-eyed skink	C		0	15	5/11/2016
263	Reptilia	Scincidae	*Ctenotus allotropis*	brown-blazed wedgesnout ctenotus	C		0	1	23/02/2013
240	Reptilia	Scincidae	*Ctenotus spaldingi*	straight-browed ctenotus	C		0	5	25/02/2013
167	Reptilia	Scincidae	*Lerista fragilis*	eastern mulch slider	C		0	4	2/05/2014
155	Reptilia	Scincidae	*Lerista timida*	timid slider	C		0	6	5/11/2016
150	Reptilia	Scincidae	*Lygisaurus foliorum*	tree-base litter-skink	C		0	9	5/11/2016
127	Reptilia	Scincidae	*Menetia greyii*	common dwarf skink	C		0	5	5/11/2016
134	Reptilia	Scincidae	*Morethia boulengeri*	south-eastern morethia skink	C		0	4	9/05/2014
138	Reptilia	Scincidae	*Morethia taeniopleura*	fire-tailed skink	C		0	1	2/11/2005
107	Reptilia	Scincidae	*Tiliqua scincoides scincoides*	eastern bluetongue	C		0	2	5/11/2016
78	Reptilia	Varanidae	*Varanus gouldii*	sand monitor	C		0	2	6/05/2014
74	Reptilia	Varanidae	*Varanus panoptes*	yellow-spotted monitor	C		0	1	24/02/2009
60	Reptilia	Varanidae	*Varanus tristis*	black-tailed monitor	C		0	3	20/02/2015

61	Reptilia	Varanidae	*Varanus varius*	lace monitor	C		0	1	30/01/2010

Table 3. Plants recorded within the area of interest and its one kilometre buffer

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
15150	Equisetopsida	Apiaceae	*Platysace ericoides*	heath platysace	C		1	1	28/11/2022
16521	Equisetopsida	Apocynaceae	*Parsonsia lanceolata*	northern silkpod	C		1	1	9/04/2025
41248	Equisetopsida	Apocynaceae	*Vincetoxicum forsteri*		E	E	2	2	8/05/2025
8398	Equisetopsida	Asteraceae	*Chrysocephalum apiculatum*	yellow buttons	C		1	1	25/06/2019
26777	Equisetopsida	Asteraceae	*Leiocarpa semicalva subsp. tenuifolia*		C		1	1	27/11/2001
8407	Equisetopsida	Asteraceae	*Praxelis clematidea*				1	1	22/04/2025
15103	Equisetopsida	Asteraceae	*Rutidosis murchisonii*		C		5	5	6/05/2025
9114	Equisetopsida	Boraginaceae	*Halgania brachyrhyncha*		C		1	1	3/04/2019
16386	Equisetopsida	Caryophyllaceae	*Polycarpaea corymbosa var. minor*		C		1	1	9/06/2009
11465	Equisetopsida	Chenopodiaceae	*Dysphania rhadinostachya subsp. inflata*		C		2	2	28/11/2003
11626	Equisetopsida	Chenopodiaceae	*Dysphania valida*		C		1	1	28/11/2003
11391	Equisetopsida	Chenopodiaceae	*Sclerolaena convexula*		C		1	1	1/09/2021
21934	Equisetopsida	Crassulaceae	*Bryophyllum delagoense*				0	1	3/02/2016
8221	Equisetopsida	Cupressaceae	*Callitris glaucophylla*	white cypress pine	C		0	1	9/10/2013
17340	Equisetopsida	Cyperaceae	*Eleocharis cylindrostachys*		C		1	1	10/09/2019
41515	Equisetopsida	Ericaceae	*Styphelia mitchellii*		C		2	2	29/07/2024
42342	Equisetopsida	Ericaceae	*Styphelia sparsa*		C		0	1	9/10/2013
5515	Equisetopsida	Euphorbiaceae	*Euphorbia drummondii*		C		1	1	19/05/2023
16233	Equisetopsida	Goodeniaceae	*Scaevola spinescens*	prickly fan flower	C		1	1	3/06/2008
10696	Equisetopsida	Haloragaceae	*Gonocarpus urceolatus*		C		2	2	7/12/2018
7443	Equisetopsida	Lamiaceae	*Prostanthera sp. (Baking Board V.Hando 135)*		C		2	2	21/08/2025
15825	Equisetopsida	Leguminosae	*Acacia aprepta*	Miles mulga	C		1	2	18/02/2020

14900	Equisetopsida	Leguminosae	*Acacia burbidgeae*		C		1	1	27/02/2020
15780	Equisetopsida	Leguminosae	*Acacia burrowii*		C		1	1	30/06/2025
14932	Equisetopsida	Leguminosae	*Acacia conferta*		C		0	1	9/10/2013
18780	Equisetopsida	Leguminosae	*Acacia deanei*		C		1	1	9/03/2020
14063	Equisetopsida	Leguminosae	*Acacia debilis*		C		1	1	9/03/2020
15747	Equisetopsida	Leguminosae	*Acacia flexifolia*		C		1	1	20/05/2020
6372	Equisetopsida	Leguminosae	*Acacia juncifolia*		C		2	2	18/04/2020
14066	Equisetopsida	Leguminosae	*Acacia leiocalyx subsp. leiocalyx*		C		0	1	9/10/2013
15696	Equisetopsida	Leguminosae	*Acacia shirleyi*	lancewood	C		1	2	6/05/2020
14083	Equisetopsida	Leguminosae	*Acacia sparsiflora*		C		1	1	6/05/2020
14891	Equisetopsida	Leguminosae	*Acacia spectabilis*	pilliga wattle	C		2	2	6/05/2020
15708	Equisetopsida	Leguminosae	*Acacia triptera*		C		2	2	30/06/2023
15529	Equisetopsida	Leguminosae	*Chorizema parviflorum*	eastern flame pea	C		1	1	7/12/2018
11443	Equisetopsida	Leguminosae	*Labichea digitata*		C		1	1	12/06/2017
12950	Equisetopsida	Loranthaceae	*Muellerina bidwillii*		C		1	1	10/08/2021
17766	Equisetopsida	Myrtaceae	*Calytrix tetragona*	fringe myrtle	C		1	1	21/08/2025
6443	Equisetopsida	Myrtaceae	*Corymbia trachyphloia subsp. trachyphloia*		C		1	2	13/06/2020
17252	Equisetopsida	Myrtaceae	*Eucalyptus crebra*	narrow-leaved red ironbark	C		0	1	9/10/2013
17203	Equisetopsida	Myrtaceae	*Eucalyptus tenuipes*	narrow-leaved white mahogany	C		0	1	9/10/2013
14441	Equisetopsida	Myrtaceae	*Leptospermum polygalifolium*	tantoon	C		2	2	17/09/2020
16473	Equisetopsida	Phyllanthaceae	*Phyllanthus virgatus*		C		1	1	2/01/2008
13636	Equisetopsida	Plantaginaceae	*Linaria maroccana*				1	1	26/06/2019
18437	Equisetopsida	Poaceae	*Amphipogon caricinus*		C		1	1	30/06/2020
11110	Equisetopsida	Poaceae	*Amphipogon caricinus var. scaber*		C		1	1	21/07/2021

13707	Equisetopsida	Poaceae	*Aristida calycina*		C		0	1	9/10/2013
15649	Equisetopsida	Poaceae	*Aristida calycina var. calycina*		C		1	1	21/07/2021
15650	Equisetopsida	Poaceae	*Aristida caput-medusae*		C		1	2	15/08/2019
15655	Equisetopsida	Poaceae	*Aristida jerichoensis var. jerichoensis*		C		1	1	20/07/2021
9959	Equisetopsida	Poaceae	*Aristida obscura*		C		1	1	7/12/2018
15604	Equisetopsida	Poaceae	*Bothriochloa bladhii subsp. bladhii*		C		1	1	6/03/2020
15531	Equisetopsida	Poaceae	*Chrysopogon fallax*		C		1	1	27/02/2020
15419	Equisetopsida	Poaceae	*Digitaria brownii*		C		1	1	21/07/2021
34047	Equisetopsida	Poaceae	*Digitaria divaricatissima var. divaricatissima*		C		1	1	15/01/2020
10340	Equisetopsida	Poaceae	*Enteropogon acicularis*	curly windmill grass	C		1	1	24/10/2019
10729	Equisetopsida	Poaceae	*Eriachne mucronata*		C		1	1	7/12/2018
27900	Equisetopsida	Poaceae	*Megathyrsus maximus var. pubiglumis*				0	1	9/10/2013
9154	Equisetopsida	Poaceae	*Melinis repens*	red natal grass			0	1	9/10/2013
15173	Equisetopsida	Poaceae	*Panicum decompositum var. decompositum*		C		0	1	9/10/2013
14974	Equisetopsida	Poaceae	*Themeda triandra*	kangaroo grass	C		0	1	9/10/2013
27672	Equisetopsida	Poaceae	*Walwhalleya subxerophila*		C		1	1	10/01/2020
17012	Equisetopsida	Proteaceae	*Hakea purpurea*		C		3	3	15/06/2023
17682	Equisetopsida	Pteridaceae	*Cheilanthes sieberi subsp. sieberi*		C		0	1	9/10/2013
9659	Equisetopsida	Rhamnaceae	*Alphitonia excelsa*	soap tree	C		0	1	9/10/2013
17567	Equisetopsida	Rhamnaceae	*Cryptandra armata*		C		1	1	27/11/2003
21798	Equisetopsida	Rutaceae	*Philotheca difformis subsp. difformis*		C		2	2	23/12/2022
14117	Equisetopsida	Santalaceae	*Viscum whitei subsp. whitei*		C		1	1	18/07/2022
17377	Equisetopsida	Sapindaceae	*Dodonaea peduncularis*		C		2	2	27/07/2021
13530	Equisetopsida	Solanaceae	*Solanum ferocissimum*		C		1	1	8/12/2022

14210	Equisetopsida	Solanaceae	*Solanum nemophilum*		C		1	1	8/12/2022
34284	Equisetopsida	Verbenaceae	*Glandularia aristigera*				0	1	9/10/2013

Table 4. Fungi recorded within the area of interest and its one kilometre buffer

No species found within the area of interest and its one kilometre buffer.

Table 5. Other species recorded within the area of interest and its one kilometre buffer

No species found within the area of interest and its one kilometre buffer.

Species table headings and codes
Taxon Id: Unique identifier of the taxon from the WildNet database.
NCA: Queensland conservation status of the taxon under the *Nature Conservation Act 1992* (Least Concern (C), Critically Endangered (CR), Endangered (E), Extinct (EX), Near Threatened (NT), Extinct in the Wild (PE), Special Least Concern (SL), and Vulnerable (V)).
EPBC: Australian conservation status of the taxon under the *Environment Protection and Biodiversity Conservation Act 1999* (Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Vulnerable (V), and Extinct in the Wild (XW)).
Specimens: The number of specimen-backed records of the taxon.
Records: The total number of records of the taxon.
Last record: Date of most recent record of the taxon.

Links and Support

Other sites that deliver species information from the WildNet database include:

- WildNet Application - public interface to find species information and species lists generated from the WildNet database.
- Biomaps - view biodiversity information, including WildNet records approved for publication, and generate reports
- Queensland Globe - view spatial information, including WildNet records approved for publication
- Qld WildNet Data API - access WildNet species information approved for publication such as notes, images and records etc.
- Wetland*Maps* - view species records, survey locations etc. approved for publication
- Wetland*Summary* - view wildlife statistics, species lists for a range of area types, and access WildNet species profiles
- WildNet wildlife records - published - Queensland - spatial layer of WildNet records approved for publication generated weekly
- Generalised distribution and densities of Queensland wildlife - Queensland species distributions and densities generalised to a 10 km grid resolution
- Conservation status of Queensland wildlife - access current lists of priority species for Queensland including nomenclature and status information
- Queensland Confidential Species - the list of species flagged as confidential in the WildNet database.

Please direct queries about this report to the WildNet Team WildNet@detsi.qld.gov.au.

Other useful sites for accessing Queensland biodiversity data include:

- Useful wildlife resources
- Queensland Government Data
- Atlas of Living Australia (ALA)
- Online Zoological Collections of Australian Museums (OZCAM)
- Australasian Virtual Herbarium (AVH)
- Protected Matters Search Tool

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Appendix D – Likelihood of occurrence assessments

Likelihood of occurrence assessment

Scientific Name	Common Name	EPBC Status	NC Status	Source	Habitat Description	Likelihood of Occurrence
Plant						
Acacia handonis	Hando's Wattle	V	V	PMST, WildNet	Inhabits gently undulating slopes and stony ridges with laterite soils. Associated vegetation includes open forest or woodland with varying density of understory. Associated species include Eucalyptus fibrosa subsp. nubila, *Corymbia watsoniana* subsp. *watsoniana*, Lysicarpus angustifolius, and Allocasuarina inophloia (Halford, 1995a). Other wattles growing in the area include Acacia conferta, *A. complanata*, *A. julifera* and *A. juncifolia* (Hando, 2007). Associated understorey species include *Dodonaea falcata, Boronia bipinnata, B. glabra, Cleistochloa subjuncea, Entolasia stricta, Schoenus kennyi, Triodia scariosa subsp. yelarbonensis, and Lomandra multiflora subsp. multiflora* (SPRAT Profile).	**Unlikely to occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area. The Study area is also outside the known distribution of this species.
Acacia lauta	Tara Wattle	V	V	PMST, WildNet	Localities are characterized by a gently undulating to flat landforms. Soils are moderately deep and hard setting with a weakly acidic to neutral sandy loam surface grading into neutral to alkaline sandy clay subsoil. The vegetation varies from open forest to low woodland with a dense or moderately dense shrub layer. Tree species present at all sites include Callitris glaucophylla (White Cypress Pine) and Allocasuarina luehmannii (Buloke) (SPRAT Profile).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Acacia wardellii		-	NT	WildNet	*Acacia wardellii* is known from south of Roma, south-west of Chinchilla and the Thomby Range in south-east QLD. In the Thomby Range, the species has been collected near Rocky Glen Homestead, Glenmore in the Silver Springs Gas Field, and in an area ranging from 15 km east-northeast to 15 km east-southeast of Condamine. It has also been collected 16 km west of Inniscraig Homestead south of Roma, near Binjour south-east of Eidsvold and Rockwood Station, 36 km south-east of Chinchilla. This species grows in gravelly soil on shallow weathered sandstone in eucalypt woodland and has been recorded from	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.

					disturbed and recently burnt areas. The species has been described from tall open forest with *Corymbia trachyphloia, C. intermedia, Eucalyptus major, E. cloeziana* with a sparse *Allocasuarina torulosa* shrub layer (QLD - Species Profile).	
Androcalva procumbens		V	-	PMST	*Androcalva procumbens* is endemic to NSW and is known from the Dubbo-Medooran-Gilgandra region, the Cobar region, and the upper hunter Valley. Populations of this species have been recorded in Goonoo State Forest, Mt Kaputar National Park, and Pilliga Nature Reserve and other populations Occur on crown land, state forests and on private land. This species Occurs in sandy soils, often in disturbed habitats such as road verges, quarry boundaries, gravel stockpiles, and power line easements. It is often found in communities of *Eucalyptus dealbata, E. sideroxylon woodland, Memaleuca uncinata* shrubland, and mallee eucalypt and *Calytrix teragona* understory (SPRAT Profile).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Arthraxon hispidus	Hairy-joint Grass	V	V	PMST	In NSW and QLD, this species is found in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps, as well as woodland. In the SE QLD Bioregion, A. hispidus has also been recorded growing around freshwater springs on coastal foreshore dunes, in shaded small gullies, on creek banks, and on sandy alluvium in creek beds in open forests, and also with bog mosses in mound springs (QLD - Species Profile)	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Bothriochloa bunyensis	Bunya Mountains Bluegrass	V	V	WildNet	The Three-leaved Bosistoa is found from the Nightcap Range north of Lismore in NW NSW to Mount Larcom in SW QLD. The species is described in herbarium collection records as locally abundant at Natural bridge-Sptingbrook NP and Coalstoun Lakes NP in QLD. This species grows in lowland subtropical rainforest up to 300m above sea level (SPRAT Profile).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Cadellia pentastylis	Ooline	V	V	PMST, WildNet	Ooline Occurs on the north-west slopes of NSW and in central and southern QLD where it is found within the 500 mm and 750 mm rainfall isohyets. This species is of considerable biogeographic interest as it is a relic of an extensive rainforest	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent

					vegetation that covered much of Australia in the past. This species grows in semi-evergreen vine thickets and sclerophyll vegetation on undulating terrain of various geology, including sandstone, conglomerate and claystone. It forms a closed or open canopy, as a dominant or commonly with White Box and White Cypress Pine, with an open understory and leaf litter dominating the forest floor (SPRAT Profile).	historical records have been recorded.
Callitris baileyi	Bailey's Cypress	-	NT	WildNet	*Callitris baileyi* is found sporadically throughout south-east Queensland, from the state border to Coomeri in the north and west to the Bunya Mountains. A small population exists in north-eastern New South Wales, near the Queensland border. This species grows on rocky slopes, hills or mountainous areas, in shallow and often clay soils. It is found in eucalypt woodland, commonly associated with ironbark, blue gum and spotted gum. The NSW population Occurs in an open grassy eucalypt forest near a creek (QLD - Species Profile).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Calytrix gurulmundensis		V	V	WildNet	Grows in patches of shrubland on shallow lateritic soils at sandstone ridges. Vegetation is predominately eucalypt, acacia, casuarina dense shrublands with spinifex, and spinifex grassland with scattered shrubs. This habitat description is consistent with RE 11.7.5 (shrubland on natural scalds on deeply weathered coarse-grained sedimentary rocks). Suitable habitats include patches of RE11.7.5 and RE11.7.4 in to the west and north-west of the central assessment area. Nearest local record is 12 km west of the SGP study area (30 km north of Miles) within Gurulmundi State Forest.	**Likely to occur** Whilst no nearby historical records have been identified, suitable habitat for this species has been identified within the Study area.
Calyptochloa gracillima subsp. ipsviciensis		-	CR	WildNet	*Calyptochloa gracillima subsp. ipsviciensis* is endemic to southeast QLD in the vicinity of Ipswich where it is known from a few small areas. It is an uncommon to dominant species in woodlands dominated by Eucalyptus spp. Including *E. crebra and E. moluccana and/or Corymbia citridora* on loam to clay loam duplex soils derived from shale on gently undulating to hilly terrain. Res represented include 12.9-10.2, 12.9-10.3 and 12.9-10.19. Associated ground layer species include Aristida caput-	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.

					medusae, *Cleistochloa subjuncea and Themeda triandra*. The habitat is typically moderately shaded (Grasses of Australia).	
Camptacra perdita		-	E	WildNet	*Camptacra perdita* is known from four collections in southern QLD (two from near Oakey, 1 near St George and one near Roma), and from a single location in NSW. It is recorded growing in grassland on heavy black soil on alluvial, at least two sites dominated by *Dichanthium sericeum*. This species typically grows in grasslands on fertile cracking clays and is therefore threatened by cropping and grazing activities (Bean, A.R. 2020).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Clematis fawcettii	Stream Clematis	V	V	PMST, WildNet	*Clematis fawcettii* is endemic to Australia where its range extends from the Bunya Mountains in QLD to Lismore in NSW. This species Occurs most commonly in the canopy gaps of drier rainforests near streams where it has been recorded in; semi-evergreen vine thickets, araucarias microphyll vine forests, occasionally in complex notaphily vine forests and occasionally in eucalypt woodland communities that are close to vine thickets or rainforests (SPRAT Profile).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Cryptandra ciliata		NT		WildNet	Suitable habitat in eucalypt dominated woodland, lancewood (Acacia shirleyi) woodland and Triodia grassland on rocky on low lateritic and sandstone ridges. Habitat in the PDA is consistent with RE 11.7.5, 11.7.4, 11.7.6, 11.5.1, 11.5.4, 11.5.21. Woodlands in the Chinchilla/Miles region in the Central assessment area provide for potential habitat for the species. Three herbarium records within 5km of the assessment area boundary with a single record within 1km of the eastern boundary, 30km to the north of Miles.	**Likely to occur** Whilst no nearby historical records have been identified, suitable habitat for this species has been identified within the Study area.
Cryptocarya floydii	Gorge Laurel	-	NT	WildNet	Gorge Laurel grows in drier rainforest, usually in rocky areas, at altitudes between 300 and 1,050m between the Bunya Mountains in southern QLD and Wollomombi Falls in northern NSW (www.ala.org.au).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.

Cymbonotus maidenii		-	E	WildNet	*Cymbonotus maidenii* Occurs on open grassland, along roadsides or beside watercourses. It grows on black, brown or grey heavy, cracking clay soils (QLD - Species Profile).	**Possible to occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Cyperus clarus		-	V	WildNet	*Cyperus clarus* grows in grassland or open woodland in heavy soils derived from basalt. This species is associated with grasslands where Aristida leptopoda and Panicum queenslandicum Occur on deep alluvial black clay; in *Eucalyptus melanophloia* woodland with mid-dense ground stratum of *Chrysopogon fallax*; growing with *Stemmacantha australis* in mountain coolibah woodland on basalt ridges; and in Dichanthium grassland with *Cyperus bifax* and Fimbristylls spp (QLD - Species Profile).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Denhamia parvifolia		V	V	WildNet	*Denhamia parvifolia* Occurs from Eidsvold to Kingaroy, and near Chinchilla. The species Occurs within Allies Creek State Forest and Koko State Forest. This species is found in vine forests and semi-evergreen vine thickets, commonly on basalt-derived, brown or red soils above 300m in altitude. It is also occasionally found in ecotone areas with open forests (QLD - Species Profile).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Dichanthium queenslandicum	King Blue-grass	E	V	PMST, WildNet	King Blue-grass is endemic to central and southern QLD where it Occurs in three disjunct populations including: Hughenden district; from Nebo to Monto and west to Clermont and Rolleston; and Dalby district. Its extent of Occurrence has reduced from 1100 km2 to 245 km2. Its area of occupancy is unknown but based on the extent of Occurrence it is likely to be restricted. This species Occurs within the Southeastern QLD, Brigalow Belt South, Brigalow Belt North, Central Mackay Coast, Desert Uplands, Mitchell Grass Downs and Einasleigh Uplands Bioregions. The distribution of this species overlaps with several EPBC listed Threatened Ecological Communities. This species Occurs on black cracking clay in tussock grasslands mainly in	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.

					association with other species of blue grasses but also with other grasses restricted to this soil type. This species is mostly confined to natural grassland on the heavy black clay soils on undulating plains (SPRAT Profile).	
Dichanthium setosum	Bluegrass	V	-	PMST	*Dichanthium setosum* has been reported from inland NSW to QLD. There are also reports from WA and TAS. The species is associated with heavy basaltic black soils and red-brown loams with clay subsoils (predominantly cracking clays or alluvium, often in gilgai). It is often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture. The species may tolerate or benefit from disturbance, otherwise, disturbance is indicative of threatening processes in its habitat (SPRAT Profile).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Digitaria porrecta		-	NT	WildNet	*Digitaria porrecta* Occurs in four disjunct areas extending over 1000km. In QLD, it Occurs in the Nebo district, south-west of Mackay; the Central Highlands between Springsure and Rolleston; and from Jandowae south to Warwick (41 sites). This species is endemic to eastern Australia in QLD and NSW where it Occurs in several disjunct population centres with appropriate heavy soils. In QD these localities are all within the Brigalow Belt Bioregion. The species Occurs in tussock grassland or open woodland of poplar box of forest red gum, invariably on heavy, cracking clays, sometimes of alluvial origin (QLD - Species Profile).	**Likely to occur.** Potentially suitable habitat has been identified within the Study area.
Diuris parvipetala		-	V	WildNet	*Diuris parvipetala* grows among grass in open forests, on ridges and gentle to steep slopes, among basalt boulders and on granite pavements. It grows in shallow, brown, basalt loam soils (QLD - Species Profile).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Eucalyptus argophloia	Queensland White Gum	V	CR	PMST, WildNet	*Eucalyptus argophloia* Occurs on flat to undulating country at 300 - 340 m above sea level. It prefers deep, dark, heavy clay soils, often with strong gilgai development. It has been recorded	**Unlikely to occur.** No suitable habitat has been identified in the Study area,

					growing in brigalow woodland and forest communities associated with Belah, Poplar Box and Inland Grey Box.	and no nearby recent historical records have been recorded.
Eucalyptus curtisii	Plunkett Mallee	-	NT	WildNet	*Eucalyptus curtisii* has two growth forms that Occur in different habitats. The shorter mallee form is more likely to Occur as the only eucalypt species on poorly drained lowland sites in shrubland dominated by banksia, with an understorey of heath plants, and sometimes *E. conglomerata* may also be present. The larger growth form Occurs as scattered individuals on better drained soils in the more open areas of mixed eucalypt forests. Commonly associated species include Corymbia citriodora subsp. variegata, *C. trachyphloia and Callitris endlicheri*, less commonly associated with *E. fibrosa, E. planchoniana and E. acmenoides*. *E. curtisii* Occurs on sandy pod soils with impeded drainage, shallow stony soils, clay loams and stony clays with a surface layer of loose stones (www.wetlandinfo.des.qld.gov.au).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Eucalyptus virens		V	V	PMST, WildNet	*Eucalyptus virens* has a very limited distribution in southern Queensland and is currently known from 5 locations scatters over a distance of approximately 500km. Locations include near Inglewood, Tara, north-east of Eidsvold and the scarp on approach to the Maranoa River near Mt Moffatt, 10km east-southeast of Brovinia, north of Binjour and north-west of Injune. This species Occurs on sandy soils on low rises, hillslopes, sandstone escarpments and scree slopes. This species grows in woodland communities (QLD - Species Profile).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Fimbristylis vagans		-	E	WildNet	This Queensland endemic is restricted to the Darling Downs between Lake Broadwater and Nudley Creek (30km NE of Chinchilla) (DEHP 2013). The species occupies habitat fringing ephemeral watercourses and lagoons on alluvium, typically RE 11.3.2, 11.3.4, 11.3.14, 11.3.26 and 11.3.27. The species is not known to be associated with non-remnant habitats.	**Unlikely to occur.** Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Haloragis exalata subsp. velutina		V	V	WildNet	*Haloragis exalata* subsp. *velutina* Occurs in south-east QLD, from Brisbane west to the Bunya Mountains, with an isolated Occurrence in Carnarvon National Park. This species is locally	**Unlikely to occur**. No suitable habitat has been identified in the Study area,

					common in some areas such as Bunya Mountains NP but is often recorded in low numbers. This species Occurs within the Bunya Mountains NP, D'Aguilar NP, Deer Reserve NP and Yarraman State Forest. This species has been recorded from eucalypt forests from rainforest margins and grasslands from near sea-level to 1000m. They have been recorded growing on brown heavy clay, shallow rock loam and basaltic soils. They are commonly associated with E*ucalyptus tereticornis, Angophora subvelutina and Acacia irrorata* (QLD - Species Profile).	and no nearby recent historical records have been recorded.
Homopholis belsonii	Belson's Panic	V	E	PMST, WildNet	*Homopholis belsonii's* distributional range lies within the Brigalow belt QLD, namely the Darling Downs area west of Toowoomba, near Oakey, Jondaryan, Bowenville, etc. The species is also found on the northwest slopes and plains of NSW, north of Warialda. This grass species is found on poor soils in dry woodlands and at elevations of 200-520 m in NSW and 342-500 in QLD. There are three general types of habitats which support this species a) Rocky, basaltic hills; b) flat to gently undulating alluvial areas; and c) drainage lines. This species is commonly found amongst fallen timber, at the base of trees and shrubs, among branches and leaves of trees hanging low and around fence lines. It is believed to be shade dependent as it almost always Occurs in these types of areas (SPRAT Profile).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Homoranthus decumbens		E	V	PMST	*Homoranthus decumberis* Occurs in QLD where it is restricted to Barakula State Forest near Chinchilla. This population consists of approximately 50 plants. This species Occurs on flat country on deep sandy soils with lateritic pebbles, in heath and shrubby woodland. Regional Ecosystems likely to support this species include 11.7.5, 11.7.5a, 11.7.5b and 11.5.21 (SPRAT Profile).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Lagenophora fimbriata		-	V	WildNet	*Lagenophora fimbriata* is endemic to south-east QLD, extending from near Cracow to Inglewood, and east to Jimboomba. It inhabits heavy clay soils in flat or gently undulating terrain, in communities dominated by *Acacia harpophylla and Casuarina cristata, or Eucalyptus moluccana or Melaleuca irbyana* (Wang and Bean 2016).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.

Lepidium monoplocoides	Winged Pepper-cress	E	-	PMST	*Lepidium monoplocoides* is widely distributed on the inland plains of south-eastern Australia, Occurring from northern NSW to western Victoria, with an old record from south-eastern SA. The species Occurs in the Murray Darling Depression, Diverina, Darling Riverine Plains and Cobar Peneplain Bioregions. This species Occurs in open, sparsely vegetated sites in a range of habitats on heavy clay or clay-loam soils, usually on sites that are seasonally flooded or prone to waterlogging, in arid to semi-arid areas with an average rainfall range of 200-450 mm per year. Vegetation communities in which the species Occurs include grasslands, wetlands and floodplain woodlands dominated by *Eucalyptus coolabah and Eucalyptus largiflorens*, and chenopod shrublands dominated by Atriplex, Maireana and/or Nitraria species. Locations where this species Occurs tend to be ephemeral, and it may be an opportunistic species able to take advantage of seasonally available habitat (National Recovery Plan).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Leuzea australis	Austral Cornflower	V	V	PMST, WildNet	The Austral Cornflower is currently confined to Queensland. The species was known to previously Occur in NSW and VIC but is now presumed extinct in those locations (2008). The current distribution of the Austral Cornflower extends from Allora (north of Warwick) to Callide (north-west of Biloela), QLD. This species usually grows on heavy black or red-brown clay, or clay loams derived from basalt. Populations are often confined to roadsides and cultivation headlands. Locations where the species Occurs range in altitude up to 480 m above sea level. The species is often found in woodland and grassland and in association with *Eucalyptus crebra, E. Orgadophila, E. populnea, E. tereticornis, E. melanophloia, Angophora subcelutina*, *A. floribunda, Dichanthium sericeum and Themeda triandra* (SPRAT, 2019).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Macrozamia machinii		V	V	PMST	*Macrozamia machinii* Occurs on the Darling Downs in QLD between Texas and Wondul Range National Park where it has been identified from 8 populations near Inglewood. This species Occurs in deep sandy soils in flat areas of open forests	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent

					dominated by *Angophora leiocarpa, Allocasuarina inophloa*, White Cypress-pine, Budgeroo and Crowded-leaf Wattle. One population also Occurs on a red lateritic ridge with Black Cypress-pine, Timbledown Ironbark and Western Yellow Stringybark. This species is found at altitudes from 320-460m (SPRAT, 2022).	historical records have been recorded.
Micromyrtus carinata	Gurulmundi Heath-myrtle	-	E	WildNet	*Micromyrtus carinata* is endemic to a small area to the north-west of Gurulmundi, on the crest of the Great Diving Range. The species Occurs east of Chinchilla and north-west of Miles (Occurs within the Gurulmundi State Forest). This species inhabits the tops of laterised ridges, on shallow to deep, yellow or red sands (QLD - Species Profile).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Philotheca sporadica		-	NT	WildNet	*Philotheca sporadica* is known from the south-east QLD just north of Tara to approximately 12 km east of Kogan in the Darling Downs Pastoral District. In 1995 the QLD herbarium had recorded 11 populations and at least four have subsequently included. Within the Condamine River catchment this species Occurs on soils derived from low fertility laterised Cretaceous sandstones in undulating to flat top or rounded hills. It is associated with open shrubland to closed shrubland to closed woodland dominated by *Allocasuarina inophloia, Angophora leiocarpa, Callistris endlicheri, Callistris glaucophylla, Eucalyptus crebra, Corymbia watsoniana, Eucalyptus exerta, Eucalyptus fibrosa, E. fibrosa subsp. nubillis and Lysicarpus angustifolius* (SPRAT, 2022).	**Unlikely to occur.** Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Picris barbarorum		-	V	WildNet	*Picris barbarorum* is found in Queensland and New South Wales along riverbanks and floodplains on heavier alluvial soils. It is also known in Victoria by 3 old collections. The lack of any recent collections would suggest that the species is either extremely rare or extinct in VIC.	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Picris evae	Hawkweed	V	V	PMST, WildNet	*Picris evae* Occurs north of the Inverell area in NSW and has been collected at Elsmore, Oxley Park, and Dangar's Falls in Oxley Wild Rivers National Park in the NSW northern tablelands.	**Unlikely to occur**. No suitable habitat has been identified in the Study area,

					In QLD, this species Occurs at 30 sites in the Darling Downs and Moreton pastoral districts in the south-east. This species Occurs in Eucalyptus open woodland with a grassy understory composed of Dichanthium spp. Upper stratum species include *Eucalyptus melliodora, E. crebra, E. populnea, E. albens, Angophora subvelutina, Allocasuarina torulosa, and Casuarina cunninghamiana*. Collections have been made along roadsides and in cultivated areas such as paddocks, on black, dark grey or red-brown soils, reddish clay-loam or medium clay soils. The distribution of this species overlaps with several EPBC listed TEC's (SPRAT).	and no nearby recent historical records have been recorded.
Polianthion minutiflorum		V	V	PMST, WildNet	*Polianthion minutiflorum* is known from Redcliffe vale, about 110 km west of Mackay, south to Kingaroy, covering a distance of approximately 800 km. This species is usually found in forest and woodland on sandstone slopes and gullies with skeletal soil, or sometimes deeper sands adjacent to deeply weathered laterite (www.des.qld.gov.au/species-search).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Pomaderris coomingalensis		-	E	WildNet	*Pomaderris coomingalensis* has been collected from the Coominglah State Forest between Monto and Theodore. There are also collections from near Kingaroy, Proston and Dalby where it is described as being locally common. The species Occurs within Braemar State Forest, Coominglah State Forest, Devine State Forest and Durikai State Forest. It is found within Eucalyptus decorticans, and Corymbia citriodora subsp. variegata open forest on red soil; and E. crebra / Eucalyptus fibrosa subsp. nubila woodland on stony brown clay loam (QLD - Species Profile).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Prostanthera sp. (Dunmore D.M.Gordon 8A)		V	V	PMST, WildNet	Prostanthera sp. Dunmore (D.M.Gordon 8A) is known from 4 locations in a small area west of Millmerran in southern QLD. Its extent of Occurrence is less than 100 km2. One population Occurs on private land and 3 in state forest, including one on the border with Wondul Range National Park. It grows in Eucalypt and Callitris woodland in shallow sandy soil or Eucalyptus	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.

					woodland on hard sandstone ridge tops. The three populations in state forest Occur in remnant vegetation (SPRAT Profile).	
Rhodamnia dumicola	Rib-fruited Malletwood	-	E	WildNet	Whilst there is little habitat information available for the Rib-fruited Mallewood, local records are all located within Araucarian complex microphyll to notophyll vine forests or cleared areas within the Bulburin National Park (no reference).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Rutidosis glandulosa		-	NT	WildNet	*Rutidosis glandulosa* is known from approximately 15 populations across 6 distinct localities. This species Occurs as far north as the Blackdown Tableland national Park, where 5 populations have been recorded. There is also one population just south on the Planet Downs Pastoral Holding. Other locations include Carnarvon Gorge National Park and just south on the Carnarvon Range, Gwambagwine, Barakula State Forest and Thulimbah. This species generally Occurs on sandy or gravelly well drained soil in grassy open eucalypt woodland. Around Blackdown National Park, this species was observed growing in open forest dominated by *Eucalyptus interstans, E. sphaerocarpa and Angophora leiocarpa*. It has also been recorded in dense woodland, within spinifex heathland and open forests dominated by *Corymbia citriodora, Eucalyptus crebra, Allocasuarina luehmannii* with herby understories (QLD - Species Profile).	**Likely to occur.** Potentially suitable habitat has been identified within the Study area.
Rutidosis lanata		-	NT	WildNet	*Rutidosis lanata* is restricted to western Darling Downs from north of Jackson to south of Hannaford, southeast QLD. A recent intensive survey of the area has recorded the species at only two of the five localities, near Meandarra and north of Jackson. This species Occurs at altitudes of 280-320 m ASL in open eucalypt forests and woodlands including Eucalyptus populnea-Casuarina cristata forest, ironbark and *Acacia sparsiflora* forest, box ironwood forest, and *E. populnea* woodland with *Eremophile mitchellii.* It has been recorded growing on flat land or stony red	**Likely to occur**. Potentially suitable habitat has been identified within the Study area, and a nearby record has been observed. This record was observed within the Study area as part of consolidated survey efforts across the broader SGP Project (Arrow, 2024).

					ridges in red-brown gravelly sands, grey clays, red-brown clay or sandy loams (QLD - Species Profile).	
Solanum papaverifolium		-	E	WildNet	This species Occurs predominantly in the Darling Down District of south-eastern Queensland and the Northern Slopes District of New South Wales. It is generally found on heavy clay in grassland or eucalypt woodland. This species flowers October to March and fruits from November to April (www.flora.sa.gov.au).	**Know to occur**
Solanum stenopterum		-	E	WildNet	*Solanum stenopterum* is patchily distributed across the Darling Downs in QLD from Gayndah south to Goondiwindi, west to Jackson and east to Oakey. It inhabits grassland or woodlands of belah and poplar box on black, brown or red clay loam soils. It also grows on loamy ridges, along roadsides and in paddocks (www.des.qld.gov.au/species-search).	**Possible to occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Sophora fraseri		V	V	PMST	This species is widespread but not common through south-east Queensland. It grows in moist habitats, often in hilly terrain at altitudes from 60-660 m on shallow soils along rainforest margins in eucalypt forests or in large canopy gaps in closed forest communities (Conservation Advice 2008 - EPBC).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Thesium australe	Austral Toadflax	V	V	PMST, WildNet	Austral Toadflax Occurs in NSW, ACT, QLD and CIV. Its current distribution is sporadic but widespread, Occurring between the Bunya Mountains in SE QLD to NE VIC, and as far inland as the southern, central and northern tablelands in NSW and the Toowoomba region. It is a semi-parasitic species found on roots of a range of grass species, notably Kangaroo Grass. It Occurs in subtropical, temperate and subalpine climates over a wide range of altitudes. It Occurs on soils derived from sedimentary, igneous and metamorphic geology on a range of soils including black clay loams to yellow podzolics and peaty loams. It Occurs in shrubland, grassland or woodland, often in damp sites (SPRAT 2018).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Vincetoxicum forsteri		E	E	PMST	*Vincetoxicum forsteri* has rarely been collected and is known from eight localities in the Dubbo area and Mt Crow near	**Possible to occur**.

					Barraba in NSW, and "Myall Park" near Glenmorgan in QLD. This species is also conserved within Goobang National Park, Eura State Forest, Goonoo State Forest, Pilliga West State Forest and Coolbaggie Nature Reserve. This species grows in dry scrub, open forest and woodlands and overlaps with the distribution of the Brigalow and White Box-Yellow Box-Blakely's Red Gum Threatened Ecological Communities (Approved Conservation Advice, 2008).	No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Westringia parvifolia		V	V	PMST, WildNet	*Westringia parvifolia* is known from four collections near Yelarbon, Inglewood and Woondiwindi in south-west QLD and from near Yetman in northern NSW. This species grows with Baker's Mallee (*Eucalyptus bakeri*) and Green Malle (*E. viridis*) and between clumps of Spinifex on sandy and stony soils (SPRAT, 2022).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Xerothamnella herbacea		E	E	PMST, WildNet	*Xerothamnella herbacea* is known from two sites north-east of Chinchilla, a single record from near Theodore and a record near Yelarbon east of Goondiwindi, QLD. This species Occurs in Brigalow dominated communities in shaded situations, often in leaf litter and is associated with gilgais (SPRAT, 2022).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Zieria obovata		V	V	WildNet	*Zieria obovata* is known only from Wild River Gorge, near Herberton and at Stannery Hills in north-eastern QLD. At the Wild River Gorge site, this species is found growing out of the granite rock face, in skeletal sandy soil associated with low cliff-side shrubs and also grows as an understory shrub in eucalypt open forest near the Gorge (SPRAT, 2020)	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Invertebrate						

Adclarkia cameroni	Brigalow Woodland Snail	E	V	PMST, WildNet	The Brigalow woodland snail is endemic to south-east QLD, where Occurs in a small number of remnant and scattered Acacia harpophylla (brigalow) and eucalypt woodland patches (such as road verges and riparian corridors) on the Condamine River floodplain, especially in the area around Dalby and Chinchilla (Stanisic, 2011).	**Unlikely to occur** No potentially suitable habitat for this species has been identified within the Study area. Considering there is no closer records and high fragmentation, this species is only considered to have a potential to occur within the Study area.
Adclarkia dulacca	Dulacca Woodland Snail	E	E	PMST	Publicly available records suggest the Dulacca Woodland Snail is restricted to the southern Brigalow Belt between Miles, Dulacca, Wandoan and Meandarra, though recent work has found the species west to the Yuleba area and east to the Chinchilla area (Eddie 2023). It has been recorded from Gurulmundi State Forest to the north-west and at one location to the 16 km east of the Study area near Barakula State Forest in 2012. It has also been recorded at 2 locations on the Condamine River ("Sherwood"; ALA 2010). The species has been located in a variety of habitats including vine thicket and Brigalow woodand with rock outcrops and Lancewood, Ironbark and E. woollsiana on ridges with and without rock (TSSC, 2016b). It shelters in moist microhabitats under wood, rocks and other debris, as well as under bark at the base of trees. It has been found persisting in Brigalow regrowth but only where there is abundant suitable microhabitat (e.g. logs, dense leaf litter). This species can also shelter under loose bark at the base of trees (SPRAT, 2023). Eggs are laid in suitable microhabitat locations during summer rains.	**Unlikely to occur** No potentially suitable habitat for this species has been identified within the Study area. Considering there is no closer records and high fragmentation, this species is only considered to have a potential to occur within the Study area.
Hypochrysops piceatus	Bulloak Jewel Butterfly	CE	CR	PMST	The Bulloak Jewel Butterfly is restricted to south-eastern QLD from near Leyburn to the Bendidee National Park/State Forest Area. Adults are active in warm, sunny conditions from late September to November. Males establish territories and settle above the ground at the edge or tops of mature Bulloak	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent

					(Allocasuarina luehmannii). Larvae feed on *A. luechmannii* and are attended by arboreal ants (*Anonychomyrma inclinata*). The ants carry the larvae to and from shelters on the host tree between dusk and dawn to feed on the soft terminal foliage. Meanwhile, the ants attend and feed on secretions from the larvae, and in turn provides the larvae with protection from predators. The attendant ants are strictly arboreal and require canopy connectivity for dispersal, and mature trees where colonies can exist in hollow branches and trunks (Braby 2016) (SPRAT Profile).	historical records have been recorded.
Jalmenus eubulus	Pale Imperial Hairstreak	-	V	WildNet	*Jalmenus eubulus* Occurs in woodland and associated forest on alluvial plains dominated by stands of Brigalow (*Acacia harpophylla*) west of the GDR from central QLD to northern NSW. The species requires a mix of mature trees of the host plant where the attendant ants (Iridomyrmex sp.) exist in hollow branches, and low shrubs on which the larvae feed. Adults fly around or close to stands of the host plant, meanwhile the larvae feed on young leaves of *A. harpophylla* accompanied by attendant ants (Braby 2016).	**Unlikely to occur** No potentially suitable habitat for this species has been identified within the Study area. Considering there is no closer records and high fragmentation, this species is only considered to have a potential to occur within the Study area.
Fish						
Bidyanus bidyanus	Silver Perch	E	-	PMST, WildNet	The Silver perch are endemic to the Murray-Darling system (including all states and sub-basins). This species formerly utilised a diversity of habitats within the Murray-Darling system and are commonly described as a lowland species that are not found in the cooler upper reaches of rivers. However, numerous reliable accounts exist of Silver Perth penetrating to Cooma (~800 m ASL) on the Murrumbidgee River in large-scale upstream migrants in summer in the early and mid-1900s. This species is consistently reported by anglers and research to show a general preference for fast-flowing water, including rapids and races, and more open sections of river, throughout the Murray-Darling Basin (SPRAT, 2023).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.

Maccullochella peelii	Murray Cod	V	-	PMST	The Murray Cod was historically distributed throughout the Murray-Darling Basin, which extends from southern QLD, through NSW, the ACT and VIC to SA, with the exception of the upper reaches of some tributaries. This species still Occurs in most parts of this natural distribution but to approximately 1000 m above sea level. The species' estimated extent of Occurrence, based on areas with an average river width of 50 m, is 660 km2. This species utilises a diverse range of habitats from clear rocky streams, such as those found in the upper western slopes of NSW, to slow-flowing, turbid lowland rivers and billabongs (SPRAT, 2023).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Amphibian						
Adelotus brevis	Tusked Frog	-	V	WildNet	The Tusked Frog inhabits wet eucalypt forest, rainforest, and sometimes dry eucalypt forest, where it can be found in close proximity to suitable breeding habitat such as ponds and slow-moving sections of streams. (Cogger 2000).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Reptile						
Acanthophis antarcticus	Common Death Adder	-	V	WildNet	The species is found in a wide variety of habitats in association with deep leaf litter, including rainforests, wet sclerophyll forests, woodland, grasslands, chenopod dominated shrublands, and coastal heathlands (DEHP 2017).	**Unlikely to occur.** Whilst potentially suitable habitat for this species has been identified within the Study area, the nearest reliable record of this species was recorded at Lake Broadwater (approximately 7 km to the north) in 1984. Considering the age of this record and the absence of more recent records indicating that a local population may utilise this

						potential habitat, this species is considered to have a potential to Occur within the Study area.
Anomalopus mackayi	Five-clawed Worm-skink	V	E	PMST, WildNet	The distribution of the Five-clawed Worm Skink is patchy in north-eastern NSE and south-eastern QLD. In south-eastern QLD the species is known from the upper Condamine River Floodplain from Warwick in the south to the Jimbour region in the north and bordered by the western edge of the Granite Belt. This species Occurs in Bluegrass and/or Mitchell Grass dominated grasslands or mixed grasslands dominated by other grass species but still categorised as Re 11.3.21. In south-east QLD, the species may also Occur in River Red Gum/Queensland Blue Gum/Coolibah/Poplar Box grassy woodland/open forest communities. The species is not likely to be found in soils in which deep cracks do not form, such as hard-setting brown clays or sandy soils (SPRAT, 2022).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Aspidites ramsayi	Woma	-	NT	WildNet	The Woma python can be found in the west and centre of Australia from WA through southern NW and northern SA to southern QLD and northwestern NSW. Its range may be discontinuous. This species was previously common on sandplains with other populations in the south and east found amongst wheatbelt and goldfield areas (www.ala.org.au). This species can be found in woodlands, heaths and shrublands, often with spinifex (Wilson, S and Swan, G, 2017). They have been known to shelter in abandoned monitor and mammal burrows and in soil cracks.	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Delma torquata	Adorned Delma	V	V	PMST	Under rocks and in soil cracks on heavy, stony and lightly timbered soils near Kenmore, Brookfield and Mt Crosby. Endemic to South- east Queensland. Also found in numerous disturbed habitats throughout Southeast Queensland (Cogger 2000).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.

Egernia rugosa	Yakka Skink	V	V	PMST, WildNet	Endemic to Queensland where its distribution is highly fragmented. Microhabitat requirements include partly buried rocks, logs or tree stumps, root cavities and abandoned animal burrows in association with dry sclerophyll forest or woodland, brigalow forest and open shrubland (Cogger 2018; McDonald 2008). It is also known to excavate deep burrow systems. The Yakka Skink can persist in cleared habitats if shelter sites such as raked log piles, deep gullies, tunnel erosion/sinkholes and rabbit warrens are available (DEHP 2017). The species can Occur on a wide variety of Queensland RE Land Zones including LZs 3, 4, 5, 7, 9 and 10 (DoE 2024) and in addition to the microhabitat features mentioned above, a 50% (combined) cover of native grasses and shrubs understory to 1m tall is indicative of suitable habitat (DSEWPC 2011).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Furina dunmalli	Dunmall's Snake	V	V	PMST, WildNet	The distribution of the Dunmall's Snake extends from near the QLD border through the Brigalow Belt South and Nandewar bioregions, as far south as Ashford in NSW. In QLD this species Occurs primarily in the Brigalow Belt region in the south-eastern interior of QLD. Records indicate sites at elevations between 200-500 m above sea level. The snake is very rare of secretive with limited records existing. It has been recorded at Archokoora, Oakey, Miles, Glenmorgan, Wallaville, Gladstone, Lake Broadwater, Mount Archer, Exhibition Range National Park, roadside reserves between Inglewood and Texas, Rosedale, Yeppoon and Lake Broadwater Conservation Park. It has been found in a broad range of habitats including forests and woodlands on black alluvial cracking clay and clay loams dominated by Brigalow; and other various Blue Spotted Gum, Ironbark, White Cypress and Bulloak open forests and woodland associations on sandstone derived soils (SPRAT).	**Unlikely to occur** Potentially suitable habitat for this species has been identified within the Study area. Considering there is no closer records and high fragmentation, this species is only considered to have a potential to occur within the Study area.
Hemiaspis damelii	Grey Snake	E	E	PMST, WildNet	Queensland, records are known from near Goondiwindi and the adjacent Darling-Riverine Plain, from the Darling Downs and from the Lockyer Valley. Several isolated records also Occur in the Rockhampton area. It favours woodlands, usually on heavier,	**Unlikely to occur** Potentially suitable habitat for this species has been identified within the Study

					cracking clay soils, particularly in association with water bodies. They shelter under rocks, logs and other debris as well as in soil cracks (SPRAT 2011).	area. Considering there is no closer records and high fragmentation, this species is only considered to have a potential to occur within the Study area.
Lampropholis colossus	Bunya Sunskink	-	NT	WildNet	The Bunya Sunskink is endemic to the Bunya mountains where it has been found in rainforest margins, dry rainforests and in moist savannah woodlands containing rainforest elements at higher altitudes (Smith et al, 2015).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Strophurus taenicauda	Golden-tailed Gecko	-	NT	WildNet	The Golden-tailed Gecko is only found in the Brigalow Belt North and Brigalow Belt South bioregions of QLD and NSW. This is a mostly arboreal nocturnal species that feeds on a variety of insects and other invertebrates. It occupies a range of vegetation types, particularly where *Acacia harpophylla, Casuarina cristata, Allocasuarina luehmannii, Eucalyptus crebra and Callitris glaucophylla* are growing (Pavey et al. 2021).	**Know to occur**
Tympanocryptis condaminensis	Condamine Earless Dragon	E	E	PMST, WildNet	The Condamine Earless Dragon Occurs in the eastern Darling Downs region of south-east QLD, in the Brigalow Belt Sough IBRA bioregion. It Occurs on the Condamine River floodplain in an area bounded by the Pirrinuan/Jimbour area in the northwest, Millmerran in the southwest, Clifton in the southeast and Toowoomba in the northeast. This species Occurs in an area on black-cracking clays that is intensively cropped. Almost all records of this species have been made on one private property, along narrow road reserves or in headlands (thin, less than 10m wide strips of grassland on paddock verges). Vegetation where this species has been observed is cropped (on private property), and remnant native grassland and exotic grassland. The species has been found in cotton, sorghum, maize and sunflower crops. it is known to forage in stubble field and may benefit in areas where no-till farming is employed (SPRAT Profile).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.

Birds						
Actitis hypoleucos	Common Sandpiper	Mi, Ma	-	PMST	The Common Sandpiper is a Holarctic migratory shorebird Occurring in Australia during its non-breeding season. In Australia it primarily frequents sheltered coastal and subcoastal habitats such as riverbanks and small estuaries, often preferring areas with a mosaic of rocks and muddy fringes, but also Occurs inland on the fringes of freshwater dams, lakes, and wetlands. It readily utilises disturbed or man-made habitats, such as storm channels, flooded parklands, and sea walls. It is typically present in Australia between late July and March (Menkhorst et al. 2019).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Anthochaera phrygia	Regent Honeyeater	CE	CR	PMST, WildNet	Inhabits dry open forest, woodlands, especially red ironbark, yellow box, yellow gum, particularly along creek flats; mistletoe on river oak; trees in farmland, streets, gardens (Pizzey and Knight 1999). This species is a patchy, irregular spring-summer breeding migrant to Dubbo-Warrumbungle NP, Munghorn Gap NR-Hunter R. and Windsor regions (NSW) (Pizzey and Knight 1999).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Aphelocephala leucopsis	Southern Whiteface	V	V	PMST, WildNet	Southern Whiteface Occurs across most of mainland Australia south of the tropics from the north-eastern edge of the WA wheatbelt east to the Great Dividing Range. In Qld, the species is largely confined to the southwest of the Mitchell Grass Downs and along the southern state border. They inhabit a wide range of open eucalypt or acacia woodlands and shrublands with an understory of grasses and/or shrubs. The species forages almost exclusively on the ground for insects, spiders and seeds, and favours habitat with low tree densities, a herbaceous understory and good litter cover (DCCEEW 2023).	**Unikely to occur**. Suitable habitat for this species has been identified within the Study area. Two records within 50km of southern SGP, undated or at least 15y old. Nearest recent record (2008) from Wilkie Creek in north of Kumbarilla SF, surrounded by southern SGP.
Apus pacificus	Fork-tailed Swift	Mi, Ma	-	PMST	The Fork-tailed Swift is a migratory species that can Occur anywhere in Australia. The species is predominantly aerial while in Australia, is highly mobile and forages over a variety of habitat types, though perhaps is most common over inland plains. It sometimes Occurs in large foraging flocks of 100's or 1000's of birds, which may forage from near ground level to hundreds of	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.

					metres above the ground. The species is typically present in Australia between approx. October and April (Menkhorst et al. 2019).	
Ardenna pacifica	Wedge-tailed Shearwater	E	V	PMST	The Wedge-tailed shearwater is widely distributed across the tropical pacific and Indian Oceans. It is known to breed on the east and west coast of Australia. It nests on low, flat islands, sand spits or atolls with little or no vegetation. It is a mostly pelagic species (www.arkive.com).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Botaurus poiciloptilus	Australasian Bittern	E	V	PMST, WildNet	Occurs from southern Queensland to Tasmania and southeastern South Australia. In NSW this species has been recorded along the coast as well as inland wetlands and rivers (NPWS, 1999). The Australasian Bittern Occurs in estuarine and freshwater wetlands with tall dense vegetation, including sedges, spike rushes, reeds and bulrush (NPWS, 2000; NPWS, 1999). It favours wetlands with tall dense vegetation, where it forages in still, shallow water up to 0.3 m deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water Feeds mostly at night upon frogs, yabbies, spiders, insects, snails, small fish and mice (Schodde and Tidemann, 1993; NPWS, 2000).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Lophochroa leadbeateri leadbeateri	Major Mitchell's cockatoo	E	E	WildNet	Major Mitchell's cockatoo Occurs in the Murray-Darling, Eyre and Bulloo River Basins, from Isisford and Roma in the north, through western NSE to north-western VIC and west to eastern SA. This subspecies had disappeared from the Adelaid and Mt Mary Plains in SA by the 1950s. IT is assumed that only 20-30% of its remaining range is still occupied. This subspecies lives in arid and semi-arid woodlands dominated by mulga (*Acacia aneura*), male and box eucalypts, slender cypress pine (*Callitris gracilis*) or Belah (*Casuarina cristata*). Within these vegetation communities, the subspecies main requirements are fresh surface water, and trees with suitable nesting hollows). They tend to have very specific hollow requirements. Suitable nesting hollows are found in trees that are large and tall relative to the	**Unlike to occur**. No suitable habitat has been identified in the Study area. Two records exist within the SGP project site in the Lake Broadwater area, both > 30 years old and several > 50 years old. The age of these sparse records indicates the species does not Occur in the area with any frequency.

					typical structure of arid and semi-arid woodlands. Therefore, nesting trees, which are mainly eucalypts or cypress pines, are usually old. The birds prefer to feed in or close to wooded areas where they feed on seeds of native shrubs and trees, and sometimes roots, bulbs, insect larvae and seeds of crops and weeds. They typically forage within wooded areas that are also used to travel between feeding areas and nesting/roosting areas. In fragmentated landscapes, individuals travel along vegetated corridors (SPRAT Profile).	
Calidris acuminata	Sharp-tailed Sandpiper	V, Mi, Ma	-	PMST, WildNet	The Sharp-tailed Sandpiper is a non-breeding migrant to Australia which Occurs in all states and territories, though mostly in the southeast of Australia in both inland and coastal locations. In Qld, the species is widespread along the coast and sparsely scattered inland. The species uses fresh, saline and hypersaline environments, feeding along the edge of water on mudflats, coastal and inland wetlands, and sewage ponds. After rainfall events, the species may also feed on areas of agricultural pasture. The species is typically present in Australia between August and April (DCCEEW 2024).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Calidris ferruginea	Curlew Sandpiper	CE, Mi, Ma	V	PMST, WildNet	In Australia, the Curlew Sandpiper is most common in the far south-east and north-west of the country, where it Occurs primarily in coastal sites, but may also be found inland in suitable wetland habitats. In Qld, the species is widespread along the coast south of Cairns and sparsely scattered inland. On the coast, the species prefers intertidal mudflats in sheltered areas; inland, it is found around ephemeral and permanent lakes, dams and waterholes, usually those with bare edges of mud or sand. The species is typically present in Australia between August and March (DCCEEW 2023).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Calidris melanotos	Pectoral Sandpiper	Mi, Ma	-	PMST	This species if found in shallow fresh waters, often with low grass and other herbage; swamp margins, flooded pastures, sewage ponds; occasionally tidal areas and saltmarshes (Pizzey and Knight 1999).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent

						historical records have been recorded.
Calyptorhynchus lathami sensu lato	Glossy Black-cockatoo (south-eastern)	V	V	PMST, WildNet	The southern Glossy Black Cockatoo has a widespread distribution, ranging from Gympie to the south-east QLD border, inland to Augathella and Tambo. The distribution of this species continues south into NSW spreading inland to the central western plains and also Occurs in the eastern coastal Gippsland region of VIC. This species prefers woodland areas dominated by she-oak (Allocasuarina) or open sclerophyll forests and woodland with a stratum of Allocasuarina beneath Eucalyptus, Corymbia or Angophora. Glossy black- cockatoos have also been observed in mixed Allocasaurina, Casuarina, Cypress, Callitris and brigalow (*Acacia harpophylla*) woodland assemblages (Hourigan, 2012).	**Know to occur**.
Climacteris picumnus victoriae	Brown Treecreeper (south-eastern)	V	V	PMST	The south-eastern Brown Treecreeper is endemic to south-eastern Australia, from the Grampians (western Vic) through central NSW to the Bunya Mountains (Qld). The subspecies occupies dry eucalypt forests and woodlands, particularly those dominated by stringybarks or other rough-barked eucalypts; preferred habitats usually have an open grassy understorey, sometimes with one or more shrub species. The subspecies is not usually found in woodlands with a dense shrub layer, and it is absent from heavily degraded woodlands and steep rocky hills. Optimal habitat must experience some kind of ongoing disturbance regime (historically Indigenous burning practices) to keep the ground layer from becoming too dense and uniform (DCCEEW 2023).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Cuculus optatus	Oriental Cuckoo	Mi	-	PMST	The Oriental Cuckoo is a regular non-breeding migrant to coastal northern and eastern Australia. Preferred habitat for the species in Australia includes monsoonal rainforest, vine thickets, wet sclerophyll forest or open Casuarina, Acacia, or Eucalyptus woodlands, in which it often Occurrs at the ecotones between habitat types. It is most frequently recorded in Australia between November and March (DoE 2015; Menkhorst et al. 2019).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.

Cyclopsitta diophthalma coxeni	Coxen's Fig-parrot	CE	V	WildNet	The distribution of the Coxen's Fig-Parrot is poorly known. Based on accepted records, the core distribution extends from Gympie in south-eastern QLD to Richmond River in north-eastern NSW. They occupy habitats that Occur from sea level to approximately 900m above sea level. They Occur in rainforest habitats including subtropical rainforest, dry rainforest, littoral and developing littoral rainforests and vine forests (SPRAT 2010).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Diomedea exulans	Wandering Albatross	V	V	WildNet	The wandering albatrosses spend the majority of their time in flight, soaring over the southern oceans. They breed on a number of islands just north of the Antarctic Circle. They breed on ridges and hillocks, amongst open and patchy vegetation (www.arkive.org).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Erythrotriorchis radiatus	Red Goshawk	E	E	PMST, WildNet	The Red Goshawk is currently known to Occur from the Kimberly in WA east to Cape York Peninsula in Qld. The historical range of the species extended through Qld into NSW, however, in the last decade records south of Cape York Peninsula are increasingly scant, and the species has experienced a rapid contraction of its range in that time (McColl et al. 2023). The species inhabits biodiverse mosaics of mostly eucalypt-dominated open forests and woodlands, in permanently watered, varied terrain. Favoured vegetation types include eucalypt woodland, tall open forest, gallery rainforest, swamp sclerophyll forest and rainforest margins. Nests are typically restricted to trees >20 m tall and within 1 km of (and often beside) a watercourse (DCCEEW 2023).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Falco hypoleucos	Grey Falcon	V	V	PMST, WildNet	The Grey Falcon Occurs in low densities throughout arid and semi-arid Australia, including the Murray-Darling Basin, Eyre Basin, central Australia and WA. The species is mainly found where annual rainfall is less than 500 mm and is very rare east of the Great Dividing Range. It frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined watercourses but has also been observed hunting in treeless areas and also Occurs in tussock grassland and open	**Unlikely to occur / Transient.** Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.

					woodlands, especially in winter. The species is also attracted to artificial structures, with tall transmission towers providing roosting and breeding habitat (Menkhorst et al. 2019; TSSC 2020).	
Gallinago hardwickii	Latham's Snipe	V, Mi, Ma	V	PMST, WildNet	Latham's Snipe is a non-breeding visitor to south-eastern Australia and is a passage migrant through northern Australia. This species has been recorded along the east coast of Australia from Cape York Peninsula through to south-eastern SA. It Occurs in permanent and ephemeral wetlands up to 2000m ASL, where they usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies). They can also Occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity (SPRAT, 2023).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Geophaps scripta scripta	Squatter Pigeon (southern)	V	V	PMST, WildNet	The known distribution of the southern Squatter Pigeon extends south from the Burdekin-Lynd divide in Central Queensland to the Border Rivers region of northern NSW, and from the east coast of Queensland inland to Hughenden, Longreach and Charleville. The subspecies habitat is generally defined as open forests to sparse, open woodlands and scrub mostly dominated by eucalypts, Corymbia, Acacia or Callitris species. They are disturbance-tolerant, often Occurring in agricultural areas around cattle yards, but are usually found within 3 km of permanent water (TSSC 2015; Menkhorst et al. 2019).	**Unlikely to occur / Transient.** Whilst this species has been described as transient for the Broader SGP Project, suitable dispersal habitat is likely to Occur within the Study area and nearby historical records have been identified. The nearest record is approximately 43 km to the north-west (ALA, 1997).
Grantiella picta	Painted Honeyeater	V	V	PMST, WildNet	The Painted Honeyeater is sparsely distributed from southeastern Australia through to northwestern Qld and eastern NT. The greatest concentration of records Occurs south of 26ºS on inland slopes of the GDR between the Grampians (Vic) and Roma (Qld). The species is migratory, moving north in winter. It is typically found in proximity to preferred food sources (fruiting mistletoes). It inhabits eucalypt forests and woodlands, riparian	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.

					woodlands of black box and river red gum, box-ironbark-yellow gum woodlands, acacia-dominated woodlands, paperbarks, casuarinas, Callitris, and trees on farmland or in gardens. It prefers woodlands with a higher number of mature trees (i.e., those with more mistletoes), but, in the north of its range may wander into arid and semi-arid scrubs (DoE 2015; Menkhorst et al. 2019).	
Hirundapus caudacutus	White-throated Needletail	V, Mi, Ma	V	PMST, WildNet	The White-throated Needletail is a non-breeding migrant to Australia, and, when present, is widespread in eastern and south-eastern Australia. It has been recorded in all coastal regions of Qld, extending inland to the western slopes of the GDR and occasionally onto adjacent plains. In Australia, the species was thought to be almost exclusively aerial, foraging from <1 m to >2000 m above the ground, but recent evidence suggests that roosting in the canopy of woodlands is a common behaviour (see Tarburton 2021; Vanderduys et al. 2024). The species has been recorded foraging over various habitats, including open forests, rainforest, heathlands, grasslands and farmlands, partly cleared pasture, plantations or remnant vegetation at the edge of paddocks (TSSC 2019).	**Know to occur**
Lathamus discolor	Swift Parrot	CE, Ma	E	PMST, WildNet	The Swift Parrot breeds in Tasmania, and the entire population migrates north to mainland Australia for the winter. On the mainland, the species disperses widely to forage on flowers and psyllid lerps in eucalypts. The majority are found in NSW and Vic, but small numbers are observed in south-eastern Qld on a regular basis. Non-breeding birds preferentially feed in inland box-ironbark and grassy woodlands, as well as coastal swamp mahogany (*Eucalyptus robusta*) and spotted gum (*Corymbia maculata*) woodland when in flower (TSSC 2016).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Limosa lapponica baueri	Western Alaskan Bar- tailed Godwit	E	E	PMST	The bar-tailed godwit (both subspecies combined) has been recorded in the coastal areas of all Australian states. It is widespread in the Torres Strait and along the eastern and south-east coasts of QLD, NSW and VIC. These species migrate southwards for the boreal winter. L. l. Menzbieri has a more	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent

					westerly migration than L. l. Baueri. They are usually located around intertidal areas along muddy coastlines, estuaries, lagoons, sewage ponds, brackish or saline inland lakes, flooded pastures and airfields (Pizzey and Knight 1999, Threatened Species Scientific Committee)	historical records have been recorded.
Limosa limosa	Black-tailed Godwit	E, Mi, Ma	-	PMST, WildNet	The temperate or tropical winter habitats are usually located around intertidal areas along muddy coastlines, estuaries, lagoons, sewage ponds, brackish or saline inland lakes, flooded pastures and airfields (Pizzey and Knight 1999).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Melanodryas cucullata cucullata	Hooded Robin (south-eastern)	E	E	WildNet	The South-eastern Hooded Robin Occurs in south-eastern Australia from far south-east QLD to Yorke Peninsula, SA, intergrading with M. c. Picata in the southern Murray-Darling basin. This subspecies is now absent from many formerly occupied sites, particularly in the wetter areas of the south and east. This species is described as shy and largely sedentary and are mostly seen in pairs of small groups. They prefer dry eucalypt and acacia woodlands and shrublands with an open understorey, some grassy areas and a complex ground layer. They avoid woodlands with tall trees or dense tree cover but sometimes Occur in tall, dense heaths with scattered open areas (SPRAT, 2023).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Motacilla flava	Yellow Wagtail	Mi, Ma	-	PMST	The Yellow Wagtail is a regular wet season visitor to northern Australia; on the east coast, it is considered a vagrant further south than Townsville. Habitat requirements are highly variable, but typically include flat grassy areas near water, as well as a variety of freshwater habitats (DoE 2015).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Neophema chrysostoma	Blue-winged Parrot	V, Ma	V	PMST	The Blue-winged parrot breeds on mainland Australia south of the Great Dividing Range in southern VIC from Port Albert in Gippsland west to Nelson, and sometimes in the far south-east of SA, and north-western, central and eastern parts of TAS. This species inhabits a range of habitats from coastal, sub-coastal	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent

					and inland areas, through to semi-arid zones. They tend to favour grasslands and grassy woodlands and are often found near wetlands both near the coast and in semi-arid zones. This species can also be seen in altered environments such as airfields, gold-courses and paddocks. Pairs of small parties of Blue-winged parrots forage mainly near or on the ground for seeds of a wide range of native and introduced grasses, herbs and shrubs (SPRAT, 2023).	historical records have been recorded.
Ninox strenua	Powerful Owl	-	V	WildNet	The Powerful Owl Occurs from south-eastern Qld to Vic, where it inhabits open forests and woodlands, as well as sheltered gullies in wet forests with dense understoreys, particularly along watercourses. The species requires mature trees providing large hollows for nesting. The species also Occurs in urban areas (where suitable nesting habitat remains), taking advantage of the large populations of arboreal mammals and flying foxes (Menkhorst et al. 2019).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Pandion haliaetus	Osprey	Mi, Ma	-	PMST	The Osprey has a broad global distribution and Occurs around the entire coast of Australia. Occasionally, individuals also Occur inland. The species forages for fish in fresh, brackish, or saline waters of rivers, lakes, estuaries and inshore coastal waters. Nests are usually located near a suitable area of foraging habitat and are a bulky structure made from piled sticks, often positioned in a tall dead tree or in artificial structures such as telecommunication towers or poles (Menkhorst et al. 2019).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Pedionomus torquatus	Plains-wanderer	CE	CR	WildNet	The Plains-wanderers are distributed across the north-central VIC, southern NSW around the Riverina region, eastern SA and west- central QLD. This species inhabits sparse grasslands with cover of 50% bare ground, with most vegetation less than 5 cm in height and some widely spaced plants up to 30 cm high. This species may occasionally use lower-quality habitat including cereal stubble but cannot persist in an agricultural landscape. They are sedentary for as long as the habitat remains suitable (DoE, 2015).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.

Psephotus pulcherrimus	Paradise Parrot	EX	EX	WildNet	The paradise Parrot has been listed as extinct in the wild since 2000. It formerly Occurred in central and southern QLD, north near Brisbane to sites near Duaringa and on the Comet and Nogoa Rivers, and west to St George. There have also been unconfirmed reports from north-eastern NSW and northern QLD, which are currently thought to be incorrect. This species formerly inhabited undulating river valleys, lightly timbered with eucalypt woodlands or open forests, often dominated by ironbark's and bloodwoods, with an understory of annual and perennial native grasses. These areas were often dotted with termitaria. Little is known about the diet, movement or reproductive traits of this species (SPRAT Profile).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Rostratula australis	Australian Painted Snipe	E, Ma	E	PMST, WildNet	The Australian Painted Snipe is a secretive, nomadic inhabitant of ephemeral and permanent wetlands of inland Australia. It has been recorded in scattered locations throughout much of Qld, with important areas including the Qld Channel Country and the Fitzroy Basin. It Occurs in freshwater or brackish wetlands such as lakes, swamps, claypans, inundated or waterlogged grassland and saltmarsh. Typically, habitat has a mosaic of concealing vegetation, exposed mud and shallow water, but when dispersing in response to poor conditions atypical habitats are often used (Menkhorst et al. 2017).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Stagonopleura guttata	Diamond Firetail	V	V	PMST, WildNet	Diamond Firetails Occur on the south-east mainland of Australia from south-east QLD to Eyre Peninsula, SA and about 300 km inland from the sea. This species Occurs in eucalypt, acacia or casuarina woodlands, open forests and other lightly timbered habitats, including farmland and grassland with scattered trees. They tend to prefer areas with relatively low tree density, few large logs, and little litter cover but high grass cover (SPRAT, 2023).	**Possible to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Tringa glareola	Wood Sandpiper	Mi, Ma	-	PMST	The Wood Sandpiper uses well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They are typically associated with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent

					as dense stands of rushes or reeds, shrubs, or dead or live trees, especially Melaleuca and River Red Gums (Eucalyptus camaldulensis) and often with fallen timber (SPRAT, 2010). Regular summer migrant to Australia from September to April (Pizzey and Knight 1999).	historical records have been recorded.
Tringa nebularia	Common Greenshank	E, Mi, Ma	-	PMST, WildNet	In Queensland, the species is widespread in the Gulf country and eastern Gulf of Carpentaria (SPRAT, 2010). Found in mudflats, estuaries, saltmarshes, margins of lakes, wetlands, claypans, fresh and salines, commercial salt fields, sewage ponds (Pizzey and Knight 1999).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Tringa stagnatilis	Marsh Sandpiper	Mi, Ma	-	PMST	The Marsh Sandpiper lives in permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, saltpans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks (SPRAT, 2010).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Turnix melanogaster	Black-breasted Button-quail	V	V	PMST, WildNet	The Black-breasted Buttonquail (BBBQ) Occurs in coastal and near-coastal areas of south-east Queensland. The BBBQ has specific habitat requirements; preferred habitats include dense forest or thicket vegetation with a closed canopy, a dense layer of midstory vegetation, and a variable ground cover mosaic, which includes both open areas with deep leaf litter and areas of ground covering vegetation (DCCEEW 2022). BBBQ typically require a dense layer of leaf litter and/or soft friable soil, in which they forage for the invertebrates (including beetles, ants and earwigs) that are their main source of food (DCCEEW 2022).	**Unlikely to occur.** No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Mammal						
Chalinolobus dwyeri	Large-eared Pied Bat	E	E	PMST, WildNet	The species' current distribution is poorly known, but records indicate that it Occurs from Shoalwater Bay on the central Qld coast south to the vicinity of Ulladulla, NSW. It is believed to be restricted within this range. In Qld, records are known from the Carnarvon, Expedition Ranges and Blackdown Tablelands. It is typically found in areas with cliffs, escarpments or rocky outcrops	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.

					for roosting (typically sandstone, but also rhyolite), with suitable caves, overhangs and cracks. Foraging habitat includes fertile valleys and plains, as well as areas with moderately tall woodland areas along watercourses and upper slopes of crests and ranges. Evidence suggests that the species requires roosting and foraging habitat Occurring in proximity; without both habitat types being present, it is unlikely to Occur (DCCEEW 2023).	
Dasyurus hallucatus	Northern Quoll	E	-	PMST	The northern quoll Occurs across much of northern Australia, from south-eastern Queensland to the south-west Kimberley, with a disjunct population in the Pilbara. In the Northern Territory it is restricted to the Top End. The species occupies a diversity of habitats across its range which includes rocky areas, eucalypt forest and woodlands, rainforest, sandy lowlands and beaches, shrubland, grasslands and desert. The habitat generally encompasses some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging and dispersal (SPRAT 2012).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Dasyurus maculatus maculatus	Spotted-tailed Quoll (southern)	E	E	PMST, WildNet	The Spotted-tailed Quoll Occurs along the east coast of Australia from southeast Queensland to South Australia and Tasmania. The Spotted-tailed Quoll has been recorded in a wide range of habitat types including dry and moist sclerophyll forests and woodlands, rainforest, coastal heathland, and riparian forest. This species been occasionally sighted in treeless areas, rocky outcrops and grazing lands (NPWS, 1999; NPWS, 2000; Strahan, 2008). The Spotted-tailed Quoll shelters and dens in small caves, fallen logs with large hollows and tree hollows and may utilise numerous dens within its home range which has been estimated to be between 800 ha to 20 km2 (NPWS, 2000; NPWS in prep, 1999). The Spotted-tailed Quoll is partly arboreal and feeds upon a variety of prey species including birds, rodents, lizards, small wallabies, and even insects. The Spotted-tailed Quoll is also known to scavenge and feed upon carrion,	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.

					road kills including wild dogs, and litter (Strahan 1998; NPWS 2000).	
Macroderma gigas	Ghost Bat	V	E	PMST	The species current known range is discontinuous, with geographically distinct colonies Occurring in northern WA, northern NT, the Gulf of Carpentaria, coastal and near coastal eastern Qld, and western Qld. Populations are highly structured and genetically distinct at local and regional scales. The species occupies a wide range of habitats and occurs in arid areas, tropical savanna woodlands and rainforests. They require undisturbed roost sites, such as caves, rock crevices and abandoned my shafts. On average, they forage ~2 km from the daytime roost. They have been found to move between caves seasonally and may require a range of cave sites (TSSC 2016).	**Unlikely to occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Nyctophilus corbeni	Corben's Long-eared Bat	V	V	PMST, WildNet	Corben's long-eared bat is patchily distributed across southern central Qld, central western NSW, northwestern Vic and eastern SA. Most of its range Occurs within the Murray-Darling Basin, and the majority of records Occur inland of the Great Dividing Range. The species inhabits a variety of inland woodland vegetation types, including box/ironbark/cypress pine woodlands, Buloke woodlands, Brigalow woodlands, Belah woodlands, smooth-barked apple woodlands, river red gum forest, black box woodland, and various types of tree mallee. In Qld, it can inhabit this variety of vegetation, however, is distinctly more common in box/ironbark/cypress pine vegetation that Occurs in a north-south belt along the western slopes and plains of NSW and southern QLD. This species is more abundant in extensive stands of vegetation in comparison to smaller woodland patches, suggesting its home range is probably large. This species has also been found to be much more abundant in habitats that have a distinct tree canopy and a dense, cluttered understory layer (TSSC, 2015).	**Know to occur**
Petauroides volans spp *volans*	Greater Glider	E	E	PMST, WildNet	The southern and central Greater Glider Occurs in eastern Australia, where it has a broad distribution from around Proserpine in QLD, south through NSW and the ACT, to Wombat	**Know to occur**.

	(southern and central)				State Forest in central VIC. This species is largely restricted to eucalypt forests and woodlands of eastern Australia. It is typically found in highest abundance in taller, montane, moist eucalypt forests on fertile soils, with relatively old trees and abundance hollows. It is likely that only a proportion of forest in potential habitat areas is suitable for the species, as the structural attributes of the forest overstorey and forage quality it relies on vary considerably across the landscape (TSSC Conservation Advice, 2022).	
Petaurus australis	Yellow-bellied Glider	V	V	PMST	The Yellow-bellied Glider (south-eastern) is found at altitudes ranging from sea level to 1400m ASL and has a widespread but patch distribution from southeastern QLD to far southeastern SA, near the SA-VIC border. This distribution also extends inland to the western slopes of the Great Dividing Range in parts of NSW and QLD. The Yellow-bellied Glider Occurs in eucalypt-dominated woodlands and forests, including both wet and dry sclerophyll forests. Their abundance is highly dependent on habitat suitability, which is in turn determined by forest age and floristics. This subspecies shows a preference for large patches of mature old growth forest that provide suitable trees for foraging and shelter. There is also a clear preference for forests with a high proportion of winter-flowering and smooth-barked eucalypts (which are a key foraging resource) (DAWE, 2022).	**Likely to occur**. Potentially suitable habitat for this species has been identified within the Study area. Considering there is no closer records and high fragmentation, this species is only considered to have a potential to occur within the Study area.
Phascolarctos cinereus	Koala	E	E	PMST, WildNet	The Koala is endemic to Australia. The biological species range extends from north-eastern QLD to the south-east corner of SA. Koalas naturally inhabit a range of temperate, subtropical and tropical forests, woodland and semi-arid community's dominated by Eucalyptus species. Their habitat can broadly be defined as any forest or woodland containing species that are a known Koala food tree, or shrubland with emergent food trees (SPRAT 2017).	**Know to occur**
Pteropus poliocephalus	Grey-headed Flying-fox	V	-	PMST	Australia's only endemic Flying-fox, the species Occurs in coastal areas from central Qld to SA. Only a small portion of this range is used at any one time, as the species selectively forages	**Unlikely to occur**. No suitable habitat has been identified in the Study area,

					where food is available. A generalist, the species may Occur in a variety of vegetation communities including rainforests, open forests, woodlands, Melaleuca swamps and Banksia woodlands. The species has adopted complex migration traits in response to ephemeral and patchy food resources. The species is colonial, with daytime camps usually found in tall, closed forests near a water source. However, due to the species' nomadism, camps are rarely permanent and are usually temporarily seasonally occupied (TSSC 2001; DAWE 2021).	and no nearby recent historical records have been recorded.
Tachyglossus aculeatus	Short-beaked Echidna	-	SLC	Arrow	The Short-beaked Echidna lives in forest and woodlands, heath, grasslands and arid environments. It is found throughout Australia, including Tasmania. Although it is found all over Australia, it is not as common in Sydney as it once was (www.australianmuseum.net.au).	**Likely to occur**. This species is not associated with a specific regional ecosystem, but there were historical records nearby to the Study area.

Appendix E - Ecological Field Survey (Arrow 2025)

SUMMARY ECOLOGICAL SURVEY REPORT

SURVEY DETAILS			
Project Batch (Infra. Surveyed): (Survey Title from invite)	Surat Basin – Girrahween 3 (35AU35) wells, gathering and access.		
Type of Survey:	Rapid Ecological		
Scope of Activity: Quantify the scope details; include length and width of surveyed RoW, number and names of well leases, gravel pits, camps etc. If this report is uprevved following additional assessments or sketch changes, detail the additional scope, sketch change, ecologist name and date of additions	Approximately 10900 metres of access and gathering of varying width (average 70m), approximately 2840m of access (30m wide) and wells (YE138, YE146, YE147, YE152, YE155, YE156, YE170, YE177, YE249)		
Lot Plan:	35AU35	**Date of Survey:** Include dates and ecologist initials for follow-up assessment	27-28/08/2025 BM
Facility Type / Activity:	Wells ☐ Appraisal ☐ Microseismic ☐ Gravel Pit	☐ Core ☑ Development / Production ☐ Directional ☐ Campsite	☐ Exploration ☐ Monitoring ☐ Tiltmeter Array ☑ Access Track
	☐ Seismic ☐ Trunkline ☐ Comms Towers ☐ FCS (Field Compression Station) ☐ Other:	☑ Gathering System ☐ Gas Pipeline ☐ Fibre Optic Cable ☐ CPP (Central Processing Plant)	☐ Security Hut ☐ Water Pipeline ☐ Pond ☐ WTP (Water Treatment Plant) ☐ Frac Pond

RECOMMENDATIONS:		
☐ No Environmental issues on site	☐ ☑ Environmental issues identified & surveyed	☐ EA amendment required
☑ Fauna spotter required	☐ Protected Flora Trigger Map Survey required	☐ Other:

ISSUES Requiring Follow-up:

Only detail significant issues here that are required to be followed up, e.g., infrastructure in ESA buffers* requiring EA amendment, additional flora or fauna surveys required etc.

*Refer to *EA Conditions Matrix* for buffer distances and permitted activities.

EVNT-specific microhabitat features were observed during the survey in some of the more protected older RE11.7.4 that might support *Nyctophilus corbeni* (southeastern long-eared bat (SELEB)), which is listed as Vulnerable under the EPBC Act and Qld NC Act. SELEB prefers to feed in relatively undisturbed dry open box, ironbark and Callitris woodland. They roost under loose bark or in small hollows and crevices. Sightings close to the study area suggest this species is likely to occur in relatively undisturbed habitat and likely to be found in part of the study area. Suitable vegetation for SELEB was observed at, and along gathering to, YE146, 147, 152, 156, 170 and 177. Clearing of SELEB habitat may require offsetting.

SUMMARY OF ECOLOGICAL CONSTRAINTS (FURTHER DETAIL IN ECOLOGICAL FIELD SURVEY FORM)	
Brief description of broader vegetation / land use:	The land use is lifestyle/forestry with most of the property mapped as remnant vegetation. Vegetation is mostly ironbark woodland in good to average condition.
Were any REs identified and what are they? Are these correctly mapped by DoR? (Survey new extents) Updates to DoR RE Mapping IDs: What is the vegetation currently mapped as (RE and status) and what should it be mapped as? *Refer to VMA Mapping and Biodiversity Status.*	Vegetation on the access/gathering is state mapped as 11.7.4/11.7.7/11.7.5/11.7.2 (80/10/5/5), 11.5.21/11.7.4/11.5.4 (40/40/20) and 11.7.4/11.5.1a/11.5.1 (50/25/25). REs present on the alignment include 11.7.4 (*Eucalyptus decorticans* and/or *Eucalyptus* spp., *Corymbia* spp., *Acacia* spp., *Lysicarpus angustifolius* woodland on Cainozoic lateritic duricrust), 11.5.21 (*Corymbia bloxsomei* +/- *Callitris glaucophylla* +/- *Eucalyptus crebra* +/- *Angophora leiocarpa* woodland on Cainozoic sand plains and/or remnant surfaces), 11.7.5 (Shrubland on natural scalds on deeply weathered coarse-grained sedimentary rocks), 11.7.6 (*Corymbia citriodora* or *Eucalyptus crebra* woodland on Cainozoic lateritic duricrust) and 11.5.1 (*Eucalyptus crebra* and/or *E. populnea*, *Callitris glaucophylla*, *Angophora leiocarpa*, *Allocasuarina luehmannii* woodland on Cainozoic sand plains and/or remnant surfaces). These REs have a VM status of Least Concern (LC) and Biodiversity Status of No Concern at Present (NCaP). HVR is indicated on part of the site and is likely to be regrowth RE11.5.1, but this vegetation is not impacted by the proposed gathering and access or well pads. RE11.3.25 (*Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines) is present along the northern boundary of the property. This RE has a VM Status of Least Concern and Biodiversity Status of Of Concern. Areas to the north and east of the property are mapped as non-remnant and were ground truthed as non-remnant with scattered Acacia regrowth.
Environmentally Sensitive Areas (ESAs) Provide a summary of mapped and unmapped ESAs surveyed/validated. If surveyed infrastructure would impact ESAs or buffers, include impact details on front page	No ESAs were mapped or observed within the survey corridor. There were no mapped ESAs within 300 metres of the surveyed corridor.
Threatened Ecological Communities (TEC) identified: Survey TEC polygon for inclusion on survey sketch.	There are no mapped or observed TECs within the corridor or within 300 metres of the surveyed corridor.
DoR-mapped High-value Regrowth present / impacted:	HVR is indicated on part of the site and is likely to be regrowth RE11.5.1, but this vegetation is not impacted by the proposed gathering and access or well pads.
Regrowth Present/Impacted: *(i.e., Species & Common name/rough estimate when cleared in years)*	Category X mapped areas contain only scattered regrowth of Eucalypt and Acacia.

EVNT Flora species present / impacted (EPBC or NCA): Is proposed infrastructure in a High-risk Area identified on a Protected Plant Trigger Map? (If yes, add requirement for Flora Survey to front page – refer to *Flora Survey Guidelines – Protected Plants*).	No EVNT flora were observed during the survey. The survey area was not shown as 'high-risk' for protected plants on the Flora Survey Area Trigger Mapping
EVNT Fauna – Does the area contain Potential Habitat for any EVNT species (EPBC or NCA)? 1. Is the area Core Habitat 'Known' or 'Possible' for any EVNT species (EPBC or NCA)? 2. If 'Yes', does the area contain microhabitat features, which would indicate likely habitat for the species OR was the species detected? 3. Survey microhabitat features or fauna encounters for inclusion on survey sketch. 3. If no suitable habitat for any threatened species is detected, provide a summary of how site conditions are unsuitable.	A Likelihood of Occurrence Matrix (LoOM) assessment, considering 34 threatened species with potential to occur in Arrow's upstream tenements, was conducted for the surveyed infrastructure on the property. The completed LoOM is appended to this report. General habitat features for a number of species were considered present on the property, although no evidence of EVNT fauna was observed during the survey. EVNT-specific microhabitat features were observed during the survey in some of the more protected older RE11.7.4 that might support *Nyctophilus corbeni* (southeastern long-eared bat (SELEB)), which is listed as Vulnerable under the EPBC Act and Qld NC Act. SELEB prefers to feed in relatively undisturbed dry open box, ironbark and Callitris woodland. They roost under loose bark or in small hollows and crevices. Sightings close to the study area suggest this species is likely to occur in relatively undisturbed habitat and likely to be found in part of the study area. Suitable vegetation for SELEB was observed at, and along gathering to, YE146, 147, 152, 156, 170 and 177. EVNT-specific microhabitat features were observed in spotted gum dominated woodlands during the survey that might support *Petauroides volans volans* (greater glider), which is listed as Endangered under the EPBC Act and Qld NC Act. While there are large live and dead tree hollows it is considered the intact vegetation may be too far from a well-developed watercourse and lacking gliding linkages. The spotted gum woodlands were also considered potential habitat for *Petaurus australis* (yellow-bellied glider (south-east)), which is listed as Vulnerable under the EPBC Act and Qld NC Act. They utilise hollows in larger trees and prefer to forage in smooth barked eucalypts such as spotted gum. Given the surrounding patchiness of vegetation (caused by fire) and the dominance of the area by regional ecosystems not considered to be preferred yellow-bellied glider habitat, its presence was considered unlikely.

Watercourses and Wetlands:
 	
Brief summary of mapped and unmapped watercourses, wetlands and buffers impacted.
 	
Assessment information to include:
• any downgrades of mapped watercourses to drainage features
• infrastructure in buffers
• Details on wetlands:
  ○ Mapped referrable HES or GES
  ○ Unmapped
  ○ Impacts in buffers
	Proposed access crosses an SO2 watercourse in the southeast of the property. The watercourse at this location was considered a watercourse under the definition in the *Water Act 2000* and is likely to contain RE11.3.14 (NACaP) although a very narrow riparian corridor.
	
	There are no mapped wetlands on the property or within buffer distance.

Restricted Invasive Plants (Weeds): Summary of invasive weeds surveyed/recorded	Extremely-low numbers of invasive weed species were observed. *Bryophyllum delagoense* (mother of millions) was noted as present along waterways.
Additional Considerations:	A suitably-qualified spotter catcher is required to investigate any tree hollows, termitaria or fallen timber for fauna prior to and during any clearance operations. The survey assessed an area larger than the proposed construction width and as such a defined construction footprint was not surveyed. There were no environmental constraints noted at the time of survey that would require realignment. It is advised that minor changes at a construction stage be made within this wider cleared area to avoid larger trees containing habitat hollows and nests under the direction of the spotter catcher.

This survey has been completed by a suitably qualified ecologist. Survey approval applies to the location & environmental constraints outlined in this report. At the time of submission, the ecologist deems the report to be satisfactory.

Features of ecological and environmental significance were identified and mapped where present in accordance with Arrow's Ecological Impact Assessment Procedure and Ecology Survey Guideline.

Bruce McLennan	28/08/25
Completed By	**Date**

SUMMARY ECOLOGICAL SURVEY REPORT

SURVEY DETAILS			
Project Batch (Infra. Surveyed): (Survey Title from invite)	Surat Basin – Girrahween 3 (33AU36) wells, gathering and access.		
Type of Survey:	Rapid Ecological		
Scope of Activity: Quantify the scope details; include length and width of surveyed RoW, number and names of well leases, gravel pits, camps etc. If this report is uprevved following additional assessments or sketch changes, detail the additional scope, sketch change, ecologist name and date of additions	Approximately 1980 metres of access and gathering of varying width (average 70m as surveyed) and one well (YE128) which was relocated to avoid grass trees at the request of CH.		
Lot Plan:	33AU36	**Date of Survey:** Include dates and ecologist initials for follow-up assessment	25-26/08/2025
Facility Type / Activity:	Wells ☐ Appraisal ☐ Microseismic ☐ Gravel Pit	☐ Core ☑ Development / Production ☐ Directional ☐ Campsite	☐ Exploration ☐ Monitoring ☐ Tiltmeter Array ☑ Access Track
	☐ Seismic ☐ Trunkline ☐ Comms Towers ☐ FCS (Field Compression Station) ☐ Other:	☑ Gathering System ☐ Gas Pipeline ☐ Fibre Optic Cable ☐ CPP (Central Processing Plant)	☐ Security Hut ☐ Water Pipeline ☐ Pond ☐ WTP (Water Treatment Plant) ☐ Frac Pond

RECOMMENDATIONS:

☐ No Environmental issues on site	☐ Environmental issues identified & surveyed	☐ EA amendment required
☑ Fauna spotter required	☐ Protected Flora Trigger Map Survey required	☐ Other:

ISSUES Requiring Follow-up:

Only detail significant issues here that are required to be followed up, e.g., infrastructure in ESA buffers* requiring EA amendment, additional flora or fauna surveys required etc.

*Refer to *EA Conditions Matrix* for buffer distances and permitted activities.

SUMMARY OF ECOLOGICAL CONSTRAINTS (FURTHER DETAIL IN ECOLOGICAL FIELD SURVEY FORM)	
Brief description of broader vegetation / land use:	The land use is lifestyle/forestry with most of the property mapped as remnant vegetation. The eastern half of the lot has suffered severe bushfire in recent years which has destroyed much of the canopy vegetation.
Were any REs identified and what are they? Are these correctly mapped by DoR? (Survey new extents) Updates to DoR RE Mapping IDs: What is the vegetation currently mapped as (RE and status) and what should it be mapped as? *Refer to VMA Mapping and Biodiversity Status.*	The REs mapped by DoR is a mixed polygon of 11.7.4/11.7.7/11.7.5/11.7.2 (80/10/5/5). While generally correct there is a discrepancy with RE11.5.21 identified along the survey alignment. Regional Ecosystems ground truthed in the survey included 11.5.21, 11.7.2 and 11.7.4. These three regional ecosystems have a VM Status of Least Concern and Biodiveristy Status of No Concern at Present.
Environmentally Sensitive Areas (ESAs) Provide a summary of mapped and unmapped ESAs surveyed/validated. If surveyed infrastructure would impact ESAs or buffers, include impact details on front page	No ESAs were mapped or observed within the survey corridor. There were no mapped ESAs within 300 metres of the surveyed corridor.
Threatened Ecological Communities (TEC) identified: Survey TEC polygon for inclusion on survey sketch.	There were no mapped or observed TECs within the corridor or within 300 metres of the surveyed corridor.
DoR-mapped High-value Regrowth present / impacted:	There was no HVR mapped within the survey area.
Regrowth Present/Impacted: *(i.e., Species & Common name/rough estimate when cleared in years)*	No regrowth was present in the survey area.
EVNT Flora species present / impacted (EPBC or NCA): Is proposed infrastructure in a High-risk Area identified on a Protected Plant Trigger Map? (If yes, add requirement for Flora Survey to front page – refer to *Flora Survey Guidelines – Protected Plants*).	No EVNT flora was observed during the survey.
EVNT Fauna – Does the area contain Potential Habitat for any EVNT species (EPBC or NCA)? 1. Is the area Core Habitat 'Known' or 'Possible' for any EVNT species (EPBC or NCA)? 2. If 'Yes', does the area contain microhabitat features, which would indicate likely habitat for the species OR was the species detected? 3. Survey microhabitat features or fauna encounters for inclusion on survey sketch. 3. If no suitable habitat for any threatened species is detected, provide summary of how site conditions are unsuitable.	A Likelihood of Occurrence Matrix (LoOM) assessment, considering 34 threatened species with potential to occur in Arrow's upstream tenements, was conducted for the surveyed infrastructure on the property. The completed LoOM is appended to this report. General habitat features for a number of species were considered present on the property, although no evidence of EVNT fauna was observed during the survey.

Watercourses and Wetlands:
Brief summary of mapped and unmapped watercourses, wetlands and buffers impacted.
Assessment information to include:
• any downgrades of mapped watercourses to drainage features
• infrastructure in buffers
• Details on wetlands:
  ○ Mapped referrable HES or GES
  ○ Unmapped
  ○ Impacts in buffers
	The gathering crossed a mapped SO1 watercourse which was determined as being a natural drainage feature under the Qld Water Act definition.
	
	There were no mapped wetlands on the property or within buffer distance of proposed infrastructure.

Restricted Invasive Plants (Weeds): Summary of invasive weeds surveyed/recorded	High Risk: *Bryophyllum delagoense* (mother-of-millions) was observed close to the survey area and considered a risk potential in the natural drainage crossing above.
Additional Considerations:	A suitably qualified spotter catcher is required to investigate any tree hollows, termitaria or fallen timber for fauna prior to and during any clearance operations.
This survey has been completed by a suitably qualified ecologist. Survey approval applies to the location & environmental constraints outlined in this report. At the time of submission, the ecologist deems the report to be satisfactory. **Features of ecological and environmental significance were identified and mapped where present in accordance with Arrow's Ecological Impact Assessment Procedure and Ecology Survey Guideline.**	
Bruce McLennan	28/08/2025
Completed By	**Date**

SUMMARY ECOLOGICAL SURVEY REPORT

SURVEY DETAILS			
Project Batch (Infra. Surveyed): (Survey Title from invite)	Surat Basin – Girrahween 3 (31AU60) wells, gathering and access.		
Type of Survey:	Rapid Ecological		
Scope of Activity: Quantify the scope details; include length and width of surveyed RoW, number and names of well leases, gravel pits, camps etc. If this report is uprevved following additional assessments or sketch changes, detail the additional scope, sketch change, ecologist name and date of additions	Approximately 5460 metres of access and gathering of varying width (average 50m) and wells (AL352, AL315, AL319, AL309, AL312, AL300)		
Lot Plan:	31AU60	**Date of Survey:** Include dates and ecologist initials for follow-up assessment	13-14/10/2025 BM
Facility Type / Activity:	Wells ☐ Appraisal ☐ Microseismic ☐ Gravel Pit	☐ Core ☑ Development / Production ☐ Directional ☐ Campsite	☐ Exploration ☐ Monitoring ☐ Tiltmeter Array ☑ Access Track
	☐ Seismic ☐ Trunkline ☐ Comms Towers ☐ FCS (Field Compression Station) ☐ Other:	☑ Gathering System ☐ Gas Pipeline ☐ Fibre Optic Cable ☐ CPP (Central Processing Plant)	☐ Security Hut ☐ Water Pipeline ☐ Pond ☐ WTP (Water Treatment Plant) ☐ Frac Pond

RECOMMENDATIONS:

☐ No Environmental issues on site	☐ Environmental issues identified & surveyed	☐ EA amendment required
☑ Fauna spotter required	☐ Protected Flora Trigger Map Survey required	☐ Other:

ISSUES Requiring Follow-up:

Only detail significant issues here that are required to be followed up, e.g., infrastructure in ESA buffers* requiring EA amendment, additional flora or fauna surveys required etc.

*Refer to *EA Conditions Matrix* for buffer distances and permitted activities.

SUMMARY OF ECOLOGICAL CONSTRAINTS (FURTHER DETAIL IN ECOLOGICAL FIELD SURVEY FORM)	
Brief description of broader vegetation / land use:	The land use is resource industry with the property mapped as remnant vegetation. Vegetation is ironbark woodland in poor to average condition and recovering from a severe bushfire in February 2023.
Were any REs identified and what are they? Are these correctly mapped by DoR? (Survey new extents) Updates to DoR RE Mapping IDs: What is the vegetation currently mapped as (RE and status) and what should it be mapped as? *Refer to VMA Mapping and Biodiversity Status.*	Vegetation on the access/gathering is state mapped as 11.7.4/11.7.7/11.7.5/11.7.2 (85/5/5/5). REs present on the alignment include 11.5.1 (Eucalyptus crebra and/or E. populnea, Callitris glaucophylla, Angophora leiocarpa, Allocasuarina luehmannii woodland on Cainozoic sand plains and/or remnant surfaces) and 11.7.4 (Eucalyptus decorticans and/or Eucalyptus spp., Corymbia spp., Acacia spp., Lysicarpus angustifolius woodland on Cainozoic lateritic duricrust). REs 11.5.1 and 11.7.4 have a VM status of Least Concern (LC) and Biodiversity Status of No Concern at Present (NCaP).
Environmentally Sensitive Areas (ESAs) Provide a summary of mapped and unmapped ESAs surveyed/validated. If surveyed infrastructure would impact ESAs or buffers, include impact details on front page	No ESAs were mapped or observed within the property and no ESA buffers were present in the survey area. Essential Habitat in the survey area (over AL352 and AL309) is mapped for *Strophurus taenicauda* (Golden-tailed Gecko) which is a Near Threatened (NT) species. Essential Habitat for NT species does not constitute an ESA under the relevant EA (EA0001399).
Threatened Ecological Communities (TEC) identified: Survey TEC polygon for inclusion on survey sketch.	There are no mapped or observed TECs within the corridor or within 300 metres of the surveyed corridor.
DoR-mapped High-value Regrowth present / impacted:	There is no mapped HVR in the survey area.
Regrowth Present/Impacted: *(i.e., Species & Common name/rough estimate when cleared in years)*	The property is fire damaged, and many locations are in various states of natural regrowth.
EVNT Flora species present / impacted (EPBC or NCA): Is proposed infrastructure in a High-risk Area identified on a Protected Plant Trigger Map? (If yes, add requirement for Flora Survey to front page – refer to *Flora Survey Guidelines – Protected Plants*).	No EVNT flora were observed during the survey. The proposed infrastructure does not intersect High-Risk areas as mapped on the Protected Plant Trigger Map.

EVNT Fauna – Does the area contain Potential Habitat for any EVNT species (EPBC or NCA)? 1. Is the area Core Habitat 'Known' or 'Possible' for any EVNT species (EPBC or NCA)? 2. If 'Yes', does the area contain microhabitat features, which would indicate likely habitat for the species OR was the species detected? 3. Survey microhabitat features or fauna encounters for inclusion on survey sketch. 3. If no suitable habitat for any threatened species is detected, provide a summary of how site conditions are unsuitable.	A Likelihood of Occurrence Matrix (LoOM) assessment, considering 34 threatened species with potential to occur in Arrow's upstream tenements, was conducted for the surveyed infrastructure on the property. The completed LoOM is appended to this report. General habitat features for some species were considered present on the property, although no evidence of EVNT fauna was observed during the survey.

Watercourses and Wetlands: Brief summary of mapped and unmapped watercourses, wetlands and buffers impacted. Assessment information to include: • any downgrades of mapped watercourses to drainage features • infrastructure in buffers • Details on wetlands: o Mapped referrable HES or GES o Unmapped o Impacts in buffers	Gathering and access crosses a SO1 mapped feature on the northern boundary of the lot. This feature was assessed as being a drainage feature under the act. There were no mapped wetlands on the property or within buffer distance.
Restricted Invasive Plants (Weeds): Summary of invasive weeds surveyed/recorded	Extremely-low numbers of invasive weed species were observed. High Risk species *Opuntia tomentosa* was observed in very low numbers across the survey area.
Additional Considerations:	A suitably-qualified spotter catcher is required during clearing although much of the vegetation has succumbed to fire. However, there is still habitat present such as fallen logs and termitaria in addition to limited numbers of tree hollows.

This survey has been completed by a suitably qualified ecologist. Survey approval applies to the location & environmental constraints outlined in this report. At the time of submission, the ecologist deems the report to be satisfactory.

Features of ecological and environmental significance were identified and mapped where present in accordance with Arrow's Ecological Impact Assessment Procedure and Ecology Survey Guideline.

Bruce McLennan	21/10/25
Completed By	**Date**

SUMMARY ECOLOGICAL SURVEY REPORT

SURVEY DETAILS			
Project Batch (Infra. Surveyed): (Survey Title from invite)	Surat Basin – Girrahween 3 (2AU49) wells, gathering and access.		
Type of Survey:	Rapid Ecological		
Scope of Activity: Quantify the scope details; include length and width of surveyed RoW, number and names of well leases, gravel pits, camps etc. If this report is uprevved following additional assessments or sketch changes, detail the additional scope, sketch change, ecologist name and date of additions	Approximately 320 metres of access and gathering of 50m (survey width) and well (AL325)		
Lot Plan:	2AU49	**Date of Survey:** Include dates and ecologist initials for follow-up assessment	7/10/2025 BM
Facility Type / Activity:	Wells ☐ Appraisal ☐ Microseismic ☐ Gravel Pit	☐ Core ☑ Development / Production ☐ Directional ☐ Campsite	☐ Exploration ☐ Monitoring ☐ Tiltmeter Array ☑ Access Track
	☐ Seismic ☐ Trunkline ☐ Comms Towers ☐ FCS (Field Compression Station) ☐ Other:	☑ Gathering System ☐ Gas Pipeline ☐ Fibre Optic Cable ☐ CPP (Central Processing Plant)	☐ Security Hut ☐ Water Pipeline ☐ Pond ☐ WTP (Water Treatment Plant) ☐ Frac Pond

RECOMMENDATIONS:

☐ No Environmental issues on site	☐ Environmental issues identified & surveyed	☐ EA amendment required
☐ Fauna spotter required	☐ Protected Flora Trigger Map Survey required	☐ Other:

ISSUES Requiring Follow-up:

Only detail significant issues here that are required to be followed up, e.g., infrastructure in ESA buffers* requiring EA amendment, additional flora or fauna surveys required etc.

*Refer to *EA Conditions Matrix* for buffer distances and permitted activities.

SUMMARY OF ECOLOGICAL CONSTRAINTS (FURTHER DETAIL IN ECOLOGICAL FIELD SURVEY FORM)	
Brief description of broader vegetation / land use:	The land use is grazing/lifestyle with most of the property mapped as remnant vegetation. Vegetation is mostly ironbark woodland in poor condition and recovering from a severe bushfire in Feb/Mar 2023.
Were any REs identified and what are they? Are these correctly mapped by DoR? (Survey new extents) Updates to DoR RE Mapping IDs: What is the vegetation currently mapped as (RE and status) and what should it be mapped as? *Refer to VMA Mapping and Biodiversity Status.*	Vegetation on the access/gathering is state mapped as 11.5.1/11.7.7/11.7.5/11.7.2 (85/5/5/5) for approximately 30 metres at the northern end and Non-remnant for the remainder. Vegetation in the northern 30 metres is acacia regrowth and possibly conforms to RE11.7.2. The dominant species is *Acacia blakei*. It is more likely that this small section is actually non-remnant and the mapping is in error. Historical imagery shows this area clear of vegetation in 2019. RE 11.7.2 has a VM status of Least Concern (LC) and Biodiversity Status of No Concern at Present (NCaP).
Environmentally Sensitive Areas (ESAs) Provide a summary of mapped and unmapped ESAs surveyed/validated. If surveyed infrastructure would impact ESAs or buffers, include impact details on front page	A Category C ESA is mapped south of AL#325 and relates to mapped Essential Habitat for Koala. AL#325 is partly within the PPZ and SPZ of the Cat C ESA.
Threatened Ecological Communities (TEC) identified: Survey TEC polygon for inclusion on survey sketch.	There are no mapped or observed TECs within the corridor or within 300 metres of the surveyed corridor.
DoR-mapped High-value Regrowth present / impacted:	High Value Regrowth (Cat C) is mapped to the south of AL#325 and is the mapped Essential Habitat Area.
Regrowth Present/Impacted: *(i.e., Species & Common name/rough estimate when cleared in years)*	The survey area is regrowth of mostly acacia species. Cleared likely in the previous 5-10 years.
EVNT Flora species present / impacted (EPBC or NCA): Is proposed infrastructure in a High-risk Area identified on a Protected Plant Trigger Map? (If yes, add requirement for Flora Survey to front page – refer to *Flora Survey Guidelines – Protected Plants*).	No EVNT flora was observed during the survey.
EVNT Fauna – Does the area contain Potential Habitat for any EVNT species (EPBC or NCA)? 1. Is the area Core Habitat 'Known' or 'Possible' for any EVNT species (EPBC or NCA)? 2. If 'Yes', does the area contain microhabitat features, which would indicate likely habitat for the species OR was the species detected? 3. Survey microhabitat features or fauna encounters for inclusion on survey sketch.	A Likelihood of Occurrence Matrix (LoOM) assessment, considering 34 threatened species with potential to occur in Arrow's upstream tenements, was conducted for the surveyed infrastructure on the property. The completed LoOM is appended to this report. General habitat features for some species were considered present on the property, although no evidence of EVNT fauna was observed during the survey.

3. If no suitable habitat for any threatened species is detected, provide a summary of how site conditions are unsuitable.	

Watercourses and Wetlands: Brief summary of mapped and unmapped watercourses, wetlands and buffers impacted. Assessment information to include: • any downgrades of mapped watercourses to drainage features • infrastructure in buffers • Details on wetlands: o Mapped referrable HES or GES o Unmapped o Impacts in buffers	There are no mapped watercourses crossed by the proposed access and gathering. There are no mapped wetlands on the property or within buffer distance.
Restricted Invasive Plants (Weeds): Summary of invasive weeds surveyed/recorded	Extremely-low numbers of invasive weed species were observed.
Additional Considerations:	A suitably-qualified spotter catcher is required during clearing although much of the vegetation has been cleared. However, there is still habitat present such as fallen logs and termitaria.

This survey has been completed by a suitably qualified ecologist. Survey approval applies to the location & environmental constraints outlined in this report. At the time of submission, the ecologist deems the report to be satisfactory.

Features of ecological and environmental significance were identified and mapped where present in accordance with Arrow's Ecological Impact Assessment Procedure and Ecology Survey Guideline.

Bruce McLennan	9/10/25
Completed By	**Date**

SUMMARY ECOLOGICAL SURVEY REPORT

SURVEY DETAILS			
Project Batch (Infra. Surveyed): (Survey Title from invite)	Surat Basin – Girrahween 3 (26AU49) wells, gathering and access.		
Type of Survey:	Rapid Ecological		
Scope of Activity: Quantify the scope details; include length and width of surveyed RoW, number and names of well leases, gravel pits, camps etc. If this report is uprevved following additional assessments or sketch changes, detail the additional scope, sketch change, ecologist name and date of additions	Approximately 5240 metres of access and gathering of varying width (average 50m) and wells (AL329, AL330*, AL316*) * not contained in this report		
Lot Plan:	26AU49	**Date of Survey:** Include dates and ecologist initials for follow-up assessment	7-8/10/2025 BM
Facility Type / Activity:	Wells ☐ Appraisal ☐ Microseismic ☐ Gravel Pit	☐ Core ☑ Development / Production ☐ Directional ☐ Campsite	☐ Exploration ☐ Monitoring ☐ Tiltmeter Array ☑ Access Track
	☐ Seismic ☐ Trunkline ☐ Comms Towers ☐ FCS (Field Compression Station) ☐ Other:	☑ Gathering System ☐ Gas Pipeline ☐ Fibre Optic Cable ☐ CPP (Central Processing Plant)	☐ Security Hut ☐ Water Pipeline ☐ Pond ☐ WTP (Water Treatment Plant) ☐ Frac Pond

RECOMMENDATIONS:

☐ No Environmental issues on site	☐ Environmental issues identified & surveyed	☐ EA amendment required
☑ Fauna spotter required	☐ Protected Flora Trigger Map Survey required	☐ Other:

ISSUES Requiring Follow-up:

Only detail significant issues here that are required to be followed up, e.g., infrastructure in ESA buffers* requiring EA amendment, additional flora or fauna surveys required etc.

*Refer to *EA Conditions Matrix* for buffer distances and permitted activities.

SUMMARY OF ECOLOGICAL CONSTRAINTS (FURTHER DETAIL IN ECOLOGICAL FIELD SURVEY FORM)	
Brief description of broader vegetation / land use:	The land use is grazing/lifestyle with most of the property mapped as remnant vegetation. Vegetation is mostly ironbark woodland in poor to average condition and recovering from a severe bushfire in Feb/Mar 2023.
Were any REs identified and what are they? Are these correctly mapped by DoR? (Survey new extents) Updates to DoR RE Mapping IDs: What is the vegetation currently mapped as (RE and status) and what should it be mapped as? *Refer to VMA Mapping and Biodiversity Status.*	Vegetation on the access/gathering is state mapped as 11.5.1/11.7.7/11.7.5/11.7.2 (85/5/5/5), HVR and non-remnant. REs present on the alignment include 11.7.4 (Eucalyptus decorticans and/or Eucalyptus spp., Corymbia spp., Acacia spp., Lysicarpus angustifolius woodland on Cainozoic lateritic duricrust), 11.5.1 (Eucalyptus crebra and/or E. populnea, Callitris glaucophylla, Angophora leiocarpa, Allocasuarina luehmannii woodland on Cainozoic sand plains and/or remnant surfaces) and 11.7.7 (Eucalyptus fibrosa subsp. nubilis +/- Corymbia spp. +/- Eucalyptus spp. woodland on Cainozoic lateritic duricrust). REs 11.5.1, 11.7.4 and 11.7.7 have a VM status of Least Concern (LC) and Biodiversity Status of No Concern at Present (NCaP).
Environmentally Sensitive Areas (ESAs) Provide a summary of mapped and unmapped ESAs surveyed/validated. If surveyed infrastructure would impact ESAs or buffers, include impact details on front page	No ESAs were mapped or observed within the survey corridor on Lot 26AU49. Vegetation within ESA buffer distance of AL316 is a possible Cat C ESA.
Threatened Ecological Communities (TEC) identified: Survey TEC polygon for inclusion on survey sketch.	There are no mapped or observed TECs within the corridor or within 300 metres of the surveyed corridor.
DoR-mapped High-value Regrowth present / impacted:	DoR mapped HVR (Cat C on the Regulated Vegetation Map) intersects the proposed access and gathering on the northern boundary of the lot.
Regrowth Present/Impacted: *(i.e., Species & Common name/rough estimate when cleared in years)*	The site is fire damaged, and most locations (including mapped HVR) are in various states of regrowth.
EVNT Flora species present / impacted (EPBC or NCA): Is proposed infrastructure in a High-risk Area identified on a Protected Plant Trigger Map? (If yes, add requirement for Flora Survey to front page – refer to *Flora Survey Guidelines – Protected Plants*).	No EVNT flora were observed during the survey. There is no High-Risk area on the Flora Trigger Map in the study area.
EVNT Fauna – Does the area contain Potential Habitat for any EVNT species (EPBC or NCA)? 1. Is the area Core Habitat 'Known' or 'Possible' for any EVNT species (EPBC or NCA)? 2. If 'Yes', does the area contain microhabitat features, which would indicate likely habitat for the species OR	A Likelihood of Occurrence Matrix (LoOM) assessment, considering 34 threatened species with potential to occur in Arrow's upstream tenements, was conducted for the surveyed infrastructure on the property. The completed LoOM is appended to this report. General habitat features for some species were considered present on the property, although no evidence of EVNT fauna was observed during the survey.

was the species detected? 3. Survey microhabitat features or fauna encounters for inclusion on survey sketch. 3. If no suitable habitat for any threatened species is detected, provide a summary of how site conditions are unsuitable.	

Watercourses and Wetlands: Brief summary of mapped and unmapped watercourses, wetlands and buffers impacted. Assessment information to include: • any downgrades of mapped watercourses to drainage features • infrastructure in buffers • Details on wetlands: ○ Mapped referrable HES or GES ○ Unmapped ○ Impacts in buffers	No mapped watercourses were crossed by proposed infrastructure. There are no mapped wetlands on the property or within buffer distance.
Restricted Invasive Plants (Weeds): Summary of invasive weeds surveyed/recorded	Extremely-low numbers of invasive weed species were observed. High Risk: *Opuntia tomentosa* was observed in very low numbers.
Additional Considerations:	A suitably-qualified spotter catcher is required during clearing although much of the vegetation has succumbed to fire. However, there is still habitat present such as fallen logs and termitaria in addition to limited numbers of tree hollows.
This survey has been completed by a suitably qualified ecologist. Survey approval applies to the location & environmental constraints outlined in this report. At the time of submission, the ecologist deems the report to be satisfactory. **Features of ecological and environmental significance were identified and mapped where present in accordance with Arrow's Ecological Impact Assessment Procedure and Ecology Survey Guideline.**	
Bruce McLennan	22/10/25
Completed By	**Date**

SUMMARY ECOLOGICAL SURVEY REPORT

SURVEY DETAILS			
Project Batch (Infra. Surveyed): (Survey Title from invite)	Surat Basin – Girrahween 3 (25AU49) wells, gathering and access.		
Type of Survey:	Rapid Ecological		
Scope of Activity: Quantify the scope details; include length and width of surveyed RoW, number and names of well leases, gravel pits, camps etc. If this report is uprevved following additional assessments or sketch changes, detail the additional scope, sketch change, ecologist name and date of additions	Approximately 8500 metres of access and gathering of varying width (average 70m) and wells (AL251, AL253, AL339, AL252)		
Lot Plan:	25AU49	**Date of Survey:** Include dates and ecologist initials for follow-up assessment	8-9/10/2025 BM 15/10/2025 BM
Facility Type / Activity:	Wells ☐ Appraisal ☐ Microseismic ☐ Gravel Pit	☐ Core ☑ Development / Production ☐ Directional ☐ Campsite	☐ Exploration ☐ Monitoring ☐ Tiltmeter Array ☑ Access Track
	☐ Seismic ☐ Trunkline ☐ Comms Towers ☐ FCS (Field Compression Station) ☐ Other:	☑ Gathering System ☐ Gas Pipeline ☐ Fibre Optic Cable ☐ CPP (Central Processing Plant)	☐ Security Hut ☐ Water Pipeline ☐ Pond ☐ WTP (Water Treatment Plant) ☐ Frac Pond

RECOMMENDATIONS:

☐ No Environmental issues on site	☐ Environmental issues identified & surveyed	☐ EA amendment required
☑ Fauna spotter required	☐ Protected Flora Trigger Map Survey required	☐ Other:

ISSUES Requiring Follow-up:

Only detail significant issues here that are required to be followed up, e.g., infrastructure in ESA buffers* requiring EA amendment, additional flora or fauna surveys required etc.

*Refer to *EA Conditions Matrix* for buffer distances and permitted activities.

SUMMARY OF ECOLOGICAL CONSTRAINTS (FURTHER DETAIL IN ECOLOGICAL FIELD SURVEY FORM)	
Brief description of broader vegetation / land use:	The land use is grazing/lifestyle with most of the property mapped as remnant vegetation. Vegetation is mostly ironbark woodland in poor to average condition and recovering from a severe bushfire in Feb/Mar 2023.
Were any REs identified and what are they? Are these correctly mapped by DoR? (Survey new extents) Updates to DoR RE Mapping IDs: What is the vegetation currently mapped as (RE and status) and what should it be mapped as? *Refer to VMA Mapping and Biodiversity Status.*	Vegetation on the access/gathering is state mapped as 11.5.1/11.7.7/11.7.5/11.7.2 (85/5/5/5), 11.5.1 (100), 11.3.14 (100), 11.7.4/11.7.7/11.7.5/11.7.2 (85/5/5/5), HVR and non-remnant. REs present on the alignment include 11.7.4 (Eucalyptus decorticans and/or Eucalyptus spp., Corymbia spp., Acacia spp., Lysicarpus angustifolius woodland on Cainozoic lateritic duricrust), 11.5.1 (Eucalyptus crebra and/or E. populnea, Callitris glaucophylla, Angophora leiocarpa, Allocasuarina luehmannii woodland on Cainozoic sand plains and/or remnant surfaces), 11.3.14 (Eucalyptus spp., Angophora spp., Callitris spp. woodland on alluvial plains) and 11.7.2 (Acacia spp. woodland on Cainozoic lateritic duricrust. Scarp retreat zone). REs 11.3.14, 11.5.1, 11.7.2 and 11.7.4 have a VM status of Least Concern (LC) and Biodiversity Status of No Concern at Present (NCaP).
Environmentally Sensitive Areas (ESAs) Provide a summary of mapped and unmapped ESAs surveyed/validated. If surveyed infrastructure would impact ESAs or buffers, include impact details on front page	No ESAs were mapped or observed within the property and no ESA buffers were present in the survey area.
Threatened Ecological Communities (TEC) identified: Survey TEC polygon for inclusion on survey sketch.	There are no mapped or observed TECs within the corridor or within 300 metres of the surveyed corridor.
DoR-mapped High-value Regrowth present / impacted:	DoR mapped HVR (Category C vegetation) is present along the western boundary of the lot and is partly intersected by the existing and proposed access which will be wider than the current access. HVR is also present on the eastern side of the lot in proposed gathering and access.
Regrowth Present/Impacted: *(i.e., Species & Common name/rough estimate when cleared in years)*	The property is fire damaged, and many locations are in various states of regrowth.
EVNT Flora species present / impacted (EPBC or NCA): Is proposed infrastructure in a High-risk Area identified on a Protected Plant Trigger Map? (If yes, add requirement for Flora Survey to front page – refer to *Flora Survey Guidelines – Protected Plants*).	No EVNT flora was observed during the survey. The proposed infrastructure does not intersect High-Risk areas as mapped on the Protected Plant Trigger Map.

EVNT Fauna – Does the area contain Potential Habitat for any EVNT species (EPBC or NCA)? 1. Is the area Core Habitat 'Known' or 'Possible' for any EVNT species (EPBC or NCA)? 2. If 'Yes', does the area contain microhabitat features, which would indicate likely habitat for the species OR was the species detected? 3. Survey microhabitat features or fauna encounters for inclusion on survey sketch. 3. If no suitable habitat for any threatened species is detected, provide a summary of how site conditions are unsuitable.	A Likelihood of Occurrence Matrix (LoOM) assessment, considering 34 threatened species with potential to occur in Arrow's upstream tenements, was conducted for the surveyed infrastructure on the property. The completed LoOM is appended to this report. General habitat features for some species were considered present on the property, although no evidence of EVNT fauna was observed during the survey.

Watercourses and Wetlands: Brief summary of mapped and unmapped watercourses, wetlands and buffers impacted. Assessment information to include: • any downgrades of mapped watercourses to drainage features • infrastructure in buffers • Details on wetlands: o Mapped referrable HES or GES o Unmapped o Impacts in buffers	Proposed access/gathering crosses Punch Bowl Creek in two places. This watercourse is a SO2 watercourse on the eastern side of the property and a SO3 watercourse on the western side of the property. At both locations the water feature was considered a watercourse under the definition in the *Water Act 2000*. (see water feature checklist reports) Gathering and access crosses a SO1 mapped feature on the northern boundary of the lot. This feature was assessed as being a drainage feature under the act. Access crosses a SO1 mapped feature on the western boundary of the lot. This feature was assessed as being a drainage feature under the act. There are no mapped wetlands on the property or within buffer distance.
Restricted Invasive Plants (Weeds): Summary of invasive weeds surveyed/recorded	Extremely-low numbers of invasive weed species were observed. High Risk species *Opuntia tomentosa* was observed in very low numbers across the survey area. High Risk species *Bryophyllum delagoense* was observed in low numbers scattered amongst riparian vegetation on Punch Bowl Creek.
Additional Considerations:	A suitably-qualified spotter catcher is required during clearing although much of the vegetation has succumbed to fire. However, there is still habitat present such as fallen logs and termitaria in addition to limited numbers of tree hollows.

This survey has been completed by a suitably qualified ecologist. Survey approval applies to the location & environmental constraints outlined in this report. At the time of submission, the ecologist deems the report to be satisfactory.

Features of ecological and environmental significance were identified and mapped where present in accordance with Arrow's Ecological Impact Assessment Procedure and Ecology Survey Guideline.

Bruce McLennan	22/10/25
Completed By	**Date**

SUMMARY ECOLOGICAL SURVEY REPORT

SURVEY DETAILS			
Project Batch (Infra. Surveyed): (Survey Title from invite)	Surat Basin – Girrahween 3 (24AU49) wells, gathering and access.		
Type of Survey:	Rapid Ecological		
Scope of Activity: Quantify the scope details; include length and width of surveyed RoW, number and names of well leases, gravel pits, camps etc. If this report is uprevved following additional assessments or sketch changes, detail the additional scope, sketch change, ecologist name and date of additions	Approximately 6830 metres of access and gathering of varying width (average 50m) and wells (AL321, AL324, AL323, AL331, AL336, AL337 and AL314*) * not within this report		
Lot Plan:	24AU49	**Date of Survey:** Include dates and ecologist initials for follow-up assessment	8th and 10th /10/2025 BM
Facility Type / Activity:	Wells ☐ Appraisal ☐ Microseismic ☐ Gravel Pit ☐ Core ☑ Development / Production ☐ Directional ☐ Campsite ☐ Exploration ☐ Monitoring ☐ Tiltmeter Array ☑ Access Track		
	☐ Seismic ☐ Trunkline ☐ Comms Towers ☐ FCS (Field Compression Station) ☐ Other: ☑ Gathering System ☐ Gas Pipeline ☐ Fibre Optic Cable ☐ CPP (Central Processing Plant) ☐ Security Hut ☐ Water Pipeline ☐ Pond ☐ WTP (Water Treatment Plant) ☐ Frac Pond		

RECOMMENDATIONS:		
☐ No Environmental issues on site	☐ Environmental issues identified & surveyed	☐ EA amendment required
☑ Fauna spotter required	☐ Protected Flora Trigger Map Survey required	☐ Other:

ISSUES Requiring Follow-up:

Only detail significant issues here that are required to be followed up, e.g., infrastructure in ESA buffers* requiring EA amendment, additional flora or fauna surveys required etc.

*Refer to *EA Conditions Matrix* for buffer distances and permitted activities.

SUMMARY OF ECOLOGICAL CONSTRAINTS (FURTHER DETAIL IN ECOLOGICAL FIELD SURVEY FORM)	
Brief description of broader vegetation / land use:	The land use is grazing/lifestyle with most of the property mapped as remnant vegetation. Vegetation is mostly ironbark woodland in poor to average condition and recovering from a severe bushfire in Feb/Mar 2023.
Were any REs identified and what are they? Are these correctly mapped by DoR? (Survey new extents) Updates to DoR RE Mapping IDs: What is the vegetation currently mapped as (RE and status) and what should it be mapped as? *Refer to VMA Mapping and Biodiversity Status.*	Vegetation on the access/gathering is state mapped as 11.5.1/11.7.7/11.7.5/11.7.2 (85/5/5/5) and 11.7.7/11.5.1 (80/20) and HVR. REs present on the alignment include 11.5.1 (*Eucalyptus crebra* and/or *E. populnea*, *Callitris glaucophylla*, *Angophora leiocarpa*, *Allocasuarina luehmannii* woodland on Cainozoic sand plains and/or remnant surfaces), 11.7.4 (Eucalyptus decorticans and/or Eucalyptus spp., Corymbia spp., Acacia spp., Lysicarpus angustifolius woodland on Cainozoic lateritic duricrust), 11.7.5 (Shrubland on natural scalds on deeply weathered coarse-grained sedimentary rocks) and 11.7.7 (Eucalyptus fibrosa subsp. nubilis +/- Corymbia spp. +/- Eucalyptus spp. woodland on Cainozoic lateritic duricrust). These REs all have a VM status of Least Concern (LC) and Biodiversity Status of No Concern at Present (NCaP).
Environmentally Sensitive Areas (ESAs) Provide a summary of mapped and unmapped ESAs surveyed/validated. If surveyed infrastructure would impact ESAs or buffers, include impact details on front page	No ESAs were mapped or observed within the study area or within buffer distance.
Threatened Ecological Communities (TEC) identified: Survey TEC polygon for inclusion on survey sketch.	There are no mapped or observed TECs within the corridor or within 300 metres of the surveyed corridor.
DoR-mapped High-value Regrowth present / impacted:	There was a small area of DoR mapped HVR (Cat C) on the southern boundary close to AL#324.
Regrowth Present/Impacted: *(i.e., Species & Common name/rough estimate when cleared in years)*	The entire site is fire damaged, and most locations are in various states of regrowth.
EVNT Flora species present / impacted (EPBC or NCA): Is proposed infrastructure in a High-risk Area identified on a Protected Plant Trigger Map? (If yes, add requirement for Flora Survey to front page – refer to *Flora Survey Guidelines – Protected Plants*).	No EVNT flora was observed during the survey. There is no High-Risk area on the Protected Plant Trigger Mapping for the survey area.

EVNT Fauna – Does the area contain Potential Habitat for any EVNT species (EPBC or NCA)? 1. Is the area Core Habitat 'Known' or 'Possible' for any EVNT species (EPBC or NCA)? 2. If 'Yes', does the area contain microhabitat features, which would indicate likely habitat for the species OR was the species detected? 3. Survey microhabitat features or fauna encounters for inclusion on survey sketch. 3. If no suitable habitat for any threatened species is detected, provide a summary of how site conditions are unsuitable.	A Likelihood of Occurrence Matrix (LoOM) assessment, considering 34 threatened species with potential to occur in Arrow's upstream tenements, was conducted for the surveyed infrastructure on the property. The completed LoOM is appended to this report. General habitat features for some species were considered present on the property, although no evidence of EVNT fauna was observed during the survey.

Watercourses and Wetlands: Brief summary of mapped and unmapped watercourses, wetlands and buffers impacted. Assessment information to include: • any downgrades of mapped watercourses to drainage features • infrastructure in buffers • Details on wetlands: o Mapped referrable HES or GES o Unmapped o Impacts in buffers	Access and gathering does not cross any mapped watercourses. There are no mapped wetlands on the property or within buffer distance.
Restricted Invasive Plants (Weeds): Summary of invasive weeds surveyed/recorded	Extremely-low numbers of invasive weed species were observed. *Opuntia tomentosa* was observed at only a few locations.
Additional Considerations:	A suitably-qualified spotter catcher is required during clearing although much of the vegetation has succumbed to fire. However, there is still habitat present such as fallen logs and termitaria in addition to limited numbers of tree hollows.

This survey has been completed by a suitably qualified ecologist. Survey approval applies to the location & environmental constraints outlined in this report. At the time of submission, the ecologist deems the report to be satisfactory.

Features of ecological and environmental significance were identified and mapped where present in accordance with Arrow's Ecological Impact Assessment Procedure and Ecology Survey Guideline.

Bruce McLennan	16/10/25
Completed By	**Date**

SUMMARY ECOLOGICAL SURVEY REPORT

SURVEY DETAILS			
Project Batch (Infra. Surveyed): (Survey Title from invite)	Surat Basin – Girrahween 3 (1RP913167) wells, gathering and access.		
Type of Survey:	Rapid Ecological		
Scope of Activity: Quantify the scope details; include length and width of surveyed RoW, number and names of well leases, gravel pits, camps etc. If this report is uprevved following additional assessments or sketch changes, detail the additional scope, sketch change, ecologist name and date of additions	Approximately 6030 metres of access and gathering of varying width (average 70m as surveyed), approximately 1800m of access (30m wide) and wells (YE120, YE121, YE131, YE132, YE145)		
Lot Plan:	1RP913167	**Date of Survey:** Include dates and ecologist initials for follow-up assessment	26-27/08/2025
Facility Type / Activity:	Wells ☐ Appraisal ☐ Microseismic ☐ Gravel Pit	☐ Core ☑ Development / Production ☐ Directional ☐ Campsite	☐ Exploration ☐ Monitoring ☐ Tiltmeter Array ☑ Access Track
	☐ Seismic ☐ Trunkline ☐ Comms Towers ☐ FCS (Field Compression Station) ☐ Other:	☑ Gathering System ☐ Gas Pipeline ☐ Fibre Optic Cable ☐ CPP (Central Processing Plant)	☐ Security Hut ☐ Water Pipeline ☐ Pond ☐ WTP (Water Treatment Plant) ☐ Frac Pond

RECOMMENDATIONS:		
☐ No Environmental issues on site	☑ Environmental issues identified & surveyed	☐ EA amendment required
☑ Fauna spotter required	☐ Protected Flora Trigger Map Survey required	☐ Other:

ISSUES Requiring Follow-up:

Only detail significant issues here that are required to be followed up, e.g., infrastructure in ESA buffers* requiring EA amendment, additional flora or fauna surveys required etc.

*Refer to *EA Conditions Matrix* for buffer distances and permitted activities.

EVNT-specific microhabitat features were observed during the survey in some of the more protected older RE11.7.4 that might support *Nyctophilus corbeni* (southeastern long-eared bat (SELEB)), which is listed as Vulnerable under the EPBC Act and Qld NC Act. SELEB prefers to feed in relatively undisturbed dry open box, ironbark and Callitris woodland with a dense cluttered understory layer. They roost under loose bark or in small hollows and crevices. Sightings close to the study area suggest this species is likely to occur in relatively undisturbed habitat and likely to be found in part of the study area. Suitable vegetation for SELEB was observed at, and along gathering, to the northwest of YE132. Clearing of SELEB habitat may require offsetting.

SUMMARY OF ECOLOGICAL CONSTRAINTS (FURTHER DETAIL IN ECOLOGICAL FIELD SURVEY FORM)	
Brief description of broader vegetation / land use:	The land use is lifestyle/forestry with most of the property mapped as remnant vegetation. The eastern half of the lot has suffered severe bushfire in recent years (March 2023) which has destroyed much of the canopy vegetation.
Were any REs identified and what are they? Are these correctly mapped by DoR? (Survey new extents) Updates to DoR RE Mapping IDs: What is the vegetation currently mapped as (RE and status) and what should it be mapped as? *Refer to VMA Mapping and Biodiversity Status.*	The REs mapped by DoR are two mixed polygons 11.7.4/11.7.7/11.7.5/11.7.3 and 11.5.21/11.7.4/11.5.4. While generally correct there are some discrepancies with RE11.5.1 identified in parts. Regional Ecosystems ground truthed in the survey included 11.5.1, 11.5.4, 11.5.21 and 11.7.4
Environmentally Sensitive Areas (ESAs) Provide a summary of mapped and unmapped ESAs surveyed/validated. If surveyed infrastructure would impact ESAs or buffers, include impact details on front page	No ESAs were mapped or observed within the survey corridor. There were no mapped ESAs within 300 metres of the surveyed corridor.
Threatened Ecological Communities (TEC) identified: Survey TEC polygon for inclusion on survey sketch.	There are no mapped or observed TECs within the corridor or within 300 metres of the surveyed corridor.
DoR-mapped High-value Regrowth present / impacted:	There is an area of HVR mapped at the location of YE145. This vegetation was assessed and confirmed as regrowth 11.7.4.
Regrowth Present/Impacted: *(i.e., Species & Common name/rough estimate when cleared in years)*	Other than the HVR mentioned above there is no other regrowth on the property.
EVNT Flora species present / impacted (EPBC or NCA): Is proposed infrastructure in a High-risk Area identified on a Protected Plant Trigger Map? (If yes, add requirement for Flora Survey to front page – refer to *Flora Survey Guidelines – Protected Plants*).	No EVNT flora was observed during the survey.
EVNT Fauna – Does the area contain Potential Habitat for any EVNT species (EPBC or NCA)? 1. Is the area Core Habitat 'Known' or 'Possible' for any EVNT species (EPBC or NCA)? 2. If 'Yes', does the area contain microhabitat features, which would indicate likely habitat for the species OR was the species detected? 3. Survey microhabitat features or fauna encounters for inclusion on survey sketch. 3. If no suitable habitat for any threatened species is detected, provide summary of how site conditions are unsuitable.	A Likelihood of Occurrence Matrix (LoOM) assessment, considering 34 threatened species with potential to occur in Arrow's upstream tenements, was conducted for the surveyed infrastructure on the property. The completed LoOM is appended to this report. General habitat features for a number of species were considered present on the property, although no evidence of EVNT fauna was observed during the survey. EVNT specific microhabitat features were observed at YE132, and in gathering and access to the northwest, that might support *Nyctophilus corbeni* (SELEB) which is listed as Vulnerable under the EPBC Act and Qld NC Act. SELEB prefers to feed in relatively undisturbed dry open box, ironbark and Callitris woodland with a dense cluttered understory layer. They roost under loose bark or in small hollows and crevices.

Watercourses and Wetlands:
Brief summary of mapped and unmapped watercourses, wetlands and buffers impacted.
Assessment information to include:
• any downgrades of mapped watercourses to drainage features
• infrastructure in buffers
• Details on wetlands:
  ○ Mapped referrable HES or GES
  ○ Unmapped
  ○ Impacts in buffers
	The gathering and access crossed a SO2 watercourse in two places, one crossing which was assessed as being a watercourse under the Qld Water Act definition.
	
	Access and gathering crossed a SO1 watercourse which was not obviously different from surrounding vegetation or landform and determined to be a drainage feature under the Qld Water Act definition.
	
	There are no mapped wetlands on the property or within buffer distance of proposed infrastructure.

Restricted Invasive Plants (Weeds): Summary of invasive weeds surveyed/recorded	No restricted invasive weed species were observed in the study area.
Additional Considerations:	A suitably qualified spotter catcher is required to investigate any tree hollows, termitaria or fallen timber for fauna prior to and during any clearance operations.
This survey has been completed by a suitably qualified ecologist. Survey approval applies to the location & environmental constraints outlined in this report. At the time of submission, the ecologist deems the report to be satisfactory. **Features of ecological and environmental significance were identified and mapped where present in accordance with Arrow's Ecological Impact Assessment Procedure and Ecology Survey Guideline.**	
Bruce McLennan	28/08/2025
Completed By	**Date**

SUMMARY ECOLOGICAL SURVEY REPORT

SURVEY DETAILS			
Project Batch (Infra. Surveyed): (Survey Title from invite)	Surat Basin – Girrahween 3 (20AU37) wells, gathering and access.		
Type of Survey:	Rapid Ecological		
Scope of Activity: Quantify the scope details; include length and width of surveyed RoW, number and names of well leases, gravel pits, camps etc. If this report is uprevved following additional assessments or sketch changes, detail the additional scope, sketch change, ecologist name and date of additions	Approximately 4735 metres of access and gathering of varying width (average 70m) and wells (YE247, YE250, YE252, YE254, YE265, YE270,)		
Lot Plan:	20AU37	**Date of Survey:** Include dates and ecologist initials for follow-up assessment	18/09/2025 BM
Facility Type / Activity:	Wells ☐ Appraisal ☐ Microseismic ☐ Gravel Pit	☐ Core ☑ Development / Production ☐ Directional ☐ Campsite	☐ Exploration ☐ Monitoring ☐ Tiltmeter Array ☑ Access Track
	☐ Seismic ☐ Trunkline ☐ Comms Towers ☐ FCS (Field Compression Station) ☐ Other:	☑ Gathering System ☐ Gas Pipeline ☐ Fibre Optic Cable ☐ CPP (Central Processing Plant)	☐ Security Hut ☐ Water Pipeline ☐ Pond ☐ WTP (Water Treatment Plant) ☐ Frac Pond

RECOMMENDATIONS:		
☐ No Environmental issues on site	☑ Environmental issues identified & surveyed	☐ EA amendment required
☑ Fauna spotter required	☐ Protected Flora Trigger Map Survey required	☐ Other:

ISSUES Requiring Follow-up:

Only detail significant issues here that are required to be followed up, e.g., infrastructure in ESA buffers* requiring EA amendment, additional flora or fauna surveys required etc.

*Refer to *EA Conditions Matrix* for buffer distances and permitted activities.

Vegetation on L-Tree Creek, outside the property boundary, is RE11.3.25 and has a Biodiversity Status of Of Concern (OC). This constitutes a Category C ESA under the EA (EA0001399_20241107). Parts of two proposed pipeline options will cross this ESA.

SUMMARY OF ECOLOGICAL CONSTRAINTS (FURTHER DETAIL IN ECOLOGICAL FIELD SURVEY FORM)	
Brief description of broader vegetation / land use:	The land use is grazing/lifestyle with most of the property mapped as remnant vegetation. Vegetation is mostly ironbark woodland in poor condition and recovering from a severe bushfire in March 2023.
Were any REs identified and what are they? Are these correctly mapped by DoR? (Survey new extents) Updates to DoR RE Mapping IDs: What is the vegetation currently mapped as (RE and status) and what should it be mapped as? *Refer to VMA Mapping and Biodiversity Status.*	Vegetation on the access/gathering is state mapped as 11.7.4/11.7.7/11.7.5/11.7.2 (80/10/5/5) and 11.5.21/11.7.4/11.5.4 (40/40/20). REs present on the alignment include 11.5.21 (*Corymbia bloxsomei* +/- *Callitris glaucophylla* +/- *Eucalyptus crebra* +/- *Angophora leiocarpa* woodland on Cainozoic sand plains and/or remnant surfaces) and 11.5.1 (*Eucalyptus crebra* and/or *E. populnea*, *Callitris glaucophylla*, *Angophora leiocarpa*, *Allocasuarina luehmannii* woodland on Cainozoic sand plains and/or remnant surfaces). These REs have a VM status of Least Concern (LC) and Biodiversity Status of No Concern at Present (NCaP). L-Tree Creek outside the northern boundary of the lot is mapped as 11.5.21/11.7.4/11.5.4, however, the riparian corridor is a narrow strip of RE11.3.25 (Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines) and has a VM Status of LC and Biodiversity Status of Of Concern (OC).
Environmentally Sensitive Areas (ESAs) Provide a summary of mapped and unmapped ESAs surveyed/validated. If surveyed infrastructure would impact ESAs or buffers, include impact details on front page	No ESAs were mapped or observed within the survey corridor on Lot 20AU37. Vegetation on L-Tree Creek, outside the property boundary, is RE11.3.25 and has a Biodiversity Status of OC. This constitutes a Category C ESA under the EA (EA0001399_20241107). Parts of the two proposed northern pipeline options will cross this ESA.
Threatened Ecological Communities (TEC) identified: Survey TEC polygon for inclusion on survey sketch.	There are no mapped or observed TECs within the corridor or within 300 metres of the surveyed corridor.
DoR-mapped High-value Regrowth present / impacted:	There was no DoR mapped HVR on the lot.
Regrowth Present/Impacted: *(i.e., Species & Common name/rough estimate when cleared in years)*	The entire site is fire damaged, and most locations are in various states of regrowth.
EVNT Flora species present / impacted (EPBC or NCA): Is proposed infrastructure in a High-risk Area identified on a Protected Plant Trigger Map? (If yes, add requirement for Flora Survey to front page – refer to *Flora Survey Guidelines – Protected Plants*).	No EVNT flora were observed during the survey.

EVNT Fauna – Does the area contain Potential Habitat for any EVNT species (EPBC or NCA)? 1. Is the area Core Habitat 'Known' or 'Possible' for any EVNT species (EPBC or NCA)? 2. If 'Yes', does the area contain microhabitat features, which would indicate likely habitat for the species OR was the species detected? 3. Survey microhabitat features or fauna encounters for inclusion on survey sketch. 3. If no suitable habitat for any threatened species is detected, provide a summary of how site conditions are unsuitable.	A Likelihood of Occurrence Matrix (LoOM) assessment, considering 34 threatened species with potential to occur in Arrow's upstream tenements, was conducted for the surveyed infrastructure on the property. The completed LoOM is appended to this report. General habitat features for some species were considered present on the property, although no evidence of EVNT fauna was observed during the survey.

Watercourses and Wetlands: Brief summary of mapped and unmapped watercourses, wetlands and buffers impacted. Assessment information to include: • any downgrades of mapped watercourses to drainage features • infrastructure in buffers • Details on wetlands: o Mapped referrable HES or GES o Unmapped o Impacts in buffers	There are no mapped watercourses crossed by the proposed access and gathering. There are no mapped wetlands on the property or within buffer distance.
Restricted Invasive Plants (Weeds): Summary of invasive weeds surveyed/recorded	Extremely-low numbers of invasive weed species were observed.
Additional Considerations:	A suitably-qualified spotter catcher is required during clearing although much of the vegetation has succumbed to fire. However, there is still habitat present such as fallen logs and termitaria in addition to limited numbers of tree hollows.

This survey has been completed by a suitably qualified ecologist. Survey approval applies to the location & environmental constraints outlined in this report. At the time of submission, the ecologist deems the report to be satisfactory.

Features of ecological and environmental significance were identified and mapped where present in accordance with Arrow's Ecological Impact Assessment Procedure and Ecology Survey Guideline.

Completed By	Date
Bruce McLennan	20/09/25

SUMMARY ECOLOGICAL SURVEY REPORT

SURVEY DETAILS			
Project Batch (Infra. Surveyed): (Survey Title from invite)	Surat Basin – Girrahween 3 (21AU37) wells, gathering and access.		
Type of Survey:	Rapid Ecological		
Scope of Activity: Quantify the scope details; include length and width of surveyed RoW, number and names of well leases, gravel pits, camps etc. If this report is uprevved following additional assessments or sketch changes, detail the additional scope, sketch change, ecologist name and date of additions	Approximately 10050 metres of access and gathering of varying width (average 70m) and wells (YE243, YE244, YE246, YE253, YE258, YE263)		
Lot Plan:	21AU37	**Date of Survey:** Include dates and ecologist initials for follow-up assessment	17-18/09/2025 BM
Facility Type / Activity:	Wells ☐ Appraisal ☐ Microseismic ☐ Gravel Pit	☐ Core ☑ Development / Production ☐ Directional ☐ Campsite	☐ Exploration ☐ Monitoring ☐ Tiltmeter Array ☑ Access Track
	☐ Seismic ☐ Trunkline ☐ Comms Towers ☐ FCS (Field Compression Station) ☐ Other:	☑ Gathering System ☐ Gas Pipeline ☐ Fibre Optic Cable ☐ CPP (Central Processing Plant)	☐ Security Hut ☐ Water Pipeline ☐ Pond ☐ WTP (Water Treatment Plant) ☐ Frac Pond

RECOMMENDATIONS:		
☐ No Environmental issues on site	☑ Environmental issues identified & surveyed	☐ EA amendment required
☑ Fauna spotter required	☑ Protected Flora Trigger Map Survey required	☐ Other:

ISSUES Requiring Follow-up:

Only detail significant issues here that are required to be followed up, e.g., infrastructure in ESA buffers* requiring EA amendment, additional flora or fauna surveys required etc.

*Refer to *EA Conditions Matrix* for buffer distances and permitted activities.

There is a High-Risk Area of a Flora Trigger Map over the northern end of the lot and around proposed wells YE253 and YE258, associated with a record for *Cryptandra ciliata* (Near Threatened Qld NC Act). While the vegetation does not match the mandatory regional ecosystems or the preferred habitat of the species, a Protected Plant Survey will be required prior to clearing.

Vegetation on L-Tree Creek, outside the property boundary, is RE11.3.25 and has a Biodiversity Status of Of Concern (OC). This constitutes a Category C ESA under the EA (EA0001399_20241107). Parts of two proposed pipeline options will cross this ESA.

SUMMARY OF ECOLOGICAL CONSTRAINTS (FURTHER DETAIL IN ECOLOGICAL FIELD SURVEY FORM)	
Brief description of broader vegetation / land use:	The land use is resource industry with most of the property mapped as remnant vegetation. Vegetation is mostly ironbark woodland in poor condition and recovering from a severe bushfire in March 2023.
Were any REs identified and what are they? Are these correctly mapped by DoR? (Survey new extents) Updates to DoR RE Mapping IDs: What is the vegetation currently mapped as (RE and status) and what should it be mapped as? *Refer to VMA Mapping and Biodiversity Status.*	Vegetation on the access/gathering is state mapped as 11.7.4/11.7.7/11.7.5/11.7.2 (80/10/5/5), 11.5.21/11.7.4/11.5.4 (40/40/20) and 11.7.4 (100). REs present on the alignment include 11.7.4 (*Eucalyptus decorticans* and/or *Eucalyptus* spp., *Corymbia* spp., *Acacia* spp., *Lysicarpus angustifolius* woodland on Cainozoic lateritic duricrust), 11.5.21 (*Corymbia bloxsomei* +/- *Callitris glaucophylla* +/- *Eucalyptus crebra* +/- *Angophora leiocarpa* woodland on Cainozoic sand plains and/or remnant surfaces), 11.7.5 (Shrubland on natural scalds on deeply weathered coarse-grained sedimentary rocks) and 11.5.1 (*Eucalyptus crebra* and/or *E. populnea*, *Callitris glaucophylla*, *Angophora leiocarpa*, *Allocasuarina luehmannii* woodland on Cainozoic sand plains and/or remnant surfaces). These REs have a VM status of Least Concern (LC) and Biodiversity Status of No Concern at Present (NCaP). L-Tree Creek outside the northern boundary of the lot is mapped as 11.5.21/11.7.4/11.5.4, however, the riparian corridor is a narrow strip of RE11.3.25 (Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines) and has a VM Status of LC and Biodiversity Status of Of Concern (OC).
Environmentally Sensitive Areas (ESAs) Provide a summary of mapped and unmapped ESAs surveyed/validated. If surveyed infrastructure would impact ESAs or buffers, include impact details on front page	No ESAs were mapped or observed within the survey corridor on Lot 21AU37. Vegetation on L-Tree Creek, outside the property boundary, is RE11.3.25 and has a Biodiversity Status of OC. This constitutes a Category C ESA under the EA (EA0001399_20241107). Parts of the two proposed northern pipeline options will cross this ESA.
Threatened Ecological Communities (TEC) identified: Survey TEC polygon for inclusion on survey sketch.	There are no mapped or observed TECs within the corridor or within 300 metres of the surveyed corridor.
DoR-mapped High-value Regrowth present / impacted:	There was no DoR mapped HVR on the lot.
Regrowth Present/Impacted: *(i.e., Species & Common name/rough estimate when cleared in years)*	The entire site is fire damaged, and most locations are in various states of regrowth.
EVNT Flora species present / impacted (EPBC or NCA): Is proposed infrastructure in a High-risk Area identified on a Protected Plant Trigger Map? (If yes, add requirement for Flora Survey to front page – refer to *Flora Survey Guidelines – Protected Plants*).	No EVNT flora were observed during the survey. There is a High-Risk Area of a Flora Trigger Map over the northern end of the lot and around proposed wells YE253 and YE258 associated with a record for *Cryptandra ciliata* (Near Threatened Qld NC Act). While the vegetation does not match the mandatory regional ecosystems or the preferred habitat of the species, a Protected Plant Survey is a requirement prior to any clearing.

EVNT Fauna – Does the area contain Potential Habitat for any EVNT species (EPBC or NCA)? 1. Is the area Core Habitat 'Known' or 'Possible' for any EVNT species (EPBC or NCA)? 2. If 'Yes', does the area contain microhabitat features, which would indicate likely habitat for the species OR was the species detected? 3. Survey microhabitat features or fauna encounters for inclusion on survey sketch. 3. If no suitable habitat for any threatened species is detected, provide a summary of how site conditions are unsuitable.	A Likelihood of Occurrence Matrix (LoOM) assessment, considering 34 threatened species with potential to occur in Arrow's upstream tenements, was conducted for the surveyed infrastructure on the property. The completed LoOM is appended to this report. General habitat features for some species were considered present on the property, although no evidence of EVNT fauna was observed during the survey.

Watercourses and Wetlands: Brief summary of mapped and unmapped watercourses, wetlands and buffers impacted. Assessment information to include: • any downgrades of mapped watercourses to drainage features • infrastructure in buffers • Details on wetlands: ○ Mapped referrable HES or GES ○ Unmapped ○ Impacts in buffers	Proposed access/gathering crosses a SO2 watercourse in the southeast of the property. The watercourse at this location was considered a drainage feature under the definition in the *Water Act 2000*. (see water feature checklist reports) Two other mapped watercourse/drainages were crossed by gathering and access on the north part of the eastern boundary. Both these mapped SO1 streams were assessed as being natural drainage features. At the northern end of the property pipeline options cross out of the lot and into the L-Tree Creek corridor. L-Tree Creek is a SO4 watercourse. There are no mapped wetlands on the property or within buffer distance.
Restricted Invasive Plants (Weeds): Summary of invasive weeds surveyed/recorded	Extremely-low numbers of invasive weed species were observed. *Opuntia stricta* was observed at only one location.
Additional Considerations:	A suitably-qualified spotter catcher is required during clearing although much of the vegetation has succumbed to fire. However, there is still habitat present such as fallen logs and termitaria in addition to limited numbers of tree hollows.

This survey has been completed by a suitably qualified ecologist. Survey approval applies to the location & environmental constraints outlined in this report. At the time of submission, the ecologist deems the report to be satisfactory.

Features of ecological and environmental significance were identified and mapped where present in accordance with Arrow's Ecological Impact Assessment Procedure and Ecology Survey Guideline.

Completed By	Date
Bruce McLennan	20/09/25

SUMMARY ECOLOGICAL SURVEY REPORT

SURVEY DETAILS			
Project Batch (Infra. Surveyed): (Survey Title from invite)	Surat Basin – Girrahween 3 (22AU37) wells, gathering and access.		
Type of Survey:	Rapid Ecological		
Scope of Activity: Quantify the scope details; include length and width of surveyed RoW, number and names of well leases, gravel pits, camps etc. If this report is uprevved following additional assessments or sketch changes, detail the additional scope, sketch change, ecologist name and date of additions	Approximately 3670 metres of access and gathering of varying width (average 70m) and wells (YE123, YE248, YE257, YE259)		
Lot Plan:	22AU37	**Date of Survey:** Include dates and ecologist initials for follow-up assessment	16/09/2025 BM
Facility Type / Activity:	Wells ☐ Appraisal ☐ Microseismic ☐ Gravel Pit	☐ Core ☑ Development / Production ☐ Directional ☐ Campsite	☐ Exploration ☐ Monitoring ☐ Tiltmeter Array ☑ Access Track
	☐ Seismic ☐ Trunkline ☐ Comms Towers ☐ FCS (Field Compression Station) ☐ Other:	☑ Gathering System ☐ Gas Pipeline ☐ Fibre Optic Cable ☐ CPP (Central Processing Plant)	☐ Security Hut ☐ Water Pipeline ☐ Pond ☐ WTP (Water Treatment Plant) ☐ Frac Pond

RECOMMENDATIONS:

☐ No Environmental issues on site	☐ Environmental issues identified & surveyed	☐ EA amendment required
☑ Fauna spotter required	☐ Protected Flora Trigger Map Survey required	☐ Other:

ISSUES Requiring Follow-up:

Only detail significant issues here that are required to be followed up, e.g., infrastructure in ESA buffers* requiring EA amendment, additional flora or fauna surveys required etc.

*Refer to *EA Conditions Matrix* for buffer distances and permitted activities.

SUMMARY OF ECOLOGICAL CONSTRAINTS (FURTHER DETAIL IN ECOLOGICAL FIELD SURVEY FORM)	
Brief description of broader vegetation / land use:	The land use is resource industry/forestry with most of the property mapped as remnant vegetation. Vegetation is mostly ironbark woodland in average to poor condition from extreme level bushfires in early 2023.
Were any REs identified and what are they? Are these correctly mapped by DoR? (Survey new extents) Updates to DoR RE Mapping IDs: What is the vegetation currently mapped as (RE and status) and what should it be mapped as? *Refer to VMA Mapping and Biodiversity Status.*	Vegetation on the access/gathering is state mapped as 11.7.4/11.7.7/11.7.5/11.7.2 (80/10/5/5) and 11.7.4 (100). REs present on the alignment include 11.7.4 (*Eucalyptus decorticans* and/or *Eucalyptus* spp., *Corymbia* spp., *Acacia* spp., *Lysicarpus angustifolius* woodland on Cainozoic lateritic duricrust) and 11.5.1 (*Eucalyptus crebra* and/or *E. populnea*, *Callitris glaucophylla*, *Angophora leiocarpa*, *Allocasuarina luehmannii* woodland on Cainozoic sand plains and/or remnant surfaces). These REs have a VM status of Least Concern (LC) and Biodiversity Status of No Concern at Present (NCaP). The northern part of the property (north of YE257) is mapped as Cat A on the Regulated Vegetation Map and is associated with an environmental offset Voluntary Declaration area.
Environmentally Sensitive Areas (ESAs) Provide a summary of mapped and unmapped ESAs surveyed/validated. If surveyed infrastructure would impact ESAs or buffers, include impact details on front page	No ESAs were mapped or observed within the survey corridor. There were no mapped ESAs within 300 metres of the surveyed corridor.
Threatened Ecological Communities (TEC) identified: Survey TEC polygon for inclusion on survey sketch.	There are no mapped or observed TECs within the corridor or within 300 metres of the surveyed corridor.
DoR-mapped High-value Regrowth present / impacted:	No HVR was mapped within the property.
Regrowth Present/Impacted: *(i.e., Species & Common name/rough estimate when cleared in years)*	The majority of the surveyed area is regrowth recovering from fire. This regrowth is Category B vegetation.
EVNT Flora species present / impacted (EPBC or NCA): Is proposed infrastructure in a High-risk Area identified on a Protected Plant Trigger Map? (If yes, add requirement for Flora Survey to front page – refer to *Flora Survey Guidelines – Protected Plants*).	No EVNT flora were observed during the survey. The survey area was not shown as 'high-risk' for protected plants on the Flora Survey Area Trigger Mapping

EVNT Fauna – Does the area contain Potential Habitat for any EVNT species (EPBC or NCA)? 1. Is the area Core Habitat 'Known' or 'Possible' for any EVNT species (EPBC or NCA)? 2. If 'Yes', does the area contain microhabitat features, which would indicate likely habitat for the species OR was the species detected? 3. Survey microhabitat features or fauna encounters for inclusion on survey sketch. 3. If no suitable habitat for any threatened species is detected, provide a summary of how site conditions are unsuitable.	A Likelihood of Occurrence Matrix (LoOM) assessment, considering 34 threatened species with potential to occur in Arrow's upstream tenements, was conducted for the surveyed infrastructure on the property. The completed LoOM is appended to this report. General habitat features for a number of species (mostly migratory) were considered present on the property, although no evidence of EVNT fauna was observed during the survey.

Watercourses and Wetlands: Brief summary of mapped and unmapped watercourses, wetlands and buffers impacted. Assessment information to include: • any downgrades of mapped watercourses to drainage features • infrastructure in buffers • Details on wetlands: o Mapped referrable HES or GES o Unmapped o Impacts in buffers	Proposed access crosses two SO1 watercourses in the north of the survey area. The watercourses at these locations were considered to be natural drainage features under the definition in the *Water Act 2000* and largely indistinguishable from surrounding vegetation or terrain. There are no mapped wetlands on the property or within buffer distance.
Restricted Invasive Plants (Weeds): Summary of invasive weeds surveyed/recorded	Not noted.
Additional Considerations:	A suitably-qualified spotter catcher is required to investigate any tree hollows, termitaria or fallen timber for fauna prior to and during any clearance operations. The survey assessed an area larger than the proposed construction width and as such a defined construction footprint was not surveyed. There were no environmental constraints noted at the time of survey that would require realignment. It is advised that minor changes at a construction stage be made within this wider cleared area to avoid larger trees containing habitat hollows and nests under the direction of the spotter catcher.

This survey has been completed by a suitably qualified ecologist. Survey approval applies to the location & environmental constraints outlined in this report. At the time of submission, the ecologist deems the report to be satisfactory.

Features of ecological and environmental significance were identified and mapped where present in accordance with Arrow's Ecological Impact Assessment Procedure and Ecology Survey Guideline.

Bruce McLennan	19/09/25
Completed By	**Date**

SUMMARY ECOLOGICAL SURVEY REPORT

SURVEY DETAILS			
Project Batch (Infra. Surveyed): (Survey Title from invite)	Surat Basin – Girrahween P3a (2RP913167) wells, gathering and access.		
Type of Survey:	Ecological assessment		
Scope of Activity: Quantify the scope details; include length and width of surveyed RoW, number and names of well leases, gravel pits, camps etc. If this report is uprevved following additional assessments or sketch changes, detail the additional scope, sketch change, ecologist name and date of additions	Approximately 9000m of gathering and access tracks. Well pads (SYE_PAD_WP137, SYE_PAD_WP148, SYE_PAD_WP262, SYE_PAD_WP267, SYE_PAD_WP268, SYE_PAD_WP269, and SYE_PAD_WP273).		
Lot Plan:	2RP913167	**Date of Survey:** Include dates and ecologist initials for follow-up assessment	11-13 August 2025
Facility Type / Activity:	Wells ☐ Appraisal ☐ Microseismic ☐ Gravel Pit	☐ Core ☑ Development / Production ☐ Directional ☐ Campsite	☐ Exploration ☐ Monitoring ☐ Tiltmeter Array ☑ Access Track
	☐ Seismic ☐ Trunkline ☐ Comms Towers ☐ FCS (Field Compression Station) ☑ Other: EWA	☑ Gathering System ☐ Gas Pipeline ☐ Fibre Optic Cable ☐ CPP (Central Processing Plant)	☐ Security Hut ☐ Water Pipeline ☐ Pond ☐ WTP (Water Treatment Plant) ☐ Frac Pond

RECOMMENDATIONS:		
☐ No Environmental issues on site	☑ Environmental issues identified & surveyed	☑EA amendment required
☑ Fauna spotter required	☐ Protected Flora Trigger Map Survey required	☐ Other:

ISSUES Requiring Follow-up:

Only detail significant issues here that are required to be followed up, e.g., infrastructure in ESA buffers* requiring EA amendment, additional flora or fauna surveys required etc.

*Refer to *EA Conditions Matrix* for buffer distances and permitted activities.

Section of ESA CAT C primary protection zone (PPZ) intersects SYE_PAD_WP273 and accompanying scouted area. ESA CAT C creating the PPZ is riparian vegetation fringing L Tree Creek on the northern boundary of 2RP913167.

SUMMARY OF ECOLOGICAL CONSTRAINTS (FURTHER DETAIL IN ECOLOGICAL FIELD SURVEY FORM)	
Brief description of broader vegetation / land use:	The land use is lifestyle/forestry with most of the property mapped as remnant vegetation. There are varying degrees of damage to the vegetation communities from recent fire.
Were any REs identified and what are they? Are these correctly mapped by DoR? (Survey new extents) Updates to DoR RE Mapping IDs: What is the vegetation currently mapped as (RE and status) and what should it be mapped as? *Refer to VMA Mapping and Biodiversity Status.*	DoR mapped polygons intersecting proposed footprint: - heterogeneous polygon of Remnant 11.7.4/11.7.7/11.7.5/11.7.2 (NCAP/NCAP/NCAP/NCAP) - heterogeneous polygon of Remnant 11.5.21/11.7.4/11.5.4 (NCAP/NCAP/NCAP). - heterogeneous polygon of Remnant 11.7.4/11.5.1a/11.5.1 (NCAP/NCAP/NCAP). Ecosmart (2019) mapped REs intersecting proposed footprint: - Remnant RE 11.7.5 (NCAP); and - Remnant RE 11.5.1 (NCAP). Ecological survey data confirmed: - Remnant RE 11.5.1 (NCAP); - Remnant RE 11.7.4 (NCAP); and - Remnant RE 11.7.5 (NCAP). Parts of the disturbance footprint have been impacted by fire to the point that the vegetation does not meet the cover/height thresholds for remnant status. However, it keeps its remnant status for the purpose of offsets. Several sections of non-remnant cleared areas were delineated such as access tracks and pre-existing laydowns.
Environmentally Sensitive Areas (ESAs) Provide a summary of mapped and unmapped ESAs surveyed/validated. If surveyed infrastructure would impact ESAs or buffers, include impact details on front page	Ecosmart (2019) mapped RE 11.3.25 (OC) associated with L Tree Creek in the north of the lot/plan. Surveys validated the presence of RE 11.3.25 outside of the scouted area and the 200m buffer zone overlaps SYE_PAD_WP273 and associated scouted area.
Threatened Ecological Communities (TEC) identified: Survey TEC polygon for inclusion on survey sketch.	No TECs identified during surveys.
DoR-mapped High-value Regrowth present / impacted:	No DoR-mapped HVR present in the lot/plan.
Regrowth Present/Impacted: *(i.e., Species & Common name/rough estimate when cleared in years)*	No regrowth vegetation observed.
EVNT Flora species present / impacted (EPBC or NCA): Is proposed infrastructure in a High-risk Area identified on a Protected Plant Trigger Map? (If yes, add requirement for Flora Survey to front page – refer to *Flora Survey Guidelines – Protected Plants*).	No EVNT Flora species observed.

EVNT Fauna – Does the area contain Potential Habitat for any EVNT species (EPBC or NCA)? 1. Is the area Core Habitat 'Known' or 'Possible' for any EVNT species (EPBC or NCA)? 2. If 'Yes', does the area contain microhabitat features, which would indicate likely habitat for the species OR was the species detected? 3. Survey microhabitat features or fauna encounters for inclusion on survey sketch. 3. If no suitable habitat for any threatened species is detected, provide summary of how site conditions are unsuitable.	Note that fire has impacted many habitats features for EVNT fauna within the lot/plan depending on the intensity of the fire. For example, reduced leaf litter from dead canopy/sub-canopies trees and reduced coarse woody debris/logs burned away. In accordance with the SGP threatened species mapping rules (2023), Core Habitat possible is present for: *Acanthophis antarcticus* (Common Death Adder) - REs: 11.5.1, 11.7.4, and 11.7.5. - Habitat features - areas of ample leaf litter coverage and coarse woody debris. *Furina dunmalli* (Dunmall's Snake) - REs: 11.5.1, and 11.7.4. - Habitat features - extensive areas of remnant vegetation with logs and fallen woody debris which were scattered to common across the lot/plan. *Nyctophilus corbeni* (South-eastern Long-eared Bat) - REs: 11.5.1, and 11.7.4. - Habitat features - Extensive stands Ironbark woodlands with Cypress Pine and Buloke. *Petauroides volans sensu lato* (Greater Glider) - REs: 11.5.1, and 11.7.4. - Habitat features – large tracts of near-continuous Eucalypt forest with few non-remnant gaps less than 150m). *Petaurus australis australis* (Yellow-bellied Glider) - REs: 11.5.1 and 11.7.4. - Habitat features – large tracts of near-continuous Eucalypt forest. Angophora leiocarpa (sap-tree) scattered across the site and a diversity of Eucalypts present, many of which are recorded flowering in winter (*C. trachyphloia, C. clarksoniana, C. watsoniana, E. crebra, E. exserta, E. tenuipes*). *Phascolarctos cinereus* (Koala) - REs: 11.5.1, 11.7.4, and 11.7.5. - Habitat features – extensive Eucalypt woodland containing feed tree species. *Stagonopleura guttata* (Diamond Firetail) - REs: 11.5.1, and 11.7.4. - Habitat features – Eucalypt woodland with sections of grassy ground-layer suitable for foraging. Potential for seeding grass cover common across much of the site. *Strophurus taenicauda* (Golden-tailed Gecko) - REs: 11.5.1, and 11.7.4. - Habitat features – Cypress Pine and *Acacia* sp. Common across much of the lot/plan. Sections of proposed disturbance footprint with high shrub density are present. The northern boundary of 2RP913167 borders L Tree Creek which was observed containing a diversity of large Eucalypts (RE 11.3.25) with dbh greater than 100cm+ and upwards of 40-50m tall. This section of creek would provide high-quality habitat for Greater Glider and Yellow-bellied Glider due to the increased likelihood of hollow-bearing trees. This suggests a higher likelihood for these species to occur within the scouted area on the lot/plan through its proximity to high quality habitat associated with L Tree Creek. None of the above species were observed during surveys.

Watercourses and Wetlands: Brief summary of mapped and unmapped watercourses, wetlands and buffers impacted. Assessment information to include: • any downgrades of mapped watercourses to drainage features • infrastructure in buffers • Details on wetlands: o Mapped referrable HES or GES o Unmapped o Impacts in buffers	DAF/VMA mapping layers for Waterway/watercourses overlap on this property and intersect the disturbance footprint in one location: - Fish passage 1 (DAF)/Stream order 1 (VMA) crosses the scouted area between 218911, 7071259 (56J), and 218855, 7071284 (56J). In accordance with the Water Act 2000 definitions, no VMA watercourses were observed (i.e. no presence of continuously defined bed and banks), only DAF Waterways in the form of drainage features were present, as follows: - DAF Waterway crosses the disturbance footprint in the same location as is mapped by DAF – between 218911, 7071259 (56J), and 218855, 7071284 (56J). There are no mapped wetlands on the property or within buffer distance of proposed infrastructure.
Restricted Invasive Plants (Weeds): Summary of invasive weeds surveyed/recorded	No restricted invasive weeds were observed.
Additional Considerations:	Fauna spotter catcher required during and prior to construction.

This survey has been completed by a suitably qualified ecologist. Survey approval applies to the location & environmental constraints outlined in this report. At the time of submission, the ecologist deems the report to be satisfactory.

Features of ecological and environmental significance were identified and mapped where present in accordance with Arrow's Ecological Impact Assessment Procedure and Ecology Survey Guideline.

Completed By	Date
Daniel Kelly	16/10/2025

SUMMARY ECOLOGICAL SURVEY REPORT

SURVEY DETAILS			
Project Batch (Infra. Surveyed): (Survey Title from invite)	Surat Basin – Girrahween P2a & P2b (3RP184124) _Survey corridor (gathering & extra work area).		
Type of Survey:	Rapid Ecological		
Scope of Activity: Quantify the scope details; include length and width of surveyed RoW, number and names of well leases, gravel pits, camps etc. If this report is uprevved following additional assessments or sketch changes, detail the additional scope, sketch change, ecologist name and date of additions	Approximately 10800 meters of gathering with EWA of varying width (average 50m as surveyed)		
Lot Plan:	3RP184124	**Date of Survey:** Include dates and ecologist initials for follow-up assessment	18/08/2025
Facility Type / Activity:	Wells ☐ Appraisal ☐ Microseismic ☐ Gravel Pit ☐ Core ☐ Development / Production ☐ Directional ☐ Campsite ☐ Exploration ☐ Monitoring ☐ Tiltmeter Array ☐ Access Track		
	☐ Seismic ☐ Trunkline ☐ Comms Towers ☐ FCS (Field Compression Station) ☑ Other: EWA ☑ Gathering System ☐ Gas Pipeline ☐ Fibre Optic Cable ☐ CPP (Central Processing Plant) ☐ Security Hut ☐ Water Pipeline ☐ Pond ☐ WTP (Water Treatment Plant) ☐ Frac Pond		

RECOMMENDATIONS:		
☐ No Environmental issues on site	☐ Environmental issues identified & surveyed	☐ EA amendment required
☑ Fauna spotter required	☐ Protected Flora Trigger Map Survey required	☐ Other:

ISSUES Requiring Follow-up:

Only detail significant issues here that are required to be followed up, e.g., infrastructure in ESA buffers* requiring EA amendment, additional flora or fauna surveys required etc.

*Refer to *EA Conditions Matrix* for buffer distances and permitted activities.

SUMMARY OF ECOLOGICAL CONSTRAINTS (FURTHER DETAIL IN ECOLOGICAL FIELD SURVEY FORM)	
Brief description of broader vegetation / land use:	The large section of the gatherings is dry woodlands to open woodlands dominated by *Eucalptus crebra* with *Angophora leiocarpa*, *corymbia trachyphloia*, *Calitris glaucophylla* and *Allocasuarina luehmannii* and most abundant shrubs species *Acacia leiocalyx*
Were any REs identified and what are they? Are these correctly mapped by DoR? (Survey new extents) Updates to DoR RE Mapping IDs: What is the vegetation currently mapped as (RE and status) and what should it be mapped as? *Refer to VMA Mapping and Biodiversity Status.*	The REs mapped by DoR are mixed polygons of 11.7.4/11.7.7/11.7.5/11.7.2 Gound-truthed Regional Ecosystems in the survey included 11.7.4 and 11.5.1
Environmentally Sensitive Areas (ESAs) Provide a summary of mapped and unmapped ESAs surveyed/validated. If surveyed infrastructure would impact ESAs or buffers, include impact details on front page	There were no mapped ESAs within 300 metres of the surveyed corridor. No ESAs observed within the survey corridor.
Threatened Ecological Communities (TEC) identified: Survey TEC polygon for inclusion on survey sketch.	There are no mapped or observed TECs within the corridor or within 300 metres of the surveyed corridor.
DoR-mapped High-value Regrowth present / impacted:	No
Regrowth Present/Impacted: *(i.e., Species & Common name/rough estimate when cleared in years)*	No
EVNT Flora species present / impacted (EPBC or NCA): Is proposed infrastructure in a High-risk Area identified on a Protected Plant Trigger Map? (If yes, add requirement for Flora Survey to front page – refer to *Flora Survey Guidelines – Protected Plants*).	No EVNT flora was observed during the survey.
EVNT Fauna – Does the area contain Potential Habitat for any EVNT species (EPBC or NCA)? 1. Is the area Core Habitat 'Known' or 'Possible' for any EVNT species (EPBC or NCA)? 2. If 'Yes', does the area contain microhabitat features, which would indicate likely habitat for the species OR was the species detected? 3. Survey microhabitat features or fauna encounters for inclusion on survey sketch. 3. If no suitable habitat for any threatened species is detected, provide summary of how site conditions are unsuitable.	Yes, the area is core habitat possible for *Acanthophis antarcticus*, *Furina dunmalli*, *Nyctophilus corbeni*, *Petauriodes volans*, *Petaurus australis*, *Phascolarctos cinereus* *Stagonopleura guttata and Strophurus taenicauda* General habitat features for several species were considered present on the property. No evidence of EVNT fauna was observed during the survey.

Watercourses and Wetlands:
Brief summary of mapped and unmapped watercourses, wetlands and buffers impacted.
Assessment information to include:
• any downgrades of mapped watercourses to drainage features
• infrastructure in buffers
• Details on wetlands:
  ○ Mapped referrable HES or GES
  ○ Unmapped
  ○ Impacts in buffers
	Though there is mapped VMA watercourse & Water barrier works (low impact) @ 56J 219344 7066352, but field survey found no defined watercourse/waterway. However, the site seems like a low-lying area. In addition, the site @218987 7066415 has a sign of flood water flow.
	
	There are no mapped wetlands on the property or within buffer distance of proposed infrastructure.

Restricted Invasive Plants (Weeds): Summary of invasive weeds surveyed/recorded	No restricted invasive weed species were observed in the study area.
Additional Considerations:	A suitably qualified spotter catcher is required to investigate any tree hollows, nest, termitaria or fallen timber for fauna prior to and during any clearance operations.
This survey has been completed by a suitably qualified ecologist. Survey approval applies to the location & environmental constraints outlined in this report. At the time of submission, the ecologist deems the report to be satisfactory. **Features of ecological and environmental significance were identified and mapped where present in accordance with Arrow's Ecological Impact Assessment Procedure and Ecology Survey Guideline.**	
Nazim Uddin	20/08/2025
Completed By	**Date**

SUMMARY ECOLOGICAL SURVEY REPORT

arrow energy

SURVEY DETAILS			
Project Batch (Infra. Surveyed): (Survey Title from invite)	Surat Basin – Girrahween (P3a) (302RP897544) wells, gathering and access tracks Note: There are same number lot on plan. This lot on plan reference point: 56J 227468 7064390		
Type of Survey:	Ecological assessment		
Scope of Activity: Quantify the scope details; include length and width of surveyed RoW, number and names of well leases, gravel pits, camps etc. If this report is uprevved following additional assessments or sketch changes, detail the additional scope, sketch change, ecologist name and date of additions	Approximated 350 m of access and gathering of varying width. Well pads (SAL_PAD_WP311)		
Lot Plan:	302RP897544	**Date of Survey:** Include dates and ecologist initials for follow-up assessment	23/09/2025
Facility Type / Activity:	Wells ☐ Appraisal ☐ Microseismic ☐ Gravel Pit	☐ Core ☑ Development / Production ☐ Directional ☐ Campsite	☐ Exploration ☐ Monitoring ☐ Tiltmeter Array ☑ Access Track
	☐ Seismic ☐ Trunkline ☐ Comms Towers ☐ FCS (Field Compression Station) ☐ Other:	☑ Gathering System ☐ Gas Pipeline ☐ Fibre Optic Cable ☐ CPP (Central Processing Plant)	☐ Security Hut ☐ Water Pipeline ☐ Pond ☐ WTP (Water Treatment Plant) ☐ Frac Pond

RECOMMENDATIONS:		
☐ No Environmental issues on site	☐ Environmental issues identified & surveyed	☐ EA amendment required
☑ Fauna spotter required	☐ Protected Flora Trigger Map Survey required	☐ Other:

ISSUES Requiring Follow-up:

Only detail significant issues here that are required to be followed up, e.g., infrastructure in ESA buffers* requiring EA amendment, additional flora or fauna surveys required etc.

*Refer to *EA Conditions Matrix* for buffer distances and permitted activities.

SUMMARY OF ECOLOGICAL CONSTRAINTS (FURTHER DETAIL IN ECOLOGICAL FIELD SURVEY FORM)	
Brief description of broader vegetation / land use:	The land use is lifestyle/forestry with most of the property mapped as remnant vegetation.
Were any REs identified and what are they? Are these correctly mapped by DoR? (Survey new extents) Updates to DoR RE Mapping IDs: What is the vegetation currently mapped as (RE and status) and what should it be mapped as? *Refer to VMA Mapping and Biodiversity Status.*	DoR mapped polygons intersecting proposed footprint: - Heterogeneous polygons consisting of Remnant 11.7.4/11.7.7/11.7.5/11.7.2 (NCAP/NCAP/NCAP/NCAP) Ecosmart (2019) mapped REs intersecting proposed footprint: - Remnant RE 11.5.1 (NCAP). Ecological survey data confirmed: - Remnant RE 11.5.1 (NCAP)
Environmentally Sensitive Areas (ESAs) Provide a summary of mapped and unmapped ESAs surveyed/validated. If surveyed infrastructure would impact ESAs or buffers, include impact details on front page	No ESAs mapped or observed during within the survey corridor. No mapped ESAs within 300m of the scouted area.
Threatened Ecological Communities (TEC) identified: Survey TEC polygon for inclusion on survey sketch.	No TECs identified within the survey corridor during surveys.
DoR-mapped High-value Regrowth present / impacted:	No DoR-mapped HVR present within the disturbance footprint.
Regrowth Present/Impacted: *(i.e., Species & Common name/rough estimate when cleared in years)*	No
EVNT Flora species present / impacted (EPBC or NCA): Is proposed infrastructure in a High-risk Area identified on a Protected Plant Trigger Map? (If yes, add requirement for Flora Survey to front page – refer to *Flora Survey Guidelines – Protected Plants*).	No EVNT Flora species observed.
EVNT Fauna – Does the area contain Potential Habitat for any EVNT species (EPBC or NCA)? 1. Is the area Core Habitat 'Known' or 'Possible' for any EVNT species (EPBC or NCA)? 2. If 'Yes', does the area contain microhabitat features, which would indicate likely habitat for the species OR was the species detected? 3. Survey microhabitat features or fauna encounters for inclusion on survey sketch. 3. If no suitable habitat for any threatened species is detected, provide summary of how site conditions are unsuitable.	In accordance with the SGP threatened species mapping rules (2023), Core Habitat possible is present for: *Acanthophis antarcticus* (Common Death Adder): - REs: 11.5.1 - Habitat features - areas of ample leaf litter coverage and coarse woody debris. *Furina dunmalli* (Dunmall's Snake): - REs: 11.5.1 - Habitat features – extensive areas of remnant vegetation with logs and fallen woody debris which were scattered to common across the lot/plan. *Nyctophilus corbeni* (South-eastern Long-eared Bat): - REs: 11.5.1 - Habitat features - Extensive stands of Ironbark woodlands with Cypress Pine and Buloke.

	Petauroides volans sensu lato (Greater Glider): - REs: 11.5.1 - Habitat features – large tracts of near-continuous Eucalypt forest with few non-remnant gaps less than 150m). *Petaurus australis australis* (Yellow-bellied Glider): - REs: 11.5.1 - Habitat features – large tracts of near-continuous Eucalypt forest. *Phascolarctos cinereus* (Koala): - REs: 11.5.1 - Habitat features – extensive Eucalypt woodland containing feed tree species. *Stagonopleura guttata* (Diamond Firetail): - REs: 11.5.1 - Habitat features – Eucalypt woodland with sections of grassy ground-layer suitable for foraging. Potential for seeding grass cover common across much of the site. *Strophurus taenicauda* (Golden-tailed Gecko): - REs: 11.5.1 - Habitat features – *Acacia* sp. common across much of the lot/plan. Site data did not yield any hollow bearing trees across the lot/plan. Hollow bearing trees are a necessary habitat feature for both *Petauroides volans volans* (Greater Glider) and *Petaurus australis australis* (Yellow-bellied Glider (southeastern)). Much of the vegetation was not mature enough to provide the density of hollow bearing trees required for these two species. As such, core habitat possible for these species has been discounted within the lot/plan.

Watercourses and Wetlands: Brief summary of mapped and unmapped watercourses, wetlands and buffers impacted. Assessment information to include: • any downgrades of mapped watercourses to drainage features • infrastructure in buffers • Details on wetlands: o Mapped referrable HES or GES o Unmapped o Impacts in buffers	No DAF/VMA mapping layers for Waterway/watercourses intersect the disturbance footprint There are no mapped wetlands on the property or within buffer distance of proposed infrastructure.
Restricted Invasive Plants (Weeds): Summary of invasive weeds surveyed/recorded	No restricted invasive weeds were observed.
Additional Considerations:	Fauna spotter catcher required during surveys.

This survey has been completed by a suitably qualified ecologist. Survey approval applies to the location & environmental constraints outlined in this report. At the time of submission, the ecologist deems the report to be satisfactory.

Features of ecological and environmental significance were identified and mapped where present in accordance with Arrow's Ecological Impact Assessment Procedure and Ecology Survey Guideline.

Nazim Uddin	16/10/2025
Completed By	**Date**

SUMMARY ECOLOGICAL SURVEY REPORT

SURVEY DETAILS			
Project Batch (Infra. Surveyed): (Survey Title from invite)	Surat Basin – Girrahween 3 Road Reserve access.		
Type of Survey:	Rapid Ecological		
Scope of Activity: Quantify the scope details; include length and width of surveyed RoW, number and names of well leases, gravel pits, camps etc. If this report is uprevved following additional assessments or sketch changes, detail the additional scope, sketch change, ecologist name and date of additions	Approximately 3170 metres of access within an existing gazetted road corridor (unmade) (30 metres wide approx.)		
Lot Plan:	Crown	**Date of Survey:** Include dates and ecologist initials for follow-up assessment	16/09/2025
Facility Type / Activity:	Wells ☐ Appraisal ☐ Microseismic ☐ Gravel Pit	☐ Core ☐ Development / Production ☐ Directional ☐ Campsite	☐ Exploration ☐ Monitoring ☐ Tiltmeter Array ☑ Access Track
	☐ Seismic ☐ Trunkline ☐ Comms Towers ☐ FCS (Field Compression Station) ☐ Other:	☐ Gathering System ☐ Gas Pipeline ☐ Fibre Optic Cable ☐ CPP (Central Processing Plant)	☐ Security Hut ☐ Water Pipeline ☐ Pond ☐ WTP (Water Treatment Plant) ☐ Frac Pond

RECOMMENDATIONS:		
☐ No Environmental issues on site	☑ Environmental issues identified & surveyed	☐ EA amendment required
☑ Fauna spotter required	☐ Protected Flora Trigger Map Survey required	☐ Other:

ISSUES Requiring Follow-up:

Only detail significant issues here that are required to be followed up, e.g., infrastructure in ESA buffers* requiring EA amendment, additional flora or fauna surveys required etc.

*Refer to *EA Conditions Matrix* for buffer distances and permitted activities.

The western 600 metres of the surveyed corridor was assessed as being RE 11.4.10 (Eucalyptus populnea or E. woollsiana, Acacia harpophylla, Casuarina cristata open forest to woodland on margins of Cainozoic clay plains) with a Biodiversity Status of Endangered. This vegetation is a Cat B ESA and an EPBC Act Threatened Ecological Community. Clearing of part of this vegetation for the access track will likely trigger the requirement for an offset.

SUMMARY OF ECOLOGICAL CONSTRAINTS (FURTHER DETAIL IN ECOLOGICAL FIELD SURVEY FORM)	
Brief description of broader vegetation / land use:	The land use is grazing/other.
Were any REs identified and what are they? Are these correctly mapped by DoR? (Survey new extents) Updates to DoR RE Mapping IDs: What is the vegetation currently mapped as (RE and status) and what should it be mapped as? *Refer to VMA Mapping and Biodiversity Status.*	Vegetation on the proposed access is state mapped from west east as non-remnant and 11.7.4/11.5.1a/11.5.1 (50/25/25). REs include 11.7.4 (Eucalyptus decorticans and/or Eucalyptus spp., Corymbia spp., Acacia spp., Lysicarpus angustifolius woodland on Cainozoic lateritic duricrust), 11.7.6 (Corymbia citriodora or Eucalyptus crebra woodland on Cainozoic lateritic duricrust) and 11.4.10 (Eucalyptus populnea or E. woollsiana, Acacia harpophylla, Casuarina cristata open forest to woodland on margins of Cainozoic clay plains). REs 11.7.4 and 11.7.6 have a VM Act status of Least Concern (LC) and Biodiversity Status of No Concern at Present (NCaP). RE 11.4.10 has a VM Act status of Endangered and a Biodiversity Status of Endangered.
Environmentally Sensitive Areas (ESAs) Provide a summary of mapped and unmapped ESAs surveyed/validated. If surveyed infrastructure would impact ESAs or buffers, include impact details on front page	RE 11.4.10 has an Endangered Biodiversity Status and is a Category B ESA. Clearing within this ESA should be minimised and where possible follow old tracks to avoid clearing mature trees.
Threatened Ecological Communities (TEC) identified: Survey TEC polygon for inclusion on survey sketch.	The vegetation in the RE11.4.10 section was assessed as meeting the condition thresholds for the Brigalow (Acacia harpophylla dominant and co-dominant) Threatened Ecological Community.
DoR-mapped High-value Regrowth present / impacted:	There was no DoR mapped HVR in the survey area.
Regrowth Present/Impacted: *(i.e., Species & Common name/rough estimate when cleared in years)*	There was no regrowth present within the survey area.
EVNT Flora species present / impacted (EPBC or NCA): Is proposed infrastructure in a High-risk Area identified on a Protected Plant Trigger Map? (If yes, add requirement for Flora Survey to front page – refer to *Flora Survey Guidelines – Protected Plants*).	No EVNT flora were observed during the survey. There is no High-Risk Area of a Flora Trigger Map over survey area.
EVNT Fauna – Does the area contain Potential Habitat for any EVNT species (EPBC or NCA)? 1. Is the area Core Habitat 'Known' or 'Possible' for any EVNT species (EPBC or NCA)? 2. If 'Yes', does the area contain microhabitat features, which would	A Likelihood of Occurrence Matrix (LoOM) assessment, considering 34 threatened species with potential to occur in Arrow's upstream tenements, was conducted for the surveyed infrastructure on the property. The completed LoOM is appended to this report. General habitat features for some species were considered present on the property, although no evidence of EVNT fauna was observed during the survey.

indicate likely habitat for the species OR was the species detected? 3. Survey microhabitat features or fauna encounters for inclusion on survey sketch. 3. If no suitable habitat for any threatened species is detected, provide a summary of how site conditions are unsuitable.	

Watercourses and Wetlands: Brief summary of mapped and unmapped watercourses, wetlands and buffers impacted. Assessment information to include: • any downgrades of mapped watercourses to drainage features • infrastructure in buffers • Details on wetlands: ○ Mapped referrable HES or GES ○ Unmapped ○ Impacts in buffers	No mapped or assessed watercourses were crossed by the survey corridor. There are no mapped wetlands on the property or within buffer distance.
Restricted Invasive Plants (Weeds): Summary of invasive weeds surveyed/recorded	Extremely-low numbers of invasive weed species were observed. *Opuntia tomentosa* was observed at only one location.
Additional Considerations:	A suitably-qualified spotter catcher is required during clearing to monitor fallen logs, deep cracking clay soils and termitaria in addition to limited numbers of tree hollows.

This survey has been completed by a suitably qualified ecologist. Survey approval applies to the location & environmental constraints outlined in this report. At the time of submission, the ecologist deems the report to be satisfactory.

Features of ecological and environmental significance were identified and mapped where present in accordance with Arrow's Ecological Impact Assessment Procedure and Ecology Survey Guideline.

Completed By	Date
Bruce McLennan	17/09/25

Appendix F – (EA0001399) Landscape Fragmentation and Connectivity (LFC)

Department of Environment and Heritage Protection (DEHP)
Landscape Fragmentation and Connectivity (LFC) Tool version 1.4 LOGFILE
Process started at 06-02-2026 07:47:07 AM
Python version: 2.7.18 (v2.7.18:8d21aa21f2, Apr 20 2020, 13:19:08) [MSC v.1500 32 bit (Intel)]
Arcpy version: 10.8.1
Username: tstringer

INPUT PARAMETERS
Output Workspace: R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\Arrow
Threshold lookup table:
R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\scripts_Toolbox\LFC_data.gdb\tbl_Regional_frag_local_threshold
Remnant cover layer: R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\Arrow\LFC_data.gdb\ArrowRegVeg
Remnant cover layer edited: False
Regional buffer extent: 20 kilometres
Local buffer extent: 5 kilometres
Impact layer: R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\Disturbance\New File Geodatabase.gdb\Disturbance_
layer projection: GDA2020
Raster cell resolution for analysis: 10 metres
Edge Width: 50 metres
(The distance from non-remnant landscapes through to the core ecosystem - the edge of remnant ecosystems)
Default projection: R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\GDA 2020 Queensland AlbersOFFSET.prj

07:47:08 Checking out the spatial analyst tool - required for LFC

07:47:08 _____BEGINNING LANDSCAPE FRAGMENTATION AND CONNECTIVITY ANALYSIS_____

07:47:08 This tool will categorise the landscape into:
{0: 'non-rem', 1: 'patch', 2: 'edge', 3: 'perforated', 4: 'core (< 100 hectares)', 5: 'core (100-500 hectares)', 6: 'core (> 500 hectares)', 7: 'water'}

07:47:19 R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\Arrow\lyr_file does not exist, creating it now.
07:47:19 Copying across impact site feature(s) and calculating area in hectares (AreaHA)
07:47:25 Making a local copy of the impact site
07:47:32 Preparing remnant cover layer for analysis
07:47:34 Created regional scale buffer of 20 kilometres
07:47:40 Created local scale buffer of 5 kilometres
07:48:09 Clipped the remnant cover to the regional buffer extent
07:48:16 Unioned the pre impact remnant layer with the impact site
07:48:30 Attributed the impact area as not RVM Cat B
07:48:30 Area of RVM Cat B clearing is 364.67 hectares
07:48:30 SQL selection used is "RVM_CAT" = 'B' and "Cover" = 'Not RVM Cat B' on shapefile R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\Arrow\main_output\clip_remcover_post.shp

07:48:38 Categorised the cover attributes in clip_remcover_pre.shp ready for raster conversion
07:49:25 Converted clip_remcover_pre.shp to raster

07:49:33 Categorised the cover attributes in clip_remcover_post.shp ready for raster conversion
07:50:19 Converted clip_remcover_post.shp to raster

07:50:19 Run Landscape fragmentation analysis on the pre impact regional landscape

REGULATED VEGETATION TYPES BEING EXTRACTED FROM LAND COVER
IDENTIFICATION OF CORE, PATCH, EDGE AND PERFORATIONS
COMBINING FRAGMENTATION CLASSES
CLASSIFYING CORE FOREST PATCHES BY AREA
COMPOSING FINAL FRAGMENTATION MAP
COMPOSING FINAL FRAGMENTATION MAP
(FRAGMENTATION CALCULATION TIME WAS 18.9 MINUTES)

08:09:16 Run Landscape fragmentation analysis on the post impact regional landscape

REGULATED VEGETATION TYPES BEING EXTRACTED FROM LAND COVER
IDENTIFICATION OF CORE, PATCH, EDGE AND PERFORATIONS
COMBINING FRAGMENTATION CLASSES
CLASSIFYING CORE FOREST PATCHES BY AREA
COMPOSING FINAL FRAGMENTATION MAP
COMPOSING FINAL FRAGMENTATION MAP
(FRAGMENTATION CALCULATION TIME WAS 17.7 MINUTES)

Extracting a local subset of lfc_regional_pre_impact
Extracting a local subset of lfc_regional_post_impact

Collating pre and post impact statistics and trigger assessment
08:28:07 Summarising area statistics for: lfc_localmsk_pre_impact
08:28:07 Summarising area statistics for: lfc_localmsk_post_impact
08:28:08 Summarising area statistics for: lfc_regional_pre_impact
08:28:10 Summarising patch count for lfc_localmsk_pre_impact
08:28:30 Summarising patch count for lfc_localmsk_post_impact

Analysing impact on Connectivity Areas

SIGNIFICANCE TEST ONE

The regional total area is 263197.15
The regional extent of core remnant is 140942.97
The regional extent of core remnant is 53.55 percent
This level of regional fragmentation sets a local impact threshold of: 20.0 percent

The table below lists the local impact thresholds for categories of regional core remnant extent:

REGIONAL CORE CATEGORY	LOCAL IMPACT THRESHOLD
< 10	2.0
10 - 30	5.0
30 - 50	10.0
50 - 70	20.0
70 - 90	30.0
>90	50.0

Area of core at the local scale (pre impact): 37808.32
Area of core at the local scale (post impact): 36915.28
Percent change of core at the local scale (post impact): 2.36 percent

SIGNIFICANCE TEST TWO

The number of core remnant areas occurring on the site: 21
The number of core remnant areas remaining on the site post impact: 21
(Only core polygons greater than or equal to 1 hectare are included)

RESULT

08:29:12 This analysis has determined any impact on connectivity areas is NOT significant
(A significant reduction in core remnant at the local scale is False OR a change from core to non-core remnant at the site scale is False)

The significance table has been written to: ..\main_output\lfc_significance_assessment.csv
The local scale summary table has been written to: ..\main_output\lfc_local_scale_summary.csv
The site scale summary table has been written to: ..\main_output\lfc_site_scale_summary.csv
GIS layer files copied into folder \lyr_file within the project folder.
View layers in ArcMAP
using..\R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\Arrow\lyr_file\lyr_file\Connectivity Area Impact Assessment.lyr

Please scrutinise the output tables and spatial layers to confirm the desktop modelling of connectivity area impact

This analysis used an unedited copy of the Regulated Vegetation layer.

08:36:29 _____COMPLETED LANDSCAPE FRAGMENTATION AND CONNECTIVITY ANALYSIS_____