APPENDIX

# AE

# Whetstone Material Distribution Centre: Supporting Technical Information

**BORDER TO GOWRIE** REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT

Inland Rail is a subsidiary of
Australian Rail Track Corporation

INLAND RAIL

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# Abbreviations

| Abbreviation | Definition |
|---|---|
| °C | Degrees Celsius |
| ABS | Australian Bureau of Statistics |
| AEP | Annual exceedance probability |
| AHD | Australian height datum |
| AIDR | Australian Institute Disaster Resilience |
| ARTC | Australian Rail Track Corporation |
| B2G | New South Wales / Queensland Border to Gowrie |
| BAL | Basic left-turn treatment |
| BoM | Bureau of Meteorology |
| CEMP | Construction Environmental Management Plan |
| CHMP | Cultural Heritage Management Plan |
| CLR | Contaminated Land Register |
| dB | Decibel |
| dB(A) | A-weighted decibel |
| DTMR | Department of Transport and Main Roads |
| EIS | Environmental Impact Statement |
| EMP | Environmental Management Plan |
| EMR | Environmental Management Register |
| GRC | Goondiwindi Regional Council |
| GTIA | Guide to Traffic Impact Assessment (Department of Transport and Main Roads, 2018) |
| ha | Hectare |
| HPFV | High Productivity Freight Vehicle |
| HV | Heavy vehicle |
| km | Kilometre |
| km/h | Kilometres per hour |
| kV | Kilovolt |
| LCT | Landscape character type |
| LGA | Local government area |
| LoS | Level of Service |
| LV | Light vehicle |
| m | Metre |
| $m^2$ | Square metre |
| $m^3$ | Cubic metre |
| ML | Megalitre |
| mm | Millimetre |
| PIA | Pavement Impact Assessment |
| OSOM | Oversize Overmass |
| QLD | Queensland |
| QR | Queensland Rail |
| RE | Regional ecosystem |
| SPP | State Planning Policy 2017 |
| t | Tonne |
| TIA | Traffic Impact Assessment |
| TMP | Traffic Management Plan |
| TRC | Toowoomba Regional Council |

# 1. Introduction

## 1.1 Scope and purpose of report

This report presents a summary of supporting technical information for relevant environmental matters and approval requirements associated with the Whetstone MDC site for the Inland Rail Border to Gowrie project (the Project), as described in Chapter 5: Project Description. All chapters of the revised draft EIS cover all components of the Project, including the Whetstone MDC as shown in Table 1-1.

**TABLE 1-1 CHAPTERS IN REVISED DRAFT EIS WHERE WHETSTONE MDC IS ADDRESSED**

| REVISED DRAFT EIS CHAPTERS | WHETSTONE MDC ADDRESSED IN CHAPTERS |
|---|---|
| **Chapter 3: Legislation and Project Approvals Process** | Yes |
| **Chapter 5: Project Description** | Yes |
| **Chapter 6: Stakeholder Engagement** | Yes |
| **Chapter 7: Sustainability** | Yes |
| **Chapter 8: Land Use and Tenure** | Yes |
| **Chapter 9: Land Resources** | Yes, and earthwork consideration is included in Appendix AB |
| **Chapter 10: Landscape and Visual Impact Assessment** | Yes, and Whetstone MDC survey information is in Attachment A of this appendix |
| **Chapter 11: Flora and Fauna** | Yes, and Whetstone MDC Survey information is in Attachment B of this appendix |
| **Chapter 12: Air Quality** | Yes |
| **Chapter 13: Surface Water** | Yes |
| **Chapter 14: Flooding and Geomorphology** | Yes |
| **Chapter 15: Groundwater** | Yes |
| **Chapter 16: Noise and Vibration** | Yes |
| **Chapter 17: Social** | Yes |
| **Chapter 18: Economics** | Yes |
| **Chapter 19: Cultural Heritage** | Yes |
| **Chapter 20: Traffic, Transport and Access** | Yes |
| **Chapter 21: Hazard and Risk** | Yes |
| **Chapter 22: Waste and Resource Management** | Yes |
| **Chapter 23: Cumulative Impacts** | Yes |
| **Chapter 24: Draft Outline EMP** | Yes |

## 1.2 Description of the Whetstone Material Distribution Centre

As part of the track construction delivery strategy for the Project, ARTC is proposing to establish a temporary material distribution centre (MDC) in Whetstone, on land bounded by the South Western Line to the north and Cunningham Highway to the south, to support construction of the Project. The Whetstone MDC will require a temporary change in land use from rural/agricultural to construction activities, including work site, material storage and laydown areas for the construction duration of the B2G Project.

The Whetstone MDC is located approximately 18 km south-west of Inglewood and 59 km east of Goondiwindi, in the Goondiwindi local government area (LGA) (refer Figure 1-1).

The facility will accept and redistribute material via the South Western Line with a 15.75 tonne axle load (TAL) limit. Rail traffic volumes on this network are subject to seasonal grain volumes. One to three trains per week are expected during off season and up to five trains a day during peak season (i.e. November and December).

The Project's construction activities comprise of delivery, stockpile, preparation, handling and distribution of bulk track construction materials. Construction materials and equipment expected to be delivered to site include concrete sleepers, ballast, steel rail, precast concrete (for bridges and culverts), communications, signalling and turnout equipment, and demountable site offices.

The site's ability to receive and distribute material via rail will improve the efficiency of the construction phase of the B2G Project and will significantly reduce the need for road transportation. The Whetstone MDC is a temporary construction-support facility, which forms part of the overall B2G Project, included as per the anticipated timing described in Chapter 5: Project Description. The Whetstone MDC will take an estimated 12 months for site establishment, and the site will be available as a construction-support facility for the remainder of the construction stage of the Project.

Onsite activities will include welding and grinding of steel rail into long welded rail strings, as well as plant storage and maintenance. To enable activities and receipt of material and equipment, the facility will require earthworks and drainage works, internal rail track, site office and facilities, rollingstock provisioning and maintenance facilities, along with the provision of gantries for rail logistic management, and ballast unloading facilities and rail welding facilities.


**Image Source:** ESRI Basemap (2022) **Data source:** Department of Resources (2022)

**FIGURE 1.1**

Whetstone MDC Regional Context

# 2. Proposed development

## 2.1 Purpose

Given the critical nature of construction material to the success of the Queensland Inland Rail projects and the timing associated with manufacturing, ARTC has identified a need to develop a temporary MDC for the Project.

The purpose of the Whetstone MDC is to support activities associated with the construction of the Project. The key objectives of the Whetstone MDC are to:

- Allow for the continued production of construction materials for the Project at a sustainable rate to meet consumption demand, without the need for significant peaks and troughs in supplier production and resource requirements
- Allow for more controlled, efficient and safer material storage and handling activities to be undertaken, using a purpose built and rail accessible MDC, thus minimising potential quality issues, double handling and material damage
- Support the construction process through the storage of materials at a centralised location for the Project, which allows for the implementation of more efficient and environmentally responsible construction methodologies
- Limit the number of times materials are required to be handled and transported prior to installation works
- Encourage the use of rail and avoid significant volumes of road freight, thus enhancing road safety, reducing environmental impacts, network strain and simplifying the materials delivery process.

## 2.2 Site description

A ‘development footprint’ has been defined for the Whetstone MDC. The development footprint is 212.62 hectares (ha) in area and includes the site of the MDC as well as the extent of possible road upgrades and maintenance works to Cunningham Highway, a State-controlled road, and Whetstone Access Road, a local government road. The development footprint is wholly contained within the Goondiwindi LGA. Existing tenure within the development footprint is comprised of freehold tenure, as well as Lot 352 on SP116434, which is lands lease (for the existing rail line) and land parcels designated as road reserves.

The land contained within the development footprint is described as:

- Part of Lot 2 on MH784
- Lot 4 on MH287
- Lot 76 on MH313
- Lot 74 on MH313
- Lot 352 on SP116434.

The development footprint for the Whetstone MDC forms part of the ‘temporary footprint’ that is defined in Chapter 5: Project Description.

## 2.3 Facility description

### 2.3.1 Site description

The general site layout for the Whetstone MDC is shown on Figure 2-1 and Figure 2-2.

The site will include:

- Site drainage as required
- Rollingstock provisioning and maintenance facilities (concrete hard stand and containers with shade)
- Hardstand area for material stockpiling
- Gantries for rail logistic management
- Ballast unloading facilities
- Rail welding facility and generators
- Internal access roads
- Site office and facilities
- Onsite sewer management.

Activities proposed to be undertaken at the Whetstone MDC have been separated into phases, comprising the following activities as described in Sections 2.3.2–2.3.4.

### 2.3.2 Site establishment

The establishment of the site is estimated to take 12 months, and will include earthworks, installation of site drainage, offices, maintenance facilities, ballast unloading facilities, rail welding facilities and gantries. Earthworks for the site has been considered in the Project-wide earthworks estimations and mass haul presented in Chapter 5: Project Description and Appendix AB: Earthworks Strategy and Draft Soil Management Plan.

### 2.3.3 Site activities

Following establishment, the facility will provide facilities to enable efficient and safe handling of material for the duration of the Project construction stage for a planned duration of a further 36 months. Primary onsite activities at the Whetstone MDC will include:

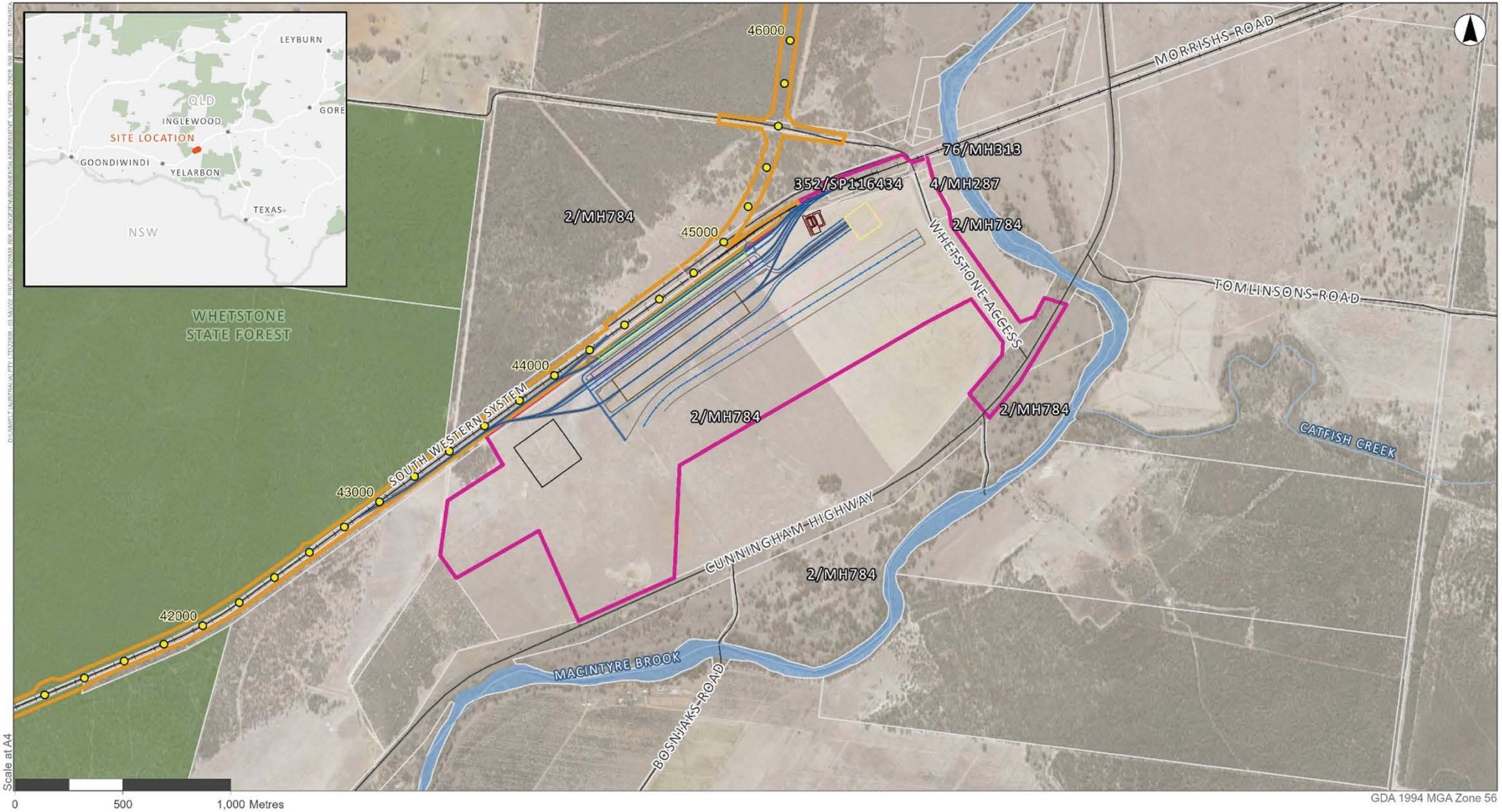
- Rail management and onsite flash-butt welding comprising:
  - the delivery of 27.5 m length steel rail to site by rail
  - fixed gantries that will unload the rail train and stockpile onsite
  - flash-butt welding of the 27.5 m length rail to form 330 m rail strings (long-welded rail strings) and grinding to make suitable for construction
  - the use of fixed gantries to stockpile the long-welded rail strings until ready for use
  - the transportation of rail strings from site to the construction site as required, using a combination of the existing QR network and newly built Inland Rail track.
- Sleeper management:
  - sleepers will be delivered to the site by train from Rockhampton. Where Rockhampton is unable to meet Project demands, Wagga Wagga will also be used
  - sleepers will be unloaded from the train by gantry and stockpiled onsite
  - sleepers will be reloaded onto a train and transported to the construction site as required.
- Ballast management:
  - ballast material will be delivered by road and rail to the site and stockpiled onsite
  - ballast material will be reloaded into a ballast train and transported to the construction site as required.
- Plant and materials storage and maintenance:
  - the delivery and stockpiling of other material and equipment by road and rail
  - materials may include precast concrete (for bridges and culverts), communications, signalling and turnout equipment, and additional demountable site offices.

### 2.3.4 Decommissioning

Once the Project is fully constructed, there will be no further requirement for the Whetstone MDC, and the facility will be decommissioned and rehabilitated in consultation with the landowner and in accordance with Project approvals and relevant management plans.

Given the nature of the proposed temporary use of the land, an assessment will be required prior to decommissioning, to determine the risk of contamination at the site associated with the activities and land use associated with the MDC. Works will be in agreement with the landowner and in accordance with the relevant mitigation measures described in Chapter 9: Land Resources.

Should the temporary use of the land for the Whetstone MDC result in any confirmed or suspected land contamination, site assessment and management will be undertaken in accordance with the EP Act and *National Environment Protection (Assessment of Site Contamination) Measure 1999* (ASC NEPM) under the direction of a suitably qualified person. Following testing in accordance with industry guidelines, any offsite disposal of contaminated material would be at a licensed facility and a soil disposal permit will be obtained.




Legend

- Development Footprint (Temporary Footprint)
- Permanent Footprint (B2G Alignment)
- B2G Alignment Chainage Location
- Cadastre
- Existing Railway
- Watercourse
- Roads

**MDC Concept Layout**

- Embankment
- 33 kV Overhead Conductor
- Ballast Laydown
- Drainage
- Gantry Rail
- Materials Laydown
- Rail Alignment
- Rail Laydown
- Site Offices
- Sleeper Laydown
- Workshop Area

**Image Source:** ESRI Basemap (2022) **Data source:** Department of Resources (2022)

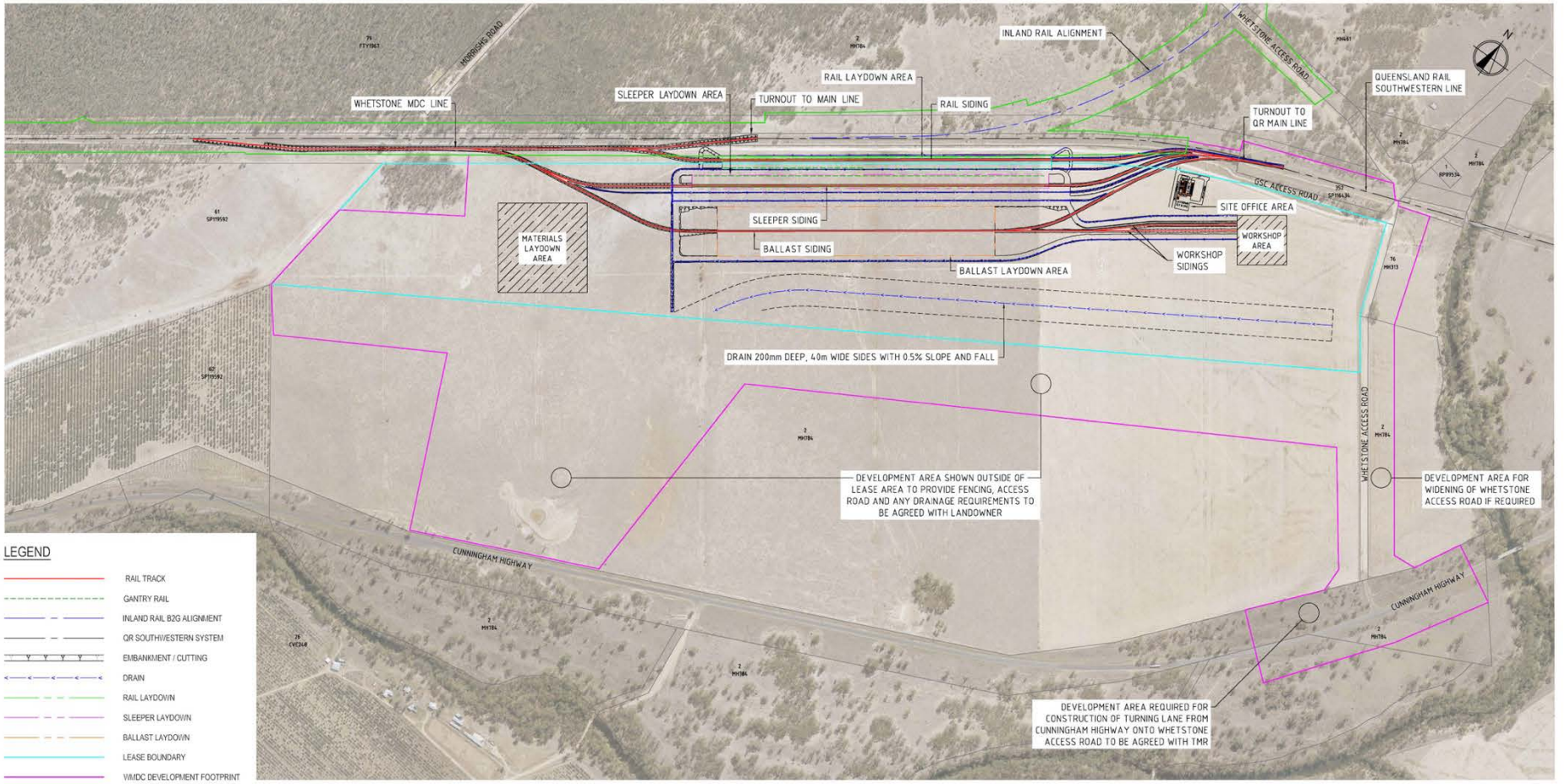
**FIGURE 2.1**

Whetstone MDC
Development Footprint

DRAWN TO AS1100 | DO NOT SCALE | ALL DIMENSIONS IN MM UNLESS STATED OTHERWISE

# FIGURE 2.2

## Whetstone MDC Development Footprint




PLAN VIEW

CONCEPT



| Rev | Date | Revision Description | Designed | Checked | Ind. Rev | Approved | Accepted |
|---|---|---|---|---|---|---|---|
| C | 02/02/2024 | ISSUED FOR CONCEPT | GRC | KMM | | | |
| B | 30/11/2023 | ISSUED FOR CONCEPT | GRC | KMM | | | |
| A | 25/01/2023 | ISSUED FOR CONCEPT | GRC | KMM | | | |

Used on / Next higher assembly:
ARTC equipment number:
Filename: WHETSTONE BOUNDARY MAP_C.DWG
Alternate DMS number:

Designing Company: LEVEL 17, 179 TURBOT STREET BRISBANE QLD 4000
Designed G.CARR
Checked K.MULHERN
Ind.Rev. Company
Ind.Rev. Name
Ind.Review Signature
Approved By
Signed
Approval Date
ARTC ACCEPTANCE
Accepted By
Signed
Acceptance Date

C:\Users\gcar3\OneDrive - Australian Rail Track Corporation Ltd\Documents - IR_TEAM_Rail Corridor Program\General\2 CFA\Whetstone MDC\Outputs\240201_B2G CIZ\Whetstone Boundary Map_C

WHETSTONE MATERIAL DISTRIBUTION CENTRE [MDC]
OVERALL GENERAL ARRANGEMENT
MASTERPLAN

Sheet No. 1 of 1
SHEET SIZE A1
Scale: AS SHOWN

## 2.4 Rail infrastructure

The narrow-gauge rail and turnout-out facilities including sidings and turnout will be established as shown on Figure 2-2. The sidings include:

- Ballast siding
- Workshop siding
- Sleeper siding.

The establishment methodology will include the following site preparation works:

- Vegetation clearing and grubbing
- Stripping and stockpiling of topsoil
- Bulk earthworks and subgrade treatment
- Installation of diversion drains and erosion controls
- Structural and engineering fill placement as required.

Construction of the rail infrastructure will include:

- Strengthening of existing rail track structure
- Placement of ballast, sleepers and rail to provide a connection to the existing rail siding and rail network.

Where the works associated with the establishment of the Whetstone MDC rail infrastructure interfere with the existing railway, approval of Queensland Rail (QR) as the railway manager, will be required in accordance with the provisions of the *Transport Infrastructure Act 1994* (Qld) (TI Act). Engagement with QR as the railway manager has commenced.

## 2.5 Roadworks

Vehicle access to the site will be from the Cunningham Highway and the Whetstone Access Road and includes site entry and intersection works.

Road works associated with the Whetstone MDC will comprise a front-in, front-out internal network of roads providing access across the expanded site, allowing the loading and unloading of goods and materials.

The construction of internal roadworks will include:

- Placement of structural and engineering fill
- Capping with quality unbound pavement gravel that complies with Project specifications
- Additional diversion drains and erosion controls.

Should works be required to the Whetstone Access Road or to land within the local road reserve, the approval of Goondiwindi Regional Council (GRC) would be sought.

Should works be required to the Cunningham Highway, a State-controlled road, or the intersection with Whetstone Access Road, that may interfere with the operation of a State-controlled road, the approval of the Chief Executive of the Department of Transport and Main Roads (DTMR) will be required in accordance with the provisions of the TI Act.

## 2.6 Hardstand, loading and unloading facilities

Hardstand for the stockpiling of materials is proposed for large parts of the Whetstone MDC site. The location of laydown areas for sleepers, ballast and materials is shown on Figure 2-2.

The construction of hardstand, loading and unloading facilities will include:

- Placement of structural and engineering fill
- Capping with quality unbound pavement gravel that complies with Project specifications
- Installation of steel structures (gantries, portal frames) on concrete foundations
- Installation of in-situ concrete elements for the flash-butt welding stations, rail handling rollers, and for the drop pits to be used for rollingstock maintenance.
- Installation of electrical connection and site distribution infrastructure.

Subject to site topography and drainage conditions, concrete plinths may provide an elevated base for the stockpiling of sleepers and rail, allow free drainage and preventing water pooling at these locations. Approximately 2,100 $m^3$ of concrete will be poured in-situ for the concrete plinths. The transport of concrete has been considered in Chapter 20: Traffic, Transport and Access.

Additional sleeper-handling gantry cranes may be required for additional sleeper laydown areas for the Whetstone MDC. Additional gantries will be assembled and installed onsite to manufacturers' specifications.

## 2.7 Buildings and support facilities

Office buildings, workshops and support facilities will be required for the Whetstone MDC. Figure 2-2 shows the proposed location of:

- Site office, including onsite amenities and vehicular access and parking areas
- Main workshop area.

Other buildings and structures proposed to support the MDC comprise:

- Road plant and on-track maintenance bays (including bunding)
- General materials storage (e.g. shipping containers/covered areas)
- Crib and ablution facilities
- Fuel storage (including bunding)
- Generators/power (including three-phase power for welding)
- Lighting to allow for 24/7 activities
- Water storage (potable/dust suppression)
- Plant storage areas
- Adequate signage and fencing to manage site access.

Construction of support buildings and structures includes:

- Placement of structural and engineering fill
- Foundation works and supports to provide the level of flood immunity required for the various buildings and structures, and their intended purposes. This will include the provision of raised pads or construction on posts, to provide freeboard for buildings and workshops
- Separate bunded areas for the onsite storage and handling of fuels, chemicals and hazardous goods. Separate bunded areas will be provided in accordance with Australian standards and kept in small volumes, wherever practicable. Spill response equipment and material will be made available onsite and in vehicles
- Installation of electrical connection and site distribution infrastructure
- Installation of fuel storage infrastructure
- Set up of offices and amenities.

Building and structural works will be undertaken and approved in accordance with the requirements of the *Building Act 1976* (Qld) and the *Plumbing and Drainage Act 2018* (Qld).

## 2.8 Power and communication

Power for the office and site lighting will be provided via the existing 33 kilovolt (kV) network, supplemented with a pole-mounted transformer and substation. Generators will be used to power the flash-butt welding and gantry cranes.

The development footprint is poorly served with mobile phone and internet networks. Installation of a temporary booster system will be provided to ensure suitable mobile phone reception. Satellite internet services will be used to provide suitable internet access.

No additional signals or rail communications are required for the development footprint.

## 2.9 Water usage

Significant volumes of water will be required for the various activities associated with construction of the Project, including for earthworks, track works, concrete production, revegetation and the non-resident workforce accommodations. The water requirements for the Whetstone MDC have been considered as part of the Project requirements. Refer to Chapter 5: Project Description (Section 5.6.24) and Appendix B5: Construction Water for the Project-wide details, inclusive of the Whetstone MDC for construction water requirements, schedule for demand and potential sources of water to meet demand, to enable the construction of the B2G Project.

## 2.10 Sewage management

During the 12-month site establishment period, temporary ablution facilities will be provided onsite for workers and visitors estimated at a maximum of 55 people. The temporary ablution facilities will include septic tanks sized according to the estimated workforce. A licensed contractor will be engaged to pump out and transport raw sewerage to a suitable, local council sewage treatment plant for treatment and disposal. The temporary ablution facilities will remain in use until such time as they are no longer required.

## 2.11 Workforce and construction hours

The construction work hours and workforce planning have been considered as part of the Project. Construction hours of work are described in Section 5.6.2 of Chapter 5: Project Description. Workforce requirements will differ between the site establishment of Whetstone MDC and subsequent materials distribution during the Project construction stage. It is estimated that the workforce requirements for the site establishment phase will be 55 onsite full-time equivalent workers. During the materials distribution phase, the size of the onsite workforce will increase to 76 full-time equivalent workers for the duration of the construction of the Project. The proposed non-resident workers accommodation camp at Inglewood has been sized to accommodate the workforce required for the Whetstone MDC facility.

## 2.12 Haulage and traffic

Materials to be used for the Whetstone MDC will be transported to the facility by rail (via the South Western Line and the existing site use rail siding) and by road (Cunningham Highway and the Whetstone Access Road). Materials will include:

- Earthwork materials (e.g. capping, structural fill and ballast) by road and rail
- 27.5 m length steel rail to site by train
- Sleepers will be delivered to the site by train from Rockhampton. Where Rockhampton is unable to meet Project demands, Wagga Wagga will also be used
- Precast concrete (for bridges and culverts) by road and rail
- Communications, signalling and turnout equipment from the manufacturer
- Additional demountable site offices by road.

The use of rail for the construction of the Project has been optimised through the design (adjacent to the existing rail corridor) and location of the MDC (at Whetstone), encouraging the use of rail for the transportation of construction materials, thereby reducing the impacts on the road network. It is currently estimated that, on average, two trains will arrive at the Whetstone MDC per day for its duration. The bulk of the deliveries will be rail sleepers and ballast.

With respect to road vehicle usage, average daily vehicle usage associated with the Whetstone MDC activities has been estimated at:

- 38 LV per day (for an estimated 55 construction workers at a vehicle occupancy of approximately 1.5 workers per vehicle) from various locations. This increases to 50 LV per day (for an estimated 75 construction workers) for the materials distribution phase servicing the construction of the entire Project.
- 19 heavy vehicles (HV) per day from various locations, including the transport of ballast material from Inglewood Quarry.

For design purposes, the 36.5 m High Productivity Freight Vehicle (HPFV) and B99 passenger vehicle have been deemed to be the largest vehicles.

# 3. Regulatory environment

The approval requirements for the Whetstone MDC are incorporated into the assessment of the Project in Chapter 3: Legislation and Project Approvals Process.

# 4. Environmental assessment

## 4.1 Climate

Koppen climate classification mapping indicates that the Whetstone MDC falls within a sub-tropical climate, which experiences wet summers and dry winters (Bureau of Meteorology (BoM), 2022). The nearest long-term BoM weather station is Inglewood Forest (station number 041097), located approximately 15 km north of the development footprint. The mean maximum temperature recorded at this station is 33.2 degrees Celsius (°C) in summer, with the mean minimum winter temperature of 5.6 °C. The mean annual rainfall is 620 mm. On average, 52.9 days a year experience rainfall equal to or above one millimetre (mm) (BoM, 2023). Prevailing winds in the area are from the north-east and south-west.

## 4.2 Sensitive receptors

There are 11 sensitive receptors located within 2 km of the Whetstone MDC development footprint, as shown on Figure 4-1. These sensitive receptors are all rural residences.

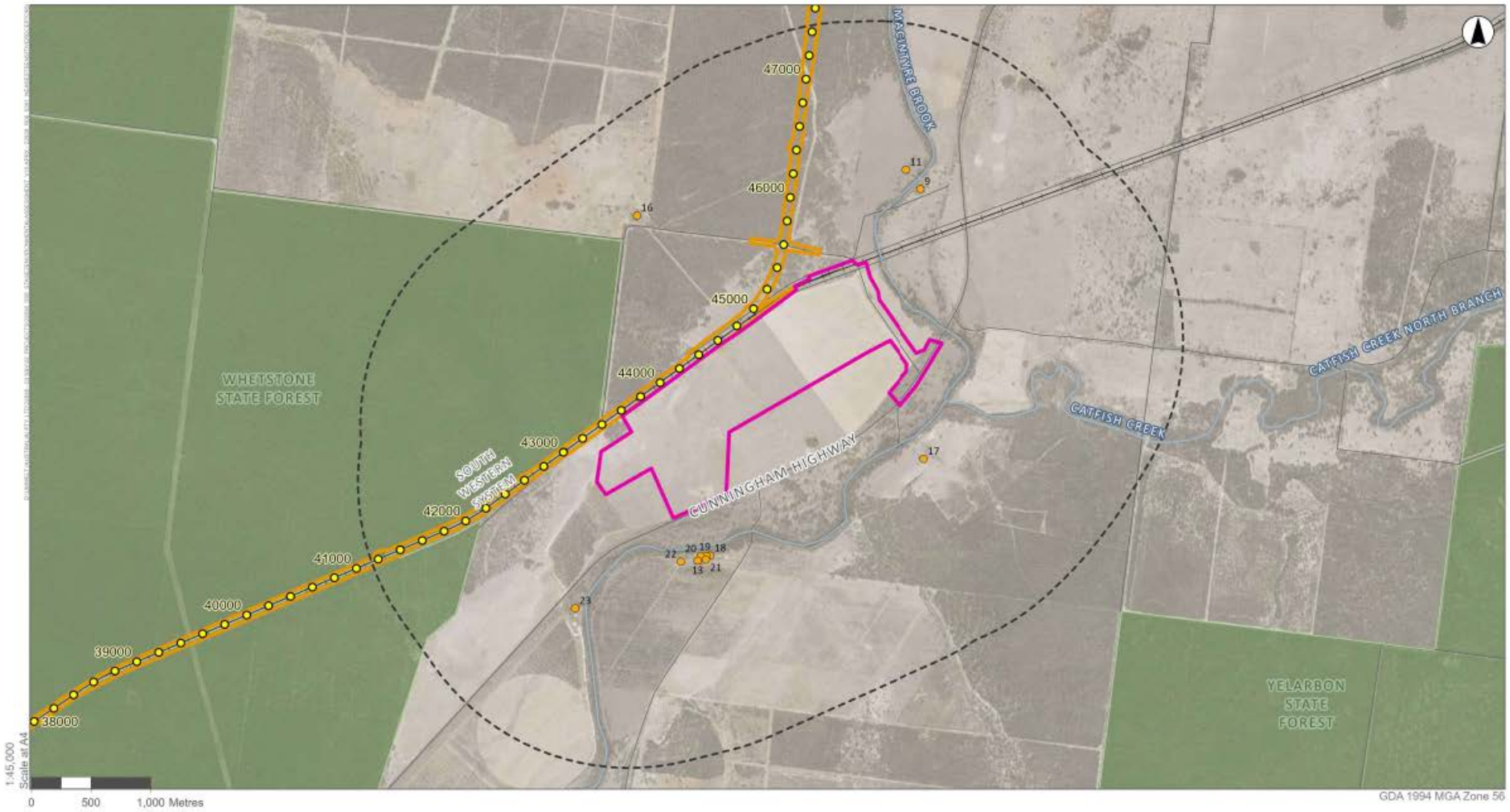



**FIGURE 3.1**

Whetstone MDC
Sensitive Receptors

**Image Source:** ESRI Basemap (2022) **Data source:** Department of Resources (2022)

## 4.3 Land use and tenure

### 4.3.1 Introduction

This section considers the potential impacts on land use and tenure during the site establishment and material distribution phases of the Whetstone MDC. It has been informed by design documentation for the Whetstone MDC and the land use and tenure assessment undertaken for the Project.

The assessment has been prepared with consideration of sections 10.2 to 10.9 and 11.70 to 11.83 of the ToR for the Project, and a subsequent request for additional information from the Queensland Coordinator-General.

### 4.3.2 Methodology

The land use and tenure assessment for the Whetstone MDC involved:

- Reviewing the land use and tenure assessment completed for the Project
- Reviewing desktop information on land use and tenure within and surrounding the Whetstone MDC, including aerial imagery, zoning and land use maps
- Identifying risks to land use and tenure from the Whetstone MDC and assessing the significance of potential impacts in the broader context of the Project
- Reviewing the mitigation measures identified in Chapter 8: Land use and tenure.

### 4.3.3 Existing environment

The existing tenure within the development footprint is mostly freehold tenure, with Lot 352 on SP116434 identified as lands lease (for the existing rail line) and land parcels designated as road reserves. Land within the development footprint is predominantly used for agricultural purposes, including irrigated cropping and cattle grazing. The development footprint is also mapped as containing Agricultural Land Class A and Class B, under the Queensland Agricultural Land Audit 2013. There are no stock routes mapped within the development footprint.

Land use and natural features surrounding the Whetstone MDC include:

- The township of Inglewood, approximately 18 km to the north-east
- The township of Yelarbon, approximately 16 km to the south-west
- Whetstone State Forest, located approximately 600 m to the north-west
- Yelarbon State Forest, located approximately 2.5 km to the south-east
- Macintyre Brook, located approximately 200 m to the south and east.

The only permanent structures within the development footprint are:

- An existing Essential Energy 33 kilovolt (kV) above-ground powerline that traverses the development footprint from the north-east through to the south-west
- An existing Essential Energy 19.1 kV above ground powerline that traverses the development footprint from the north and intersects the above 33 kV line
- An existing fence located along Whetstone Access Road, to the east of the development footprint.

There are no mineral or petroleum resource interests mapped over the development footprint (DoR, 2023).

A review of development application information from the GRC database indicates there are no recent or relevant planning approvals within or adjoining the development footprint.

A review of the Department of Treaty, Aboriginal and Torres Strait Islander Partnerships, Communities and the Arts (DTATSIPCA) Cultural Heritage Database and Register indicates that the development footprint is not within any native title determination areas.

In March 2023, DTMR completed a native title assessment on behalf of ARTC. The assessment indicated that none of the property parcels or roads are impacted by native title.

Access to the Whetstone MDC will be via Whetstone Access Road, which is connected to the Cunningham Highway to the south via a T-intersection (refer to Figure 4-2). Whetstone Access Road is an unsealed local road managed by GRC, whereas the Cunningham Highway is a State-controlled road managed by DTMR. Once the Whetstone MDC is established, the development will have an approximate 400 m frontage with the northern section of Whetstone Access Road (refer to Figure 4-3).

FIGURE 4-2 CUNNINGHAM HIGHWAY/WHETSTONE ACCESS ROAD INTERSECTION LOOKING NORTH

FIGURE 4-3 NORTHERN PORTION OF WHETSTONE ACCESS ROAD. MDC IS PROPOSED ON THE RIGHT SIDE OF UNSEALED ROAD

### 4.3.4 Potential impacts

The Whetstone MDC is a temporary facility that will be progressively decommissioned once the Project is fully constructed. The potential impacts associated with the site establishment and material distribution phases relate to:

- Temporary changes in land use through impacts on agricultural activities
- Reduction of available Agricultural Land Class—Class A and Class B
- Potential accessibility impacts on the road network and private property access
- Temporary impacts on services and utilities (33 kV powerline).

The Whetstone MDC has been considered against the relevant matters of State interest in the State Planning Policy (SPP) 2017 and regional outcomes of the Darling Downs Regional Plan 2013. Consistency of the Whetstone MDC with matters of State interest in the SPP is detailed in Table 4-1.

**TABLE 4-1 WHETSTONE MDC—– CONSISTENCY WITH MATTERS OF STATE INTEREST**

| State Interest | Response |
|---|---|
| **Agriculture:**<br>**Agricultural Land Class— Class A and Class B**<br>The agriculture State interest seeks to protect land defined as agricultural land class A and class B from incompatible and irreversible land uses, fragmentation, and land degradation.<br>The agriculture State interest supports the provision of infrastructure and services necessary to support a strong agriculture industry and associated supply chains. | Activities associated with the Whetstone MDC are temporary in nature and are not expected to have a permanent impact on the future use of the development footprint for agricultural purposes or adjoining rural land uses. The Project is not a resource activity or regulated activity under the *Regional Planning Interests Act 2014* (Qld) (RPI Act); therefore, the RPI Act does not apply to the Project. |
| **Natural Hazards, Risk and Resilience:**<br>**Flood Hazard Area— Level 1— Queensland Floodplain Assessment Overlay**<br>The natural hazards risk and resilience State interest seeks to ensure that flood risks are avoided or mitigated to protect people and property, and enhance the community's resilience to flood risk. | The Whetstone MDC design does not propose to develop infrastructure that is expected to significantly alter natural drainage patterns within, adjoining or downstream of the development footprint.<br>A geomorphology assessment has been undertaken for the Whetstone MDC, which confirms that the proposed works are unlikely to result in the worsening of existing flood conditions downstream (refer to Section 4.8). |
| **Transport infrastructure:**<br>**State-controlled road and railway network**<br>The transport infrastructure State interest seeks to ensure that the safety and efficiency of transport infrastructure is not adversely affected by development and seeks to protect State transport infrastructure from incompatible development. | A Traffic Impact Assessment (TIA) has been prepared for the Project, incorporating the Whetstone MDC, in accordance with the DTMR Guide to Traffic Impact Assessments (refer to Section 4.13), which has confirmed that the Whetstone MDC will not impact on the safety or efficiency of the Cunningham Highway State-controlled road. |

The Whetstone MDC is situated in the eastern portion of the Darling Downs region. In accordance with the Darling Downs Regional Plan, this area is identified as being 'the gateway' to the region, supporting an extensive network of freight routes. The Whetstone MDC is consistent with the intent of the eastern portion of the Darling Downs region, as it will allow for the construction of the Project.

### 4.3.5 Conclusion

The potential impacts to land use and tenure from the Whetstone MDC during the site establishment and material distribution phases are predominantly associated with a temporary change in land use from rural/agricultural to rail construction activities including work site, material storage and laydown areas. The mitigation measures to avoid, minimise or mitigate potential impacts attributed to land use and tenure are detailed in Chapter 8: Land Use and Tenure. No further mitigation measures are proposed to address the potential impacts from the Whetstone MDC on land use and tenure. The potential impacts are considered to have a low risk, as the activities associated with the Whetstone MDC are temporary in nature and not expected to have a permanent impact on future use of the development footprint.

ARTC will engage with impacted private landowners and DTMR regarding land requirements for the Project. ARTC has commenced discussion with all relevant private landowners and will lease the required land from the landowner for the duration of construction of the Project. The land will be rehabilitated in consultation with the landowner.

## 4.4 Land resources

### 4.4.1 Introduction

Assessment of the potential impacts of the Whetstone MDC on land resources was undertaken as part of the broader B2G Project and are reported in the land resources assessments in Chapter 9: Land Resources and Appendix J: Soil Assessment Report. This section provides a summary of the existing environment, potential impacts, mitigation measures and residual impacts for the Whetstone MDC.

### 4.4.2 Methodology

The land resources assessment for the Whetstone MDC involved:

- Reviewing desktop information on land resources within and surrounding the Whetstone MDC, including aerial imagery and public database searches
- Identifying risks to land resource values from the Whetstone MDC and assessing the significance of potential impacts in the context of the Project

### 4.4.3 Existing environment

The development footprint is characterised by land that has a relatively flat terrain, with elevations ranging between 262 m Australian Height Datum (AHD) to the north and 266 m AHD to the south towards Macintyre Brook (refer to Appendix J: Soil Assessment Report). The Whetstone MDC is separated from Macintyre Brook to the south by the Cunningham Highway and portions of land parcels that form part of Lot 2 on MH784.

The geology of the development footprint is mapped as being dominated by quaternary alluvium associated with the Macintyre Brook system (refer to Appendix J: Soil Assessment Report). Soil management unit C2 to the north of the Whetstone MDC (within the Project footprint) indicates the presence of clayey soils that occur adjacent to major creeks and rivers on terraces and floodplains, which are subject to flooding. The overlying soils are mapped as eutrophic mottled-sodic brown dermosols (soil unit: 1.1.1.2k).

Soil sampling that was completed for the Project included a location close to the development footprint (310-03-AH3177) (refer to Appendix J: Soil Assessment Report). This sampling location is located approximately 65 m north of the Whetstone MDC and land use is predominantly grazing native vegetation. Laboratory analysis from this location shows a sodic subsoil from 0.5 m depth, with exchangeable sodium percentage of 14 per cent, indicating potential for poor soil structure and high dispersivity and erodibility (refer to Appendix J: Soil Assessment Report, ).

Acid sulfate soils are unlikely to be present within the development footprint due to its elevation.

Land within the development footprint has been cleared to allow its use for cropping and grazing. The development footprint contains Agricultural Land Class—Class A and Class B. These areas are identified as being suitable for cropping, with the predominant land use being intensive horticulture.

The development footprint adjoins the South Western Line railway corridor being Lot 352 on SP116434. Lot 352 is listed on the Environmental Management Register (EMR), with the potential to contain hazardous contaminants (i.e. arsenic, other heavy metals and herbicides) associated with rail use. A search of the Queensland Government Land Register indicates that Lot 2 on MH784, Lot 4 on MH287, Lot 76 on MH313 and Lot 74 on MH313 are not included on the EMR or the Contaminated Land Register (CLR) (refer to Appendix I: EMR search certificates and soil laboratory results).

### 4.4.4 Potential impacts

The potential impacts associated with the MDC are described in Chapter 9: Land Resources and relate to:

- Loss of agricultural resources due to temporary repurposing of land
- Potential loss of soil resources due to erosion following site establishment activities, such as vegetation clearing and grubbing, and vehicle use
- Potential reduced production value of soils as a result of the damage to topsoil structure, and compacted subsoil from increased traffic and heavy loads
- Contamination of land from unmitigated storage and potential spillages of fuels, chemicals and hazardous goods at laydown areas and workshops
- Introduction of contaminants to land from runoff, including areas of disturbed contaminated land (Lot 352 on SP116434) and stockpile areas.

### 4.4.5 Conclusion

The potential impacts to land resources from the Whetstone MDC are mostly considered to have a low residual risk rating following the application of mitigation measures. The key initial risks identified include the temporary loss of soil resources (i.e. temporary reduction of available agricultural land), disturbance of contaminated land and creation of contaminated land from the inadequate storage of chemicals and hazardous goods.

All potential impacts to land resources will be managed in accordance the processes and mitigation measures to avoid, minimise or mitigate potential impacts attributed to land resources are detailed in Chapter 9: Land Resources. No further mitigation measures are proposed to address the potential impacts from the Whetstone MDC on land resources.

The approach for the further assessment and investigation of contaminated land within the development footprint will be documented in the Contaminated Land Management plan, as a component of the Construction Environmental Management Plan (CEMP) for the Project. The Contaminated Land Management plan will be based on the Contaminated Land Management Strategy, as detailed in Chapter 9: Land Resources.

## 4.5 Landscape and visual amenity

### 4.5.1 Introduction

This section considers the potential landscape and visual amenity impacts of the Whetstone MDC. This section has been informed by design documentation for the Whetstone MDC, the landscape and visual impact assessment undertaken by LatStudios (see Attachment A–Whetstone MDC Landscape and Visual Impact Assessment) and the landscape and visual impact assessment undertaken for the Project.

The assessment has been prepared with consideration of sections 10.10 and 11.84 to 11.87 of the ToR for the Project and the request for additional information from the Queensland Coordinator-General. Policies and guidelines relevant to landscape and visual amenity are detailed in Chapter 10: Landscape and Visual Impact Assessment.

### 4.5.2 Methodology

The landscape and visual impact assessment for the Whetstone MDC involved:

- Reviewing the landscape and visual impact assessment completed for the Project
- Reviewing desktop information on landscape and visual amenity within and surrounding the Whetstone MDC, including aerial imagery and public database searches
- Reviewing the landscape and visual impact assessment prepared to support the design of the Whetstone MDC
- Identifying risks to landscape and visual amenity values from the Whetstone MDC and assessing the significance of potential impacts in the context of the Project
- Reviewing mitigation measures in Chapter 10: Landscape and Visual Assessment with relevance to the Whetstone MDC.

### 4.5.3 Existing environment

The Whetstone MDC is located within a rural setting, with surrounding land uses being largely agricultural, with some reserves and State forests. Several rural residences are located within 2 km of the development footprint (refer to Figure 4-1).

The Cunningham Highway is located to the south of the development footprint, and Whetstone Access Road, which will become an access road for the Whetstone MDC, traverses through the eastern side of the development footprint. The Whetstone rest area is located approximately 1 km from the development footprint off the Cunningham Highway. The South Western Line traverses the northern boundary of the development footprint and is primarily used for transportation of freight.

Land within the development footprint is relatively flat and has mostly been cleared for grazing and wheat cropping, with some small, vegetated areas located in the vicinity of the development footprint. Macintyre Brook is located to the east and south of the Whetstone MDC (outside of the development footprint) and is lined with riparian vegetation.

The Whetstone MDC is located within the following landscape character type (LCT) see Figure 4-4:

- LCT D: Dry Croplands and Pastures (D28)

**FIGURE 4-4 WHETSTONE MDC LANDSCAPE CHARACTER TYPE D TYPICAL IMAGES**

Three other LCTs are present within the vicinity of the Whetstone MDC, being:

- LCT B: Vegetated Watercourses—Creeks and Channels
- LCT C: Irrigated Croplands
- LCT J: Forested Hills and Plains.

These LCTs are not directly impacted and therefore any impacts on these LCTs would be indirect and relatively minor. As such, potential impacts on these LCTs have not been assessed in detail.

### 4.5.4 Potential impacts

As described in Attachment A Whetstone MDC Landscape and Visual Impact Assessment, the Whetstone MDC will be located on a highly modified site that has been subject to historical clearing practices for agriculture and grazing. The Whetstone MDC will introduce temporary short- to medium-term construction impacts on the landscape, associated with both the site establishment and the construction of the Project.

The key landscape and visual impacts of the Whetstone MDC relate to the earthworks and drainage works required to establish the facility, the removal of a limited amount of vegetation and the provision of new infrastructure elements associated with the facility into the rural landscape (including large workshops, gantries and railway sidings). The landscape and visual impacts of the Whetstone MDC are low to moderate taking into consideration its low-rise built form and surrounding established vegetation.

Three viewpoints were selected in the landscape and visual impact assessment for the Whetstone MDC including:

- VP1: View from across the Whetstone rest area on the Cunningham Highway (refer to Figure 4-5)
- VP2: View from Whetstone Access Road near Cunningham Highway (refer to Figure 4-6)
- VP3: View from Whetstone Access Road near South Western Line railway (refer to Figure 4-7).

**FIGURE 4-5 WHETSTONE MDC VIEWPOINT 1**

**FIGURE 4-6 WHETSTONE MDC VIEWPOINT 2**

**FIGURE 4-7 WHETSTONE MDC VIEWPOINT 3**

Four of the twelve LCTs identified within the landscape character assessment undertaken for the Project occur within the landscape and visual impact assessment area (refer to Attachment A Whetstone MDC Landscape and Visual Impact Assessment); however, only one LCT is directly impacted by the Whetstone MDC, LCT D: Dry Croplands and Pastures (D28). This LCT has been identified to have a low sensitivity to change and impacts associated with the Whetstone MDC during site establishment, construction and decommissioning are anticipated to have up to a moderate level of effect.

There are no landscapes of high scenic amenity value identified in the planning scheme within the landscape and visual impact assessment area; however, the GRC Planning Scheme does outline specific outcomes relating to scenic amenity and regional landscape character, requiring protection of the productive use of rural land and the dominance of natural landforms and open space over built form in rural areas. There are a limited number of permanent rural residential receptors in the landscape and visual impact assessment area; however, close views towards the Whetstone MDC can be obtained by travellers on the Cunningham Highway and other local roads throughout the area. None of these roads are part of formal tourist routes.

Three representative viewpoints have been assessed to represent impacts on these views. Of these, one visual impact of up to a moderate level of effect has been identified relating to the site establishment, construction and decommissioning. This moderate level of effect is associated with close views to the Whetstone MDC experienced by receptors travelling along Whetstone Access Road (Viewpoint 3). This viewpoint is situated approximately 1,000 m from two sensitive receptors who would experience views towards the Whetstone MDC when travelling to and from their properties.

It is anticipated that existing vegetation present within these private properties would screen views towards the facility from the dwellings; therefore, this viewpoint is considered to represent the ‘worst case’ scenario for these rural receptors.

Other visual impacts are of up to a low level of effect relate to other views available from the Cunningham Highway (near the Whetstone Rest Area) (Viewpoint 1) and the eastern part of Whetstone Access Road, where it intersects the Cunningham Highway (Viewpoint 2).

The three representative views that have been assessed are considered representative of views experienced by rural receptors travelling to and from their properties, due to the limited availability of views towards the facility from other rural receptors within the landscape and visual impact assessment area (e.g. those located to the south of the Cunningham Highway and at a further distance from the facility).

### 4.5.5 Conclusion

Potential impacts to landscape and visual amenity from the Whetstone MDC are considered to have a low to moderate significance. All potential impacts to landscape and visual amenity will be managed through the mitigation measures outlined in Chapter 10: Landscape and Visual Impact Assessment.

In terms of visual effects, impacts are temporary short- to medium-term impacts (anticipated to last for four years) for the Whetstone MDC on views are anticipated to result in impacts up to a moderate level of effect during site establishment and undertaking construction activities. It is acknowledged that there is the potential for localised noise abatement treatments to be required, which will be determined during detailed design of the Whetstone MDC.

This has the potential to reduce visibility towards the actual facility, which may be perceived by some receptors as a positive benefit; however, others may find noise barriers unsightly. Therefore, this may affect the perception of magnitude of change of identified impacts.

The duration of the decommissioning and rehabilitation activities will be short-term and intended to result in a positive outcome for landscape character and visual amenity. It is therefore anticipated that, over time, rehabilitation will reinstate the landscape character, views and visual amenity of the development footprint, as agreed with the landowner.

## 4.6 Flora and fauna

### 4.6.1 Introduction

This section describes the biodiversity values present and the potential impacts on flora and fauna during the site establishment and material distribution phases of the Whetstone MDC. This section has been informed by design documentation for the Whetstone MDC, ecological assessment undertaken by Umwelt (see Attachment B: Whetstone MDC Ecological Survey) and the ecological assessment presented in Chapter 11: Flora and Fauna.

The assessment has been prepared with consideration of sections 11.10 to 11.35 and 11.94 to 11.106 of the ToR for the Project and the request for additional information from the Queensland Coordinator-General. Legislation, policies and guidelines relevant to flora and fauna Whetstone MDC are also detailed Chapter 3: Legislation and Project Approvals Process and Chapter 11: Flora and Fauna.

### 4.6.2 Methodology

The flora and fauna assessment for the Whetstone MDC involved a desktop assessment to characterise and identify the ecological values that may be supported by the site, followed by a field survey on 20 September 2022 to validate these conclusions and ground-truth biodiversity values.

The desktop assessment included:

- Reviewing existing literature and online mapping, as well as searches of publicly available databases
- Reviewing the flora and fauna assessments completed for the Project, including those completed in the adjacent areas and areas overlapping the proposed Whetstone MDC
- Reviewing the ecological assessment prepared to support the design of the Whetstone MDC
- Reviewing mitigations in Chapter 11: Flora and Fauna with relevance to the Whetstone MDC.

The field survey was undertaken by a suitably qualified ecologist on 20 September 2022. The assessment employed a number of techniques to verify vegetation communities and confirm the potential suitability of the site as habitat for conservation significant species. These techniques included:

- Quaternary assessments: rapid vegetation surveys including marking the GPS location and recording the dominant species in the characteristics layers, along with soil/landform and structural data, as per Neldner et al. (2020)
- Opportunistic threatened flora searches: searches for flora species listed under the *Nature Conservation Act 1992* (NC Act) and/or the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) were completed throughout the survey in areas of potential habitat
- Fauna habitat assessments: these assessments included recording macrohabitat and microhabitat characteristics that can be used to infer suitability of the habitat for faunal taxa including conservation significant species
- Active searches: these searches including scanning the trees and ground, searching beneath microhabitat such as rocks, fallen timber and peeling bark, digging through leaf litter and soil at tree bases and flushing birds from areas with a dense or grassy ground cover
- Diurnal bird surveys: diurnal birds were sampled used an area census method, supplemented by broad observational surveys throughout
- Opportunistic fauna sightings: all fauna observed directly or indirectly (scats and tracks) during the survey visit were recorded.

### 4.6.3 Existing environment

The Whetstone MDC occurs within the Brigalow Belt Bioregion (Bioregion), which covers the 500 mm to 759 mm rainfall area between the Queensland–NSW border in the south, to Townsville in the north. The Bioregion is characterised by the tree species brigalow (*Acacia harpophylla*) that forms forest and woodland on clay soils. Brigalow does not predominate across the entire region, with the bioregion including a range of ecosystems including eucalypt forest and woodland, grassland, dry rainforest, cypress pine woodland and riparian communities (Sattler & Williams, 1999).

Within the Brigalow Belt bioregion, the Whetstone MDC occurs within the Inglewood Sandstones subregion (Sattler & Williams, 1999).

Land within the Whetstone MDC is largely flat and level, occurring at elevations between 260 m and 270 m Australian Height Datum (AHD). Shallow depressions occur in select locations, largely associated with the overflow of the farm dam present. A single, first order, drainage line is mapped within the south-western extent of the Ecology Study Area.

The Whetstone MDC comprises historically cleared land dominated by exotic grasslands and wheat cropping, with occasional patches of regrowth vegetation and scattered canopy trees, generally located close to the boundary or along existing tracks. Exotic grass cover in the ground layer was dense across the Whetstone MDC, and weeds such as velvety tree pear (*Opuntia tomentosa*) are common. North of the South Western Line and near the southern boundary of the Whetstone MDC, small and narrow, fragmented patches of eucalypt woodland in regrowth condition also occur.

Much of the land within the broader landscape, is disturbed and fragmented as a result of ongoing agricultural practices; however, to the north and south of the Whetstone MDC, large, intact areas of remnant vegetation occur in association with State forests (the Whetstone State Forest and Yelarbon State Forest) and riparian vegetation along the Macintyre Brook watercourse.

#### 4.6.3.1 Vegetation communities

A review of the *Vegetation Management Act 1999* (Qld) (VM Act) Regional Ecosystem (RE) map identified that there are no mapped REs located within the development footprint (refer to Figure 4-8).

Field surveys undertaken by Umwelt in 2022 confirmed this result but identified regrowth vegetation, dominated by eucalypt species, along the Whetstone Access Road, the Cunningham Highway and the South Western Line within the development footprint (refer to Figure 4-9).

Previous surveys (undertaken by Ausecology, 2022) identified areas of RE 11.3.2 *Eucalyptus populnea* woodland on alluvial plains (listed as Of Concern under the VM Act), which met the condition thresholds and diagnostic criteria for the Poplar Box Grassy Woodland Threatened Ecological Community (TEC) to the north of the Whetstone MDC. The design was adjusted to ensure avoidance of this TEC.

#### 4.6.3.2 Flora

Field surveys undertaken by Umwelt in 2022 recorded 25 common and/or dominant flora species, mostly from the families *Myrtaceae* and *Poaceae*. No flora species listed as threatened under the NC Act or the EPBC Act were recorded during this field survey. The flora survey trigger map did not indicate any high-risk areas for protected plants within the Whetstone MDC as detailed in section 4.2.3 of Attachment B: Whetstone MDC Ecological Survey.

Six introduced flora species were identified, including the velvety tree pear (*Opuntia tomentosa*), which is a Weed of National Significance (WoNS) and is listed as a Category 3 restricted invasive species under the *Biosecurity Act 2014* (Qld).

#### 4.6.3.3 Fauna

Field surveys undertaken by Umwelt in 2022 identified a total of 40 fauna species, comprising 37 bird species, one reptile, one amphibian and one mammal. All species recorded are common species listed as Least Concern under the NC Act and none are listed under the EPBC Act (see Attachment B: Whetstone MDC Ecological Survey).

No introduced fauna species were recorded during the field surveys; however, several pest species are considered likely to occur including the cane toad (*Rhinella marina*), black rat (*Rattus rattus*), house mouse (*Mus musculus*), red fox (*Vulpes vulpes*) and feral cat (*Felis catus*).

#### 4.6.3.4 Fauna habitat

The Whetstone MDC supports a total of four fauna habitat types. All habitat types have been subject to disturbance from clearing, agricultural practices, weeds and pests, and as a result are of reduced quality. Ongoing disturbance has led to a general lack of native understory growth, structural complexity and microhabitat features such as fallen woody debris and leaf litter. Despite this, habitat within the Whetstone MDC may provide marginal habitat for several matters of national environmental significance (MNES) and matters of State environmental significance (MSES) species.

The development footprint covers an area of 212.62 ha, and comprises the following fauna habitat types (refer to Figure 4-10):

- 2.74 ha of regrowth eucalypt woodland with scattered mature trees
- 144.47 ha of cleared areas comprising exotic pasture and tracks
- 63.11 ha of cleared areas comprising wheat cropping
- 2.3 ha of farm dam.

No active animal breeding places were identified during the field surveys within the Whetstone MDC; however, potential animal breeding places in the form of small and medium hollows were present in low abundance. These hollows have the potential to be used by a range of species including reptiles, small hollow-dependent birds and microchiropteran bats.

No areas of essential habitat for threatened flora or fauna species occur within the Whetstone MDC.

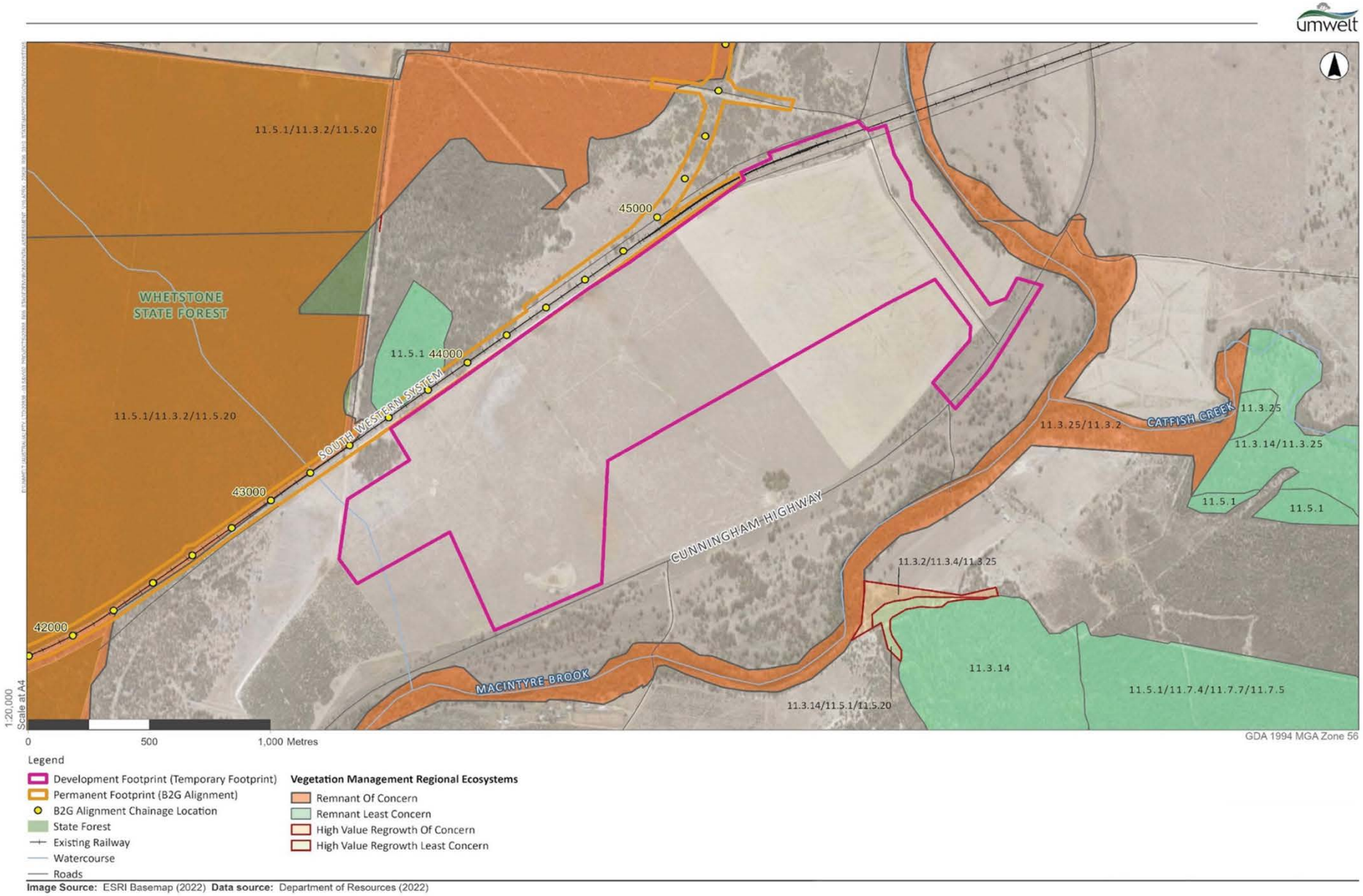



**FIGURE 4-8 WHETSTONE MDC STATE MAPPED REGIONAL ECOSYSTEMS**

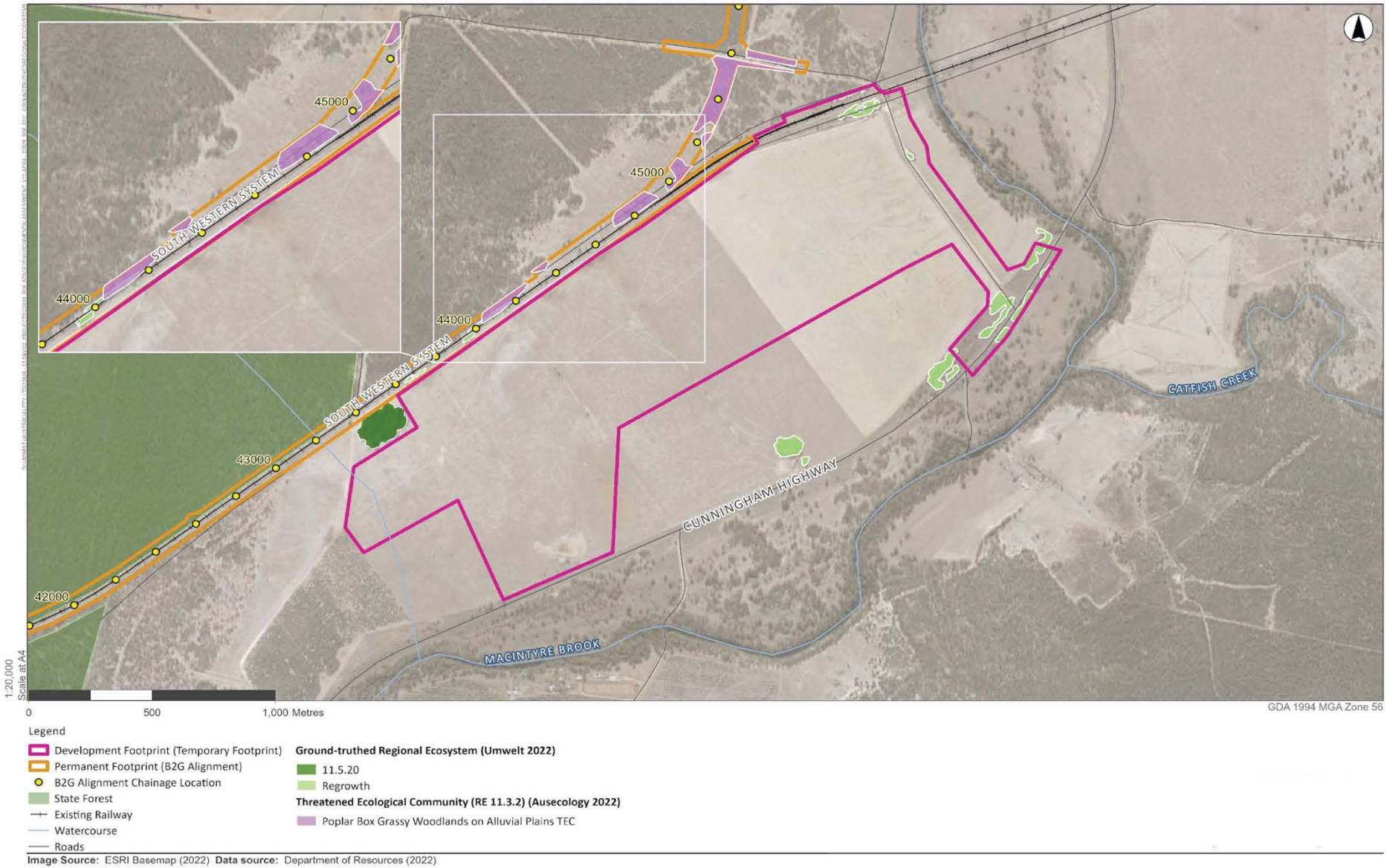



**FIGURE 4-9 WHETSTONE MDC GROUNDTRUTHED REGIONAL ECOSYSTEMS**

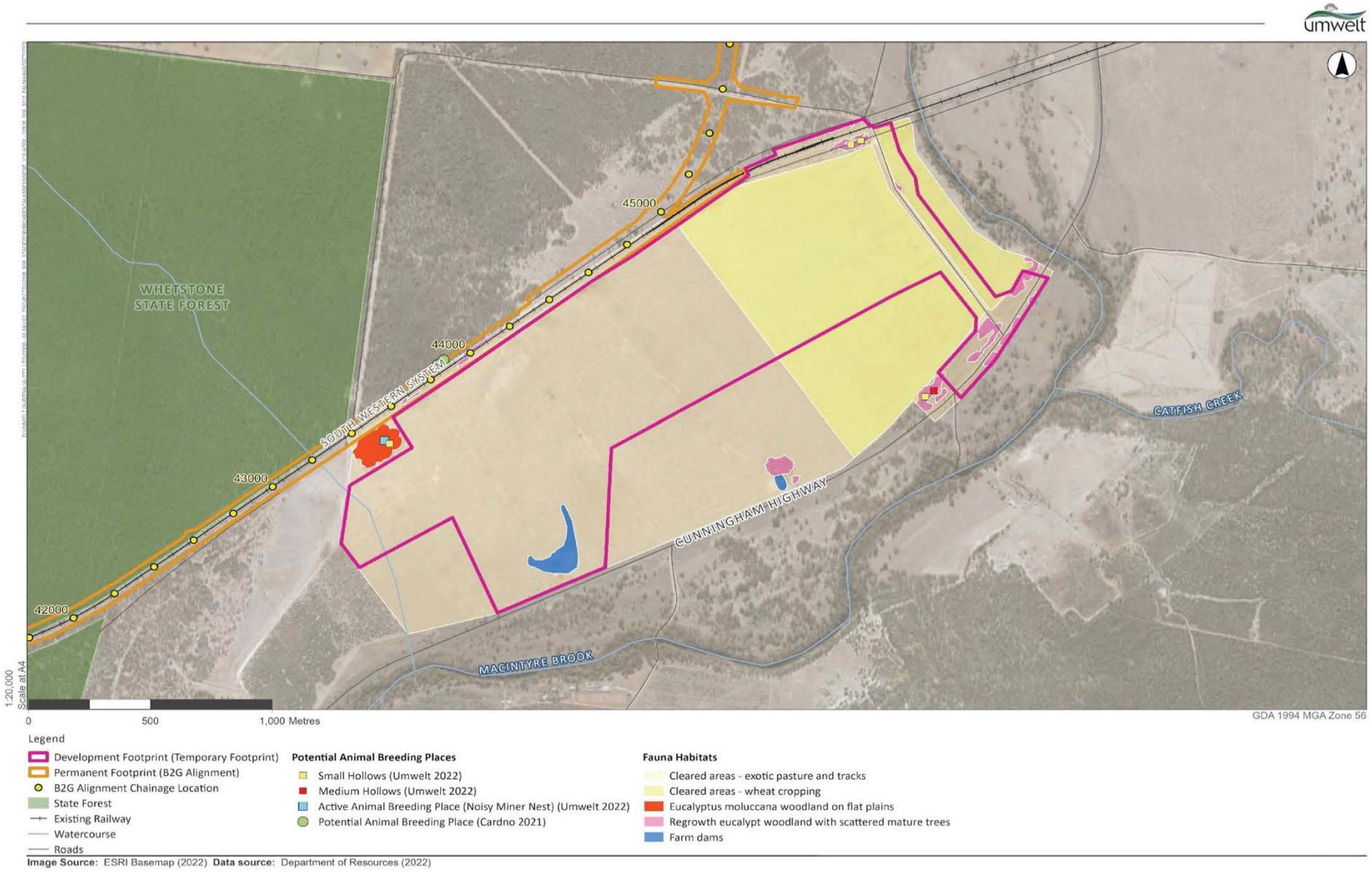



**FIGURE 4-10 WHETSTONE MDC FAUNA HABITAT TYPES**

### 4.6.4 Potential impacts

The Whetstone MDC has been designed and sited within areas of existing clearing and disturbance to minimise vegetation clearing as much as possible.

The potential impacts associated with flora and fauna during site establishment and material distribution phases of the Whetstone MDC are summarised below:

**Direct impacts:**

- Vegetation clearance and associated habitat loss
- Loss or alteration of marginal MSES or MNES habitat
- Disturbance, injury and mortality of fauna
- Alteration of the first order watercourse.

**Indirect impacts:**

- Downstream impacts to adjacent watercourses (i.e. Macintyre Brook) including:
  - erosion and sedimentation
  - reduced water quality from point and non-point sources
  - increased nutrient input which may have flow on effects to vegetation and algal growth
  - contamination of hydrocarbons and other chemicals due to spills
  - sediment and suspended solids as a run off from tracks and other exposed areas
  - facilitation of the establishment of terrestrial and aquatic weed species, which may further degrade habitat value in fringing vegetation.
- Exacerbation of pest fauna and weeds
- Impacts from noise and activity on fauna, including:
  - reduced foraging ability by auditory predators due to increased background noise
  - increased risk of predation by visual predators due to increased background noise
  - increased potential for collisions with vehicles and plant
- Human visitation causing disturbance to foraging or breeding behaviours
- Increased dust deposition on native plants.

### 4.6.5 Conclusion

Ecological values validated within the development footprint include regrowth and non-remnant vegetation in degraded condition. Nonetheless, these communities support some habitat values and resources for a diversity of flora and fauna species, conservatively including listed threatened and migratory species. This includes potential animal breeding places for least concern, threatened and colonial breeding fauna. One first order drainage line is mapped along the western extent of the development footprint.

The field survey did not confirm the presence of any conservation significant fauna or flora species; however, field surveys were observational only and were not intended to provide an exhaustive list of species diversity. In the absence of baseline fauna and flora surveys, desktop assessment in combination with habitat assessment was conducted to determine the potential for listed threatened and migratory species to occur. The result of this assessment was that four threatened, two migratory and one special least concern fauna species listed under the NC Act or EPBC Act were considered as having a moderate likelihood of occurrence in the development footprint.

The Whetstone MDC has the potential to impact on a range of biodiversity values. Impact assessment for this area has been completed as part of Chapter 11: Flora and Fauna, Appendix O: Matters of National Environmental Significance and Appendix L: Terrestrial and Aquatic Ecology Technical Report.

The management of the MDC and relevant mitigation measures will be in accordance with other construction activities associated with the temporary disturbance footprint for the Project. All potential impacts to flora and fauna will be managed through measures outlined in Chapter 11: Flora and Fauna.

## 4.7 Air quality

### 4.7.1 Introduction

Assessment of the potential impacts of the Whetstone MDC on air quality was undertaken as part of the broader Project and is reported in the air quality assessment presented in Chapter 12: Air Quality and Appendix R: Air Quality Technical Report.

## 4.8 Surface water and hydrology

### 4.8.1 Introduction

Assessment of the potential impacts of the Whetstone MDC on surface water was undertaken as part of the broader Project and is reported in:

- Chapter 13: Surface Water and Appendix S: Surface Water Quality Technical Report
- Chapter 14: Flooding and Geomorphology and Appendix T1: Hydrology and Flooding Technical Report—Volume I
- Appendix H: Geomorphology Report.

This section considers the potential impacts on surface water and hydrology during the site establishment and material distribution phases of the Whetstone MDC. Legislation, policies and guidelines relevant to surface water and hydrology are detailed in Chapter 3: Legislation and Project Approvals Process, Chapter 13: Surface Water and Hydrology and Chapter 14: Flooding and Geomorphology.

### 4.8.2 Whetstone MDC layout considerations

The Whetstone MDC layout considers the flooding constraints of the site; in particular, the positioning of the areas of hardstand and support buildings and structures have been located to minimise potential impacts on drainage across the site, as well as to minimise flood storage and potential flood flows that may occur during flood events.

### 4.8.3 Methodology

The surface water assessment for the Whetstone MDC involved:

- Identifying the baseline surface water, geomorphological and hydrological conditions
- Identification of the environmental values which are potentially impacted by the Project
- Identifying risks to surface water and hydrology values from the Whetstone MDC and assessing the significance of potential impacts in the context of the Project
- Review of mitigations in Chapter 13: Surface Water and Chapter 14: Flooding and Geomorphology with relevance to the Whetstone MDC.

### 4.8.4 Existing environment

The Whetstone MDC is located within the Border Rivers catchment area, which covers 49,500 km² in southern Queensland and north-eastern NSW. Macintyre Brook runs parallel to the southern and eastern boundaries of the development footprint and is a defined watercourse under the *Water Act 2000* (Qld) (Water Act). A drainage feature (as defined by the Water Act) and unnamed tributary of Macintyre Brook (MB9) is present to the west of the development footprint (refer to Figure 3.11). A farm dam is also located to the south-west of the development footprint. No watercourses or drainage features, as defined by the Water Act, connect to the farm dam. There are no wetlands of international importance or wetlands of high ecological significance in the vicinity of the Whetstone MDC.

Floodplain landforms and features that are present within or adjacent to the development footprint are described in Appendix H: Geomorphology Technical Report, including:

- A flood channel along the southern portion of Lot 2 on MH784, which runs parallel to the Macintyre Brook
- An area identified in the eastern area of the facility is likely to pond after rain events and may form a temporary backswamp
- A backflow channel that exists to the west of the development footprint, which leads to the dam that is located towards the southern end. A swampy/wet area is located directly downstream of the dam. The dam embankment is approximately 200 m long.

Potential flooding in the vicinity of the Whetstone MDC has also been modelled as part of the Project modelling (in Appendix T1: Hydrology and Flooding Technical Report—Volume I) (refer to Figure 4-12). The findings of the flood assessment indicate that:

- The development footprint is located in a high-risk flood zone on the Macintyre Brook floodplain and starts to become inundated in the 10 % Annual Exceedance Probability (AEP) event
- In a 1 % AEP event, the Whetstone MDC would be subject to flood depths over 1 m and as per Australian Institute Disaster Resilience (AIDR) (2017) guidelines would be considered hazardous for vehicles and people, with potential for structural damage and/or failure to less robust building types
- The proposed MDC access roads along with the connecting roads, Whetstone Access Road and Cunningham Highway are predicted to be inundated with over 1 m of depth and would be considered unsafe for people and vehicles and inaccessible during a 1% AEP event.

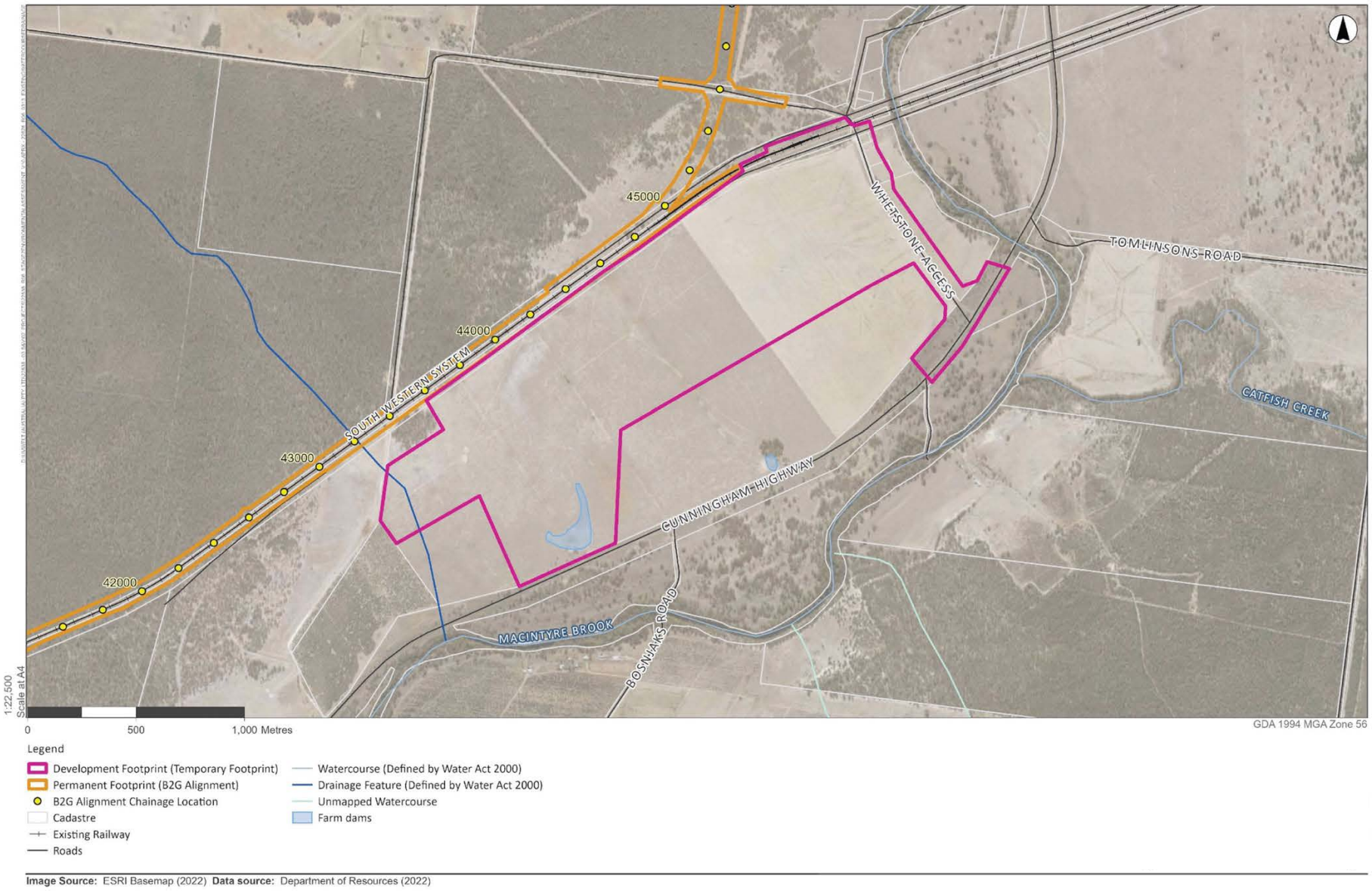



**Image Source:** ESRI Basemap (2022) **Data source:** Department of Resources (2022)

**FIGURE 4-11WHETSTONE MDC EXISTING WATERCOURSE DRAINAGE**

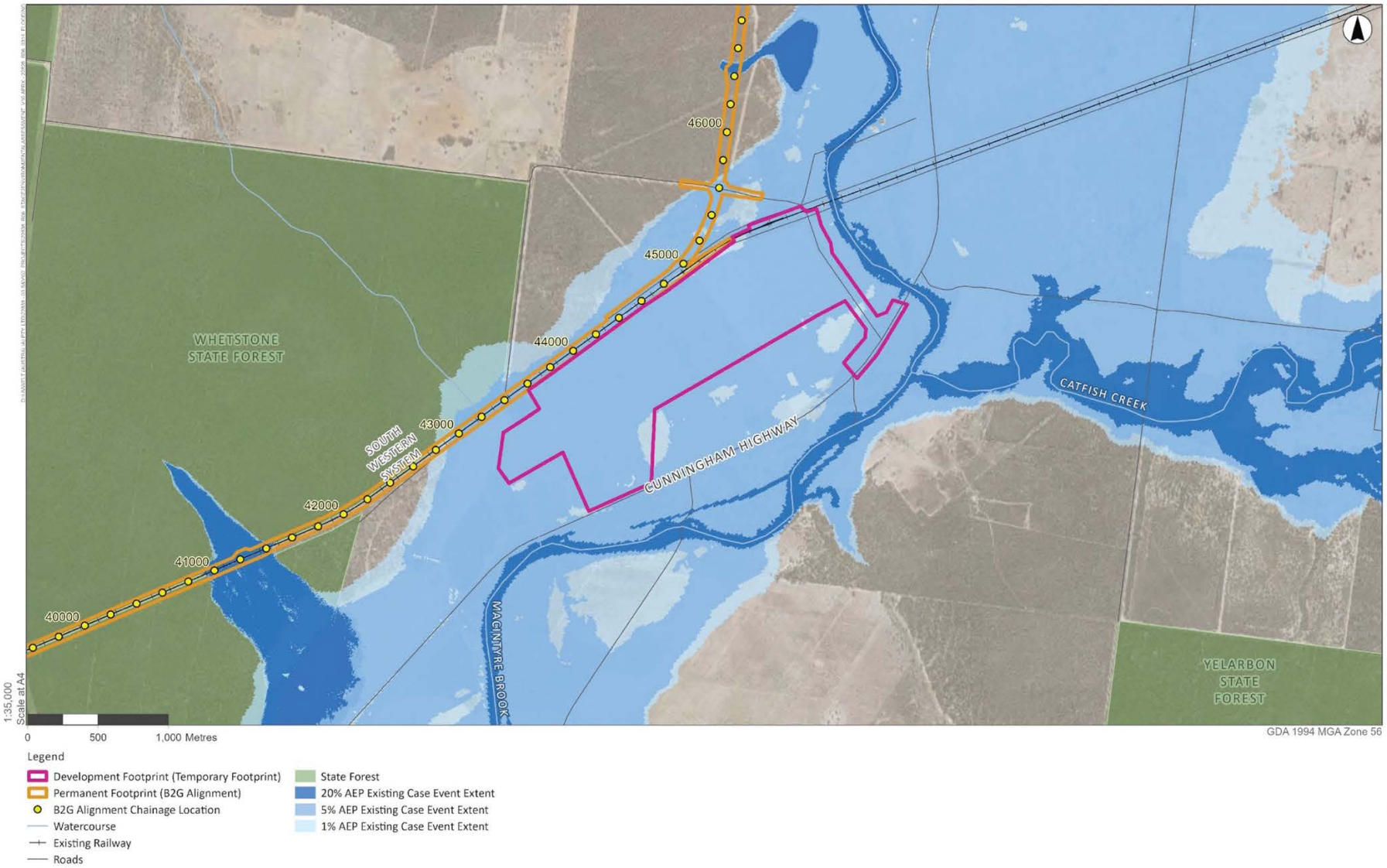



**Image Source:** ESRI Basemap (2022) **Data source:** Department of Resources (2022)

**FIGURE 4-12 WHETSTONE MDC FLOOD LEVELS**

Water management in this area is regulated by the Water Plan (Border Rivers and Moonie) 2019. The Whetstone MDC is located upstream of Macintyre Weir, which provides for the storage of water to 90 bulk water users to support surrounding agricultural and horticultural land uses.

Environmental values (EVs) for waters in the Border Rivers catchment are defined in the Queensland Border Rivers and Moonie River basins Environmental Values and Water Quality Objectives (Queensland Government, 2020). The Whetstone MDC is located in the Canning Creek EV zone and is directly adjacent to the Lower Macintyre Brook EV zone. Environmental values selected for protection in these zones are shown in Table 4-2.

**TABLE 4-2 ENVIRONMENTAL VALUES FOR WATER**

| Environmental Value | Canning Creek EV Zone | Lower Macintyre Brook EV Zone |
|---|---|---|
| Aquatic ecosystems | Yes | Yes |
| Irrigation | Yes | Yes |
| Farm supply | - | Yes |
| Stock water | Yes | Yes |
| Human consumption | - | Yes |
| Primary recreation | - | Yes |
| Visual recreation | Yes | Yes |
| Drinking water | - | Yes |
| Cultural, spiritual and ceremonial values | Yes | Yes |

Water quality monitoring has been conducted for the Project and presented in Chapter 13: Surface Water and Chapter 14: Flooding and Geomorphology. The nearest water quality monitoring location is immediately east and upstream of the Whetstone MDC on Macintyre Brook (416401A) (refer to Figure 4-13). Water quality at this site was characterised by low dissolved oxygen, high electrical conductivity, elevated turbidity and total suspended solids (TSS), and elevated total nitrogen (TN) and ammonia. These results were often outside water quality objectives (WQO) ranges and were likely indicative of the low flow conditions at the time of monitoring. Dissolved metal and polyaromatic hydrocarbon concentrations were generally below laboratory detection limits and met the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG) WQOs.

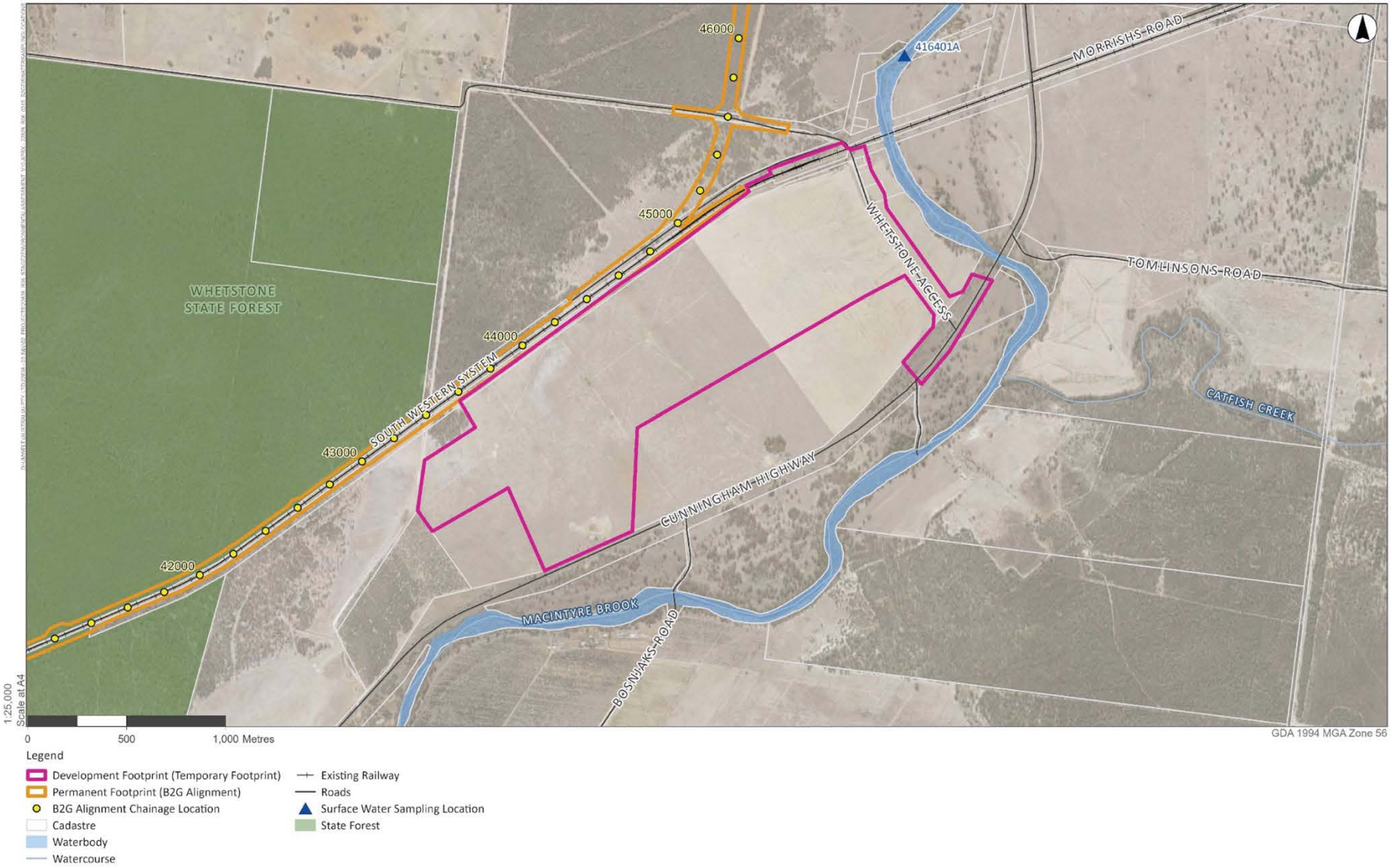



**Image Source:** ESRI Basemap (2022) **Data source:** Department of Resources (2022)

**FIGURE 4-13B2G EIS SURFACE WATER SAMPLING LOCATIONS**

### 4.8.5 Potential impacts

The potential impacts associated with both site establishment and material distribution phases relate to:

- Increased erosion due to vegetation clearance and disturbance of soil surface
- Potential blockage of drainage pathways through site design
- Sediment transport causing infilling of drainage infrastructure
- Changes to the floodplain landforms over time if drains or other features are left in place
- Increased debris load in waterways reducing the aesthetic quality of downstream waterway systems
- Altered water quality from increased water turbidity and sedimentation as a result of land disturbance
- Contamination of waterways from inadequate storage of fuels, chemicals and hazardous goods
- Introduction of contaminants to waterways from runoff, including areas of disturbed contaminated lands and stockpiles
- Introduction of contaminants to waterways from flooding, as the Whetstone MDC is located in a floodplain, including areas of disturbed contaminated lands
- Reduced water availability from the extraction of water from surface water sources
- Potential reduction in floodplain function (i.e. storage conveyance), as a result of infilling/bunding leading to increased flood risk elsewhere
- Increased surface water runoff quantities, as a result of increased hardstand area
- Reduced access and egress during a flood event.

### 4.8.6 Conclusion

Potential impacts have been evaluated against the significance assessment for surface water and hydrology to determine their overall significance in Chapter 13: Surface Water and Chapter 14: Flooding and Geomorphology. In addition, several strategies and design considerations have been employed by ARTC that consider the specific flood characteristics of the Whetstone MDC site including:

- Site office location: given the flood depth variations over the development footprint, site offices are located in an optimised position, which are within the lower flood depth areas, specifically in the north-east. Here, flood depths are expected to be around 0.8 m to 1.2 m in a 1% annual exceedance probability (AEP) and 0.3 m in a 5% AEP. This strategic placement aligns with the aim of minimising flood risk to critical infrastructure.
- Elevated foundations: buildings may be constructed on elevated foundations or pilings to lift them above the expected flood levels. The piles will use reinforced concrete or steel to support elevated platforms and working spaces above the peak flood depth.
- Critical infrastructure: other critical infrastructure, such as electrical equipment and chemical storage, will also be positioned using the same methodology as site offices.
- Site access: during a 5% AEP flood event, the site will experience flood depths varying between 0.2 m and 0.8 m. As a result, site access will be inundated due to the existing immunity levels of the Cunningham Highway/Whetstone Access Road, and therefore, no construction works will occur during these conditions or worse. A Flood Emergency Response Plan will be developed for workers already onsite when a flood event is imminent, or begins unexpectedly, to ensure safe evacuation.
- Stockpiled materials: due to the types of material being stored and the low velocities of 0.7 m/s, there is expected to be no damage or dislocation of materials during these events. This means that these materials will remain in position when the water subsides, reducing potential damage and the need for extensive cleanup or replacements.

The potential impacts to surface water and hydrology from the Whetstone MDC are mostly considered to have a low residual risk rating following the application of mitigation measures. The key initial significance identified include changes to water quality and chemistry, exacerbation of flood risk from floodplain infilling/bunding, contamination of waterways and reduced water availability. All potential impacts to surface water and hydrology will be managed through the mitigation measures outlined in Chater 13 Surface Water and Chapter 14: Flooding and Geomorphology.

## 4.9 Groundwater

### 4.9.1 Introduction

Assessment of the potential impacts of the Whetstone MDC on groundwater was undertaken for the Project and is reported in Appendix U: Groundwater Technical Report and Chapter 15: Groundwater. Legislation, policies and guidelines relevant to groundwater are also detailed in Chapter 3: Legislation and Project Approvals Process.

### 4.9.2 Methodology

The groundwater assessment for the Whetstone MDC involved:

- Reviewing desktop information on groundwater within and surrounding the Whetstone MDC, including aerial imagery and public database searches
- Identifying risks to groundwater values from the Whetstone MDC and assessing the significance of potential impacts in the context of the Project
- Review of mitigations in Chapter 15: Groundwater with relevance to the Whetstone MDC.

### 4.9.3 Existing environment

The Whetstone MDC is underlain by the Jurassic-to-Cretaceous aged Surat and Clarence-Moreton basins. Surface geology mapped across the development footprint is identified as Border Rivers Alluvium, comprising clays, silts, sands and gravels (refer to Chapter 15: Groundwater).

There are no groundwater bores located within the proposed Whetstone MDC development footprint; however, there are two registered water bores (Department of Regional Development, Manufacturing and Water and private), including RN41640017, located approximately 1 km north-east, and RN41640038, located approximately 400 m south, of the development footprint (refer to Figure 4-14).

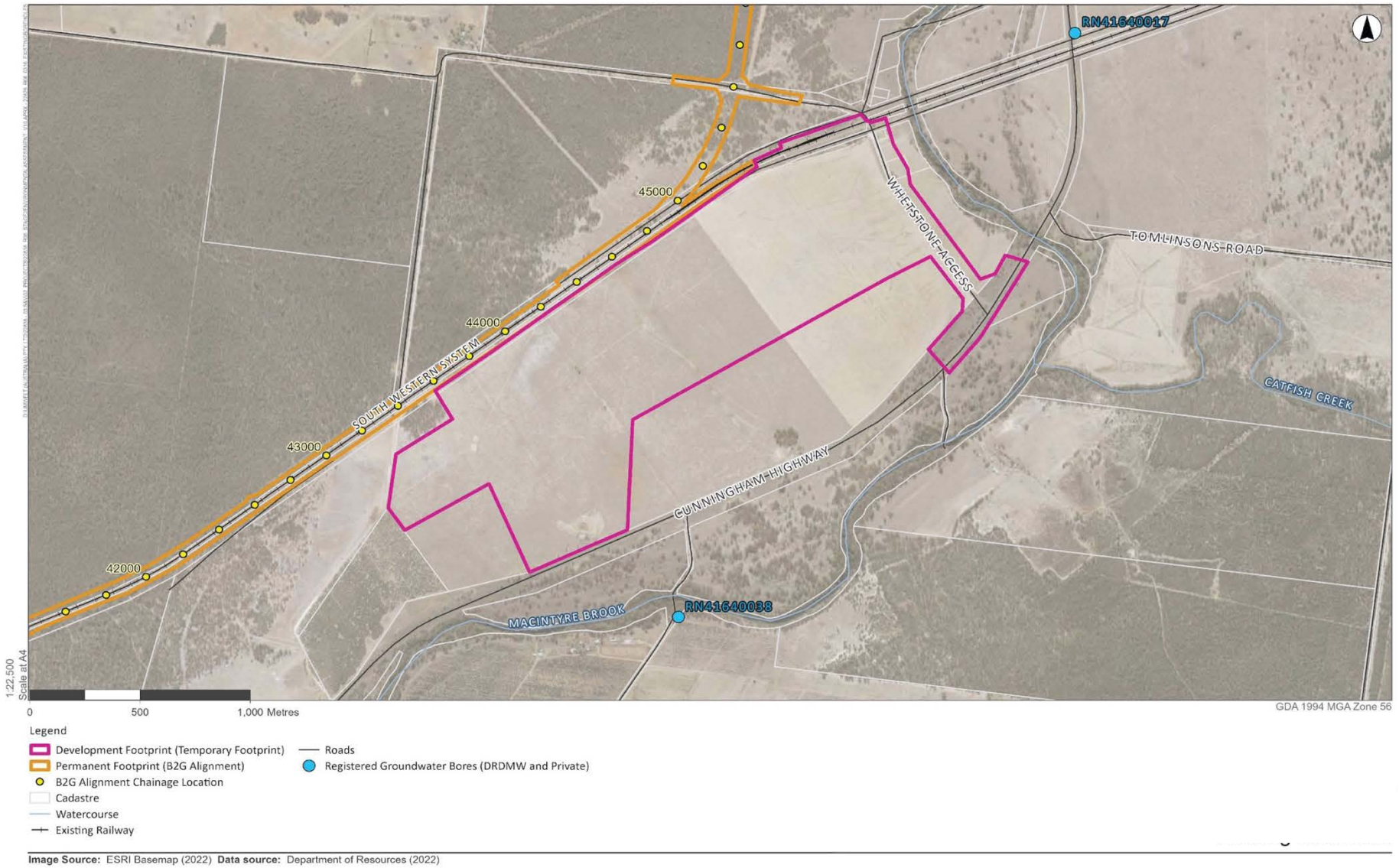



**FIGURE 4-14 WHETSTONE MDC EXISTING BOREHOLES**

### 4.9.4 Potential impacts

The potential impacts associated with both site establishment and material distribution phases relate to:

- Site clearing and grading, resulting in recharge and discharge, compaction and increased salinity risks
- Impacts to groundwater elevations, where bore water is sourced to supply water for activities
- Alterations of existing groundwater flow pathways due to new infrastructure and modified landform
- Contamination of groundwater from inadequate storage and potential spillages of fuels, chemicals and hazardous goods at laydown areas and workshops.

### 4.9.5 Conclusion

Potential impacts associated with groundwater during site establishment and material distribution of the Whetstone MDC have been evaluated and are outlined in Table 9.1 in Appendix U: Groundwater Technical Report. It is anticipated that any spill or leak would be small and isolated and responses to any uncontrolled releases would be managed in accordance with the measures identified in Chapter 15: Groundwater.

The potential impacts to groundwater from the Whetstone MDC are all considered to have a low residual significance rating following the application of mitigation measures. The key initial significance identified include the contamination of groundwater resources from inadequate storage of chemicals and hazardous goods.

The review of the significance assessment for the Whetstone MDC identified the potential impacts to groundwater from the Whetstone MDC are all considered to have a low residual significance rating. All potential impacts to groundwater will be managed through adherence to the mitigation measures outlined in Chapter 15: Groundwater.

## 4.10 Noise and vibration

### 4.10.1 Introduction

Assessment of the potential noise and vibration impacts of the Whetstone MDC have been undertaken as part of the broader Project and is reported in:

- Chapter 16: Noise and Vibration
- Appendix V: Noise and Vibration Assessment—Construction and Road Traffic.

The purpose of the noise and vibration construction assessment, inclusive of the Whetstone MDC, was to identify how noise and vibration from the construction of the Project may impact sensitive receptors within the surrounding environment and, based on the identified impacts, outline measures to reduce and control noise and vibration levels to provide reasonable and practical mitigation of potential impacts. The following sections provide a summary of the main findings of the noise and vibration assessment for the Whetstone MDC.

### 4.10.2 Methodology

Appendix V: Noise and Vibration Assessment—Construction and Road Traffic provides details on the assessment methodology associated with the construction-based Whetstone MDC.

Assessment involved:

- Identifying existing background noise levels based through environmental noise monitoring
- Identifying potentially sensitive receptors
- Establishing the noise and vibration assessment criteria and management levels to provide a basis for assessing the potential noise and vibration impacts
- Developing and completing noise and vibration modelling to predict construction noise levels based on sources of noise and vibration expected at the site associated with construction-based activities and equipment.
- Assessing the potential for noise and vibration to exceed the applicable criteria and impact to sensitive receptors during stages. For the Whetstone MDC this included both the site establishment and the materials handling phases for the temporary facility.
- Provide for measures to reduce and control noise and vibration levels for the reasonable and practical mitigation of potential impacts.

The noise and vibration construction assessment was undertaken in accordance with applicable guidelines including the *Transport Noise Management Code of Practice (CoP) Volume 2—Construction Noise and Vibration* (DTMR, 2016) (CoP Vol 2).

### 4.10.3 Existing environment

The development footprint is located within a rural environment and is expected to be subject to low background noise levels. In order to assess the baseline environmental noise levels, the noise monitoring locations detailed in Appendix V: Noise and Vibration Assessment—Construction and Road Traffic were reviewed. This includes the nearest baseline monitoring location approximately 780 m northeast from the development footprint. The measured background noise levels at monitoring location W01 are shown in Table 4-3.

**TABLE 4-3 BASELINE ENVIRONMENTAL NOISE LEVELS**

| Monitoring Location[1] | Rating Background Level, dB(A) | | | Ambient Noise Level, $L_{Aeq,15min}$ dB(A) | | |
|---|---|---|---|---|---|---|
| | Day[2] | Evening[2] | Night[2] | Day[2] | Evening[2] | Night[2] |
| **W01** 26076 Cunningham Highway, Whetstone | 33 | 26 | 20 | 50 | 54 | 49 |

[1] Noise monitoring locations are shown within the site overview included in Appendix B of B2G revised draft EIS Appendix V.
[2] As defined in accordance with the Transport Noise Management Code of Practice Volume 2—Construction Noise and Vibration

The existing sensitive receptors within a 2 km radius of the Whetstone MDC are detailed in Table 4-4 and shown on Figure 4-1.

**TABLE 4-4 WHETSTONE MDC SENSITIVE RECEPTORS**

| ID | Receptor Type | Lot/Plan | Easting | Northing | Approximate Distance from the MDC |
|---|---|---|---|---|---|
| **RES0160 (SLRID 254675)** | Residential | Lot 61/SP119592 | 295333 | 6843176 | 1,000 m |
| **RES0162 (SLRID 254681** | Residential | Lot 26/CVE248 | 296220 | 6843558 | 385 m |
| **RES0163 (SLRID 254682)** | Residential | Lot 26/CVE248 | 296364 | 6843580 | 385 m |
| **RES0164 (SLRID 254683)** | Residential | Lot 26/CVE248 | 296440 | 6843585 | 385 m |
| **RES0165 (SLRID 254689)** | Residential | Lot 26/CVE248 | 296401 | 6843615 | 385 m |
| **RES0166 (SLRID 254690)** | Residential | Lot 26/CVE248 | 296452 | 6843618 | 385 m |
| **RES0167 (SLRID 254691)** | Residential | Lot 26/CVE248 | 296476 | 6843617 | 385 m |
| **RES0168 (SLRID 319210)** | Residential | Lot 4/CVE177 | 298287 | 6844423 | 500 m |
| **RES0171 (SLRID 254705)** | Residential | Lot 4/SP204071 | 295870 | 6846491 | 1,300 m |
| **RES0172 (SLRID 254714)** | Residential | Lot 39/CVE602 | 298250 | 6846713 | 780 m |
| **RES017X (SLRID 254717)** | Residential | Lot 1/MH461 | 298130 | 6846868 | 862 m |

### 4.10.4 Potential impacts

Seven indicative noise scenarios were assessed against construction noise criteria for standard hours and non-standard hours (as defined in the CoP Vol 2), as part of the noise and vibration assessment for the Whetstone MDC detailed in Appendix V: Noise and Vibration Assessment—Construction and Road Traffic. The scenarios include stages of work considered to have the greatest potential to adversely impact sensitive receptors.

The noise and vibration criteria used for this assessment are described in detail in Appendix V: Noise and Vibration Assessment—Construction and Road Traffic. The assessment of noise and vibration arising from the site establishment and use of the facility have been assessed in accordance with CoP Vol 2 dated May 2023 (gazetted 11 August 2023). The MDC will be required to operate for the duration of the construction phase of the Project. Consequently, a lower limit of 45 dBA $L_{Aeq,adj,15min}$ has been applied to the assessment of standard hours and non-standard hours of the material distribution activities scenarios.

Modelling of Whetstone MDC material distribution activities noise levels has incorporated the following noise mitigation measures to achieve compliance with the 45 dBA $L_{Aeq,adj,15min}$ noise limit:

- Quiet plant selection and acoustic design to limit the noise from the sand blasting activity to no more than 125 dBA SWL. Acoustic design options could include the addition of acoustic screening to the specific item of plant associated with the sand blasting activity and adding attenuators to fan inlets, outlets or treatment to duct work
- Use quiet plant selection to limit the noise from the electric conveyor motors to no more than 101 dBA SWL. If more than 10 conveyor motors are needed, then a reduced SWL for each unit may be required.

The predicted Whetstone MDC site establishment and mitigated material distribution activities noise levels has indicated the following:

- The site establishment noise levels are predicted to exceed the 45 dBA $L_{Aeq,adj,15min}$ noise limit at all receptors except RES0171 (SLRID 254705)
- No exceedances have been predicted during rail stockpiling, sleeper stockpiling, ballast stockpiling and workshop activities, when these activities occur in isolation
- For all activities combined, excluding laydown area activities, compliance with the 45 dBA $L_{Aeq,adj,15min}$ noise limit noise limit is predicted for all sensitive receptors except for RES0171 (SLRID 254705), where a marginal 1 dBA exceedance is predicted.
- For all activities combined, including laydown area activities, marginal 1 dBA exceedances are predicted for sensitive receptors RES0165 (SLRID 254689) and RES0160 (SLRID 254705). The predicted marginal 1 dBA exceedances are primarily attributed to sandblasting activities.

Further noise mitigation and controls will be investigated as the design progresses, seeking to minimise the residual noise levels at the sensitive receptors.

### 4.10.5 Conclusion

Unmitigated, noise levels generated during the site establishment phase are predicted to be above the construction noise limit of 45 dBA LAeq. The Whetstone MDC materials distribution activities, with every activity occurring simultaneously, including activities in the laydown areas, a marginal 1 dB exceedance is predicted at two sensitive receptors. The application of reasonable and practicable mitigation measures will be necessary.

The approach to mitigating construction noise and vibration impacts is described in Chapter 16: Noise and Vibration. These measures may include quiet plant selection and scheduling of activities; monitoring noise and vibration during construction works to inform the management of potential impacts; and confirming the application of reasonable and practicable noise and vibration management measures. Construction works for the Whetstone MDC will also be undertaken in accordance with the requirements of the CoP Vol 2 (DTMR, 2016).

With the application of the frameworks and controls described, works associated with the Whetstone MDC will be planned and undertaken to maintain human health and wellbeing, including ensuring a suitable acoustic environment so sensitive receptors are not unduly disturbed.

## 4.11 Social

### 4.11.1 Introduction

Assessment of the potential impacts of the Whetstone MDC on social was undertaken as part of the broader Project and are reported in Chapter 17: Social and Appendix X: Social Impact Assessment. Legislation, policies and guidelines relevant to the social aspects of the Whetstone MDC are also detailed in Chapter 3: Legislation and Project Approvals Process and Chapter 17: Social.

### 4.11.2 Methodology

The social assessment for the Whetstone MDC involved:

- Reviewing desktop information on the overarching stakeholder engagement tasks undertaken by ARTC to identify community concerns
- Identifying risks to local and regional communities (i.e. workforce, local supply and business) from the Whetstone MDC and assessing the significance of potential impacts in the context of the Project
- Review of mitigations in Chapter 17: Social to minimise potential impacts.

### 4.11.3 Existing environment

The Whetstone MDC is situated within Whetstone, which is a rural locality in the Goondiwindi LGA. In 2021, Whetstone had approximately 70 residents (ABS, 2022). As detailed in Section 4.2, there are 11 sensitive receptors located within a 2 km radius of the development footprint.

Inglewood and Goondiwindi are the closest towns to the Whetstone MDC. In 2021, Inglewood had approximately 936 residents and Goondiwindi had approximately 10,310 residents (ABS, 2022). Goondiwindi is the main urban centre of the Goondiwindi LGA and is located on the banks of the Macintyre River at the border with NSW, at the juncture of five major inland highways (Barwon Highway, Cunningham Highway, Gore Highway, Leichhardt Highway and Newell Highway). The bridge over Macintyre Brook was first built in 1878 to allow for goods transport from NSW. The South Western Line was established in 1906, enabling grain to be transported more efficiently to export markets in the east.

The local economy is largely driven by agricultural production from the fertile floodplains of the Border Rivers basins of Macintyre Brook and the Macintyre and Weir rivers.

GRC promotes a welcoming community with opportunity and lifestyle. Strategic goals for the LGA outlined in the planning scheme include:

- Community safety and health
- Fair and reasonable access to services
- Recognition of culture, identity and heritage
- Inclusivity
- Effective disaster management.

#### 4.11.3.1 Stakeholder engagement

Engagement has occurred in parallel with the preparation and exhibition of the draft EIS, and throughout the revised reference design and revised draft EIS process. Outcomes of these discussions have been used to inform progression of the revised reference design and to confirm assumptions adopted in this assessment.

Full details of consultation undertaken with key stakeholders throughout the revised reference design and impact assessment process are provided in Appendix E: Consultation Report.

### 4.11.4 Potential impacts

The potential impacts to local and regional communities are temporary in nature due to the use of the Whetstone MDC during the construction of the Project only. The potential impacts associated with both site establishment and material distribution phases relate to changes in local character and employment, which are described in the following sections.

#### 4.11.4.1 Local character

The Whetstone MDC site is located adjacent to the existing rail corridor, within a rural setting. Surrounding land uses include the South Western Line to the north, Whetstone Access Road to the east, the Cunningham Highway to the south, agricultural properties, reserves and State forests.

The Whetstone Siding (established in 1908 as part the South Western Line) is located within the development footprint but no heritage structures associated with the Whetstone Siding remain. There will be no direct or indirect impact on the nearby Railway Bridge crossing of Macintyre Brook.

There will be no impacts on the Whetstone rest area, which is located to the south on the Cunningham Highway, within approximately 500 m of the rail turn around the siding within the Whetstone MDC. Rail noise may be audible at the rest stop but with only two trains per day for MDC activities, and in the context of noise from the Cunningham Highway, this would not be a significant impact to the rest area's character.

There are 11 rural residences located within 2 km of the development footprint, mostly located close to Macintyre Brook, which is located approximately 200 m to the east and south of the development footprint, and is lined with riparian vegetation. The Whetstone MDC will have no direct impact on the Macintyre Brook, which could affect its amenity or visitor's environmental appreciation. Any impacts on scenic amenity in this area would be temporary.

When construction of the Project is complete, the need for the Whetstone MDC will no longer exist and the site will be progressively decommissioned. The site will be rehabilitated in consultation with the landowner.

#### 4.11.4.2 Estimated Project employment

Whetstone MDC site establishment would require 55 full-time equivalent (FTE) personnel over a 12-month period, prior to the commencement of Project construction. This will be an advantage to local and regional construction workers, however in the context of construction labour shortages, may contribute to local skills and labour shortages.

Inclusive of the workforce requirement for the Whetstone MDC, the Project is expected to have a peak construction workforce peak of approximately 900 FTE personnel, 50 less than the peak workforce anticipated in the draft EIS. The Project's average workforce will be approximately 396 FTE (refer to Chapter 5: Project Description).

The Project includes a proposed temporary non-resident workers' accommodation facility in Inglewood. This will be available to Whetstone MDC personnel from the commencement of the site establishment phase and for the duration of the Project construction, so no additional impacts on housing or accommodation are anticipated. Workforce parking will be provided within the Whetstone MDC disturbance footprint.

Establishment of the Whetstone MDC is likely to present supply opportunities for local and regional businesses, e.g. earthworks, transport, fencing, quarry materials, civil construction and road works, which would contribute to indirect employment. At approximately 16 km from the Whetstone MDC, businesses in Yelarbon and Inglewood (such as shops and hotels) may benefit from increased trade from Project and/or personnel expenditure.

### 4.11.5 Conclusion

The potential impacts to local and regional communities from the Whetstone MDC are mostly considered to have a low to moderate residual risk rating. Appendix X: Social Impact Assessment has assessed the social impact of the Project. Potential for the Whetstone MDC to affect the amenity of landowners in this vicinity during the Project construction works stage, requiring measures to mitigate potential noise impacts and impacts on visual amenity. The Whetstone MDC will be subject to the Social Impact Management Plan (SIMP) prepared for the Project (refer to Chapter 17: Social).

## 4.12 Cultural heritage

### 4.12.1 Introduction

This section considers the potential impacts on Indigenous and non-Indigenous heritage values during the site establishment and material distribution phases of the Whetstone MDC. This section has been informed by design documentation for the Whetstone MDC and the cultural heritage assessment undertaken for the Project.

The assessment has been prepared with consideration of sections 11.166 to 11.167 of the ToR for the Project and a subsequent request for further information from the Queensland Coordinator-General. Legislation, policies and guidelines relevant to cultural heritage are detailed in Chapter 3: Legislation and Project Approvals Process and Chapter 19: Cultural Heritage.

### 4.12.2 Methodology

The cultural heritage assessment for the Whetstone MDC involved:

- Reviewing desktop information on cultural heritage within and surrounding the Whetstone MDC, including aerial imagery and public database searches
- Identifying known and potential cultural heritage within and surrounding the Whetstone MDC
- Identifying risks to cultural heritage from the Whetstone MDC and assessing the significance of potential impacts in the context of the Project
- Reviewing mitigation measures in Chapter 19: Cultural Heritage with relevance to the Whetstone MDC.

### 4.12.3 Existing environment

There are no heritage sites recorded on local, State or federal heritage registers within the development footprint.

Indigenous cultural heritage values and Project impacts to these values will be managed under an approved CHMP, in accordance with the Project EIS terms of reference and the *Aboriginal Cultural Heritage Act 2003* (Qld) ACH Act. Where identified, objects or areas of significance will be managed in accordance with the management measures and recommendations set out in the relevant approved CHMP.

A search of the DTATSIPCA cultural heritage database was undertaken for the development footprint. Four sites that contain an artefact scatter, engravings and grinding grooves are located approximately 5.6 km to the north-west of the development footprint; however, there are no recorded sites within the development footprint.

The cultural heritage assessment undertaken for the Project noted the Whetstone siding, which is a railway siding established in 1908 as a part the South Western Line, is located within the development footprint. No heritage structures associated with the Whetstone siding remain.

A search of the GRC Planning Scheme heritage overlay shows that there is one local heritage place, namely the Railway Bridge crossing Macintyre Brook at Whetstone, located approximately 200 m beyond the development footprint to the north-east.

### 4.12.4 Potential impacts

The potential impacts associated with cultural heritage during site establishment and material distribution phases of the Whetstone MDC relate to:

- Direct impacts: occur if a cultural heritage place or site is located directly in a development area and/or physically impacted by development
- Indirect impacts: alter the surrounding physical environment in such a way that a cultural heritage place or site is affected.

As previously identified, there are no heritage sites recorded on local, State or federal heritage registers within the development footprint. Whetstone siding is located within the development footprint. There are no mapped DTATSIPCA sites within the development footprint.

According to Chapter 19: Cultural Heritage, no impacts are considered to occur to Whetstone siding, as a result of the Whetstone MDC. No heritage structures associated with the Whetstone Siding remain and an assessment of the sites cultural heritage significance determined that it does not meet any significance criteria; therefore, having a negligible sensitivity (refer to Chapter 19: Cultural Heritage). The site is recommended for inclusion in a Project Heritage Interpretation Plan.

### 4.12.5 Conclusion

The desktop review indicated that there are no heritage sites recorded on local, State or federal heritage registers within the development footprint. Whetstone siding is located within the Development Footprint. The Whetstone MDC would have no change on the Whetstone siding.

Indigenous cultural heritage values and Project impacts to these values will be managed under an approved CHMP, in accordance with the Project EIS terms of reference and the ACH Act. Where identified, objects or areas of significance will be managed in accordance with the management measures and recommendations set out in the CHMP.

Any signage that is installed to identify the previous location of the Whetstone siding can be located on an area beyond the development footprint, in consultation with the parties responsible for the installation of the signage.

Where possible, the location of the proposed site establishment and material distribution activities will be positioned to avoid any known restricted area identified through further cultural heritage assessment. All potential impacts to cultural heritage will be managed through the implementation of mitigation measures in Chapter 19: Cultural Heritage as well as an approved CHMP.

## 4.13 Traffic, transport and access

### 4.13.1 Introduction

Assessment of the potential impacts of traffic, transport and access during the site establishment and material distribution phases of the Whetstone MDC was undertaken as part of the broader Project, and is reported in the transport and access impact assessment in Chapter 20: Traffic, Transport and Access and Appendix AA: Traffic Impact Assessment.

The assessment has been prepared with consideration of sections 11.107 to 11.116 of the ToR for the Project and subsequent requests for additional information from the Queensland Coordinator-General. Legislation, policies and guidelines relevant to the traffic, transport and access aspects of the Whetstone MDC are also detailed in Chapter 3: Legislation and Project Approvals Process and Chapter 20: Traffic, Transport and Access.

### 4.13.2 Methodology

#### 4.13.2.1 Traffic Impact Assessment study area

The DTMR Guide to Traffic Impact Assessment (GTIA) (version 1.2, December 2018) provides guidance on the conditions for determining the spatial extent for a traffic, transport and access impact assessment based on required mitigation measures. This guidance is provided in Chapter 20: Traffic, Transport and Access Section 20.3.1. Application of the GTIA identifies the Whetstone MDC traffic, transport and access study area as follows:

- The road–rail interface locations included in the impact assessment area are all public road crossings that are intersected by the revised reference design for the Project
- The road network anticipated to be used for the transport of workforce, materials and equipment during the site establishment and materials distribution stages of the Project
- Other transport facilities in proximity to the Project, such as airports.

Further detail is provided in Section 20.3.1 of Chapter 20: Traffic, Transport and Access regarding the impact assessment area and impact assessment year.

The pavement and transport infrastructure assessments follow a slightly different methodology to accommodate operational traffic assessment; however, it is envisaged that the likely impact from the operational stage of the Project, mainly from vehicles used for routine maintenance, would be negligible.

### 4.13.2.2 Development of traffic volumes

The assessment of traffic impacts requires a background 'without' Project traffic scenario to be established for the road networks within the impact assessment area, and for this background to be compared to future scenarios that include construction and operation traffic for the Project (i.e. the 'with Project' scenario).

The assessment of background and Project-induced conditions, summarised in Figure 4-15 includes consideration of the Project's activities and traffic impacts on road safety, access and frontage, intersections, road links, pavement and road-rail interfaces. Following the assessment of potential impacts, suitable mitigation and management measures can be developed and proposed, as further described in Chapter 20: Traffic, Transport and Access.

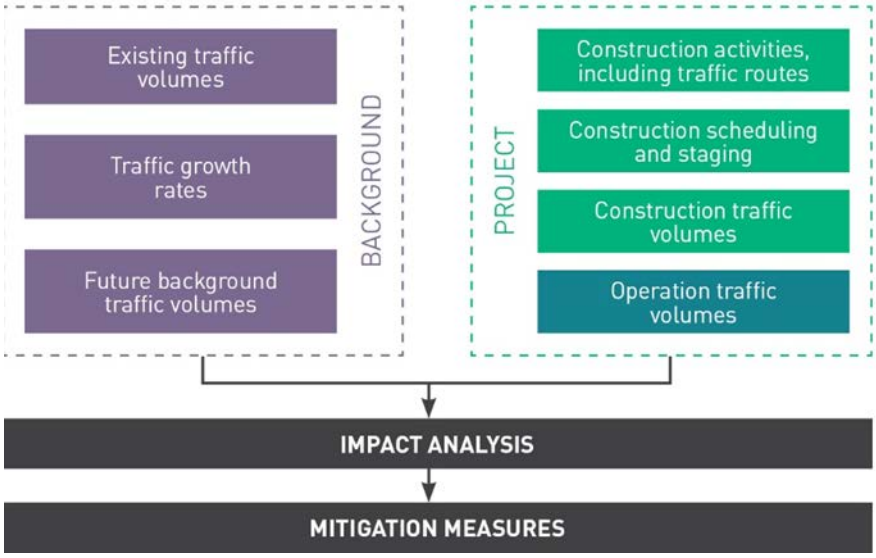



**FIGURE 4-15 BACKGROUND TRAFFIC DATA AND PROJECT CONTRIBUTIONS REQUIRED FOR TRAFFIC IMPACT ASSESSMENT**

### 4.13.2.3 Primary construction transport routes

Primary construction transport routes refer to State-controlled roads and local roads used by vehicles during the construction of the Project rail alignment. These routes are assumed as feasible routes that the construction contractor will use in the transportation for movement of:

- Construction materials, plant, equipment, and workforce
- Materials which would otherwise have used existing rail facilities, which will be temporarily closed during the Project construction.

Chapter 20: Traffic, Transport and Access (Section 20.3.1) and Appendix AA: Traffic Impact Assessment provide further detail regarding primary construction route definition.

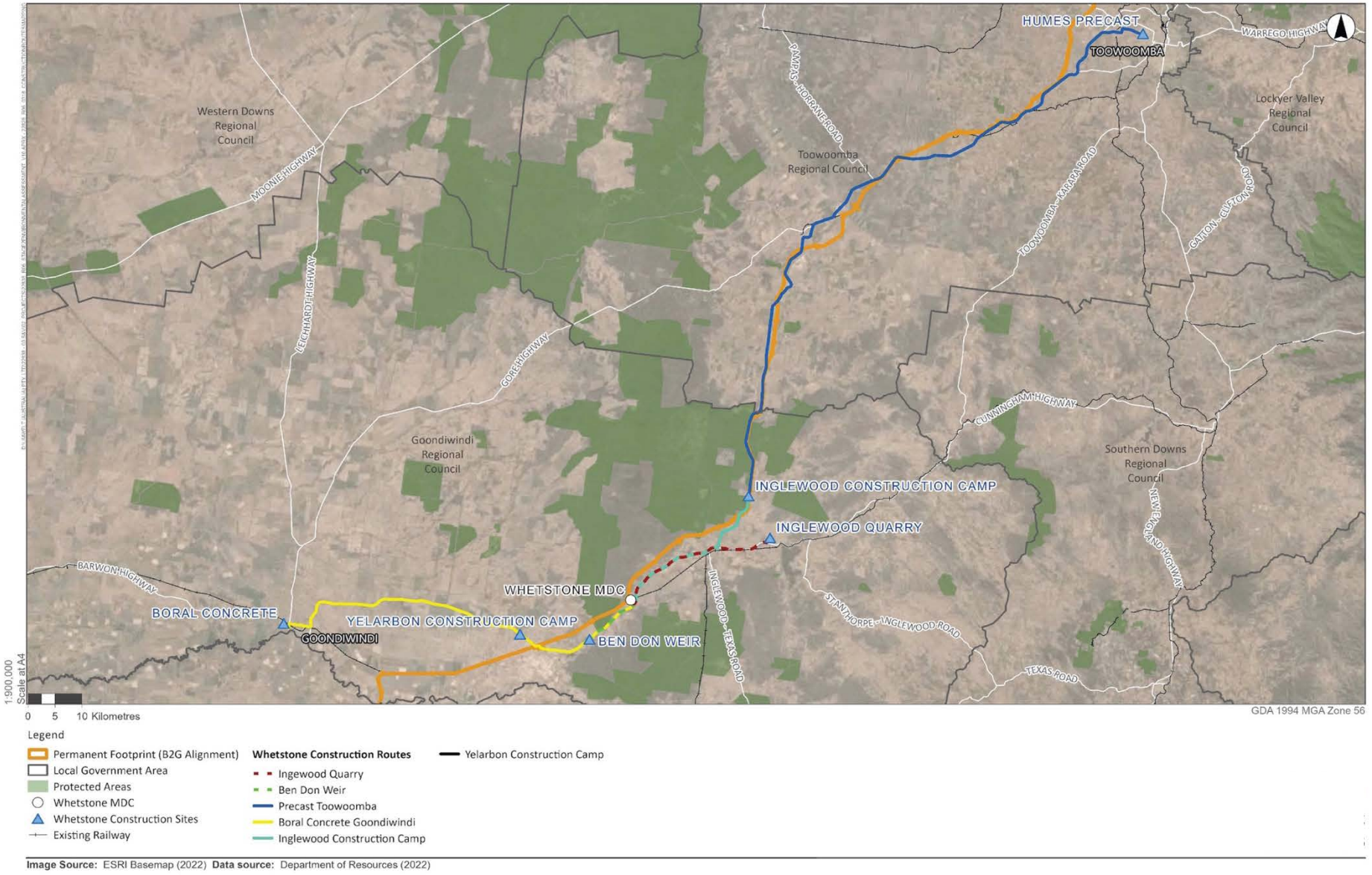



**Image Source:** ESRI Basemap (2022) **Data source:** Department of Resources (2022)

**FIGURE 4-16 WHETSTONE MDC CONSTRUCTION ROUTES**

#### 4.13.2.4 Whetstone MDC

The Whetstone MDC site establishment and materials preparation, handling and distribution transport tasks, associated with the Project, have been assessed as a part of the Chapter 20: Traffic, Transport and Access and Appendix AA: Traffic Impact Assessment.

The Whetstone MDC will include the delivery and stockpiling of bulk track construction materials and will allow for track construction via a progressive rail head from the Whetstone MDC, thereby significantly reducing the need for road transportation.

The facility will require: earthworks and drainage works; internal rail track; site office and facilities; rollingstock provisioning and maintenance facilities; the provision of gantries for rail logistic management; ballast unloading facilities; and rail welding facilities. Infrastructure will include State and local road intersection works and upgrades, and onsite sewer management.

It is currently assumed that rail will be supplied and distributed via the existing QR rail network to the Whetstone MDC, from where it will be distributed along the corridor during the construction of the Project. The traffic, transport and access impact assessment has assumed that rail will be welded into long welded rail and delivered to the point of use via material train. Even though no rail is proposed to be transported via the public road network, a contingency allowance of 10 per cent has been assumed to assess the impacts of these vehicle types on the road network.

### 4.13.3 Existing environment

Chapter 20: Traffic, Transport and Access (Section 20.4) and Appendix AA: Traffic Impact Assessment detail the existing environment in relation to the Project, which includes reference to items relevant to the Whetstone MDC, in the following areas:

- Rail network
- Road network
- Private access
- Public transport, school bus routes, long-distance coach services
- Stock routes
- Strategic touring routes, active transport
- Airports, ports
- Parking
- Pavement
- Emergency services
- Transport infrastructure.

The following sections provide more detail in relation to the rail network and road network for the Whetstone MDC.

### 4.13.4 Potential impacts

The Project uses approximately 46.8 km of the existing rail corridor for the South Western Line and approximately 21.2 km of the existing rail corridor for the Millmerran Branch Line.

Approximately 41,150 tonnes (t) of rail are required for the Project. It is assumed that rail will be supplied and delivered by the existing QR and ARTC rail network to the Whetstone MDC along the Project alignment. As a conservative allowance, 10 per cent of all rail deliveries have been assumed to be transported to four laydown areas along the alignment to account for any required use of the road network.

The South Western Line, is proposed to provide access to the Whetstone MDC, and is a critical link in agricultural export supply chains (particularly grain), supporting the movement of significant volumes of commodities to the Port of Brisbane.

In 2017, the South Western Line had a maximum of 50 monthly train movements (June 2017) and a minimum of 5 monthly train movements (September 2017). In the same year, the Millmerran Branch Line had a maximum of 19 train movements (August 2017) and a minimum of 0 train movements (6 of the 12 months). Based on the total numbers and monthly variance of train movements on both of these existing rail lines (Sections 20.4.1.1 and 20.4.1.2 of Chapter 20: Traffic, Transport and Access), it is anticipated that if rail deliveries to Whetstone MDC are via the existing rail network, the additional rail movements would be within the operational capacity of the networks used and would not result in network impacts.

ARTC will continue to consult with QR as the Project progresses through detailed design and construction planning regarding the identification of an acceptable construction method within existing rail corridor.

Chapter 20: Traffic, Transport and Access (Section 20.5.1) provides further detail of railway construction methodologies for new rail infrastructure, use of existing sidings and loops, and rail delivery assumptions.

Establishing the Whetstone MDC will support the construction and delivery of the Project by receiving the delivery of the majority of the bulk track construction materials via rail. Encouraging the use of rail, the Whetstone MDC will minimise heavy vehicle movement on the road network that would have occurred during the construction of the Project (refer to Table 4-5).

**TABLE 4-5 WHETSTONE MDC TRAIN AND TRUCK QUANTITIES**

| Description | Unit | Quantity | Allowance for Truck Delivery | No. Truck Movements | No. Train Movements | Truck Movements Avoided by the MDC |
|---|---|---|---|---|---|---|
| Sleepers | No. | 378,933 | 10% | 474 | 68 | 4,263 |
| Rail | (t) | 41,105 | 10% | 208 | 117 | 1,868 |
| Ballast | (t) | 669,385 | 100% | 15,750 | 0 | 0 |

It is currently estimated that, on average, two trains will arrive at the Whetstone MDC per day for the duration of the facility. The bulk of the deliveries will be rail sleepers and ballast.

### 4.13.4.1 Road network

The number of trips made by light vehicles and heavy vehicles for each materials distribution activity was estimated based on the volume of materials required to be transported and the duration of activity.

The estimated number of traffic trips were assigned to the corresponding transport route for each construction activity. This allowed for the estimation of the peak construction traffic volume for each construction route as well as for separate component road sections of each route. For further details on the construction-related traffic generation, distribution and assignment, refer to Chapter 20: Traffic, Transport and Access and Appendix AA: Traffic Impact Assessment.

The Whetstone MDC is located on Whetstone Access Road, which intersects with the Cunningham Highway.

The Cunningham Highway is a State-controlled national highway managed by DTMR, stretching from Goondiwindi to Ipswich. In the vicinity of the development footprint, the highway is a two-lane, two-way, sealed, single carriageway with a posted speed limit of 100 km/hr. To the east of the site, there is a rail level crossing with the Cunningham Highway.

Whetstone Access Road is managed by GRC. It is a two-lane, two-way unsealed road providing access to the development site. It is listed in the GRC Planning Scheme as a Class 5 unsealed road. The road has an assumed unposted rural speed limit of 100 km/hr. The South Western Line is State transport infrastructure owned by QR, which traverses the northern boundary of the development footprint. It is primarily used for freight transportation and is no longer used for passenger services.

Further detail around existing vehicle movements is available in Chapter 20: Traffic, Transport and Access (Section 20.4) and Appendix AA: Traffic Impact Assessment.

With respect to road vehicle usage, average daily vehicle usage associated with the Whetstone MDC activities has been estimated at:

- 38 LV per day (for an estimated 55 construction workers at a vehicle occupancy of approximately 1.5 workers per vehicle) from various locations. This increases to 50 LV per day (for an estimated 75 construction workers) for the materials distribution phase servicing the construction of the entire Project.
- 19 HV per day from various locations, including the transport of:
  - earthworks and ballast material from Inglewood Quarry
  - concrete plinths from Goondiwindi.

For design purposes, the 36.5 m HPFV and B99 passenger vehicle have been selected as the largest vehicles.

## 4.13.5 Impact assessment summary

Chapter 20: Traffic, Transport and Access (Section 20.7) and Appendix AA: Traffic Impact Assessment summarise the traffic, transport, and access impact assessment for the B2G revised draft EIS. The following sections provide a summary of the impacts and mitigations relevant to the Whetstone MDC.

#### 4.13.5.1 Traffic impact—Road safety

Chapter 20: Traffic, Transport and Access (Section 20.7.1) summarises the road safety assessment of the B2G revised draft EIS. Neither Cunningham Highway, Whetstone Access Road, nor the Cunningham Highway/Whetstone Access Road intersection trigger any physical infrastructure upgrade mitigation measures..

Appendix AA: Traffic Impact Assessment provides further details on the safety assessment undertaken for all intersection and road links.

#### 4.13.5.2 Traffic impact—Accesses

Chapter 20: Traffic, Transport and Access (Section 20.7.2), summarises the access impacts of the Project. There are no other specific impacts to access occurring in the vicinity of Whetstone MDC.

#### 4.13.5.3 Traffic impact—Intersections

Intersections will be assessed against requirements outlined in Austroads Guide to Road Design Version 4A (AGRD4a) requirements. The impact assessment methodology applied to the Project is discussed in Chapter 20: Traffic, Transport and Access (Section 20.6) and in accordance with GTIA requirements.

**Turn warrants**

Chapter 20: Traffic, Transport and Access (Section 20.7.3) summarises the intersection impacts of the Project and includes the following results of interest to the assessment of the Whetstone MDC:

- The Cunningham Highway/Whetstone Access Road intersection existing basic-right turn treatments (BAR) and basic left-turn treatments (BAL) can accommodate Project traffic volumes without an upgrade. The assumed peak hour construction traffic right-turn score is just below the threshold for Channelised Right Turn Lanes CHR(S).
- The Cunningham Highway/Bybera Road at Inglewood requires an additional right-turn warrant because of the additional Project construction traffic.

This assessment will be reviewed and revised during detailed design to determine whether further certainty around construction traffic volumes is available, which will include reviewing Project peak hour traffic volumes for turn warrant assessment.

**Sight distance**

The mitigation measures proposed in Chapter 20: Traffic, Transport and Access (Section 20.6) may not be required once the construction routes have been finalised. Given that construction traffic is temporary, mitigation measures to improve sight distance will be agreed with the relevant road authority.

The Cunningham Highway/Whetstone Access Road intersection existing sight distance is sufficient.

**Delay**

The Cunningham Highway/Whetstone Access Road intersection achieves an acceptable level of service (LoS) and does not require any physical infrastructure mitigation measures.

Appendix AA: Traffic Impact Assessment provides further detail, including SIDRA assessment results.

#### 4.13.5.4 Traffic impact—Road links

Chapter 20: Traffic, Transport and Access (Section 20.5.2) and Appendix AA: Traffic Impact Assessment provide a summary of the number of roads, number of road sections and length of roads by road authority that exceed the prescribed 5 per cent threshold for construction traffic compared with background traffic, for impacts generated by the Project.

Traffic volumes generated by the Whetstone MDC have been distributed within the broader road network, contributing to the impact assessment described in Chapter 20: Traffic, Transport and Access (Section 20.7.4) and Appendix AA: Traffic Impact Assessment.

Based on the LoS comparison, it is not expected that the Project would generate the need to upgrade the road network for these temporary construction activities. Regardless, as per the earlier assessments, it is important that the routes are reviewed in the preparation of a Traffic Management Plan (TMP) from a physical and safety perspective, prior to the commencement of construction activities, to ensure they are suitable. This will include joint visual inspection of all routes by the contractor, the asset owner and an accredited road safety auditor to agree on routes and any works required to ensure the routes are suitable for the level of construction activity proposed.

#### 4.13.5.5 Traffic impact—Pavements

Pavement impacts generated by the Whetstone MDC have been distributed within the broader road network, contributing to the impact assessment and mitigation measures described in Chapter 20: Traffic, Transport and Access (Section 20.7.5) and Appendix AA: Traffic Impact Assessment..

The Pavement Impact Assessment (PIA) indicates that the majority of State-controlled road segments would have minimal pavement impact given the duration of construction activities and pavement loading; however, it was found that the 5 per cent threshold would be exceeded for several road sections, as outlined in Table 4-6.

**TABLE 4-6 NUMBER OF ROADS EXCEEDING 5 PER CENT BASE STANDARD AXLE REPETITIONS BY ROAD AUTHORITY**

| Road authority | Number of roads > 5% | Number of road links > 5% | Length of roads > 5% (km) |
|---|---|---|---|
| **DTMR** | 12 | 81 | 531.2 |
| **BSC** | 1 | 1 | 0.4 |
| **GRC** | 26 | 39 | 136.8 |
| **MPSC** | 2 | 2 | 6.7 |
| **TRC** | 42 | 59 | 76.9 |

It should be noted that some of the percentages are relatively high due to very low background traffic volumes along particular road sections. Detailed analysis outputs and results of these road segments are provided in Chapter 20: Traffic, Transport and Access (Section 20.5.2.7).

Detailed pavement design life assessments will be carried out prior to the commencement of construction, in consultation with DTMR, once specific construction routes are agreed in the detailed design stage of the Project. Further detailed assessment will assist in identifying if contributions may be required towards the maintenance costs for the affected road sections as a result of additional pavement loading. The TMP will also be developed by the contractor prior to the commencement of construction, with mitigation measures included to supplement the EMPs. This will assist further discussions with DTMR to identify if contributions may be required towards the maintenance costs for the affected road sections, as a result of additional pavement loading.

The estimated contribution required based on the vehicle movements of all construction vehicles on DTMR roads, excluding cumulative impacts, has been provided to DTMR. Contributions are only required on sections of the State-controlled road where the Project vehicles exceeded the 5 per cent threshold.

### 4.13.5.6 Traffic impact—Transport infrastructure

Chapter 20: Traffic, Transport and Access (Section 20.7.6) and Appendix AA: Traffic Impact Assessment (Section 5.7) summarise the transport infrastructure impacts of the Project including any traffic generated by the Whetstone MDC as it disperses through the network..

#### Heavy vehicle movement

Where heavy vehicle routes and restrictions are defined, the Project construction vehicles comply with these requirements, with the exception of oversize overmass (OSOM) vehicles; these are generally on State-controlled roads. There are a number of roads used by construction vehicles which are not defined under the Queensland heavy vehicle routes and restrictions information. Routes unclassified for heavy vehicle use are generally local government roads, which usually have no requirement for B-double, higher mass limit or road train-sized vehicles. These roads may not typically be designed for such large vehicle types; the construction vehicles could impact on the pavement or road formation or be unsuitable for the road geometry.

Mitigation measures for impacts to these roads due to the use of heavy vehicles are:

- Road safety audits to be carried out at the detailed design and post-construction stage, where such road upgrade works are required to ensure the design vehicle can be accommodated
- All conflict points impacting vehicle turn path will be relocated/removed. Further road widening works of kerb turnouts or carriageway of minor roads to accommodate vehicle swept path will be reviewed during the detailed design stage
- All OSOM and Restricted Access Vehicles will comply with the *Guideline for Excess Dimension Vehicles in Queensland* (DTMR, 2013) in terms of transport safety.

#### Oversize overmass vehicle movement

Swept path analysis has been undertaken at a total of 35 identified pinch point locations. These locations were identified through a desktop study of the proposed routes of OSOM movements. A number of pinch points require upgrading (temporary or permanent) to accommodate the movement of OSOM vehicles.

Appendix AA: Traffic Impact Assessment provides additional details, including swept path assessments, which include Cunningham Highway/Whetstone Access Road (Pinch Point ID 33), a summary of impact and possible mitigation measures is provided in Table 4-7.

**TABLE 4-7 CUNNINGHAM HIGHWAY/WHETSTONE ACCESS ROAD SUMMARY OF OSOM IMPACTS AND MITIGATION MEASURES**

| Impact identification | Possible mitigation measures |
|---|---|
| The swept path analysis indicates that upon approaching the intersection there is not sufficient carriageway width to accommodate the vehicle using both lanes to manoeuvre the left-hand turn. The vehicle and sweeping path will collide with a sign. | Mitigation extends to the temporary removal and relocation of signage and widening of the pavement on the southern side of the intersection to accommodate the swept path of the vehicle. |
| Analyses also indicate that upon the right turn movement, the intersection is not sufficiently wide enough for the vehicle to remain on the road pavement. The vehicle is required to take a wide-angle manoeuvre and may encroach on the give-way sign and edge of pavement. | Use pilot vehicle and police escorts to warn opposing vehicles. Travel outside of peak times, perhaps in the evenings to avoid vehicular conflict. Use temporary lighting where required. Ensure minimal delays occur while traversing through the intersection. Provide temporary signage where required. |

The Whetstone MDC access arrangements will be designed in accordance with relevant standards and guidelines to provide OSOM vehicle access in a safe and efficient manner during the detailed design phase.

#### 4.13.5.7 Traffic impact—Road-rail interface

Chapter 20: Traffic, Transport and Access (Section 20.7.7) summarises the road-rail interface traffic impacts of the Project. The following impacts occur in the vicinity of the Whetstone MDC:

- Cunningham Highway (Whetstone) existing QR active level crossing: train crossings limited to those for delivery of Project construction materials. Vehicle volumes expected to increase from 681 vehicles/day/direction to 912 vehicles/day/direction (38.2 % increase) in the peak impact year.

Traffic management strategies proposed to mitigate road-rail interface impacts include:

- Road safety audits will be undertaken at level crossings pre and post construction, as well as post opening, in accordance with the Austroads guidelines
- Physical controls such as boom barrier gates and/or warning lights will be incorporated into the revised reference design at active level crossing locations on the Project alignment in accordance with the *Guide to Development in a Transport Environment: Rail* (DTMR, 2015), *Manual of Uniform Traffic Control Devices Part 7: Railway Crossings* (DTMR, 2019) and ARTC *Engineering Code of Practice – Level Crossings* (ARTC, 2023)
- Railway safety messages will be provided to the community through awareness activities, community engagement activities, and campaigns to increase public awareness regarding the Project.

#### 4.13.5.8 Traffic impact—Active travel

Chapter 20: Traffic, Transport and Access (Section 20.5) summarises the active travel impacts of the Project. Construction of the Project has the potential to result in the following impacts to existing cycle networks within the Project traffic, transport and access study area:

- Temporary diversion of cycling routes or pedestrian access, resulting in modified routes and increased journey times
- Increased vehicle movements on cycleway network linkages that are co-located with construction traffic routes for the Project, which may result in longer journey times and increased likelihood of interactions between cyclists and vehicles.

There are no other specific active travel impacts requiring mitigation occurring in the vicinity of the Whetstone MDC.

#### 4.13.5.9 Traffic impact—Emergency services

Chapter 20: Traffic, Transport and Access (Section 20.5) summarises the impacts to emergency services from the Project. The Project has the potential to result in the following during construction:

- Increased journey times on road linkages used by construction traffic
- Increased waiting time at intersections used by construction traffic
- Temporarily altered driving conditions in proximity to construction areas, such as reduced speed limits, mobile traffic lights and lane reconfigurations
- Reduced connectivity across the Project alignment, impacting accessibility during flooding and fires.

Such impacts have potential to result in increased response times for emergency services. There are no other specific impacts to emergency services requiring mitigation occurring in the vicinity of the Whetstone MDC.

The TMP will identify and include secondary/alternative construction routes, which can be used by construction traffic should a primary construction route be blocked by an accident or emergency situation. Where a suitable secondary route is not identified, the movement of construction vehicles will stop until suitable alternative routes are identified and agreed with the relevant road authority.

#### 4.13.5.10 Traffic impact—Bus routes

Chapter 20: Traffic, Transport and Access (Section 20.5) summarises the impacts to bus routes from the Project. There are no bus routes located within the Whetstone area. Table 4-8 outlines the impacts occurring on routes that carry Whetstone MDC-related construction traffic but no impacts are required to be mitigated.

**TABLE 4-8 POTENTIAL IMPACTS TO SCHOOL BUS SERVICES DUE TO UPGRADED OR NEW ROAD-RAIL INTERSECTION**

| School Bus Service | Potential Impact |
|---|---|
| YEL5 Yelarbon to Goondiwindi State High School | This bus route interfaces with construction traffic on the Cunningham Highway. It is expected that school bus services would not be substantially impacted from an operational and service reliability perspective as a result of Project-generated traffic during Project construction. The Department of Education will be consulted to identify a suitable solution should any Project impact on this service be anticipated. |
| GLE11 Glenoak Road to Goondiwindi State High School, connecting with P451 | This bus route interfaces with construction traffic on the Cunningham Highway. It is expected that school bus services would not be substantially impacted from an operational and service reliability perspective as a result of Project-generated traffic during Project construction. The Department of Education will be consulted to identify a suitable solution should any Project impact on this service be anticipated. |

### 4.13.6 Conclusion

The traffic, transport and access impact assessment presented in Chapter 20 and Appendix AA: Traffic Impact Assessment has been prepared to address Section 11.107 to 11.116 of the ToR and additional information requested by the Coordinator-General. In doing so, the assessment has evaluated a comprehensive range of issues encompassing potential impacts of the construction and operation stages of the Project on the surrounding transport infrastructure and its users.

Chapter 20: Traffic, Transport and Access and Appendix AA: Traffic Impact Assessment included potential traffic and pavement impact of the Whetstone MDC, including the movement of materials, workforce, and equipment during the construction stage of the Project on the surrounding road network.

The key findings of the traffic, transport and access impact assessment are summarised in Chapter 20: Traffic, Transport and Access (Section 20.7). The Whetstone MDC has been assessed as a part of the Project and contributes to these findings.

Responses to the revised reference design to potential traffic and transport issues have been detailed in Chapter 20: Traffic, Transport and Access (Section 20.6.1).

Where potential impacts to traffic and transport have not been fully avoided or mitigated through the revised reference design, additional mitigation measures have been nominated for implementation in future stages of the Project. These proposed mitigation measures have been detailed in Chapter 20: Traffic, Transport and Access (Section 20.6.2).

Design solutions for avoiding, minimising, or mitigating impacts have been incorporated into the revised reference design as appropriate and where possible. These are summarised in Chapter 20: Traffic, Transport and Access (Section 20.6.1) and address:

- Traffic
- Rail incidents as a result of development of the Project
- Road-rail interfaces
- Airport operation and infrastructure
- Access
- Stock routes
- Bridges.

Mitigation measures have been proposed for implementation in future stages of Project delivery (e.g. detailed design). Chapter 20: Traffic, Transport and Access (Section 20.6.2 and Table 20-51) identifies the relevant Project stage, the aspect to be managed and the proposed mitigation measure. Location-specific details of where each mitigation measure will be applied is provided in Appendix AA: Traffic Impact Assessment.

A TMP will be developed to limit impact to the public and asset owners by managing construction movements and deliveries during peak hours, and minimising construction staff traffic using shuttles and public transport.

## 4.14 Hazard and risk

### 4.14.1 Introduction

Assessment of the potential impacts of the Whetstone MDC on hazard and risk was undertaken as part of the broader Project and are reported in Chapter 14: Flooding and Geomorphology (see Appendix T1: Hydrology and Flooding Technical Report—Volume 1 and Appendix T2: Hydrology and Flooding Technical Report—Volume 2) and Chapter 21: Hazard and Risk. Legislation, policies and guidelines relevant to hazard and risks are detailed in Chapter 3: Legislation and Project Approvals Process and Chapter 21: Hazard and Risk.

### 4.14.2 Methodology

The hazards and risk assessment method for the Whetstone MDC involved:

- Reviewing the site establishment and material distribution activities of the Whetstone MDC
- Reviewing the existing climate data for the region, air quality assessment, and noise and vibration assessment for the existing site and the proposed Whetstone MDC
- Reviewing the SPP Interactive Mapping System bushfire and flood hazard overlay mapping
- Identifying hazards and risks from the Whetstone MDC and assessing the significance of potential impacts in the context of the Project
- Review mitigation measures for potential impacts presented in Chapter 21: Hazard and Risk with relevance to the Whetstone MDC.

### 4.14.3 Existing environment

Lot 352 on SP116434 has been identified as being on the EMR. Lot 2 on MH784, Lot 4 on MH287, Lot 76 on MH313 and Lot 74 on MH313 are not included on the EMR or the CLR (refer to Section 4.4).

The development footprint has been mostly cleared and is dominated by exotic grasses and weeds (refer to Section 4.6). The SPP mapping shows that the north and south of the development footprint is within medium potential bushfire intensity. In periods of reduced rainfall and increased temperatures, the threat of bushfire is highest. For southern Queensland, the peak period for bushfire to occur is in spring and early summer.

The development footprint is entirely within the ‘Flood hazard area—Local Government flood mapping area’ of the SPP mapping, as well as the flood hazard overlay map in the GRC Planning Scheme. Flooding of the development footprint has been modelled using hydrological and hydraulic models (refer to Appendix T1: Hydrology and Flooding Technical Report Volume I). The flooding assessment indicates the development footprint is located in a high-risk flood zone on the Macintyre Brook floodplain and starts to become inundated in the 10% AEP event. In a 1% AEP event the Whetstone MDC would be subject to flood depths over 1 m and, as per Flood Risk Management in Australia (AIDR, 2017) guidelines, is considered hazardous for vehicles and people, with potential for structural damage and failure to less robust building types (refer to Section 4.8).

The proposed access roads along with the connecting roads, Whetstone Access Road and Cunningham Highway, are predicted to be inundated with over 1 m of depth and a velocity multiplied by depth product > 0.6 $m^2/s$. These roads would be considered unsafe for people and vehicles and inaccessible during a 1% AEP event (refer to Section 4.8).

### 4.14.4 Potential impacts

The Whetstone MDC has the potential to impose hazards and risks onto people, property and the environment. The potential hazards and risks identified during site establishment and material distribution phases of the Whetstone MDC relate to damage to infrastructure, workers and the public from bushfire, from potential sources of ignition, e.g. welding (hot works); storage of hazardous material, flammable liquid, leaking plant and ignited cigarettes; damage to infrastructure and materials caused by flooding and storms; injury to workers from fatigue and heat stress, as a result of severe weather events and impacts to human health and the environment from disruption of contaminated land (Lot 352 on SP116434).

### 4.14.5 Conclusion

The risk assessment identified the potential impacts associated with the management of hazards and risks from the Whetstone MDC are considered to have a low to medium residual risk rating. The medium residual risk identified includes potential incidents relating to bushfire and flooding. Further details of ARTC's approach to implementing and maintaining safety practices is provided in Chapter 21: Hazard and Risk.

## 4.15 Waste management

### 4.15.1 Introduction

Assessment of the potential impacts of the Whetstone MDC on waste and resource management was undertaken as part of the broader Project and are reported in Chapter 22: Waste and Resource Management. This section considers the sources of waste likely to be generated during the site establishment and material distribution phases of the Whetstone MDC. This section has been informed by design documentation for the Whetstone MDC and waste management assessment undertaken for the Project. Legislation, policies and guidelines of relevance to waste are detailed in Chapter 3: Legislation and Project Approvals Process and Chapter 22: Waste and Resource Management.

### 4.15.2 Methodology

The assessment of potential impacts from waste management for the Whetstone MDC involved:

- Identifying existing waste facilities in proximity to the Whetstone MDC
- Identifying potential waste-generating activities and types of waste from the Whetstone MDC
- Classifying potential types of waste identified
- Identifying risks associated with waste management from the Whetstone MDC and assessing the significance of potential impacts in the context of the Project
- Review of mitigation measures for potential impacts in Chapter 22: Waste and Resource Management with relevance to the Whetstone MDC.

### 4.15.3 Existing environment

The following environmental values have been identified as being in proximity to the Whetstone MDC:

- Human receptors, including the workforce, landowners and communities in the area
- Environmental receptors, including the receiving natural environment (i.e. air, land and surface water)
- Commercial and industrial receptors, including existing land uses and waste facilities within a reasonable transportable distance of the Whetstone MDC.

The proximity of existing waste management facilities to the Whetstone MDC is based on commonly adopted haul route distances of 50 km for bulk waste and 15 km for municipal waste, as considered in Chapter 22: Waste Management. Details of the existing waste management facilities in proximity to the Whetstone MDC include Inglewood landfill, Goondiwindi transfer and landfill and E & E Waste facility described in Chapter 22: Waste and Resource Management.

Due to the anticipated spoil material deficit for the wider Project, it is a core principle of the design and construction planning for the Project that the offsite disposal of spoil material is avoided for the Whetstone MDC, where practicable. The principle of retaining spoil material onsite is reflected in Appendix AB: Draft Earthworks Strategy and Appendix J: Soil Assessment Report.

### 4.15.4 Waste-generating activities

Various waste materials will be generated from the Whetstone MDC during the site establishment and material distribution phases. The waste streams identified for the Whetstone MDC are indicative and estimated for the purpose of determining potential impacts and waste management options.

Waste streams expected to be generated during site establishment phase are detailed in Table 4-9.

**TABLE 4-9 WASTE STREAMS SITE ESTABLISHMENT**

| Waste Type | Waste Stream | Potential Reuse |
|---|---|---|
| **Vegetation** | Green waste | Yes, reused within MDC |
| **Topsoil** | C&D waste | Yes, reused within MDC |
| **Steel** | C&D waste | Yes, opportunities considered |

| Waste Type | Waste Stream | Potential Reuse |
|---|---|---|
| **Timber sleepers** | Regulated waste | Yes, opportunities considered |
| **Ballast** | Regulated waste | Yes, opportunities considered |
| **Occupying site offices** | General waste | No |
| **Concrete culverts** | C&D waste | Yes, opportunities considered |
| **Concrete (in situ)** | C&D waste | Yes, opportunities considered |
| **Oils, lubricants and greases** | Regulated waste | No |
| **Packaging** | General waste | Yes, opportunities considered |

Maintenance activities will be undertaken during the material distribution phase of the Whetstone MDC and typically include inspections of rail track, vegetation management and general asset upkeep. The material preparation, handling and distribution phase is anticipated to occur for a period of 36 months, following the completion of site establishment.

Waste streams expected to be generated during the material distribution phase are detailed in Table 4-10.

**TABLE 4-10 WASTE STREAMS MATERIAL PREPARATION, HANDLING AND DISTRIBUTION**

| Activity | Waste Type | Waste Stream |
|---|---|---|
| **Rail track replacement/upgrade** | Scrap metal | General waste (non-putrescible) |
| | Potentially contaminated waste | Regulated waste |
| **Vegetation management** | Green waste | General waste (non-putrescible) |
| **Infrastructure maintenance** | Waste paints and solvents | Regulated waste |
| **General upkeep** | Empty chemical containers | Regulated waste |
| **Maintenance of erosion and control devices and culverts** | Silt management | General waste (non-putrescible) |
| | Vegetative debris | General waste (non-putrescible) |

Waste storage areas will be located and managed to ensure that risks to the environment are avoided or minimised. Further information on waste storage is provided in Chapter 22: Waste and Resource Management.

### 4.15.5 Potential impacts

The waste generated during site establishment and material distribution phases of the Whetstone MDC may result in the following potential impacts:

- Waste disposal, additional to current levels, resulting in increased consumption of airspace and reduction of community access to waste facilities within the region
- Uncontrolled release of waste from the improper storage, or failure of management systems resulting in contamination of receiving environments (i.e. land, air and surface water)
- Increase in the incidence of vermin, insects and pests from the inappropriate storage and handling of putrescible wastes
- Reduced visual amenity of land uses adjacent to the Whetstone MDC
- Increased transportation of waste materials on and offsite, resulting in increased greenhouse gas emissions due to the combustion of hydrocarbons from the use of vehicles/plant
- Risks to human health and safety of site personnel, through the release of pollutants from the poor management of regulated wastes.

### 4.15.6 Conclusion

The risk assessment identified the potential impacts associated with the management of waste from the Whetstone MDC are considered to have a low residual risk rating. The key initial risks identified include the disposal of C&D waste to landfill (additional to current levels) and loss of containment of dangerous goods. Potential impacts associated with the management of waste during the site establishment and material distribution phases of the Whetstone MDC are outlined in Chapter 22: Waste and Resource Management.

In accordance with the Project, a hierarchical waste management approach will be implemented for the Whetstone MDC, from the most preferrable—avoidance, to the least preferrable—disposal. Further consultation with operators of landfills and waste-receival facilities in proximity to the Whetstone MDC will also be undertaken during detailed design to inform the assignment of waste disposal locations.

# 5. Conclusions and recommendations

The environmental assessment of the Whetstone MDC indicates that potential impacts to land use, land resources, visual amenity, flora and fauna, air quality, groundwater, social, cultural heritage, traffic, hazards and waste are relatively minor and can be mitigated through compliance with legislative requirements and implementation of standard mitigation measures identified in the respective revised draft EIS chapters; however, the potential impacts relating to surface water, flooding and noise will require further consideration prior to the establishment of the Whetstone MDC during the detailed design stage.

The key findings for each environmental aspect include:

- Potential impacts to land use and tenure from the Whetstone MDC during the site establishment and material distribution phases are associated with a temporary change in land use from rural/agricultural to construction activities including work site, material storage and laydown areas. These potential impacts are considered to have a low residual risk, due to the temporary nature of the Whetstone MDC. Furthermore, the facility will be progressively decommissioned once the Project is fully constructed. Land will be rehabilitated as agreed with the landowner.
- Potential impacts to land resources from the Whetstone MDC during the site establishment and material distribution phases of the Whetstone MDC are associated with the temporary reduction of available agricultural land, disturbance of contaminated land, and the potential creation of contaminated land from the unmitigated storage of chemicals and hazardous goods. These potential impacts are considered to have a low residual risk, due to the mitigation measures proposed in Chapter 9: Land Resources. Separate bunded areas for the onsite storage and handling of fuels, chemicals and hazardous goods will be provided, in accordance with Australian standards and kept in small volumes, wherever practicable. Spill response equipment and material will be made available onsite and in vehicles.
- Visually the site has been characterised as Dry Croplands and Pastures and has been identified as having a low sensitivity to change. Impacts associated with the Whetstone MDC development are anticipated to have up to a moderate temporary level of effect. One visual impact of up to a moderate level of effect has been identified relating to the site establishment, materials handling, and decommissioning. This moderate level of effect is associated with very close views of the Whetstone MDC experienced by receptors travelling along Whetstone Access Road (refer to Viewpoint 3 at Section 4.5.4).
- Ecological values validated within the development footprint include regrowth and non-remnant vegetation in degraded condition. Nonetheless, these communities support some habitat values and resources for flora and fauna species, potentially including listed threatened and migratory species. This includes potential animal breeding places for least concern, threatened and colonial breeding fauna. The Whetstone MDC avoids the more significant habitat within the development footprint, with no impacts proposed to the drainage feature that provides a potential connection to surrounding State forests. An assessment of significant impacts for species listed under the EPBC Act and NC Act within the Project is provided in Chapter 11: Flora and Fauna.
- Potential impacts to air quality during the site establishment and material distribution phases of the Whetstone MDC are associated with dust generation and emissions from combustion engines. These potential impacts are considered to have a low residual risk, due to implementation of mitigation measures outlined in Chapter 12: Air Quality. Controls will be implemented to further prevent or minimise dust generation during the site establishment phase, which may include the use of water on cleared land and unsealed roads, installation of barriers, installation of wheel wash stations, and stabilisation of disturbed areas and exposed surfaces, as soon as practicable.
- Potential impacts to surface water and hydrology during the site establishment and material distribution phases of the Whetstone MDC are associated with changes to water quality and chemistry, contamination of waterways and reduced water availability. These potential impacts are considered to have a low residual risk, due to implementation of mitigation measures outlined in Chapter 13: Surface Water and Chapter 14: Hydrology. A Stormwater Management Plan is proposed to be established for the facility prior to its establishment, with the use of the existing farm dam onsite to capture stormwater and allow for reuse.
- Potential impacts from flooding over the site are associated with reduction in floodplain function, increased surface water runoff quantities and reduced access and egress during a flood event. These potential impacts are considered to have a low residual risk, due to the low likelihood and duration of events and the temporary nature of the Whetstone MDC.
- Foundation works and supports will be provided at locations across the site, as required, to provide an appropriate level of flood immunity for office buildings, machinery, workshops and support facilities. Separate bunded areas will be provided for the onsite storage and handling of fuels, chemicals and hazardous goods in accordance with Australian standards.
- The design of the MDC will incorporate the results of updated hydrological investigations undertaken for the Project resulting in no interference with drainage features within the development footprint as a result of the Whetstone MDC.

- Potential impacts to groundwater during the site establishment and material distribution phases of the Whetstone MDC are associated with the contamination of groundwater resources from inadequate storage of chemicals and hazardous goods. These potential impacts are considered to have a low residual risk, due to implementation of mitigation measures outlined in Chapter 15: Groundwater.
- The Whetstone MDC has been incorporated into the construction noise and vibration assessment for the Project, as presented in Appendix V: Noise and Vibration Assessment—Construction and Road Traffic and Chapter 16: Noise and Vibration. Noise levels generated during the site establishment phase are predicted to exceed the construction noise limit. Site establishment works are recommended to be completed during standard hours, to minimise the potential noise impacts. With every activity at the Whetstone MDC occurring simultaneously, including activities in the laydown areas, a marginal exceedance (1 dB) is predicted at two sensitive receptors. The potential impacts will be managed through the mitigation measures outlined in Chapter 16: Noise and Vibration.
- Potential impacts to social aspects during the site establishment and material distribution phases of the Whetstone MDC are associated with the local character in areas near the development footprint and temporary influx of population to Inglewood. These potential impacts are considered to have a low to moderate residual risk. A qualitative assessment of the economic impacts associated with establishing the Whetstone MDC in Whetstone identified no prolonged disruption to existing agricultural land and businesses, tourism businesses, and local services and supply businesses within Whetstone and nearby towns.
- The desktop review indicated that there are no heritage sites recorded on local, State or federal heritage registers within the development footprint. The site of the Whetstone siding is located within the development footprint; however, no structures remain. The Whetstone MDC would have no change on the Whetstone siding.
- The Whetstone MDC has been incorporated into the traffic impact assessment for the Project and is provided in Appendix AA: Traffic Impact Assessment. The traffic impact assessment confirms that the Whetstone MDC will not impact on the safety or efficiency of the Cunningham Highway. Further, the use of rail to transport materials will reduce heavy vehicle movement on the road network that would have otherwise occurred during the construction of the Project.
- Potential hazards and risks from the Whetstone MDC during the site establishment and material distribution phases of the Whetstone MDC are predominantly associated with severe weather events and potential disruption of contaminated land. Flooding has been identified as a medium residual risk and will be considered further in the detailed design of the Whetstone MDC. A Flood Emergency Response Plan will be prepared to manage flood risk on persons, plant, and materials, prior to establishment of the facility.
- Potential impacts associated with the management of waste from the Whetstone MDC are associated with the disposal of C&D waste to landfill (additional to current levels) and loss of containment of dangerous goods. These potential impacts are considered to have a low residual risk, due to implementation of mitigation measures outlined in Chapter 22: Waster and Resource Management.

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# APPENDIX AE

Whetstone Material Distribution Centre:
Supporting Technical Information

# **Attachment A** Whetstone MDC landscape and visual impact assessment

**BORDER TO GOWRIE** REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT

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INLAND RAIL

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# 1 Introduction

## 1.1 Background and purpose of this report

This Landscape and Visual Impact Assessment (LVIA) has been prepared by LatStudios Pty Ltd (LatStudios) on behalf of Umwelt (Australia) Pty Ltd (Umwelt) for the Future Freight Joint Venture (FFJV) for the proposed Whetstone Material Distribution Centre (MDC) being developed by the Australian Rail Track Corporation Ltd (ARTC).

The Whetstone MDC will provide a facility that will allow for the rail transport, stockpiling and supply of materials required for the construction of the NSW/QLD Border to Gowrie (B2G) section of Inland Rail and is part of the construction delivery strategy for the Inland Rail Program.

## 1.2 Site location and context

### *1.2.1 Location*

The Whetstone MDC facility is located immediately adjacent to the rail alignment for the B2G Project. The B2G Project consists of 149.48 km of new rail corridor (greenfield) and 68.01 km of existing open access rail corridor (brownfield) between the NSW/QLD border and Gowrie, in Queensland.

The Whetstone MDC is located approximately 18 km south-west of Inglewood and 59 km east of Goondiwindi within the Goondiwindi Regional Council local government area (LGA) as shown on Figure 1: Whetstone MDC site and  is described as Lot 2 MH784 (part).

The site is approximately 213 ha in area. It is bounded by Queensland Rail's (QR) existing South Western System Railway Line to the north and has road access to and from the Cunningham Highway, which is located to the south of the site, via the Whetstone Access Road, a local government-controlled road.

The temporary construction footprint includes sections of the Whetstone Access Road and an unformed road reserve that runs parallel to the existing rail corridor, both of which will provide site access and will need to be maintained for the duration of the construction of the B2G Project. The footprint also includes a section of the Cunningham Highway that may be impacted by upgrades to the Cunningham Highway/Whetstone Access Road intersection.

### *1.2.2 Phasing*

A concept layout for the Whetstone MDC is shown on Figure 1: Whetstone MDC site and layout in Appendix 1.

The Project comprises two phases:

- Site establishment phase: this comprises activities to establish and prepare the MDC (estimated to be for a duration of 12 months)
- Materials preparation, handling and distribution: this phase comprises activities for materials preparation, handling and distribution that will occur at or are supported by the MDC site to facilitate the construction of the B2G Project (estimated to be for a duration of 36 months).

Once the B2G Project is fully constructed, the need for the Whetstone MDC will no longer exist and the site will be decommissioned. It is anticipated that the land will be returned to the landowner in accordance with the requirements of agreement with ARTC.

## 1.3 Key elements of Whetstone MDC relevant to LVIA

The elements of the Whetstone MDC that are relevant to the LVIA include the:

- Site establishment works (including earthworks, drainage, construction of internal rail tracks), as described in more detail in Section 6.1.1
- Construction activities (including delivery of materials, stockpiling of materials, flash butt welding and ballast management), as described in Section 6.1.2
- Presence of workers on site, as described in Section 6.1.3
- Hours of operation, which include night-time works, as described in Section 6.1.4
- Provision of workers' temporary accommodation, as described in Section 6.1.5
- Haulage of materials to and from the site, as described in Section 6.1.6
- Duration of the MDC facility is anticipated to be 36 months, as described in Section 6.1.7
- Process of decommissioning the facility upon completion of the B2G Project, as described in Section 6.1.8.

# 2 Scope of report

## 2.1 Objectives of the LVIA

The purpose of the LVIA is to:

- Describe the existing landscape character and environment, including key natural landscape features, major views, view sheds and outlooks that contribute to the amenity of the area associated with the Whetstone MDC.
- Describe the visual impact associated with the site establishment and materials preparation, handling and distribution phases of the Whetstone MDC.
- Address any applicable policy outcomes regarding regional landscape values and scenic amenity in the *Darling Downs Regional Plan 2013*.

## 2.2 Limitations of this report

This LVIA seeks to identify potential landscape and visual amenity issues associated with the concept design for the Whetstone MDC. Limitations of this review include:

- This review has been based on the review of the concept layout for the Whetstone MDC, and other relevant information.
- No detailed review has been undertaken of background reports that have informed the development of the concept design.
- No qualitative or obtrusive lighting assessment has been made of potential amenity impacts due to night lighting and lighting associated with construction activities on local receptors associated with the Whetstone MDC.
- No assessment of residual impacts has been made (i.e. application of mitigation measures).

# 3 Legislation, policies, standards and guidelines

The purpose of this section is to identify and discuss the relevance of legislative or policy level objectives and standards that exist to protect or manage the landscape and visual values in the context of the Whetstone MDC. Further details on the relevant legislation and policy applicable to the B2G Project are provided in Appendix K: Landscape and Visual Impact Assessment (Section 3: Legislation, polices, standards and guidelines). Relevant guidelines that have informed the LVIA methodology used for this assessment are discussed in Appendix K: Landscape and Visual Impact Assessment (Section 4: Methodology).

Legislation, policies and standards that have been considered in this LVIA are described in the sections below and, where applicable, shown on Figure 2.

## 3.1 National

The national regulatory context for landscape and visual impact assessment practice and policy is summarised in Table 1.

***Table 1: Regulatory context – national***

| Policy or guideline | Relevance to the Project |
|---|---|
| ***AS4970-2009: Protection of Trees on Development Sites (2009)*** | • This Standard provides guidance on the principles for protecting trees on land subject to development. Where development is to occur, the Standard provides guidance on how to decide which trees are appropriate for retention, and on the means of protecting those trees during construction work. |

## 3.2 Regional

The site is located within the Darling Downs regional planning area, and the relevant provisions of the *Darling Downs Regional Plan* (2013) are summarised in Table 2.

***Table 2: Regulatory context – Queensland State and regional***

| Policy or guideline | Relevance to the Whetstone MDC |
|---|---|
| ***Darling Downs Regional Plan (2013)***<br><br>The *Darling Downs Regional Plan 2013* provides strategic direction and policies to deliver regional outcomes which align with the state's interests in planning and development. It is focussed on delivering regional policy aimed at achieving specific regional outcomes. | • The Whetstone MDC is located within the Darling Downs Region, of which the Darling Downs Regional Plan applies as the relevant statutory regional plan.<br>• Key regional policies are to protect Priority Agricultural Land Uses while supporting co-existence opportunities for the resources sector and provide certainty for the future of towns in the region.<br>• The Plan states the importance of the regional landscape values stating "*the region has some of the state's best assets, with high value scenic and natural amenity, vibrant towns and strong communities underpinned by a diverse range of cultural values. The region encompasses a variety of regional landscapes, including urban and rural holdings, agricultural production, resource and mine sites, and protected areas.*"<br>• The Plan addresses the increasing importance of the region for tourism noting increasing growth with visitors coming to experience scenic, natural, cultural and heritage attractions. |

| Policy or guideline | Relevance to the Whetstone MDC |
|---|---|
| | • The plan also emphasises the importance of the region for freight connectivity, noting the eastern Darling Downs is at the junction of several strategic highways and railway lines and is the major transport and service hub of the region. This area facilitates the movement of goods and resources between Queensland's south-east and west, enabling access to domestic and international markets through the strategic port facilities along the east coast. The plan also notes that the eastern area of the Darling Downs region contains the region's largest population centre, Toowoomba—the largest non-capital inland city within Australia.<br>• The Plan highlights the balanced approach that needs to be taken to managing the environmental, community and economic values of the Darling Downs. |

## 3.3 Local

The Whetstone MDC is located within the Goondiwindi Regional Council LGA, and therefore the relevant provisions of the *Goondiwindi Region Planning Scheme* (2016) have been considered and are described in Table 3.

***Table 3: Regulatory Context – Queensland Local***

| Policy or guideline | Relevance to the Project |
|---|---|
| ***Goondiwindi Regional Council Planning Scheme 2016***<br><br>The scheme divides the area into zones with associated codes. | • The *Goondiwindi Regional Planning Scheme* is the primary planning document for land located within the Goondiwindi Regional Council LGA. While the planning scheme does not apply to the Whetstone MDC, it is relevant to consider its provisions in terms of landscape and visual amenity.<br>• The Whetstone MDC is situated in the Rural Zone within the Horticulture 1precinct.<br>• Part 3, Strategic Framework includes the following specific outcomes that reference amenity and rural landscape as follows:<br>• 3.6.1 Community Identity<br>(v) The unique identity of the towns of the Goondiwindi Region is recognised and strengthened through appropriate development outcomes that protect and enhance the character of the town centres, heritage places and, more generally, the scenic amenity values of the rural landscape that provide the settings for these towns.<br>• 3.6.2.1 Town Character Specific Outcomes<br>(a) The traditional town character integral to the identity of Goondiwindi Region is preserved and promoted through development that maintains the unique built form character and identity of each town centre; and<br>(b) The dominance of natural landforms and open space in the Rural Area identified on Strategic Framework Map 1—Settlement Pattern and associated landscape and scenic amenity values that provide the setting for the towns are maintained. |

| Policy or guideline | Relevance to the Project |
|---|---|
| | • Section 3.6.6.1 of the planning scheme outlines specific outcomes relating to Scenic Amenity and Regional Landscape Character requiring protection of the productive use of rural land and the dominance of natural landforms and open space over built form in rural areas.<br>• Section 3.8.4.1 of the planning scheme outlines specific outcomes for the rail network, requiring it is protected from development, including that which has the potential to generate reverse amenity impacts;<br>• Section 6.2.9.2 Purpose and Overall outcomes for Rural Zone areas includes provisions for amenity and rural landscape as follows:<br>…I a general low rise and low intensity scale of development is maintained consistent with the predominant rural character of the zone and visual prominence of environmental and landscape features in the rural landscape;…<br>(f) the viability of rural activities, are protected from the encroachment of incompatible development such as sensitive land uses;<br>(g) uses other than rural activities are located in the Rural zone only where those uses:<br>(i) do not impact adversely on the amenity of the Rural zone;<br>(ii) have a demonstrated need to co-locate with rural activities or natural or cultural resource.<br>(v) protect the landscape values and scenic amenity of the Rural zone. |

# 4 Methodology

The methodology and approaches used in this LVIA are in accordance with the LVIA methodology developed and used for other components of the B2G Project (Appendix K: Landscape and Visual Impact Assessment of the revised draft EIS), which has in turn been developed with reference to guidelines and techniques used in Australia and internationally.

## 4.1 LVIA impact assessment area

An impact assessment area has been defined for the LVIA of the Whetstone MDC and is shown in Figure 2: LVIA impact assessment area and landscape planning . The purpose of the LVIA impact assessment area is to establish the area within which the Whetstone MDC has potential to influence landscape and/or visual values and receptors. The LVIA impact assessment area is a 2.5 km offset from the site boundary; a distance derived from fieldwork.

The extent of the LVIA impact assessment area has been determined based on:

- Assumptions regarding the likely extent of visibility of the Whetstone MDC based on desktop review, which is limited by the extent of vegetation within the area, including that associated with Whetstone State Forest and Macintyre Brook.
- The concept design for the Whetstone MDC
- Confirmation during the field survey stage of the visibility of the Whetstone MDC from viewpoints proximal to the site.

On the basis of these inputs, it is considered likely that visual receptors located beyond the boundary of the 2.5 km LVIA impact assessment area will not be able to obtain clear views of the Whetstone MDC.

# 5 Description of existing landscape and visual amenity values

## 5.1 Regional landscape context

The existing regional landscape context of the B2G Project and site is described in detail in the B2G EIS Appendix K: Landscape and Visual Impact Assessment (Section 5: Description of existing landscape and visual amenity values).

## 5.2 Site context

The Whetstone MDC is located between Yelarbon and Inglewood on a level plain immediately to the north of the Cunningham Highway and Macintyre Brook, as shown on Figure 1 and Figure 3 in Appendix 1 of this report.

The site has been extensively cleared for rural land uses, and vegetation within the site boundary is limited to small isolated pockets adjacent the Cunningham Highway, near the site entrance and scattered trees within the site's interior. An olive plantation is located to the southwest of the site, and limits views from parts of the Cunningham Highway.

The landscape surrounding Macintyre Brook is relatively flat and homogenous and riparian vegetation along Macintyre Brook restricts open views from isolated rural receptors located to the south and southeast of the Whetstone MDC.

To the north and northwest, the site is bounded by QR's existing South Western System railway, densely forested areas within Whetstone State Forest and private rural land holdings. Views from within these areas, including isolated rural properties and parts of Whetstone Access Road north of the railway are typically limited due to the density of vegetation.

### *5.2.1 Regional and local landscape values*

Landscapes within the LVIA impact assessment area have not been subject to detailed independent scenic amenity studies (for example undertaken by Goondiwindi Regional Council) and, as a consequence, no regional or local scenic amenity mapping is available for the area. However, the value of rural landscapes is supported by the Goondiwindi Regional Council Planning Scheme which outlines specific outcomes relating to Scenic Amenity and Regional Landscape Character requiring protection of the productive use of rural land and the dominance of natural landforms and open space over built form in rural areas.

## 5.3 Landscape character baseline

Twelve LCTs have been identified within the landscape character assessment for the B2G Project, as summarised in Table 4, and shown on Figure 7 of Appendix K: Landscape and Visual Impact Assessment.

No parts of LCT A: Vegetated Watercourses – Rivers, LCT E: Vegetated Grazing, LCT F: Rural Settlement, LCT G: Rural Living, LCT H: Forested Uplands or LCT I: Settled Hills occur within the LVIA impact assessment area, and therefore these LCTs have not been discussed further in this LVIA.

Parts of LCT B Vegetated Watercourses – Creeks and Channels, LCT C: Irrigated Croplands, LCT D: Dry Croplands and Pastures and LCT J: Forested Hills and Plains occur within the LVIA impact assessment area for the Whetstone MDC and are described in Table 4.

***Table 4: Landscape Character Types and Areas***

| Landscape Character Type (LCT) | Associated Landscape Character Areas (LCAs) |
|---|---|
| LCT B: Vegetated Watercourses – Creeks and Channels | • Macintyre Brook Vegetated Watercourse (LCA B33)<br>• Catfish Creek Vegetated Watercourse (LCA B34). |
| LCT C: Irrigated Croplands | • Whetstone Irrigated Croplands (LCA C47)<br>• Wondalli Creek North Irrigated Croplands (LCA C48)<br>• Macintyre Brook North Irrigated Croplands (LCA C49) |
| LCT D: Dry Croplands and Pastures | • Yelarbon Dry Croplands and Pastures (LCA D26)<br>• Whetstone East Dry Croplands and Pastures (LCA D28)<br>• Catfish Creek Dry Croplands and Pastures (LCA D29)<br>• Macintyre Brook Dry Croplands and Pastures (LCA D30) |
| LCT J: Forested Hills and Plains | • Bringalily State Forest West (LCA J10)<br>• Yelarbon State Forest South (LCA J14) |

## 5.4 Visual assessment baseline

### *5.4.1 Visual audiences and receptors*

A number of visual receptor audiences were assessed to have the potential to be affected by the Whetstone MDC including:

- Local residents and workers on rural properties
- Travellers on main and local roads
- Recreational users of the landscape, particularly those visiting State forests in the area, which have no formal recreation facilities, however, provide opportunities for informal nature-based recreation experiences.

### *5.4.2 Viewpoint selection*

Representative views from a range of visual audiences anticipated to be impacted by the Whetstone MDC are assessed in detail in Section 8.1.

Views from rural properties within the LVIA impact assessment area are considered to be limited due to the presence of existing vegetation that restricts visibility towards the Whetstone MDC from permanent dwelling locations. However, representative views from the Cunningham Highway and Whetstone Access Road are considered to represent views experienced by local rural residents travelling to their properties.

Other roads within the LVIA impact assessment area are unlikely to be affected due to distance from the site, local variations in topography and presence of screening vegetation, so views from these roads have not been included. These include Bosnjaks Road, Tominsons Road and Loupals Road (which provides private property access only).

Views experienced by visitors accessing Whetstone State Forest via Whetstone Access Road have been considered. However, due to the density of vegetation and lack of recreational facilities no formal viewpoint assessment has been provided from within Whetstone State Forest.

The identified assessment viewpoints are shown on Figure 5 and are summarised in Table 5.

***Table 5: Viewpoint selection***

| Viewpoint name | Anticipated approximate distance to alignment | Key visual receptors |
|---|---|---|
| Viewpoint 1: View from Whetstone Rest Area on the Cunningham Highway | Proposed site boundary is approximately 5 m northeast of this viewpoint, and the nearest proposed infrastructure within the site (materials laydown area) is approximately 650 m north of this location. | Represents typical and accessible views of those travelling along the Cunningham Highway, as well as those stopping at the rest area.<br>Also considered representative of views experienced by nearby residential receptors accessing their rural properties. |
| Viewpoint 2: View from Whetstone Access Road near Cunningham Highway | Viewpoint is located within the proposed site boundary, as Whetstone Access Road provides access to the site. The nearest proposed infrastructure within the site is approximately 275 m northwest of this location (drain). | Represents typical and accessible views of those travelling along the Whetstone Access Road, which provides access to Whetstone State Forest and nearby rural properties. |
| Viewpoint 3: View from Whetstone Access Road near the South Western Line railway | Proposed viewpoint is situated just within the site boundary, approximately 25 m from the site entry. The workshop is approximately 275 m southwest of this location. | Represents typical and accessible views of those travelling along the Whetstone Access Road, which provides access to Whetstone State Forest.<br>Also considered representative of views experienced by nearby residential receptors accessing their rural properties, noting that views from these properties are anticipated to be limited due to existing vegetation. |

# 6 Potential impacts

## 6.1 Key sources of potential landscape and visual impact

Impacts are considered during site establishment and the operation of the Whetstone MDC (i.e. for the duration of the construction of the B2G Project). Key potential impacts are described below.

### *6.1.1 Site establishment*

The establishment phase will include the following construction activities:

- Earthworks utilising site won and imported material
- Establishment of site drainage works, as required
- Rolling stock provisioning and maintenance facilities (concrete hardstand and containers with shade)
- Construction of:
    - internal rail tracks and supporting infrastructure to service material handling activities,
    - hardstand areas for material stockpiling,
    - rolling stock maintenance facilities (concrete hard stand and containers with shade),
    - gantries for rail logistic management,
    - ballast unloading facilities,
    - a rail welding facility and generators,
    - a workshop,
    - internal access roads,
    - a site office and facilities (located in an optimised position which falls within lower flood depth areas), and
    - temporary ablution facilities.
- Perimeter fencing to prevent livestock access (likely to be barbed wire in keeping with the rural landscape).

### *6.1.2 Materials preparation, handling and distribution (construction activities)*

Primary on-site activities during the construction of the B2G Project will include:

- Rail management and onsite flash butt welding, comprising:
    - The delivery of 27.5 m length steel rail to site by train
    - Fixed gantries to unload the rail and stockpile onsite
    - 27.5 m length rail that will be flash butt welded into 330m rail strings and ground in preparation for construction
    - Long-Welded Rail strings will be stockpiled onsite using fixed gantries until ready for use
    - Transportation of rail strings from the Whetstone MDC, by train, to the construction front as required.
- Management of sleepers:
    - Sleepers will be delivered to the site by train from Rockhampton and Wagga Wagga
    - Sleepers will be unloaded from the train by gantry and stockpiled onsite at the Whetstone MDC
    - Sleepers will be reloaded onto a train at the Whetstone MDC and transported to the construction front, as required.
- Management of ballast:
    - Ballast material will be delivered by train to the Whetstone MDC and stockpiled onsite
    - Ballast material will be reloaded into a ballast train at the Whetstone MDC (refer Section 6.1.6: Haulage and traffic for details) with loaders and transported to the construction site as required.

- Storage and maintenance of plant and materials:
    - The delivery and stockpiling of other material and equipment by road and rail
    - Materials to include precast concrete (for bridges and culverts), communications, signalling and turnout equipment and additional demountable site offices.

- Potential inclusion of noise barriers surrounding key noise sources (subject to future detailed design and noise modelling).

### *6.1.3 Workforce*

It is estimated that the workforce requirement for the site establishment phase will be 55 on-site full-time equivalent workers. During the materials preparation, handling and distribution phase, the size of the on-site workforce will increase to 76 full-time equivalent workers for the duration of the construction of the B2G Project.

### *6.1.4 Accommodation*

A purpose-built non-resident workers accommodation camp is proposed near Inglewood to facilitate the construction of the B2G Project. Construction of the accommodation camp will be completed prior to the commencement of site establishment works for the Whetstone MDC and will be available for use by the Whetstone MDC workforce. Potential impacts associated with temporary accommodation camps are addressed in Appendix K: Landscape and Visual Impact Assessment.

### *6.1.5 Haulage and traffic*

Materials to be used for the Whetstone MDC will be transported to site by rail (via the South Western System Railway Line and B2G rail siding) and by road (Cunningham Highway and the Whetstone Access Road). Materials will include:

- Earthwork materials (capping, structural fill and ballast) by trucks from Inglewood Quarry
- 27.5 m length steel rail to site by train
- Sleepers by train from Rockhampton and Wagga Wagga
- Precast concrete (for bridges and culverts) by road and rail
- Communications, signalling and turnout equipment from the manufacturer
- Additional demountable site offices by road.

The desire to use rail for material distribution during construction of the B2G Project has been a key influence on the location and design of the Whetstone MDC (adjacent to the existing rail corridor). It is currently estimated that on average, up to two trains will arrive at the Whetstone MDC per day for the duration of construction of the B2G Project. The bulk of the deliveries will be rail sleepers and ballast.

With respect to road vehicle usage, average daily vehicle usage associated with activities has been estimated at:

- 38 light vehicles (LV) per day (for an estimated 55 construction workers) from various locations during the site establishment phase, increasing to 50 LV (for an estimated 75 construction workers) travelling to and from the Inglewood Camp during the materials preparation, handling and distribution phase of the Whetstone MDC
- 19 heavy vehicles (HV) per day from various locations, including the transport of ballast material from Inglewood Quarry.

### *6.1.6 Schedule*

Site establishment activities are anticipated to take 12 months. The materials preparation, handling and distribution phase of the Whetstone MDC is anticipated to last for a duration of 36 months.

### *6.1.7 Decommissioning*

Once the B2G Project is fully constructed, the need for the Whetstone MDC will no longer exist and the site can be decommissioned. A decommissioning strategy will be developed prior to commencement of decommissioning works. The decommissioning strategy will inform the preparation of location and strategy specific management plans with all work to be undertaken in accordance with the management plans and with relevant ARTC policies, forms and procedures.

It is therefore assumed for the purposes of this LVIA, that the site will be returned to the landowner in accordance with the requirements of the agreement with ARTC.

# 7 Landscape impact assessment

## 7.1 Landscape character impact assessment

As shown on Figure 4, the Whetstone MDC is located within the following LCT which has been assessed below:

- LCT D: Dry Croplands and Pastures.

Three other LCTs are present in the wider LVIA impact assessment area and are described in full in the Appendix K of the B2G revised draft EIS, however, are not directly impacted by the Whetstone MDC and therefore any impacts on these LCTs would be indirect. As such, potential impacts on the following LCTs have not been assessed in detail:

- LCT B: Vegetated Watercourses - Creeks and Channels (low sensitivity as described in Appendix K)
- LCT C: Irrigated Croplands (low sensitivity as described in Appendix K)
- LCT J: Forested Hills and Plains (moderate sensitivity as described in Appendix K)

It is noted that construction impacts on landscape character are temporary and relate to things like removal of vegetation. The assessment presented below is a combined assessment of impacts during both site establishment and materials preparation, handling and distribution phases, reflecting elements removed or disturbed during site establishment works as well as the introduction of infrastructure associated with material distribution from the Whetstone MDC for the construction of the B2G Project. These impacts, whilst temporal, will affect the perception and character of the landscape over the short to medium term (i.e. for approximately four years).

Potential impacts on LCT D: Dry Croplands and Pastures are described in Table 6. Table 6 also assesses the likely sensitivity of LCT D: Dry Croplands and Pastures in relation to the Whetstone MDC and provides a preliminary indication of the likely magnitude of change and consequent likely significance of that effect on landscape amenity.

The description of LCT D: Dry Croplands and Pastures prepared for and presented in Appendix K of the B2G revised draft EIS has been updated to reflect the local characteristics present within the LVIA impact assessment area for the Whetstone MDC.

### *7.1.1 Landscape Character Type D*

***Table 6: Landscape impact assessment of LCT D: Dry Croplands and Pastures***

| **Type D: Dry Croplands and Pastures** | |
|---|---|
| **Landscape Baseline Assessment** | |
| Location and boundaries | This landscape occurs across the LVIA impact assessment area and is largely defined by extensively cleared, open rural properties utilised for agriculture and livestock production. Within the vicinity of the Whetstone MDC, the landscape is typically flatter and prone to flooding, whilst elsewhere throughout the B2G Project LVIA IAA, the landscape is more undulating.<br><br>There are 44 LCAs of this type identified in the landscape character assessment of the B2G Project (refer Section 7: Landscape Impact Assessment of Appendix K: Landscape and Visual Impact Assessment). Four of these LCAs occur within in the Whetstone MDC LVIA impact assessment area:<br>• *Yelarbon Dry Croplands and Pastures (LCA D26)*<br>• *Whetstone East Dry Croplands and Pastures (LCA D28)*<br>• *Catfish Creek Dry Croplands and Pastures (LCA D29)*<br>• *Macintyre Brook Dry Croplands and Pastures (LCA D30).* |

<table>
<tr><th colspan="3">Type D: Dry Croplands and Pastures</th></tr>
<tr><td colspan="3">Typical character images:</td></tr>
<tr><td>  <br>View across the site from Whetstone Access Road</td><td>  <br>Existing vegetation adjacent to the site boundary</td><td>  <br>View towards the site from Whetstone Access Road</td></tr>
<tr><td>  <br>View across the site from the Cunningham Highway towards Whetstone State Forest</td><td>  <br>View across the site from the access road adjacent to the South Western System Railway</td><td>  <br>View along Whetstone Access Road near intersection with the Cunningham Highway</td></tr>
<tr><td>Key characteristics</td><td colspan="2">• The landscape is typically found on the undulating, poorer foothills of the LVIA impact assessment area surrounding the low-lying alluvial floodplains (LCT C – Irrigated Croplands).<br>• Soils within the LVIA impact assessment area typically comprise dermosols (which occur within the site), sodosols and chromosols whilst localised areas of kandosols and tenosols also occur.<br>• Land use within the LVIA impact assessment area varies and is dominated by rural land uses (including dryland and irrigated cropping/horticulture and pastoral properties for livestock production) whilst Whetstone State Forest and other rural land holdings support significant tracts of vegetation.<br>• Other vegetation comprises native roadside shelter belts and riparian vegetation associated with creek lines, including Macintyre Brook.<br>• Views to vegetated hills and peaks associated with LCT J – Forested Hills and Plains provided a forested backdrop to this LCT.<br>• Transport corridors are typically straight in character reflecting the flat topography, with subtle curves associated with topographic variation, which connect the key settlements and rural properties. State-controlled roads are sealed but other roads are typically unsealed gravel.<br>• Generally this LCT has an open and exposed character with long distant views and strong skylines, except where views are contained by vegetation.<br>• LCT D is a sparsely settled landscape, with scattered homesteads. Farmsteads are typically located on gently elevated areas surrounding the site and are typically screened by vegetation.<br>• Harmonious but fairly typical rural character, which is valued at a local level by local communities and visitors.</td></tr>
<tr><td>Precedent modifications and infrastructure elements</td><td colspan="2">• Highly modified for agricultural practices, including clearing and levelling of land for cultivation of arable farmland and pastures for grazing.<br>• Construction of roads, railways and bridges.<br>• Telecommunication infrastructure including telegraph poles.</td></tr>
</table>

| **Type D: Dry Croplands and Pastures** | |
|---|---|
| Landscape character sensitivity assessment | • This LCT is predominantly visually open, with a sparsely settled rural character and little large-scale infrastructure. It has long distant views and strong skylines.<br>• Roadside shelter belts and riparian vegetation provides some screening – which is particularly evident adjacent to Macintyre Brook.<br>• No part of this LCT within the LVIA impact assessment area is considered to have high scenic amenity value in a LGA planning scheme.<br>• Overall, due to the simple character of the landscape and local value of the landscape, which is not protected in any planning scheme, the overall inherent sensitivity is considered to be ***Low***. |
| **Impact Assessment** | |
| Magnitude of change assessment | • The primary impact will be on private land where new temporary infrastructure associated with the Whetstone MDC is being introduced.<br>• Parts of LCA D28 would be directly affected, whilst other impacts on LCAs within the LVIA impact assessment area will be indirect.<br>• The Whetstone MDC will be introducing new infrastructure into what is a largely modified rural environment.<br>• Impacts within this LCT during site establishment and construction will be due to localised vegetation removal, earthworks and the provision of rail infrastructure, internal access roads, hardstand areas, gantries, site offices and facilities and other ancillary infrastructure associated with the Whetstone MDC.<br>• Whilst it is noted that these impacts are temporary and associated with the site establishment and materials preparation, handling and distribution to support the construction of the B2G Project, it is acknowledged that these impacts are anticipated to occur over a period of four years. Therefore, these impacts are considered to be short to medium term.<br>• Overall, therefore, the impact on this LCT due to the Whetstone MDC is considered to be up to ***Moderate***.<br>• In addition, it is noted that the site will be decommissioned and will be returned to the landowner in accordance with the requirements of the agreement with ARTC. |
| Potential effect | • The effect of the Whetstone MDC on LCT D: Dry Croplands and Pastures (LCA D28) is ***Low*** during site establishment and construction.<br>• All other impacts on this LCT due to the Whetstone MDC are indirect.<br>• It is acknowledged that the Whetstone MDC will be decommissioned once the B2G Project is fully constructed, and therefore, the impacts on LCT D: Dry Croplands and Pastures (LCA D28) are considered to be largely reversible. |

# 8 Visual impact assessment

## 8.1 Viewpoint assessment

The impact of the Whetstone MDC on selected receptors, illustrating the effects of actual ground conditions on visibility, is described below. This includes an assessment of the impact on selected representative viewpoints during site establishment and materials preparation, handling and distribution phases. Refer to Appendix 2 for full sized and annotated images.

### *8.1.1 Viewpoint 1*

***Table 7: Likely visual effect of the Whetstone MDC on Viewpoint 1***

| **VP1: View from Whetstone Rest Area on the Cunningham Highway** | |
|---|---|
| **Visual baseline assessment** | |
|  <br>**Contextual view from Viewpoint 1**<br>*Refer to Figure 6 in Appendix 2 for full sized image.*<br>  <br>**Existing view (approximately 75 degree horizontal field of view) from Viewpoint 1**<br>*Refer to Figure 6 in Appendix 2 for full sized image.* | |
| Location and description | • GPS Location: 28°30'55.44" S 150°55'1.698" E<br>• Elevation: 255.0 m<br>• Northerly view across site towards Whetstone State Forest from the Cunningham Highway near the Whetstone Rest Area.<br>• Proposed site boundary is approximately 5 m northeast of this viewpoint, and the nearest proposed infrastructure within the site (materials laydown area) is approximately 650 m north of this location.<br>• Represents typical and accessible views of those travelling along the Cunningham Highway, as well as those stopping at the rest area.<br>• Also considered representative of views experienced by nearby residential receptors accessing their rural properties.<br>• Northerly views from this point provide open views towards the site, the existing railway line (approximately 990 m away at its closest point) and landscapes typical of LCT D: Dry Croplands and Pastures (D28: Whetstone East) and LCT J: Forested Hills and Plains (J10: Bringalily West). |

| **VP1: View from Whetstone Rest Area on the Cunningham Highway** | |
|---|---|
| Key visual sensitivities | • Receptors include isolated rural residents, workers and travellers experiencing transient views at speed along the Cunningham Highway (Annual Average Daily Traffic (AADT) around 1,538 per day, of which up to 43.74 per cent are heavy vehicles) as well as drivers utilising rest stop facilities.<br>• This viewpoint is not located on or near any tourist drives.<br>• The presence of existing infrastructure road infrastructure and the nearby railway line reduces the overall sensitivity of this view.<br>• Overall, this viewpoint is considered to have a ***Low*** sensitivity to the change proposed, due to the small number of isolated rural properties near this viewpoint, and the relatively low interest of travellers passing at some speed along the Cunningham Highway, who are the primary visual audience in this location. |
| ***Visual evaluation*** | |
|  <br>**Visualisation (approximately 75 degree horizontal field of view) from Viewpoint 1**<br>*Refer to Figure 6 in Appendix 2 for full sized image.* | |
| ***Site establishment and construction*** | |
| Magnitude of change assessment | The Whetstone MDC is anticipated to be clearly perceptible from this location, the nearby Whetstone Rest Area and other parts of the Cunningham Highway where it is adjacent to the site, due to the following factors:<br><br>• Presence of plant undertaking site establishment works and constructing the Whetstone MDC facility for a period of 12 months.<br>• Presence of the Whetstone MDC facility (including materials stockpiles) and ancillary infrastructure. While the site boundary is immediately adjacent to the Cunningham Highway, proposed facilities are located approximately 650 m from the Cunningham Highway at their nearest point.<br>• Transient views towards train movements delivering materials to the Whetstone MDC (anticipated to occur on average twice a day) and transporting materials to the construction fronts, as required. Trains will be evident on rail tracks within and sidings within the site and on the broader rail network.<br>• Transient views towards vehicle movements on internal access roads and on the nearby public road network. This includes heavy vehicles delivering material to the site (assumed to be 19 vehicles per day) and workers travelling to and around the site (assumed to be up to 50 light vehicles per day during the materials preparation, handling and distribution phase).<br>• Localised vegetation clearing during site establishment is considered to have negligible impact upon the extent of screening vegetation due to the limited extent of vegetation within the site boundary. |

| VP1: View from Whetstone Rest Area on the Cunningham Highway | |
|---|---|
| | This temporary, short to medium term impact represents a ***Moderate*** magnitude of change.<br><br>It is also noted that a small section of the Cunningham Highway at the intersection of Whetstone Access Road (not clearly evident in this view) will be upgraded to facilitate safe access to the Whetstone MDC. However, due to the localised footprint of these road works, it is considered that this would have a negligible influence on the magnitude of change. |
| Potential effect | The effect on VP1 due to the provision of the Whetstone MDC is considered to be ***Low***.<br><br>It is noted that once the Whetstone MDC is decommissioned (when the B2G Project is fully constructed), the land will be returned to the landowner in accordance with the requirements of the agreement with ARTC. |

### *8.1.2 Viewpoint 2*

***Table 8: Likely visual effect of the Whetstone MDC on Viewpoint 2***

| VP2: View from Whetstone Access Road near Cunningham Highway | |
|---|---|
| **Visual baseline assessment** | |
|  <br>**Contextual view from Viewpoint 2**<br>*Refer to Figure 7 in Appendix 2 for full sized image.* | |
| Location and description | • GPS Location: 28°30'10.776" S 150°56'14.136" E<br>• Elevation: 267.0 m<br>• North-westerly view towards the site and Whetstone State Forest from Whetstone Access Road near the intersection with the Cunningham Highway.<br>• Viewpoint is located within the proposed site boundary, as Whetstone Access Road provides access to the site. The nearest proposed infrastructure within the site is approximately 480 m northwest of this location (drain).<br>• Represents typical and accessible views of those travelling along the Whetstone Access Road, which provides access to Whetstone State Forest and nearby rural properties.<br>• North-westerly views from this point provide open views towards the site, existing railway line (approximately 835 m away at its closest point) and landscapes typical of LCT D: Dry Croplands and Pastures (D28: Whetstone East) and LCT J: Forested Hills and Plains (J10: Bringalily West). |
| Key visual sensitivities | • Receptors include isolated rural residents, workers and travellers experiencing transient views at speed along Whetstone Access Road.<br>• This viewpoint is not located on or near any tourist drives, however, is considered representative of very low numbers of visitors to Whetstone State Forest. |

| **VP2: View from Whetstone Access Road near Cunningham Highway** | |
|---|---|
| | • The presence of existing rural road infrastructure and the nearby railway line reduces the overall sensitivity of this view.<br>• Overall, this viewpoint is considered to have a ***Low*** sensitivity to the change proposed, due to the small number of isolated rural properties near this viewpoint, and the relatively low interest of travellers passing at some speed along Whetstone Access Road, who are the primary visual audience in this location. |
| ***Visual evaluation*** | |
| *Please note that no visualisation has been provided for this viewpoint, as the visualisations presented for Viewpoint 1 (above) and Viewpoint 3 (below) are sufficient to communicate the visual impacts of the Whetstone MDC facility.* | |
| ***Site establishment and construction*** | |
| Magnitude of change assessment | The Whetstone MDC is anticipated to be clearly perceptible from this location and other parts of Whetstone Access Road near this location, due to the following factors:<br>• Presence of plant undertaking site establishment works and constructing the Whetstone MDC facility for a period of 12 months.<br>• Presence of the Whetstone MDC facility and ancillary infrastructure, which is approximately 480 m from this location at the nearest point.<br>• Transient views towards train movements delivering materials to the Whetstone MDC (anticipated to occur on average twice a day) and transporting materials to the construction site as required. Trains will be evident on rail tracks within and sidings within the site and on the broader rail network.<br>• Transient views towards vehicle movements on internal access roads and on the nearby public road network. This includes heavy vehicles delivering material to the site (assumed to be 19 vehicles per day) and workers travelling to and around the site (assumed to be up to 50 light vehicles per day during the materials preparation, handling and distribution phase).<br>• Localised vegetation clearing during site establishment is considered to have negligible impact upon the extent of screening vegetation due to the limited extent of vegetation within the site boundary.<br>This temporary, short to medium term impact represents a ***Moderate*** magnitude of change. |
| Potential effect | The effect on VP2 due to the provision of the Whetstone MDC is considered to be ***Low***.<br>It is noted that once the Whetstone MDC is decommissioned (when the B2G Project is fully constructed), the land will be returned to the landowner in accordance with the requirements of the agreement with ARTC. |

### *8.1.3 Viewpoint 3*

***Table 9: Likely visual effect of the Whetstone MDC on Viewpoint 3***

| **VP3: View from Whetstone Access Road near the South Western Line railway** | |
|---|---|
| **Visual baseline assessment** | |
|  <br>**Contextual view from Viewpoint 3**<br>*Refer to Figure 8 in Appendix 2 for full sized image.*<br>  <br>**Existing view (approximately 75 degree horizontal field of view) from Viewpoint 3**<br>*Refer to Figure 8 in Appendix 2 for full sized image.* | |
| Location and description | • GPS Location: 28°29'47.616" S 150°55'59.61" E<br>• Elevation: 269.6 m<br>• South-westerly view from Whetstone Access Road towards the site and the main site entry.<br>• Proposed viewpoint is situated just within the site boundary, approximately 25 m from the site entry. The workshop area is approximately 275 m southwest of this location.<br>• Represents typical and accessible views of those travelling along the Whetstone Access Road, which provides access to Whetstone State Forest and nearby rural properties.<br>• Also considered representative of views experienced by nearby residential receptors accessing their rural properties, noting that views from these properties are anticipated to be limited due to existing vegetation. It is also noted that the buildings located closest to this viewpoint are not residential and the closest buildings are as shown on Figure 5 in Appendix A.<br>• South-westerly views from this point provide open views towards the existing railway line, as well as views across landscapes typical of LCT D: Dry Croplands and Pastures (D28: Whetstone East) and LCT J: Forested Hills and Plains (J10: Bringalily West). |
| Key visual sensitivities | • Receptors include isolated rural residents, workers and travellers experiencing transient views at speed along Whetstone Access Road.<br>• This viewpoint is not located on or near any tourist drives, however, is considered representative of very low numbers of visitors to Whetstone State Forest. |

| VP3: View from Whetstone Access Road near the South Western Line railway | |
|---|---|
| | • The presence of existing infrastructure (railway line and rural road infrastructure) reduces the overall sensitivity of this view.<br>• Overall, this viewpoint is considered to have a ***Low*** sensitivity to the change proposed, due to the small number of isolated rural properties near this viewpoint, and the relatively low interest of travellers passing at some speed along Whetstone Access Road, who are the primary visual audience in this location. |
| ***Visual evaluation*** | |
|  <br>**Visualisation (approximately 75 degree horizontal field of view) from Viewpoint 3**<br>*Refer to Figure 8 in Appendix 2 for full sized image.* | |
| ***Site establishment and construction*** | |
| Magnitude of change assessment | The Whetstone MDC is anticipated to result in a dominant change to views experienced from this location and other nearby parts of Whetstone Access Road in proximity to the main site entrance, due to the following factors:<br>• Presence of plant undertaking site establishment works and constructing the Whetstone MDC facility for a period of 12 months.<br>• Presence of the Whetstone MDC facility and ancillary infrastructure. The site entry is approximately 25 m from this location, whilst the workshop (anticipated to be a 'container dome' of approximately 12 m in height) is approximately 275 m southwest of this location.<br>• Transient views towards train movements delivering materials to the Whetstone MDC (anticipated to occur on average twice a day) and transporting materials to the construction fronts, as required. Trains will be evident on rail tracks within and sidings within the site and on the broader rail network.<br>• Transient views towards vehicle movements on internal access roads and on the nearby public road network. This includes heavy vehicles delivering material to the site (assumed to be 19 vehicles per day) and workers travelling to and around the site (assumed to be up to 50 light vehicles per day during the materials preparation, handling and distribution phase).<br>• Prescence of site fencing on the perimeter of the site.<br>This temporary, short to medium term impact represents up to a ***High*** magnitude of change, noting that vegetation evident in this view restricts the visibility of views towards the Whetstone MDC from this particular location (which is near the access point to two nearby properties). |
| Potential effect | The effect on VP3 due to the provision of the Whetstone MDC is considered to be ***Moderate***.<br>It is noted that once the Whetstone MDC is decommissioned (when the B2G Project is fully constructed), the land will be returned to the landowner in accordance with the requirements of the agreement with ARTC. |

# 9 Summary and conclusions

## 9.1 Summary of landscape impacts

Four of the twelve LCTs identified in the landscape character assessment for the B2G Project are present within the LVIA impact assessment area. A summary of the overall likely landscape impact anticipated during the site establishment, construction and decommissioning of the Whetstone MDC for each LCT is presented in Table 10.

***Table 10: Summary landscape assessment (construction and operation)***

| Landscape character type | Landscape sensitivity | Magnitude of change | Potential effect/ significance |
|---|---|---|---|
| LCT B: Vegetated Watercourses – Creeks and Channels | Low | No Impact | No impact |
| LCT C: Irrigated Croplands | Low | No Impact | No impact |
| LCT D: Dry Croplands and Pastures | Low | Moderate | Low |
| LCT J: Forested Hills and Plains | Moderate | No Impact | No impact |

This shows that the Whetstone MDC is considered likely to result in impacts of up to a low level of effect on landscape character and amenity of LCT D: Dry Croplands and Pastures (within which the Whetstone MDC is located). Impacts on LCT D: Dry Croplands and Pastures principally relate to impacts associated with earthworks, site drainage works, localised clearance of vegetation and the construction of MDC infrastructure, including rail tracks. All other impacts on other LCTs present within the LVIA impact assessment area are indirect.

As the site will be decommissioned once the B2G Project is fully constructed, it is considered that the impacts of the Whetstone MDC on landscape values are largely reversible so the residual impact of the Whetstone MDC will be negligible.

## 9.2 Summary of visual impacts

Based on the field survey, three representative viewpoints were selected for detailed assessment. A summary of the baseline analysis and overall likely visual impact anticipated during the site establishment and construction of the Whetstone MDC (as described in 8.1: Viewpoint assessment) is summarised for each viewpoint in Table 11.

***Table 11: Summary preliminary visual assessment (site establishment and construction)***

| Viewpoint name | Viewpoint sensitivity | Magnitude of change | Potential effect/ significance |
|---|---|---|---|
| Viewpoint 1: View from Whetstone Rest Area on the Cunningham Highway | Low | Moderate | Low |
| Viewpoint 2: View from Whetstone Access Road near Cunningham Highway | Low | Moderate | Low |
| Viewpoint 3: View from Whetstone Access Road near the South Western Line railway | Low | High | Moderate |

This shows that temporary short to medium term impacts (anticipated to last for four years) of the Whetstone MDC on views are anticipated to result in impacts up to a moderate level of effect during site establishment and construction.

In addition, it is acknowledged that there is the potential for localised noise abatement treatments to be required, which will be determined during detailed design of the Whetstone MDC. This has the potential to reduce visibility towards the actual facility, which may be perceived by some receptors as a positive benefit; however, others may find noise barriers unsightly. Therefore, this may, or may not, affect the perception of magnitude of change of identified impacts.

It is also acknowledged the site will be decommissioned once the B2G Project is fully constructed, and the site will be returned to the landowner in accordance with the requirements of the agreement with ARTC.

## 9.3 Conclusions

The Whetstone MDC site is in a sparsely settled rural landscape characterised by generally flat rural landscapes and surrounded by gently undulating and forested areas that provide a backdrop of forested low hills. The Whetstone MDC will be located on a highly modified site that has been subject to historical clearing practices for agriculture and grazing.

Historically, freight rail has existed within the LVIA impact assessment area, with the South Western System railway located to the north of the site, and there is a legacy of modern and heritage rail infrastructure throughout IAA. Other existing infrastructure in the area includes the Cunningham Highway and other local roads and ancillary infrastructure such as that associated with telecommunications and power.

The Whetstone MDC would introduce temporary short to medium term construction impacts on the landscape anticipated to last for four years, associated with both the establishment of the site and the construction of the B2G Project.

The key landscape and visual impacts of the Whetstone MDC relate to the earthworks and drainage works required to establish the facility, the removal of vegetation (albeit very limited) and the provision of new infrastructure elements associated with the Whetstone MDC into the rural landscape (including large workshops, gantries and railway sidings).

Four of the twelve LCTs identified within the landscape character assessment undertaken for the B2G Project occur within the LVIA impact assessment area. However, only one LCT is directly impacted by the Whetstone MDC; LCT D: Dry Croplands and Pastures. This LCT has been identified to have a low sensitivity to change and impacts of moderate magnitude associated with the Whetstone MDC during site establishment, construction and decommissioning of the facility are anticipated to have up to a ***Low*** level of effect on LCT D: Dry Croplands and Pastures.

There are no landscapes of high scenic amenity value identified in any planning scheme within the LVIA impact assessment area. However, the *Goondiwindi Regional Council Planning Scheme* does outline specific outcomes relating to Scenic Amenity and Regional Landscape Character requiring protection of the productive use of rural land and the dominance of natural landforms and open space over built form in rural areas.

There are a limited number of permanent rural residential receptors in the LVIA impact assessment area. However, close views towards the Whetstone MDC can be obtained by travellers on the Cunningham Highway and other local roads throughout the area. None of these roads are part of formal tourist routes.

Three representative viewpoints have been assessed to represent impacts on these views. Of these, one visual impact of up to a ***Moderate*** level of effect has been identified relating to the site establishment, construction and decommissioning of the Whetstone MDC. This moderate level of effect is associated with very close views to the Whetstone MDC experienced by receptors travelling along Whetstone Access Road, as represented by Viewpoint 3: View from Whetstone Access Road near the South Western Line railway. This viewpoint is situated in proximity to two sensitive receptors who would experience close views towards the Whetstone MDC when travelling to and from their properties. However, it is anticipated that existing vegetation present within these private properties would screen views towards the Whetstone MDC from these dwellings. Therefore, this viewpoint is considered to represent the 'worst case' scenario for these rural receptors.

Other visual impacts are of up to a ***Low*** level of effect and relate to other views available from the Cunningham Highway (near the Whetstone Rest Area) (Viewpoint 1) and the eastern part of Whetstone Access Road, where it intersects the Cunningham Highway (Viewpoint 2).

The three representative views that have been assessed are considered representative of views experienced by rural receptors travelling to and from their properties due to the limited availability of views towards the site from other rural receptors within the LVIA impact assessment area (e.g. those located to the south of the Cunningham Highway and at a further distance from the site).

It is also acknowledged that the Whetstone MDC will be decommissioned once the B2G Project is fully constructed. The intention is that the site will be returned to the landowner in accordance with the requirements of the agreement with ARTC.

# 10 Glossary

## 10.1 Acronyms

| | |
|---|---|
| **AADT** | Annual Average Daily Traffic |
| **ARTC** | ARTC Australian Rail Track Corporation |
| **FFJV** | Future Freight Joint Venture |
| **LCA** | Landscape Character Area |
| **LCT** | Landscape Character Type |
| **LGA** | Local Government Area |
| **LVIA** | Landscape and Visual Impact Assessment |
| **MDC** | Whetstone Materials Distribution Centre |
| **NSW** | New South Wales |
| **QLD** | Queensland |

## 10.2 Glossary of assessment terms

| | |
|---|---|
| **Amenity** | The pleasantness of a place as conveyed by desirable attributes including visual, noise, odour etc.<br><br>With regards to quantitative lighting impacts, amenity is considered to be the '*state of pleasantness of the night-time environment or a particular night-time view.'* |
| **Character** | A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, and often conveys a distinctive sense of place. This term does not imply a level of value or importance. |
| **Effect** | The landscape or visual outcome of a proposed change. It may be the combined result of sensitivity together with the magnitude of the change. |
| **Impact** | The categorisation of effects. Legislative context is considered in defining impacts and their significance. |
| **Landscape** | Landscape is an all-encompassing term that refers to areas of the earth's surface at various scales. It includes those landscapes that are: urban, rural, and natural; combining bio-physical elements with the cultural overlay of human use and values. |
| **Landscape Character Type (LCT)** | Distinct types of landscape that are relatively homogeneous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur they share broadly similar combinations of geology, topography, drainage patterns, vegetation and historical land use and settlement pattern |
| **Landscape Character Area (LCA)** | Single unique areas and are the discrete geographical areas of a particular Landscape Character Type. |
| **Magnitude of change** | The extent of change that will be experienced by receptors. This change can be adverse or beneficial. Factors that could be considered in assessing magnitude are: the proportion of the view / landscape affected; extent of the area over which the change occurs; the size and scale of the change; the rate and duration of the change; the level of contrast and compatibility. |
| **Mitigation** | Measures to avoid, reduce and manage identified potential adverse impacts. |
| **Impact assessment area** | Impact assessment area; comprising land within the potential viewshed of and forming the wider landscape context of the Whetstone MDC |
| **Receptor** | A place, route, viewer audience or interest group which may require assessment. |

| | |
|---|---|
| **Sensitivity** | Capacity of a landscape or receptor to change without losing valued attributes. |
| **Values** | Any aspect of landscape or views people consider to be important. Landscape and visual values may be reflected in local, state or federal planning regulations, other published documents or be established through community consultation and engagement, or as professionally assessed. |
| **View** | Any sight, prospect or field of vision as seen from a place, and may be wide or narrow, partial or full, pleasant or unattractive, distinctive or nondescript, and may include background, mid ground and/or foreground elements or features. |
| **Viewpoint** | The specific location of a view, typically used for assessment purposes. |
| **Viewshed** | Areas visible from a particular location (may be modelled or field-validated). |
| **Visual catchment** | Areas visible from a combination of locations within a defined setting (may be modelled or field-validated). |
| **Visual audience** | Groups of visual receptors with common attributes and sensitivities to changes in views (e.g. residents, road travellers, farmers and recreational users). |
| **Visual amenity** | The attractiveness of a scene or view. |
| **Scenic amenity** | A measure of the relative contribution of each place in the landscape to the collective appreciation of open space as viewed from places that are important to the public (Department of Natural Resources, 2001). |

# 11 References

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Queensland Government, Department of Resources (2023). Queensland Globe. [online]. Available at: https://qldglobe.information.qld.gov.au/. Accessed 22/02/2023.

# APPENDIX 1: GIS Figures

The following plans prepared by Umwelt have been used to inform and illustrate this assessment:

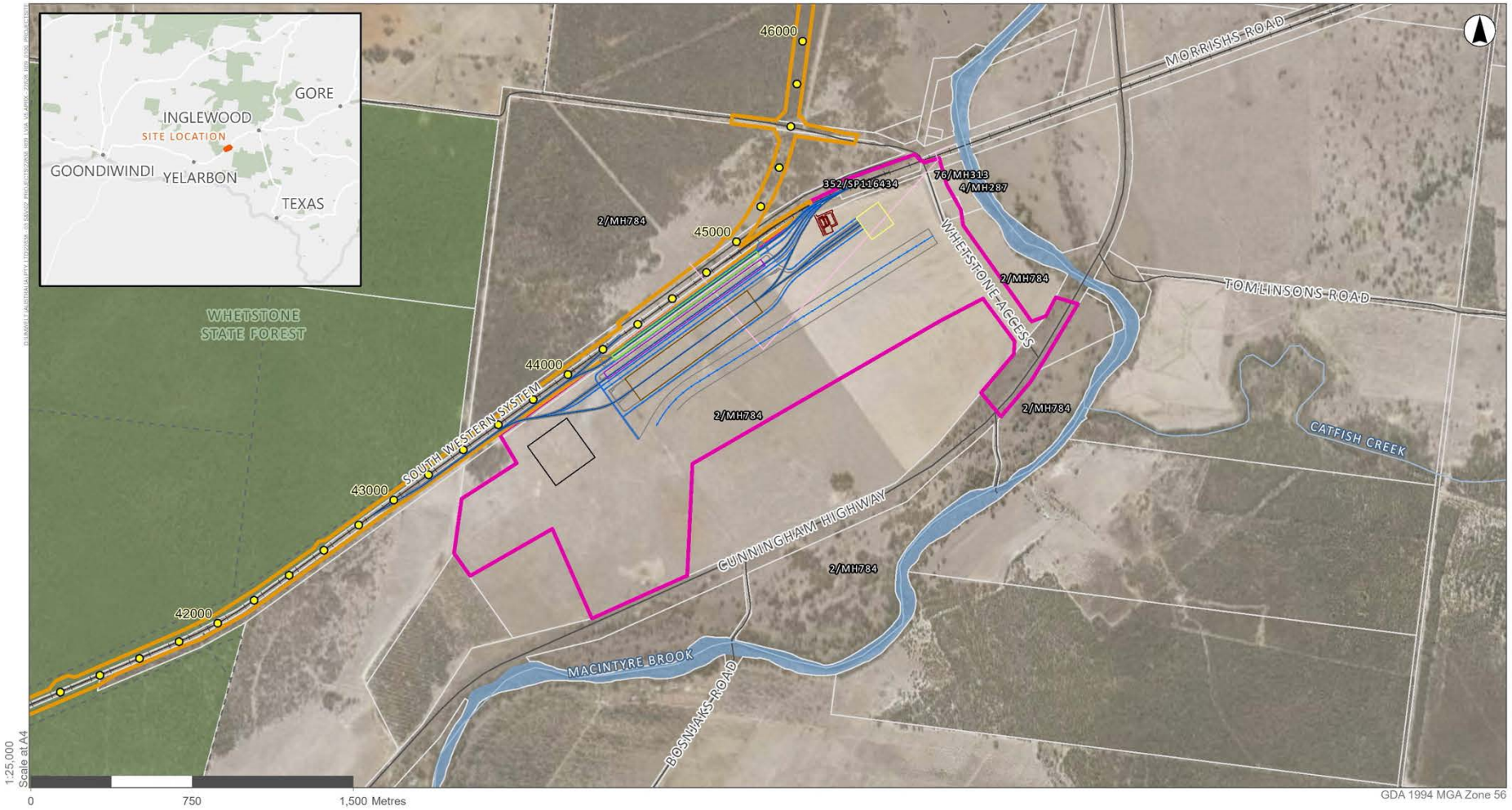
Figure 1: Whetstone MDC site and layout

Figure 2: LVIA impact assessment area and landscape planning designations

Figure 3: Landform and hydrology context

Figure 4: Landscape character types

Figure 5: Key visual receptors and representative viewpoint locations




Legend

- Development Footprint (Temporary Footprint)
- Permanent Footprint (B2G Alignment)
- B2G Alignment Chainage Location
- Cadastre
- State Forest
- Existing Railway
- Watercourse
- Roads
- Tracks

**MDC Concept Layout**

- Embankment
- 33 kV Overhead Conductor
- Ballast Laydown
- Drainage
- Gantry Rail
- Materials Laydown
- Rail Alignment
- Rail Laydown
- Site Offices
- Sleeper Laydown
- Workshop Area

**FIGURE 1**
Whetstone MDC site and layout

**Image Source:** ESRI Basemap (2022) **Data source:** Department of Resources (2022)


Legend

- Development Footprint (Temporary Footprint)
- Permanent Footprint (B2G Alignment)
- B2G Alignment Chainage Location
- 2.5km Offset from Development Footprint (Temporary Footprint)
- State Forest
- Cadastre
- Existing Railway
- Watercourse
- Roads
- Tracks

**Queensland Land Use Zoning**

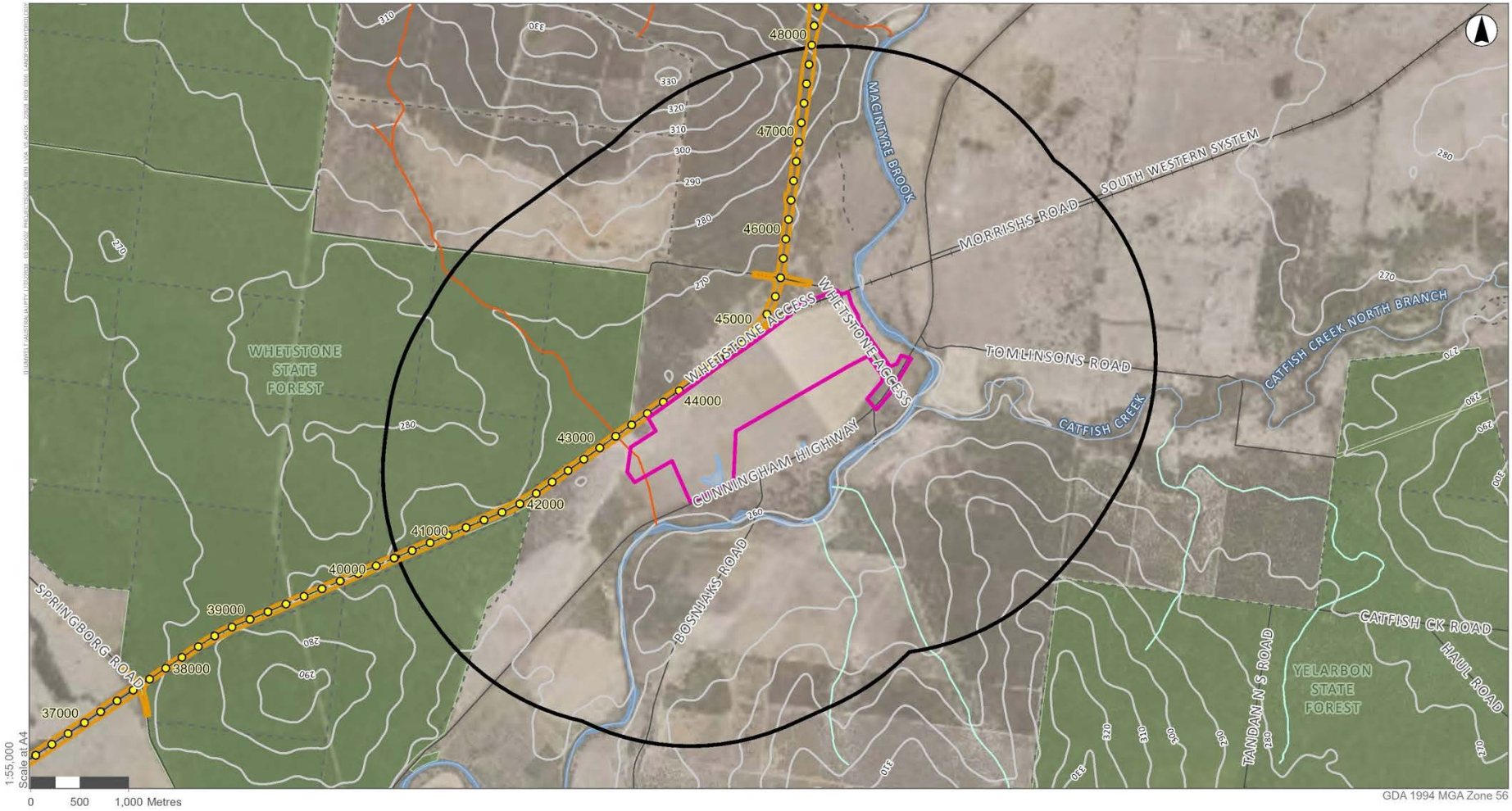
- Grazing native vegetation
- Production forestry
- Cropping
- Perennial horticulture
- Irrigated cropping
- Irrigated perennial horticulture
- Transport and communication
- Reservoir/dam
- River
- Marsh/wetland

**FIGURE 2**

LVIA impact assessment area and landscape planning designations

**Image Source:** ESRI Basemap (2022) **Data source:** Department of Resources (2022); Queensland Government (2023)

umwelt




Legend

- Development Footprint (Temporary Footprint)
- Permanent Footprint (B2G Alignment)
- B2G Alignment Chainage Location
- 2.5km Offset from Development Footprint (Temporary Footprint)
- State Forest
- Existing Railway
- Roads
- Tracks
- Contours (10m interval)
- Watercourse (Defined by Water Act 2000)
- Drainage Feature (Defined by Water Act 2000)
- Unmapped Watercourse
- Farm dams

**FIGURE 3**

Landform and hydrology context

**Image Source:** ESRI Basemap (2022) **Data source:** Department of Resources (2022)

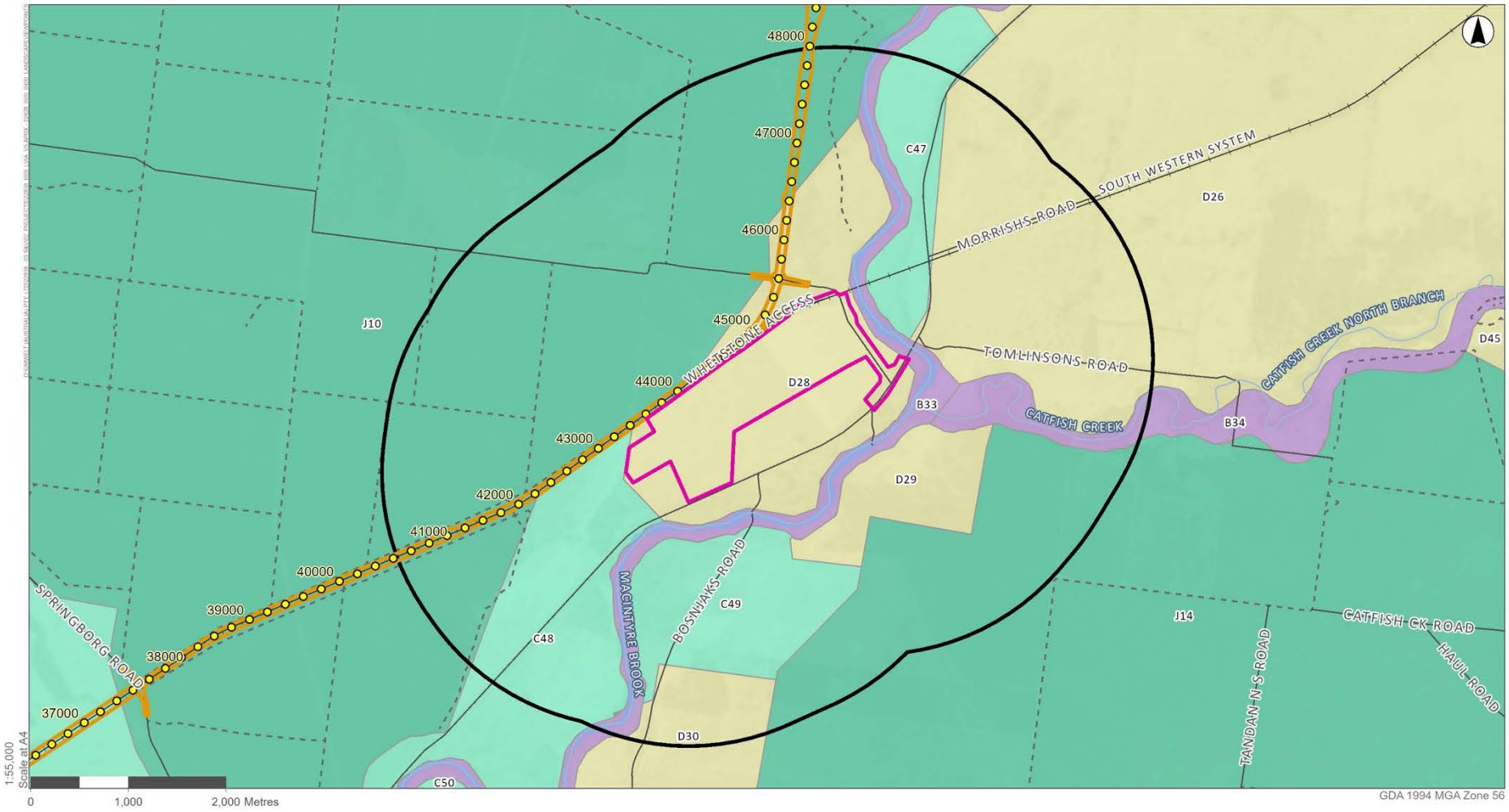



**FIGURE 4**
Landscape character types

**Image Source:** ESRI Basemap (2022) **Data source:** Department of Resources (2022); Border to Gowrie LVIA (2023)

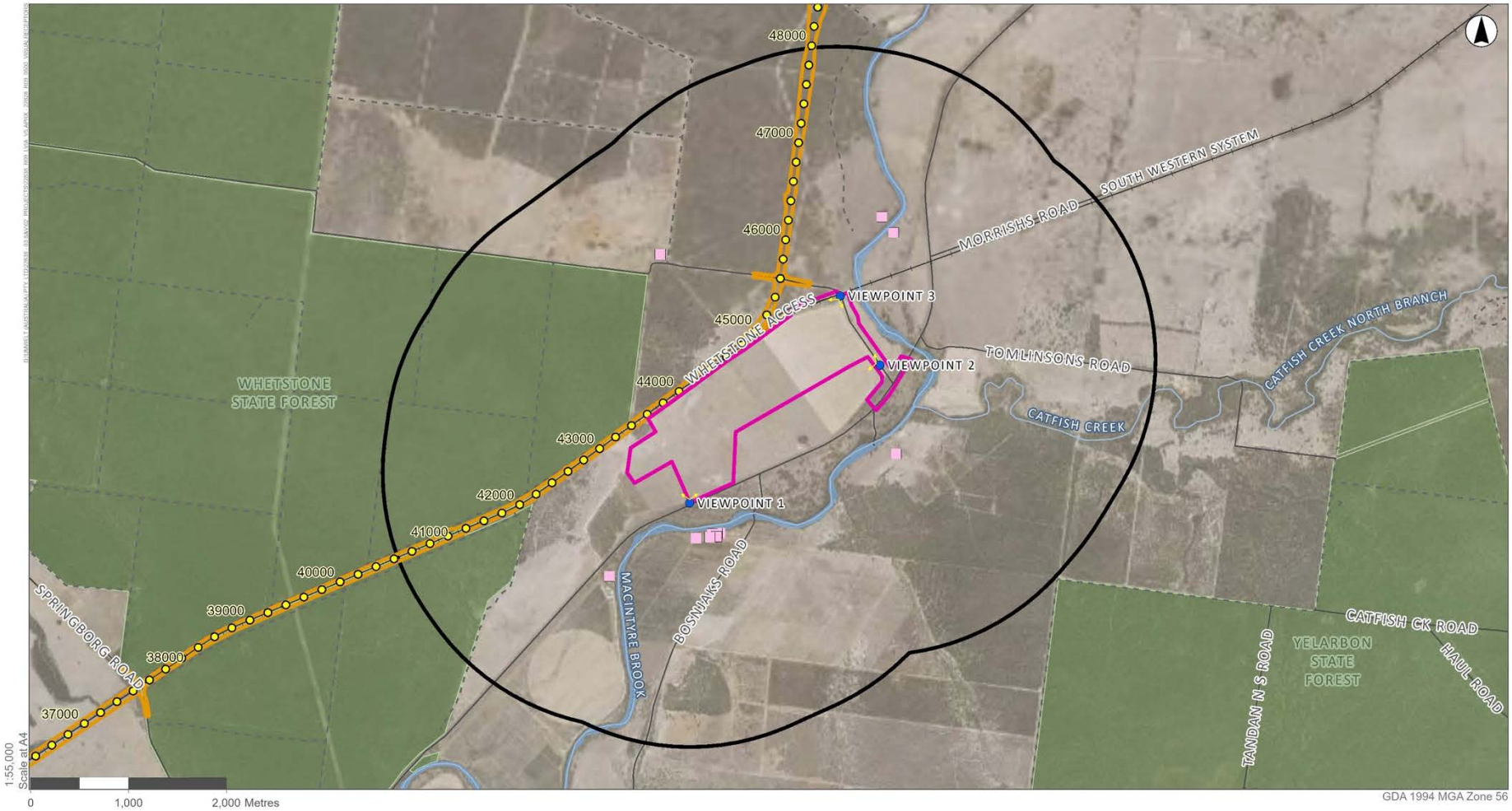



**FIGURE 5**

Key visual receptors and representative viewpoint locations

**Image Source:** ESRI Basemap (2022) **Data source:** Department of Resources (2022)

# APPENDIX 2: Viewpoints

The following viewpoints have been used to inform and illustrate the assessment;

**Figure 6: Viewpoint 1: View from Whetstone Rest Area on the Cunningham Highway**

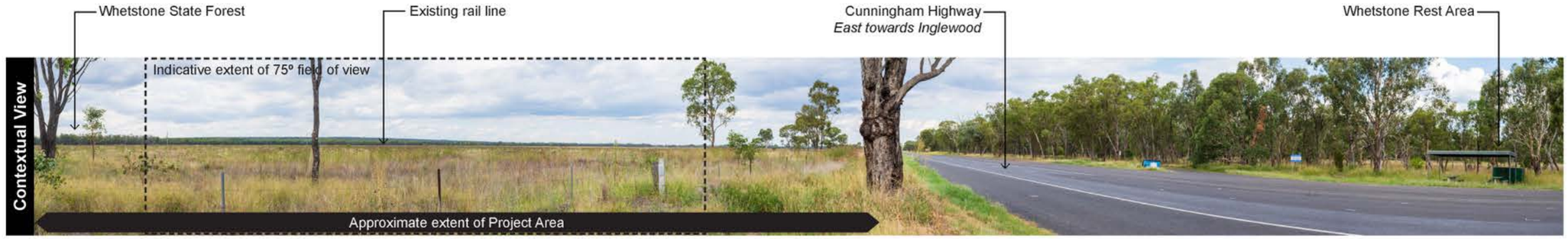
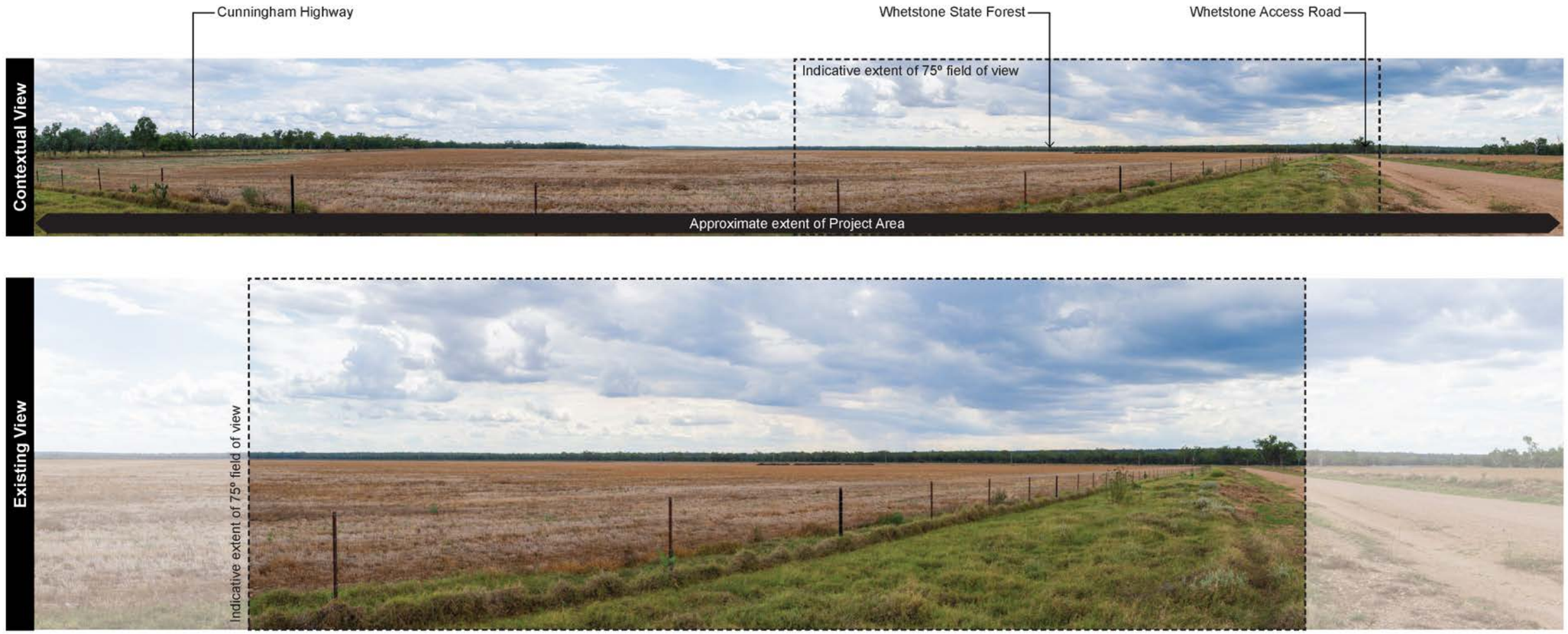


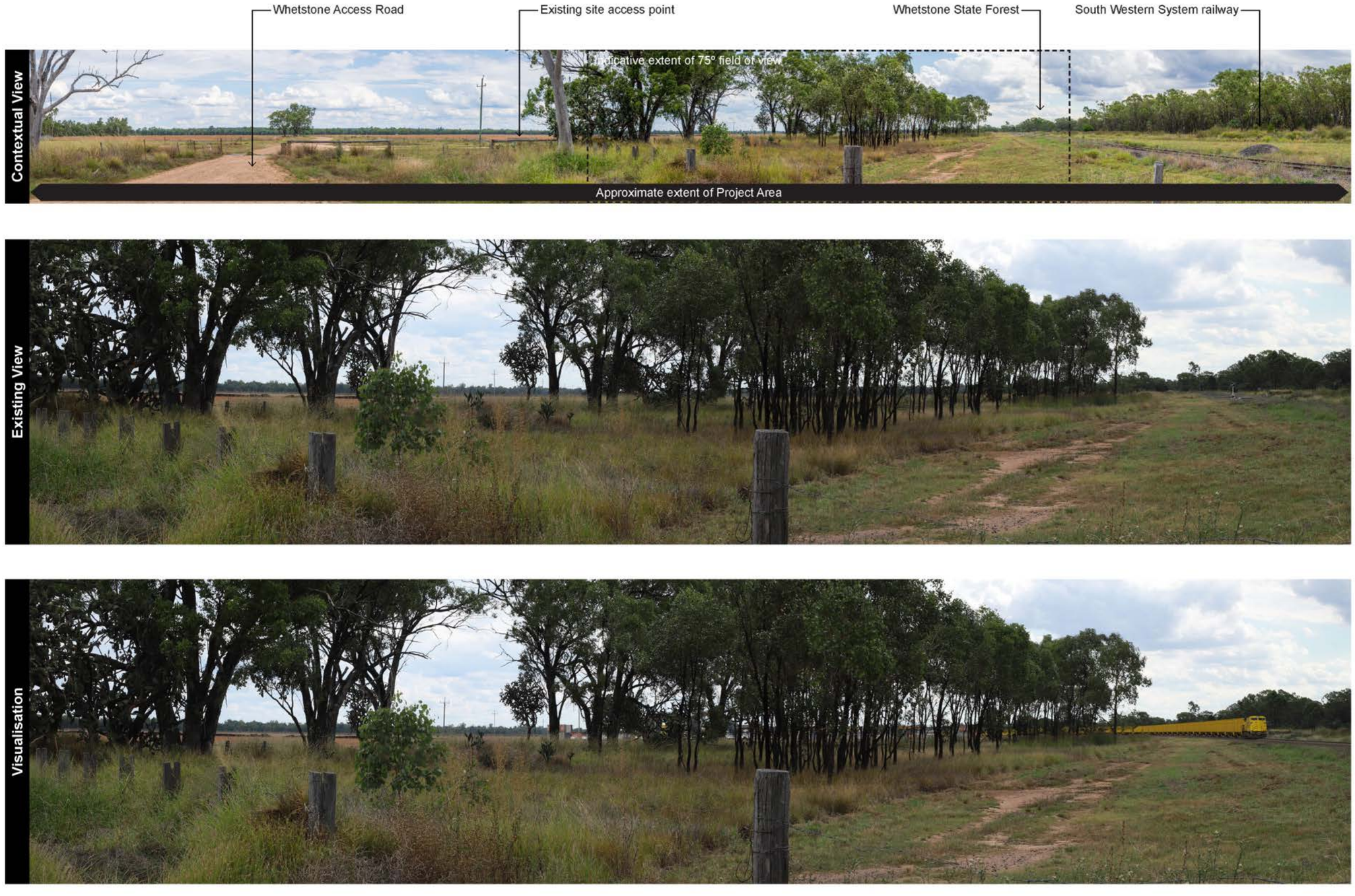


**Figure 7: Viewpoint 2: View from Whetstone Access Road near Cunningham Highway**




Note: Please note that no visualisation has been provided for this viewpoint, as discussed in Section 4.9: Visual Impact Assessment of the Landscape and Visual Impact Assessment Technical Report.

**Figure 8: Viewpoint 3: View from Whetstone Access Road near South Western Line railway**



# APPENDIX AE

Whetstone Material Distribution Centre:
Supporting Technical Information

# **Attachment B** Whetstone MDC ecological survey

**BORDER TO GOWRIE** REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT

Inland Rail is a subsidiary of
Australian Rail Track Corporation

INLAND RAIL

***Acknowledgement of Country***

*Umwelt would like to acknowledge the traditional custodians of the country on which we work and pay respect to their cultural heritage, beliefs, and continuing relationship with the land. We pay our respect to the Elders – past, present, and future.*

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# Figures



# Photos



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# Appendices

# 1.0 Introduction

Umwelt (Australia) Pty Ltd were engaged by Australian Rail Track Corporation (ARTC) to provide an approvals and environmental due diligence assessment for a temporary Material Distribution Centre (MDC) in Whetstone. Once operational, the Whetstone MDC will be used to store materials and service the construction of the New South Wales/Queensland border to Gowrie (B2G), which is currently subject to an Environmental Impact Statement (EIS) assessment process.

To support the environmental assessment, a supplementary terrestrial ecological assessment was deemed necessary to provide additional detail regarding the flora and fauna values of the Ecology Study Area. This report documents the terrestrial ecological assessment which has been informed by both desktop and field-based assessments.

## 1.1 Ecology Study Area and Development Footprint

The MDC is proposed for a site within the rural locality of Whetstone, approximately 18 kilometres (km) to the south-west of Inglewood and 59 km east of Goondiwindi in Queensland. The Whetstone MDC will be constructed within part of Lot 2 on MH784, Lot 4 on MH287, Lot 76 on MH313, Lot 74 on MH313 and Lot 352 on SP116434 (the 'Ecology Study Area'). Lot 352 on SP116434 is a lands lease (for the existing rail line) and land parcels designated as road reserves. Other mapped roads connect to the Ecology Study Area including Loupals Road and Bosnjaks Road to the south and the Whetstone Access Road to the north-east, while the Cunningham Highway traverses the southern boundary of the Ecology Study Area. Lot 2 MH784 is freehold land located within the Goondiwindi Regional local government area.

The Ecology Study Area covers approximately 336.46 hectares (ha) and comprises largely flat, rural agricultural land currently used for cropping with historical evidence of use for cattle grazing. Although land use in the surrounding area is also predominantly agricultural, large intact areas of woody vegetation also occur. These surrounding areas include Whetstone State Forest to the immediate north-west of the Ecology Study Area, and Yelarbon State Forest approximately 2.5 km to the south-east.

A 'Development Footprint' has been defined for the Whetstone MDC. The development footprint is 212.62 hectares (ha) in area and includes the site of the proposed MDC as well as the extent of possible road upgrades and maintenance works to the Cunningham Highway, a State-controlled road, and Whetstone Access Road, a local government road. The development footprint is wholly contained with Goondiwindi LGA.

The site will be accessed from Whetstone Access Road, an existing local road that intersects with the Cunningham Highway.

The Ecology Study Area and the Development Footprint along with notable local landscape features are shown in **Figure 1.1**.

The Development Footprint for the Whetstone MDC forms part of the 'temporary footprint' that is further defined in Chapter 5: Project Description of the B2G EIS.

## 1.2 Objective and Scope

The objective of this assessment is to identify the presence and extent of terrestrial ecological values within the Ecology Study Area. To achieve this, the assessment included the following tasks:

- Conduct a desktop review of available literature and previous studies in the vicinity of the Ecology Study Area and run database searches to identify the ecological values that may be supported by the Ecology Study Area .
- Undertake a field survey within the Ecology Study Area to:
    - document condition, extent and value of vegetation communities, habitat types and other ecological values within the Ecology Study Area
    - identify potential habitat resources for threatened species and migratory species.

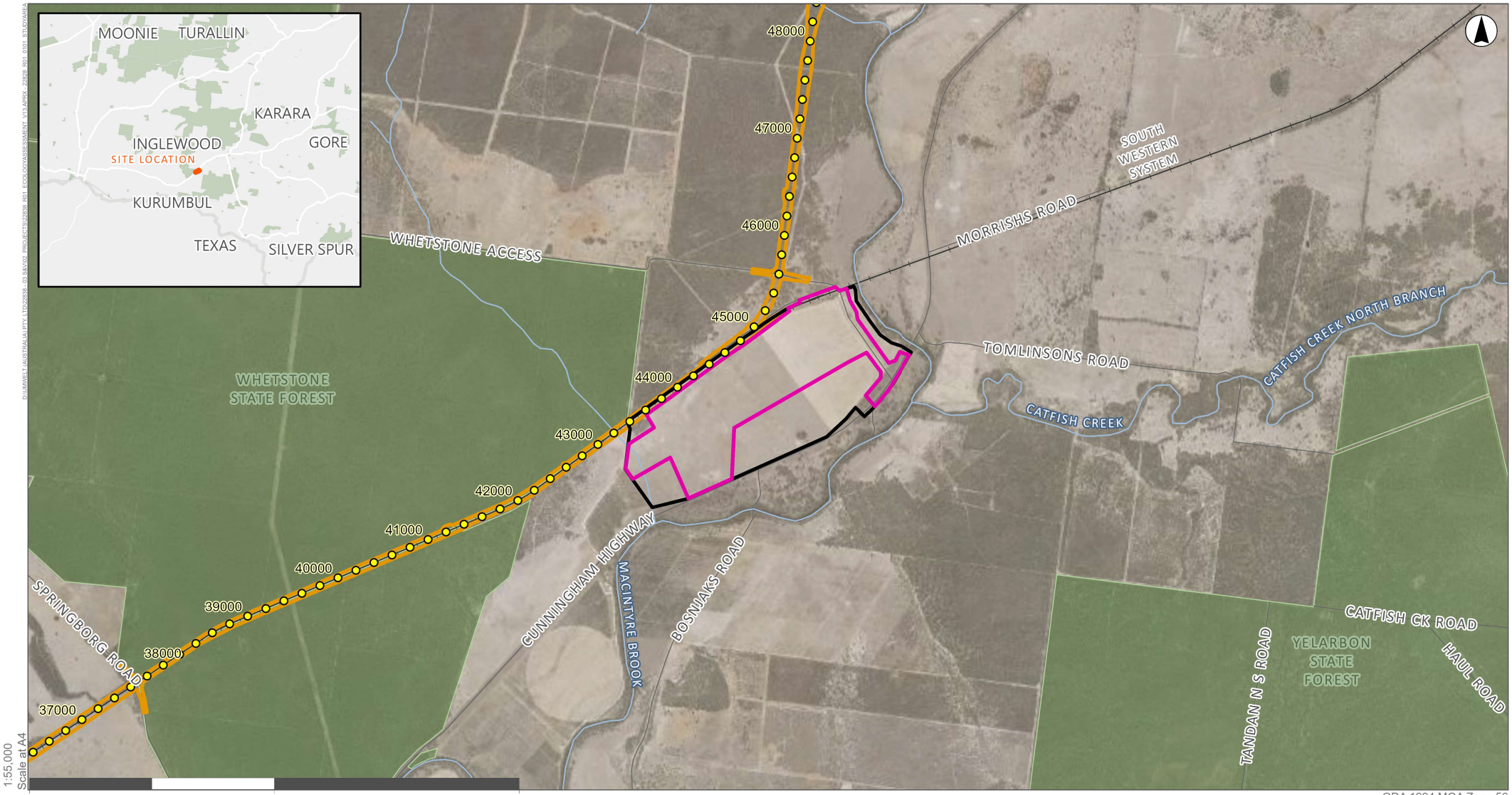



**FIGURE 1.1**
Ecology Study Area

**Image Source:** ESRI Basemap (2022) **Data source:** Department of Resources (2022)

# 2.0 Legislative Context

The legislation relevant to the assessment is summarised in **Table 2.1** below.

**Table 2.1 Relevant Legislation Summary**

| Relevant Legislation | Governing Agency | Summary | Whetstone MDC Relevance |
|---|---|---|---|
| **Commonwealth** | | | |
| ***Environment Protection and Biodiversity Conservation Act 1999*** **(EPBC Act)** | Department of Climate Change, Energy, the Environment and Water (DCCEEW) | The EPBC Act is Australia's key piece of environmental legislation. It outlines nine MNES. Actions that adversely affect MNES may be deemed to be a controlled action requiring assessment under the EPBC Act. | The presence of MNES values within the Development Footprint is discussed in **Section 4.0.** Two MNES are relevant to the Whetstone MDC: listed threatened species and ecological communities; listed migratory species. |
| **State Legislation** | | | |
| ***Nature Conservation Act 1992*** **(NC Act)** | Department of Environment, Science, and Innovation (DESI) | The purpose of the NC Act is to conserve biodiversity by creating and managing protected areas, managing and protecting native plants and animals, and managing the spread of non-native plants and animals. | Where a proposed development will result in such impacts to flora and/or fauna protected under the NC Act, authorisation from the Director General of the DES is required.<br>The presence of species listed threatened or Special Least Concern under the NC Act within the Development Footprint is discussed in **Section 4.0.** |
| ***Vegetation Management Act 1999*** **(VM Act)** | Department of Resources (DoR) | The VM Act establishes the vegetation management framework for Queensland that applies to all vegetation with the exception of State forests, National parks, forest reserves, and certain other tenures defined under the NC Act and the *Forestry Act 1959*. | The presence of regulated vegetation including Regional Ecosystems (REs) within the Development Footprint and broader Ecology Study Area is detailed in **Section 4.2.2**. |
| ***Biosecurity Act 2014*** **(Biosecurity Act)** | Department of Agriculture and Fisheries (DAF) | The Biosecurity Act lists fauna and flora pest species as either a prohibited or restricted biosecurity matter. | The Biosecurity Act defines specific requirements for notification and management actions for all listed biosecurity matters, including specific requirements for the disposal of restricted matters.<br>The potential presence of flora and fauna species listed as restricted matters within the Development Footprint and broader Ecology Study Area is discussed in **Section 4.2.4.1** and **Section 4.3.2.1** respectively. |

| Relevant Legislation | Governing Agency | Summary | Whetstone MDC Relevance |
|---|---|---|---|
| ***Environmental Offsets Act 2014* (EO Act)** | DESI | An environmental offset condition may be imposed for prescribed activities under the EO Act. Activities which have an impact on MSES may require offsetting under the EO Act. | MSES relevant to the Whetstone MDC include protected wildlife habitat. |

# 3.0 Methodology

## 3.1 Desktop Assessment

A desktop assessment was undertaken to characterise and identify the ecological values that may be supported by the Ecology Study Area. The desktop assessment included a review of existing literature and online mapping, as well as searches of publicly available databases. The following information sources were reviewed:

- EPBC Act Protected Matters Search Tool (PMST) for MNES (10 km buffer applied from the Ecology Study Area boundary) (**Appendix A**).
- Species Profile and Threats (SPRAT) database for MNES information (Department of Climate Change, Energy, the Environment and Water 2022).
- DESI BioMaps/WildNet databases for species records (10 km buffer applied from the Ecology Study Area boundary) (**Appendix A**).
- (Former) Department of Environment and Science (DES) (2021c) Protected Plants Flora Survey Trigger map to identify the locations of previously recorded threatened flora species.
- (Former) Department of Environment and Science (DES) certified Biodiversity Planning Assessment (BPA) (2018) mapping to identify significant wildlife corridors and areas of state, regional and local biodiversity significance.
- DES (2019) Queensland Wetland areas mapping.
- DoR (2023) Vegetation Management Regional Ecosystem map (Version 12.02).
- DoR (2021a) Vegetation Management Watercourse and Drainage Feature map (Version 5.0).
- DoR (2021b) Vegetation Management Supporting Map, including Essential Habitat mapping.
- DAF (2016) Queensland waterways for waterway barrier works mapping.
- Qld Herbarium (2023) Regional Ecosystem Description Database (REDD) (Version 13).
- Atlas of Living Australia (ALA) (2022) spatial records database.
- Ebird (2023) spatial records database.
- Published and unpublished ecology reports relevant to the Whetstone MDC, including:
    - Supplementary Ecological Assessments: Leeson's Road, Whetstone, Yelarbon (Ausecology 2022).
    - Inland Rail – Border to Gowrie Whetstone MDC: Geotechnical Investigations – Matters of National Environmental Significance Report (Australian Rail Track Corporation 2021).

Information collected as part of the desktop assessment was collated and used in the preparation of the field survey to determine target areas and appropriate survey techniques to employ.

## 3.2 Field Assessment

### 3.2.1 Other Ecological Assessments

Previously completed ecological assessments were reviewed where available. Two assessments were considered particularly relevant to the Whetstone MDC, both being undertaken within or in proximity to the Ecology Study Area. These studies were reviewed to gain an understanding of the ecological values across the area as well as the methods utilised to determine possible presence of the MNES or MSES values. The methods adopted by each study are summarised below.

**Ausecology (2022). Supplementary Ecological Assessments: Leeson's Road, Whetstone, Yelarbon**

In early 2022, Ausecology Pty Ltd (Ausecology) was engaged by ARTC to complete additional ecological assessments relevant to the B2G Project footprint. One of the three areas assessed ('Whetstone') primarily occurs over the Whetstone State Forest but also overlaps a section of the northern extent of the Ecology Study Area discussed in this report.

The scope of the assessment included both a desktop and field assessment. The field assessment was completed in March 2022 and the primary focus was to verify RE occurrence and extent via quaternary assessments and identify the presence and extent of threatened ecological communities (TECs). Targeted searches for threatened flora and opportunistic searches for threatened fauna were also undertaken.

**ARTC (2021). Inland Rail – Border to Gowrie Project: Geotechnical Investigations – Matters of National Environmental Significance Report**

As described in **Section 1.0**, ARTC is progressing the EIS assessment of the B2G section of the Inland Rail. To inform design and siting of the B2G Project, geotechnical investigations were required to gain an understanding of the landform conditions. An MNES report was produced and published in April 2021 as supporting information to the referral of the geotechnical works. This report details the ecological surveys that have been completed as part of the EIS assessment which includes:

- Initial constraints assessments in April, September and October of 2016, conducted by EcoLogical.
- Baseline seasonal sampling in autumn and spring 2018 totalling 14 days, conducted by Aurecon.
- Aquatic surveys over three survey periods: June 2018, November/December 2018 and May 2019 conducted by EcoLogical.
- Supplementary targeted surveys conducted by Cardno in 2019–2020.

Across the entirety of the field program, a suite of methodologies has been employed including habitat assessments, verification of vegetation communities, protected plant surveys, aquatic surveys and an array of terrestrial fauna sampling and trapping techniques.

### 3.2.2 Umwelt Survey

Field assessments within the Ecology Study Area were undertaken by a suitably qualified Umwelt ecologist on 20 September 2022. The methods employed and the respective survey effort is detailed in **Table 3.1**. Field assessment sites are shown on **Figure 3.1**.

**Table 3.1 Field Assessment Methods and Effort**

| Method | Description | Total Effort |
|---|---|---|
| **Quaternary Assessments** | Quaternary plots constitute rapid vegetation surveys which include marking the GPS location and recording the dominant species in the characteristic layers, along with soil/landform and structural data, as per Neldner *et al.* (2020). | 13 sites |
| **Opportunistic Threatened Flora** | Opportunistic searches for flora species listed under the NC Act or EPBC Act were completed throughout the survey in areas of potential habitat. If threatened flora species were found during these searches, their location and spatial extent were recorded along with population size and photographs were collected. | NA |
| **Fauna Habitat Assessments** | Each habitat assessment occurred within a one hectare (100 m x 100 m, or 200 m x 50 m) site, and had the following characteristics recorded:<br>• Vegetation structure and dominant species, including a description of canopy, shrub and ground layer structure and composition.<br>• Soil composition and landform.<br>• Presence and abundance of tree hollows and stags.<br>• Presence of large trees.<br>• Presence and abundance of woody debris such as habitat logs and ground timber.<br>• Rocky habitat such as surface rocks, boulders, crevices etc.<br>• Proximity to water (both permanent and ephemeral).<br>• Disturbance from invasive weeds/pests.<br>• Other disturbances such as grazing pressure, clearing, thinning or fire.<br>Any other significant habitat features, or values present, such as leaf litter, gilgai, decorticating bark, dense grass/shrub shelter, seeding grass cover, fruiting plants, nectar and pollen producing plants (i.e. mistletoe), and koala food trees. | 13 sites |
| **Active Searches** | Active searching was completed at habitat assessment sites across the Ecology Study Area. Searches included scanning the trees and ground, searching beneath microhabitat such as rocks, fallen timber and peeling bark, digging through leaf litter and soil at tree bases and flushing birds from areas with a dense or grassy ground cover. Physical disturbance to habitat features and reptiles was kept to a minimum. | |
| **Diurnal Bird Surveys** | Diurnal birds were sampled using an area census method, supplemented by broad observational surveys throughout the Ecology Study Area. | 8 person-hours |
| **Opportunistic Fauna Sightings** | All fauna observed directly or indirectly (scats and tracks) during the survey were recorded. | NA |

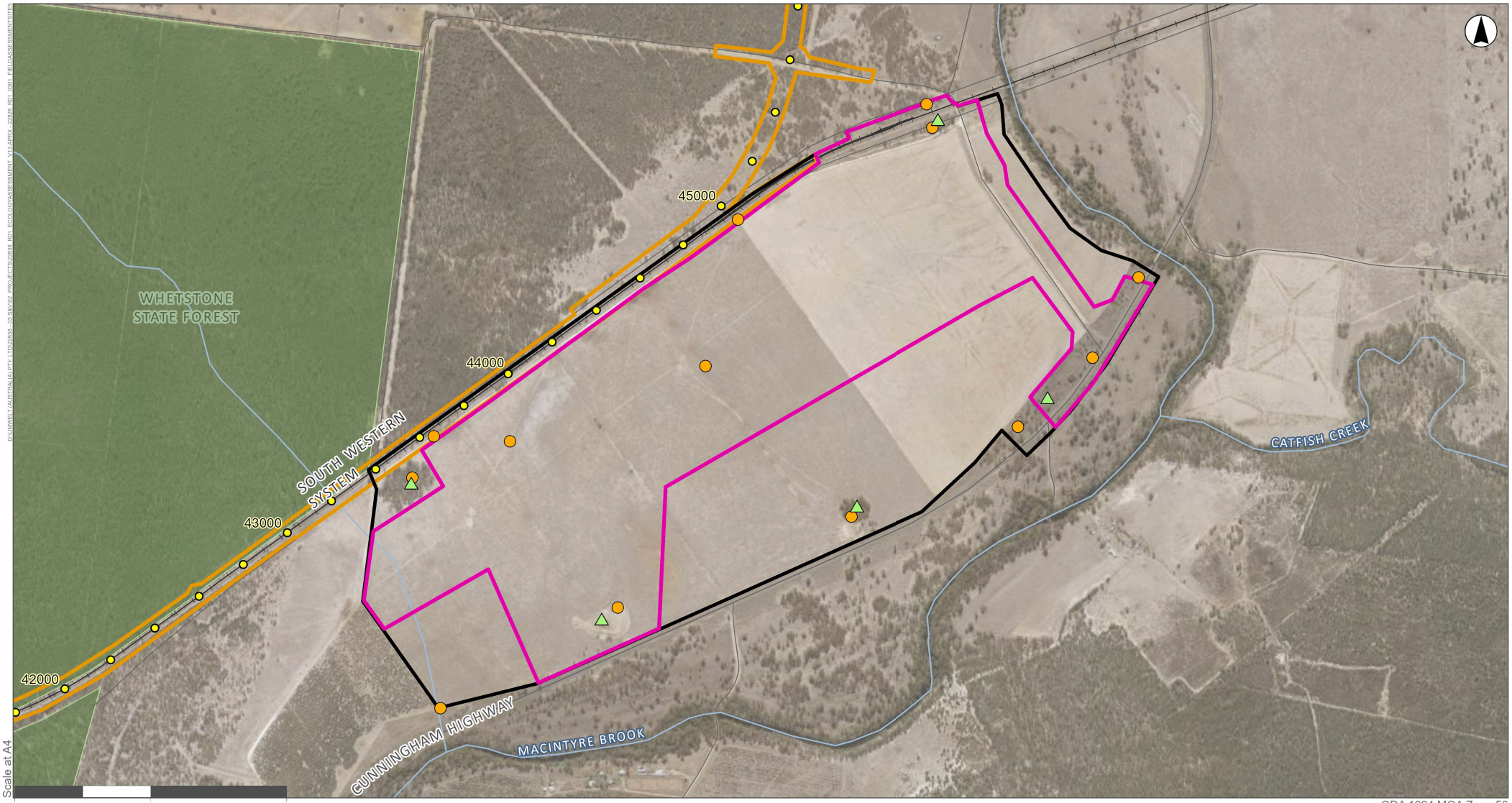



**FIGURE 3.1**

Field Assessment Sites

**Image Source:** ESRI Basemap (2022) **Data source:** Department of Resources (2022)

### 3.2.3 Assumptions and Limitations

A flora assessment has inherent limitations associated with the variability of vegetation communities across a survey location, and changes to the detectability and presence of species over time. It is recognised that field studies undertaken over just one season cannot always account for all potential floral diversity present across a survey location. However, the seasonal condition during which the survey was undertaken (spring) is generally conducive to a high degree of detectable floral diversity.

The detection of fauna species during habitat assessments is limited, given the cryptic and nocturnal nature of many fauna. The species directly observed during the survey are opportunistic sightings only and not considered exhaustive. However, habitat assessment is an accepted method to identify the potentially occurring threatened and migratory species within the Ecology Study Area.

It should be noted that the objective of the survey was not to provide an exhaustive list of flora and fauna species relevant to a baseline survey effort. The survey did however record common and dominant flora species as well as all fauna species observed.

Field survey data collection to inform mapping was conducted using a hand-held iPad unit with aerial imagery. The accuracy of the iPad is generally <5 metres and is not intended to be relied upon for design purposes.

As the Ecology Study Area intersected a rail corridor and the survey team do not hold Rail Industry Workers Cards, no survey was conducted in these areas. Ausecology (2022) has previously surveyed this area and for the purpose of this assessment, the findings of this report have been used and have been assumed to be correct.

### 3.2.4 Nomenclature

Taxonomic nomenclature used for the description of flora species is according to Census of the Queensland Flora 2021 (Bostock & Holland, 2021).

Exotic flora and fauna species are signified in the text by an asterisk (*).

## 3.3 Likelihood of Occurrence Assessment

As part of the B2G EIS, a likelihood of occurrence assessment was undertaken for threatened communities, flora and fauna species and migratory species identified as potentially occurring within the Project footprint (refer to Chapter 11: Flora and Fauna and Appendix L: Terrestrial Ecology Technical Report of the B2G EIS). The Whetstone MDC Development Footprint has been considered in the assessment for the overarching EIS and as such a standalone assessment has not been completed for the purpose of this report.

## 3.4 Impact Assessment

To ensure consistency with the B2G EIS, impact assessment and species habitat mapping is presented within the EIS documentation and not considered in this report (refer to Chapter 11: Flora and Fauna and Appendix L: Terrestrial Ecology Technical Report of the B2G EIS). MNES and MSES known or deemed to have a likely or moderate potential of occurrence within the Development Footprint are subject to assessment under the Commonwealth *Significant Impact Guidelines 1.1* (DoE, 2013) and/or the Queensland *Significant Residual Impact Guideline* (DSDIP, 2014) within the B2G EIS.

# 4.0 Ecological Values

## 4.1 Ecology Study Area Characteristics

The Ecology Study Area comprises historically cleared land dominated by exotic grasslands and wheat cropping with occasional patches of remnant or regrowth vegetation and scattered canopy trees, generally located close to the boundary or along existing tracks. Exotic grass cover in the ground layer is dense across the entire Ecology Study Area, and weeds such as velvety tree pear (*Opuntia tomentosa**) are common. North of the rail corridor and near the southern Ecology Study Area boundary, small and narrow, fragmented patches of eucalypt woodland in regrowth and remnant condition also occur. The highest quality vegetation within the Ecology Study Area occurs in the north-western extent: a single patch of grey-box (*Eucalyptus moluccana*) woodland on flat plains analogous to RE 11.5.20 (detailed further in **Section 4.2.2.2** below).

Aerial imagery indicates that vegetation communities and fauna habitats within the Ecology Study Area and portions of the local area are generally disturbed and fragmented as a result of ongoing agricultural land use practices. Within the broader landscape, large, intact areas of remnant vegetation occur outside of the Whetstone MDC in association with State Forests (namely the Whetstone State Forest and Yelarbon State Forest) and riparian vegetation along the Macintyre Brook watercourse. In the north-west and north-east, these occur directly adjacent to the Ecology Study Area.

Land within the Ecology Study Area is largely flat and level, occurring at elevations between 260 m and 270 m Australian Height Datum (AHD). Shallow depressions occur in select locations, largely associated with the overflow of the two farm dams present. A single, first order, drainage line is mapped within the south-western extent of the Ecology Study Area. Wetlands and watercourses are discussed further in **Section 4.3.5**.

## 4.2 Flora

### 4.2.1 Bioregion and Subregion

The Ecology Study Area occurs within the Brigalow Belt Bioregion, which covers the 500–759 mm rainfall area between the Queensland – New South Wales border in the south, to Townsville in the north. The Bioregion is characterised by the tree species brigalow (*Acacia harpophylla*) that forms forest and woodland on clay soils. Brigalow does not predominate across the entire region, with the bioregion including a range of ecosystems including eucalypt forest and woodland, grassland, dry rainforest, cypress pine woodland and riparian communities (Sattler & Williams 1999).

Within the Brigalow Belt Bioregion, the Ecology Study Area occurs within the Inglewood Sandstones subregion (Sattler & Williams 1999).

## 4.2.2 Vegetation Communities

### 4.2.2.1 Regulated Vegetation

As per the DoR Regulated Vegetation Management map, the Ecology Study Area almost entirely contains Category X non-remnant vegetation. One small area (0.15 ha) of Category B remnant vegetation is mapped along the north-western boundary of the Ecology Study Area, north of the existing South Western Rail Line corridor. No other regulated vegetation categories are mapped.

The field assessment found that the extent of regulated vegetation within the Ecology Study Area was similar to that shown in the Regulated Vegetation Management map, with the Ecology Study Area dominated by Category X non-remnant vegetation. The primary difference noted was the presence of one patch of remnant Category B vegetation in the north-western extent of the Ecology Study Area, south of the existing rail corridor.

### 4.2.2.2 Regional Ecosystems

Review of the Vegetation Management Regional Ecosystem map (Version 12) (Department of Resources 2022) identified the potential presence of three REs within the Ecology Study Area (including one heterogeneous polygons) (see **Figure 4.1)**. One RE (11.3.2) is listed as Of Concern while the other two are listed Least Concern under the VM Act.

Umwelt's field assessments within the Ecology Study Area confirmed the presence of one State-mapped RE. A single patch of RE 11.5.20 approximately 2.45 ha in size was recorded in the north-western corner of the Ecology Study Area (see **Figure 4.2)**, however will not be impacted by the Whetstone MDC. This area is likely too small to have been captured in the State Regional Ecosystem map which is generally developed using a scale of 1:100,000.

A small area of RE 11.3.2 (0.22 ha) was confirmed by Ausecology (2022) to occur in the far northern Ecology Study Area (see **Figure 4.2**), which formed the edges of several larger patches. These patches were unable to be assessed during the Umwelt survey due to their location within the existing rail corridor but are considered present as per the findings of Ausecology (2022). This RE does not intersect the Development Footprint and will not be impacted by the Whetstone MDC.

The three REs State mapped REs, their short description and VM Act status are summarised in **Table 4.1** while **Figure 4.1** displays their occurrence spatially. **Table 4.1** also provides comment on the ground-truthed presence of REs in both the Ecology Study Area and the Development Footprint. Ground-truthed RE mapping is presented in **Figure 4.2**.

**Table 4.1 Regional Ecosystems within the Ecology Study Area**

| State Mapped REs | REDD Description | VM Act Class | Ground-truthed extent within the Ecology Study Area (ha) | Ground-truthed extent within the Development Footprint (ha) |
|---|---|---|---|---|
| **11.5.1** | *Eucalyptus crebra* and/or *E. populnea*, *Callitris glaucophylla*, *Angophora leiocarpa, Allocasuarina luehmannii* woodland on Cainozoic sand plains and/or remnant surfaces | Least Concern | Not present | Not present |
| **11.3.2** | *Eucalyptus populnea* woodland on alluvial plains | Of Concern | 0.22 ha (confirmed by Ausecology) | Not present |
| **11.5.20** | *Eucalyptus moluccana* and/or *E. microcarpa* and/or *E. woollsiana* +/- *E. crebra woodland* on Cainozoic sand plains | Least Concern | 2.45 ha | Not present |

Three non-remnant vegetation communities were also confirmed by Umwelt to occur within the Ecology Study Area and Development Footprint, as described below:

- Regrowth eucalypt woodland with scattered mature canopy trees occurs as small linear patches near the north and south of the Ecology Study Area boundary and are intersected by the Development Footprint. Dominant species vary between patches but include silver-leaved ironbark (*Eucalyptus melanophloia*), Queensland blue gum (*Eucalyptus tereticornis*), poplar box (*Eucalyptus populnea*), Moreton Bay ash (*Corymbia tessellaris*) up to 12 m tall. A very sparse shrub layer is present containing wilga (*Geijera parviflora*) and velvet tree pear (*Opuntia tomentosa**). The ground layer cover is variable, but dense throughout and dominated by a mixture of exotic and native grasses including slender chloris (*Chloris divaricata*), *Austrostipa sp.,* barbed-wire grass (*Cymbopogon refractus*), *Sporobolus sp.,* buffel grass (*Cenchrus ciliaris**) and grader grass (*Themeda quadrivalvis**).
- The majority of the Ecology Study Area and Development Footprint is open paddock with 95 to 100 % cover of exotic and native grasses, herbs and forbs. Very rare paddock trees occur along a small strip in the centre of the site, however elsewhere no canopy or subcanopy is present. The shrub layer is also very low in cover (<5 %) and height (<1 m) and consists of small-leaf bluebrush (*Maireana microphylla*) and velvety tree pear (*Opuntia tomentosa**). Other common species in the ground layer included buffel grass (*Cenchrus ciliaris**), black speargrass (*Heteropogon contortus*), *Vittadinia sp., Einadia nutans subsp. nutans,* South American vervains (*Verbena bonariensis**), Mayne's pest (*Glandularia aristigera**), and lippia (*Phyla canescens**).
- Recently sown monoculture crops also occur within the north-eastern extent of the Ecology Study Area and Development Footprint, likely comprising wheat.

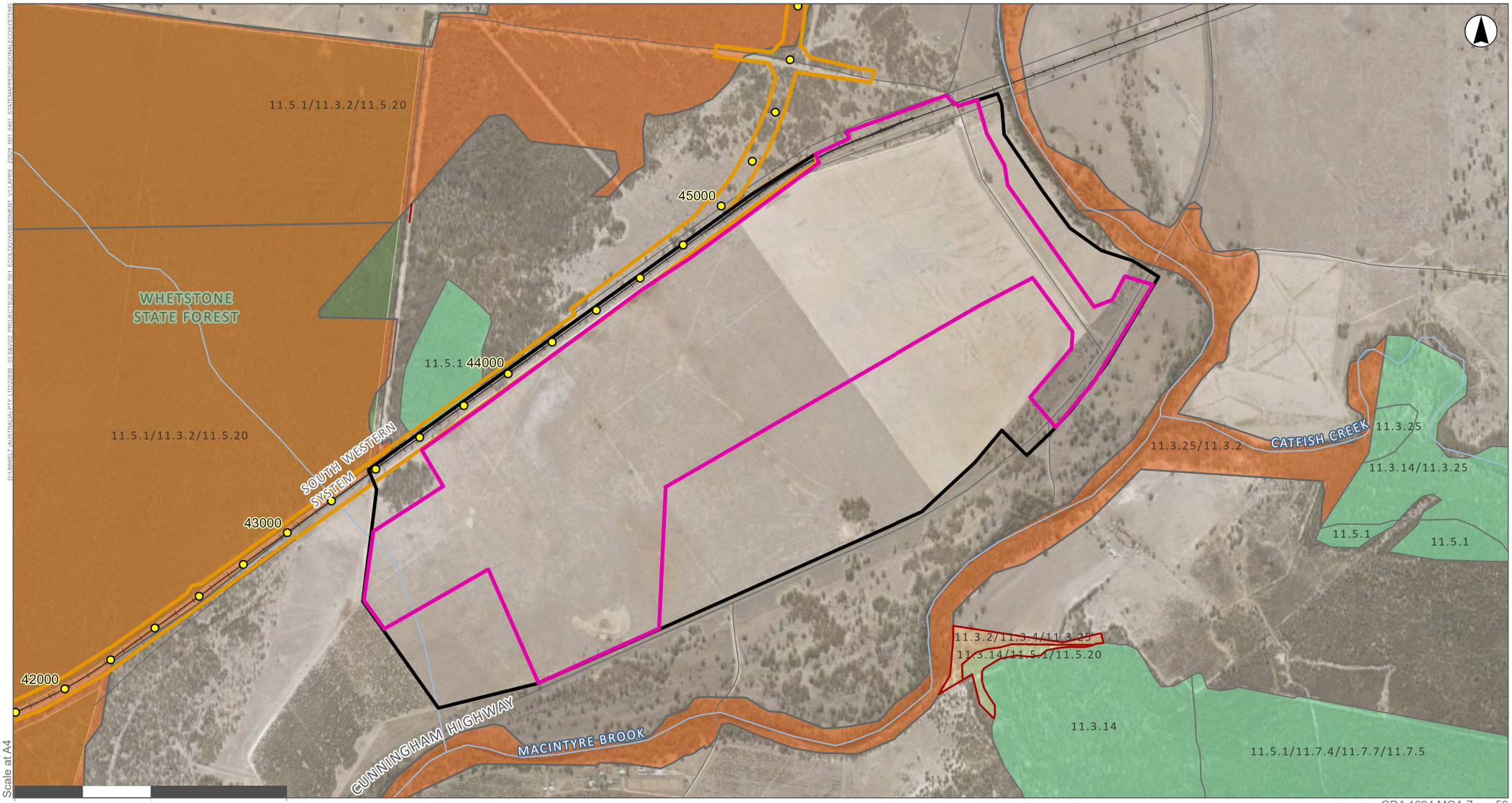
Non-remnant communities within the Ecology Study Area and Development Footprint are also shown on **Figure 4.2**.

#### 4.2.2.3 Threatened Ecological Communities (TECs)

No TECs or analogous REs were identified within the Ecology Study Area or Development Footprint during the Umwelt survey.

The Poplar Box Grassy Woodland on Alluvial Plains TEC (Poplar Box TEC) was recorded within the Ecology Study Area, associated with remnant patches of RE 11.3.2 by Ausecology (2022), located north of the South Western Rail Line (see **Figure 4.2**). As per Ausecology (2022), the patches of RE 11.3.2 within the Ecology Study Area were assessed and all were found to meet the criteria of the highest condition class of the Poplar Box TEC. All patches of Poplar Box TEC have been avoided through Whetstone MDC design, with no patches intersecting the Development Footprint and hence no direct impact is anticipated from Whetstone MDC activities.

As described above, areas assessed and mapped by Ausecology were unable to be assessed during the Umwelt survey due to their location within the rail corridor. Given the Ausecology assessment was completed in 2022, it is unlikely the vegetation community condition has changed. Therefore, the Poplar Box TEC is considered present as per the findings of Ausecology (2022).




Legend

- Ecology Study Area
- Development Footprint (Temporary Footprint)
- Permanent Footprint (B2G Alignment)
- B2G Alignment Chainage Location
- State Forest
- Existing Railway
- Roads
- Watercourse

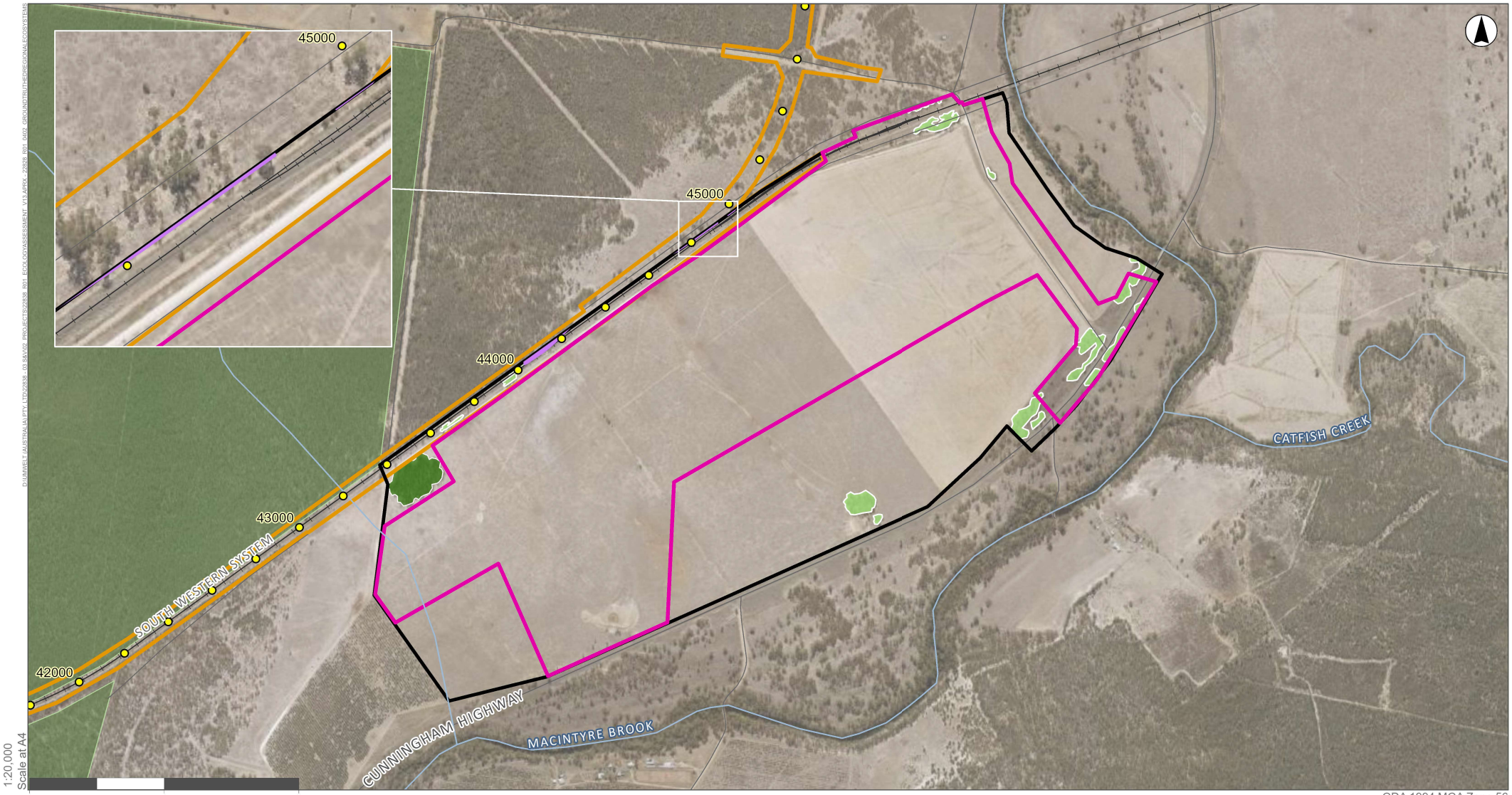
**Vegetation Management Regional Ecosystems**

- Remnant Of Concern
- Remnant Least Concern
- High Value Regrowth Of Concern
- High Value Regrowth Least Concern

**FIGURE 4.1**

State Mapped Regional Ecosystems

**Image Source:** ESRI Basemap (2022) **Data source:** Department of Resources (2022)




Legend

- Ecology Study Area
- Development Footprint (Temporary Footprint)
- Permanent Footprint (B2G Alignment)
- B2G Alignment Chainage Location
- State Forest
- Existing Railway
- Roads
- Watercourse

**Ground-truthed Regional Ecosystem (Umwelt 2022)**

- 11.5.20
- Regrowth

**Threatened Ecological Community (RE 11.3.2) (Ausecology 2022)**

- Poplar Box Grassy Woodlands on Alluvial Plains TEC

**FIGURE 4.2**

Ground-truthed Regional Ecosystems

**Image Source:** ESRI Basemap (2022) **Data source:** Department of Resources (2022)

### 4.2.3 Protected Plants

No high-risk areas for protected plants on the flora survey trigger map were identified within the Ecology Study Area. The closest mapped high-risk area for protected plants is approximately 1 km to the south-east of the Ecology Study Area, connected to Yelarbon State Forest.

### 4.2.4 Flora Diversity

The objective of the flora scope was to characterise vegetation communities and conduct searches for threatened species. Nonetheless, a total of 25 flora species were recorded within the Ecology Study Area during the Umwelt survey. These species represented the dominant species in each strata and common species in the ground layer. The dominant plant families recorded were Myrtaceae (5 taxa) and Poaceae (9 taxa). The field survey identified six introduced flora species which are discussed further in **Section 4.2.4.1** below.

No flora species listed as threatened under the NC Act or EPBC Act were recorded during the field survey.

The full list of flora recorded during the field survey is provided as **Appendix B**.

#### 4.2.4.1 Introduced Flora

Six introduced flora species were recorded within the Ecology Study Area representing three families. One species, velvety tree pear (*Opuntia tomentosa**), is listed under the National Weeds Strategy as a Weed of National Significance and a Category 3 Restricted Invasive species under the Biosecurity Act.

## 4.3 Fauna

### 4.3.1 Fauna Habitat Types

The Ecology Study Area supports a total of four fauna habitat types (**Table 4.2** and **Figure 4.3**). Three of these fauna habitat types are also intersected by the Development Footprint. Habitat type 1 (*Eucalyptus moluccana* woodland on flat plains) will not be disturbed by the Whetstone MDC, with the boundary of the Development Footprint a distance of approximately 10 – 15 m from the habitat type, respectively. A description of these communities and the key fauna habitat opportunities is provided in the subsequent sections below.

It is noted that an additional RE (11.3.2) occurs within the Ecology Study Area as described in **Section 4.2.2.2**. While this RE may provide fauna habitat it was not assessed during the Umwelt survey and will not be impacted by the Whetstone MDC, and as such has not been described further in this section.

Fauna habitat within the Development Footprint and broader Ecology Study Area has been subject to disturbance from clearing, agricultural practices, weeds and pests, and as a result is considered to be of reduced quality. Ongoing disturbance has led to a general lack of native understorey growth, structural complexity and microhabitat features such as fallen woody debris and leaf litter.

**Table 4.2 Fauna Habitat Types**

| Habitat Number | Habitat Type | Extent within Ecology Study Area (ha) | Extent within Development Footprint (ha) |
|---|---|---|---|
| **1** | *Eucalyptus moluccana* woodland on flat plains | 2.45 | 0 |
| **2** | Regrowth eucalypt woodland with scattered mature trees | 5.32 | 2.74 |
| **3** | Farm dams | 2.52 | 2.3 |
| **4A** | Cleared areas – exotic pasture and tracks | 222.0 | 144.47 |
| **4B** | Cleared areas – wheat cropping | 104.17 | 63.11 |

#### 4.3.1.1 Habitat 1 – *Eucalyptus moluccana* Woodland on Flat Plains

This habitat occurs as a single patch in the north-western Ecology Study Area, associated with RE 11.5.20, which is flanked by barbed wire fencing to the north and west. Further north is the existing South Western Rail Line and the Whetstone State Forest. The Development Footprint is approximately 10–15 m away at the closest point and no impacts area expected as a result of the Whetstone MDC.

Characterised as a woodland dominated by grey-box (*Eucalyptus moluccana*) with an open grassy understorey, this habitat is primarily expected to support woodland birds, small reptiles and some mammals. Mature koala food trees (grey-box (*Eucalyptus moluccana*)) to 12m high are common, providing potential foraging opportunities for the koala. However, a number of existing barriers to movement (mesh fencing excluding large tracts of remnant vegetation in the adjacent Whetstone State Forest; the existing South Western Rail Line and the Cunningham Highway) occur in close proximity and may restrict access to this habitat. Hollows in canopy trees are rare and exclusively small in size (2-5 cm entrance width) indicating suitability is likely limited to microbats, arboreal reptiles and some small parrot species.

RE 11.5.20 is identified as 'habitat' for the greater glider (southern and central) (*Petauroides volans*) in the *Guide to greater glider habitat in Queensland* (DES 2022). However, to meet the species ecological requirements, habitat attributes including live and dead hollow-bearing trees are required to be present. The small hollows present in this patch are not considered to be usable by the species. Further, the basal diameter for trees in this patch did not meet the BioCondition benchmark threshold for large trees (46 cm for eucalypts) and hence it its considered unlikely that they are at the senescence stage to develop suitable hollows. Several of the largest trees were >30cm Diameter Breast Height (DBH), a size threshold which the species preferentially selects for foraging, as described in the *Guide to greater glider habitat in Queensland* (DES 2022). However, the patch is disconnected from surrounding vegetation by greater than 1.2 times the canopy height (the typical volplane capacity of the species) with the nearest vegetation approximately 45m to the north. As such the greater glider (southern and central) (*Petauroides volans*) is unlikely to utilise this habitat.

When in flower, the myrtaceous canopy is likely to provide foraging opportunities for a range of common bird and flying-fox species. A single, large bull oak (*Allocasuarina luehmannii*) also occurs within the canopy. This species is a non-preferred foraging resource for the threatened glossy black cockatoo (south-eastern) (*Calyptorhynchus lathami lathami*); however, no evidence of foraging was recorded. Although several recruiting individuals were observed, the rarity of this species indicates the habitat provides negligible habitat opportunities for the species. No mistletoe or fruiting shrub species were recorded.

The grassy ground layer also contains occasional ground-timber, which may be used by small ground-dwelling mammals and reptiles. Occasional decorticating bark on trees may also provide opportunities for common geckos and skinks. Macropods are also likely to utilise the habitat for foraging and shelter as evident by the presence of scats in the ground layer.

**Photo 4.1 *Eucalyptus moluccana* woodland on flat plains**

#### 4.3.1.2 Habitat 2 – Regrowth Eucalypt Woodland with Scattered Mature Trees

This habitat occurs as disconnected, scattered patches within the Ecology Study Area and Development Footprint boundary, generally in proximity to the Cunningham Highway and South Western Rail Line. In the south-eastern corner of the Ecology Study Area, this habitat is connected to the riparian vegetation of the Macintyre Brook to the east of Whetstone Access Road. Habitat exhibits a high level of disturbance, with weeds common and evidence of selective thinning.

Variable in composition and structure, this habitat is broadly characterised as regrowth woodland dominated by *Eucalyptus spp.* with an open grassy understorey. Young and mature koala food trees including Queensland blue gum (*Eucalyptus tereticornis*), poplar box (*Eucalyptus populnea*), narrow-leaved ironbark (*Eucalyptus crebra*) and Morten Bay ash (*Corymbia tessellaris*) are generally common, providing potential foraging opportunities for the koala. Hollows in canopy trees are rare; and all but one medium sized hollow (5-15 cm entrance width) recorded were small (2-5 cm entrance width).

As per habitat type 1, the myrtaceous canopy is likely to provide foraging opportunities for a range of common bird and flying-fox species when in flower. Rare white cypress pine (*Callitris glaucophylla*) trees were recorded in the south-eastern corner of the Ecology Study Area where the patch connects to the Macintyre Brook. However, no other key foraging resources such as mistletoe or fruiting species were

recorded. Habitat opportunities for reptiles and small mammals are limited to the grassy ground layer and occasional ground-timber which consisted of occasional fallen logs.

Based on the small patch size, low density of hollows and the existing fragmentation impacts, habitat is not suitable for the greater glider (central and southern) (*Petauroides volans*). In the north-west of the Ecology Study Area, a small patch of this habitat type exists with some mature poplar box (*Eucalyptus populnea*) to 12m high (see **Photo 4.2** ). This vegetation is represented by regrowth RE 11.3.2 which is not a 'habitat' or 'potential habitat' RE as per the *Guide to greater glider habitat in Queensland* (DES 2022). The patch is also disconnected by a minimum of 50 m to the closest vegetation to the north, across the South Western Rail Line – in excess of volplane capacity of the species (i.e. 1:1.2 times the canopy height – 14.4m). The patch of regrowth adjacent the farm dam on the southern boundary of the Ecology Study Area is dominated by Moreton Bay ash (*Corymbia tessellaris*) and poplar box (*Eucalyptus populnea*), with trees up to 11m and rarely exceeding 20cm DBH (see **Photo 4.3** ). This patch does not meet the size thresholds considered to be suitable for foraging (>30 DBH) and breeding (BioCondition benchmark large tree size or 50cm DBH). It is also disconnected from potentially suitable habitat by over 150m including the Cunningham Highway.

Scattered patches of this habitat type also occur adjacent the Cunninham Highway in the eastern portion of the Ecology Study Area. Although one medium hollow was recorded in the southern patches in this area and occasional trees had larger DBHs, these areas are functionally disconnected from suitable habitat. However, the north-eastern most patch of vegetation is functionally connected to the riparian corridor of the Macintyre Brook (see **Photo 4.4**). In this location, some trees exceed the 30cm DBH threshold preferred by greater glider (southern and central) (*Petauroides volans*), which includes tree species characterising greater glider habitat in Queensland (as per the *Guide to greater glider habitat in Queensland* (DES 2022)) including Queensland blue gum (*Eucalyptus tereticornis*) and narrow-leaved ironbark (*Eucalyptus crebra*). This area has the potential to provide foraging opportunities for the greater glider (southern and central) (*Petauroides volans*), albeit higher value habitat is available and present in the riparian corridor.

**Photo 4.2 Regrowth eucalypt woodland with scattered mature trees in the north-west of the Ecology Study Area**

**Photo 4.3 Regrowth eucalypt woodland with scattered mature trees adjacent the farm dam on the southern boundary of the Ecology Study Area**

**Photo 4.4 Regrowth eucalypt woodland with scattered mature trees in the north-east of the Ecology Study Area connected to the Macintyre Brook riparian corridor**

#### 4.3.1.3 Habitat 3 – Farm Dams

Two farm dams were identified within the southern Ecology Study Area. One dam is within the Development Footprint and the other dam is within the Ecology Study Area approximately 450 m from the

Development Footprint at its closest point. The farm dams differed in quality, however both had modified banks which had been raised primarily along the southern boundary and were dominated by common weed species.

The western-most farm dam is the largest (approximately 2.3 ha) and highest quality (**Photo 4.5**, left). Relative to the extent observable on aerial imagery, this dam was found to be considerably larger during the field survey likely as a result of recent rainfall and the extended wet season in 2022. Margins up to 6 m wide of wetland vegetation including *Juncus sp.* and macrophytes occur on the low-lying fringes in the northern, shallow overflow areas. These areas may provide refuge and foraging opportunities for a diversity of waterbirds including some migratory shorebirds which are known to occur in the region (e.g. common greenshank (*Tringa nebularia*) and Latham's snipe (*Gallinago hardwickii*)).

The second farm dam located to the east is smaller in size (approximately 0.3 ha) and has more defined banks (**Photo 4.5**, right). Fringing wetland vegetation is largely absent. However, a small area of regrowth eucalypt woodland occurs directly adjacent and may provide shade to aquatic species in the dam such as turtles, as well as perching opportunities for foraging raptors.

Species observed utilising the farm dams during the field survey include the Australasian grebe (*Tachybaptus novaehollandiae*), Australian wood duck (*Chenonetta jubata*), sulphur crested cockatoo (*Cacatua galerita*), pied cormorant (*Phalacrocorax varius*), white-necked heron (*Ardea pacifica*), black-fronted dotterel (*Elseyornis melanops*), straw-necked ibis (*Threskiornis spinicollis*), intermediate egret (*Ardea intermedia*) and spotted black snake (*Pseudechis guttatus*). The larger farm dam within the Development footprint is conservatively considered to provide some foraging and dispersal opportunities for wetland birds while on passage to higher quality habitat, however the depth and lack of fringing vegetation at the smaller farm dam were not suitable to support the ecological requirements for these species.

**Photo 4.5 Two farm dams within the Ecology Study Area. Larger and higher quality dam in the west (pictured left), smaller dam in the east (pictured right).**

#### 4.3.1.4 Habitat 4A – Cleared Areas – Exotic Pasture and Tracks

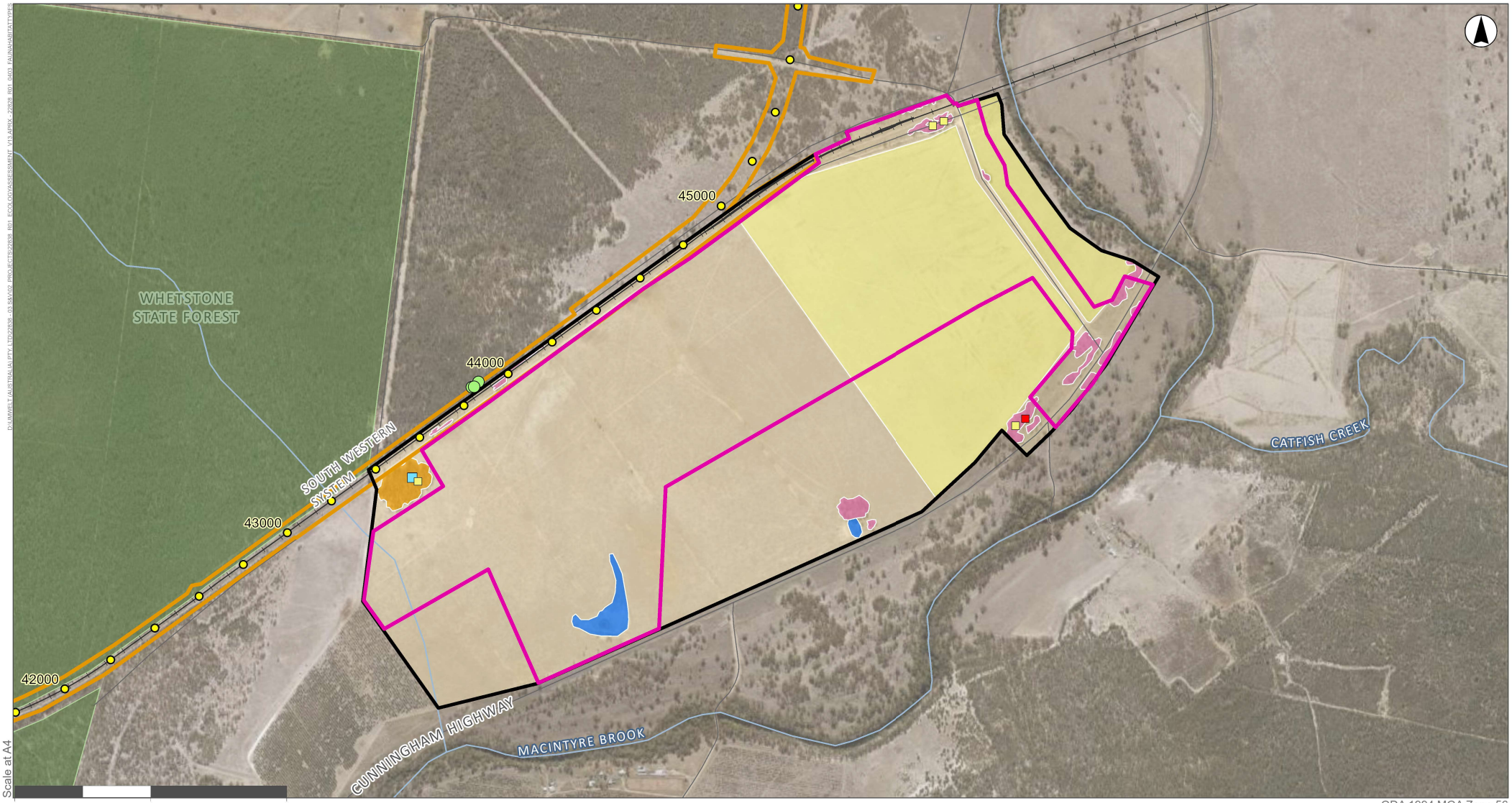
Cleared areas comprising exotic pasture and tracks occur over the majority of the Ecology Study Area and the Development Footprint. Habitat is highly disturbed, and values are limited but include rare individual paddock trees (generally adjacent to tracks, on fence lines or near farm dams) and an abundance of exotic grass in the ground layer where grazing had been restricted. Rare areas of bare ground are also present as a result of recent clearing works (**Photo 4.6**). Where grass cover is high, dispersal opportunities for small reptiles and mammals occur. Common raptors, granivorous birds and common mammal species such as the eastern grey kangaroo may forage in this habitat and emu (*Dromaius novaehollandiae*) and red-backed fairy wren (*Malurus melanocephalus*) were regularly recorded. Given the species' very broad habitat requirements, habitat may also be suitable for the short-beaked echidna (*Tachyglossus aculeatus*). As Although highly marginal with no potential shelter trees recorded, this habitat may meet the Project definition for koala dispersal habitat (ERM, 2023) given that it is separates large patches of potential habitat to the north and south by less than 2 km (widest disconnection between suitable habitat from north to south approximately 1.6 km).

**Photo 4.6 Exotic pasture**

#### 4.3.1.5 Habitat 4B – Cleared Areas – Wheat Cropping

Cleared areas comprising cropping occur in the eastern extent of the Ecology Study Area and the Development Footprint. Similar to the exotic pasture, habitat is highly disturbed and provides very limited habitat opportunities. The crop observed during the field survey was very short, likely only recently planted, however did provide ground-cover for dispersing small-bodied ground-dwelling fauna (**Photo 4.7**). Birds are the fauna group most likely to utilise this habitat for foraging and dispersal purposes. Although opportunities for conservation significant species are minimal in this habitat type, it is understood that this area would broadly meet the B2G EIS definition for koala dispersal habitat (ERM, 2023). However, dispersal opportunities are marginal given the distance between potential habitat patches (up to 1.4 km), the lack of habitat trees and the dense cropping vegetation in the ground layer which would be present for much of the year.

**Photo 4.7 Wheat cropping**




Legend

- Ecology Study Area
- Development Footprint (Temporary Footprint)
- Permanent Footprint (B2G Alignment)
- B2G Alignment Chainage Location
- State Forest
- Existing Railway
- Roads
- Watercourse

**Potential Animal Breeding Places**

- Small Hollows (Umwelt 2022)
- Medium Hollows (Umwelt 2022)
- Active Animal Breeding Place (Noisy Miner Nest) (Umwelt 2022)
- Potential Animal Breeding Place (Cardno 2021)

**Fauna Habitats**

- Cleared areas - exotic pasture and tracks
- Cleared areas - wheat cropping
- *Eucalyptus moluccana* woodland on flat plains
- Regrowth eucalypt woodland with scattered mature trees
- Farm dams

**Image Source:** ESRI Basemap (2022) **Data source:** Department of Resources (2022)

# FIGURE 4.3
## Fauna Habitat Types

### 4.3.2 Fauna Diversity

Fauna species were recorded opportunistically throughout the duration of the field survey as ecologists traversed the Ecology Study Area on foot. A total of 40 fauna species were recorded including one reptile, one amphibian, one mammal and 37 birds.

No fauna species listed as threatened and or migratory under the EPBC Act NC Act or were recorded during the field survey.

The full fauna species list is provided in **Appendix B**.

#### 4.3.2.1 Introduced Fauna

A number of introduced fauna species are recognised as threats to native flora and fauna under the EPBC Act. No introduced fauna species were recorded during the field assessment; however, introduced species likely to occur (and listed as restricted matters under the Biosecurity Act) include, but are not limited to: cane toad (*Rhinella marina**), black rat (*Rattus rattus**), house mouse (*Mus musculus**), red fox (*Vulpes vulpes**) and feral cat (*Felis catus**).

### 4.3.3 Animal Breeding Places

Findings of the Umwelt survey confirmed the presence of one active animal breeding place within the *Eucalyptus moluccana* woodland on flat plains habitat type (habitat 1), in the western Ecology Study Area outside of the Development Footprint (**Figure 4.3)**. A noisy miner (*Manorina melanocephala*) nest with two chicks was recorded in a low branch of the single mature bull oak (*Allocasuarina luehmannii*) present. The noisy miner is not listed threatened or migratory under the NC Act or EPBC Act, however, the 'Aggressive exclusion of birds from potential woodland and forest habitat by over-abundant noisy miners (*Manorina melanocephala*)' is a Key Threatened Process under the EPBC Act. Additionally, small hollows which may be utilised by microchiropteran bats or small parrot species were present in regrowth eucalypt woodlands. One medium hollow was also present in this habitat type (**Figure 4.3**).

Ecology surveys completed by Cardno to support the B2G EIS also identified three potential animal breeding places immediately north of the Ecology Study Area, as described below:

- Large stag with 5 large hollows and 5 medium hollows.
- Stag with 2 medium hollows.
- Large hollow log.

### 4.3.4 Connectivity and Fauna Movement

Although occurring in an area used largely for agriculture, a number of protected areas including State Forests occur in the immediate vicinity of the Ecology Study Area, supported extensive areas of woodland habitat. The Macintyre Brook also occurs directly east and south-east which has a well-developed, remnant riparian zone and was flowing heavily at the time of the Umwelt survey.

As discussed in **Section 4.3.1**, the Ecology Study Area is dominated by non-remnant cleared areas with only relatively small, scattered areas of remnant and regrowth woodland habitat. While these woodland habitats may provide increased habitat resources relative to the surrounding grasslands, a number of barriers to movement exist that may limit access to these areas. Movement within the Ecology Study Area is restricted by the large areas of cleared land and tracks. Although areas outside of the Ecology Study Area are functionally connected for more mobile species, the South Western Rail Line in the north and the Cunningham Highway in the south may be a barrier to movement for smaller species and also present a risk of vehicle strike for dispersing fauna.

Nonetheless, woodland patches within the Ecology Study Area are expected to provide some 'stepping-stone' opportunities and potentially facilitate the movement of threatened fauna such as the koala by limiting the distance required to travel in cleared exposed landscapes. Further, as the koala is known to disperse across non-remnant areas, the entire Ecology Study Area is likely to meet the definition of dispersal habitat (ERM, 2023), albeit marginal.

In the south-eastern Ecology Study Area especially, regrowth woodland connects to the riparian vegetation of the Macintyre Brook, which ultimately connects the extensive woodlands to the north and south. In the far northern and north-western corner of the Ecology Study Area, regrowth and remnant vegetation occurs in close proximity to the rail corridor and existing vegetation, potentially allowing the crossing of this barrier to be simplified.

The Ecology Study Area is not located within a Biodiversity Planning Assessment (BPA) Statewide Biodiversity Corridor; however, adjacent areas to the north and south are considered to be of State significance.

### 4.3.5 Wetlands and Watercourses

The DES Queensland Wetland mapping, MSES High Ecological Significance (HES) wetland mapping and Vegetation management wetland mapping were reviewed as part of the desktop assessment. State mapped watercourse values such as VM Act watercourses and DAF waterways for waterway barrier works were also reviewed.

The Ecology Study Area is located within the Macintyre Brook sub-basin of the Murry Darling Basin. Macintyre Brook, a stream order 8 watercourse, flows north to south around the eastern and southern boundary of the Ecology Study Area. Feeding into Macintyre Brook, Catfish Creek, a stream order 5 watercourse, flows east to west to the south-east of the Ecology Study Area. Both Macintyre Brook and Catfish Creek occur on the VM Act Watercourses map. One unnamed, stream order 1 drainage feature, flows north to south through the western portion of the Ecology Study Area and Development Footprint and into Macintyre Brook. However, this watercourse could not be identified during the field survey possibly due to severe exotic grass incursion and lack of defined banks. Macintyre Brook and Catfish Creek are classified as Major waterways for waterway barrier works. Both of these systems are located outside of the Ecology Study Area.

The Ecology Study Area contains two mapped artificial waterbodies represented as agricultural dams. No HES wetlands occur within the Ecology Study Area. Field surveys confirmed the presence of the two agricultural dams on the southern boundary of the Ecology Study Area (**Section 4.3.1.3**) which support aquatic flora species and may provide habitat for fauna species such as turtles, reptiles, frogs, freshwater fish and birds. Under ideal conditions, this habitat may provide marginal foraging and roosting

opportunities for migratory birds, such as the EPBC Act Latham's snipe and common greenshank, during migration. Outside of the Ecology Study Area, the Macintyre Brook is likely to support a greater diversity of aquatic fauna including the Murray cod (*Maccullochella peelii*), which was confirmed during field surveys completed for the B2G EIS (ARTC, 2021).

## 4.4 Essential Habitat

No areas of Essential Habitat for threatened flora or fauna species occur within the Development Footprint as per the DES Essential Habitat mapping. The nearest area of mapped Essential Habitat occurs >10 km to the south-east, within Yelarbon State Forest.

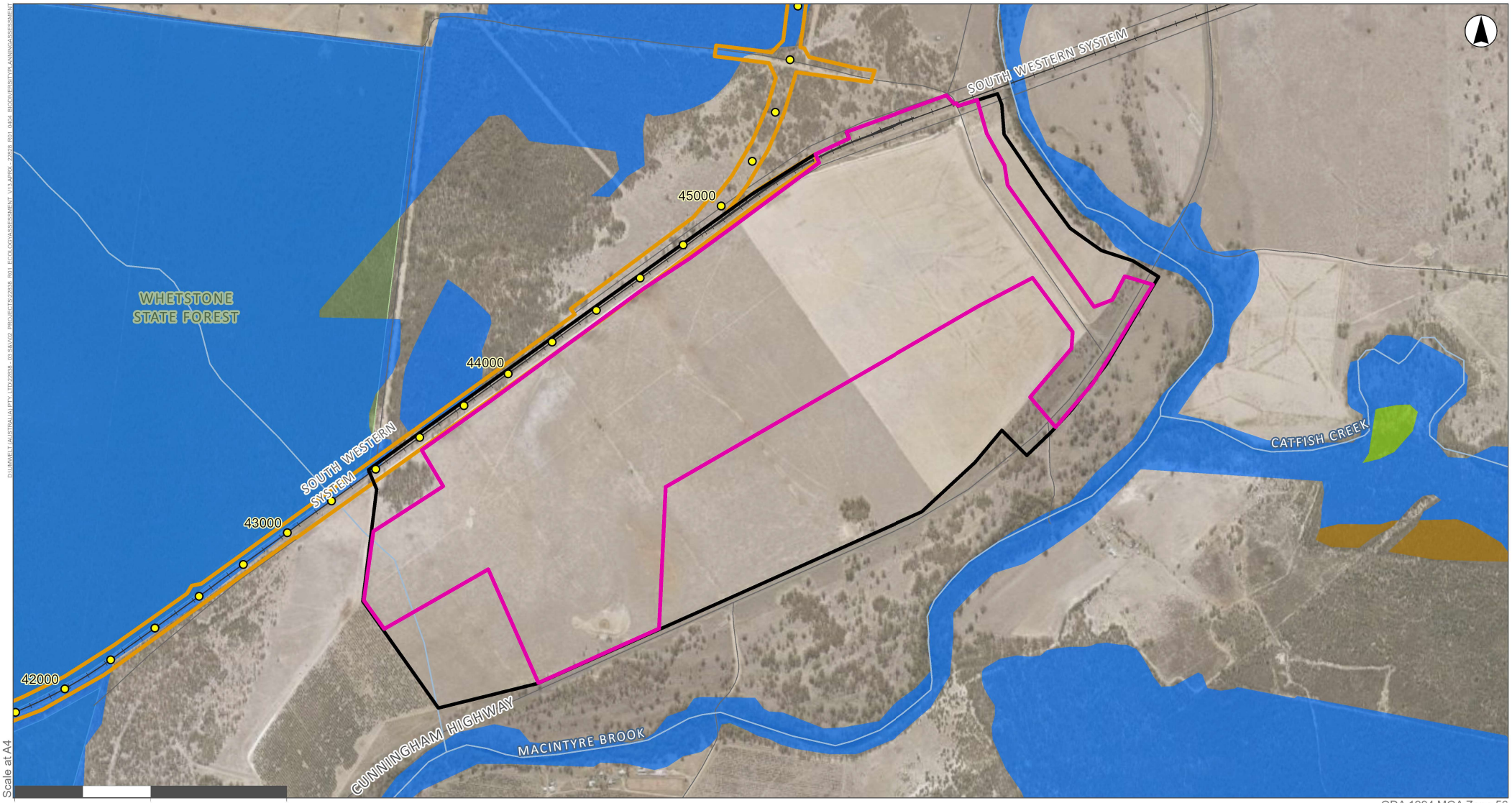



**FIGURE 4.4**

Biodiversity Planning Assessment Mapping

**Image Source:** ESRI Basemap (2022) **Data source:** Department of Resources (2022)

# 5.0 Summary

Ecological values validated within the Development Footprint include regrowth and non-remnant vegetation in degraded condition. Nonetheless, these communities support some habitat values and resources for a diversity of flora and fauna species, conservatively including listed threatened and migratory species. This includes potential animal breeding places for least concern, threatened and colonial breeding fauna. One first order drainage line is mapped along the western extent of the Development Footprint.

The field survey did not confirm the presence of any conservation significant fauna or flora species. However, field surveys were observational only and were not intended to provide an exhaustive list of species diversity.

The Whetstone MDC has the potential to impact on a range of biodiversity values. Impact assessment for this area has been completed as part of the B2G EIS for consistency in approach and has not been discussed in this report. A suite of mitigation measures defined in the B2G EIS will be implemented throughout construction and operation to ensure impacts to ecological values are limited to the greatest extent possible.

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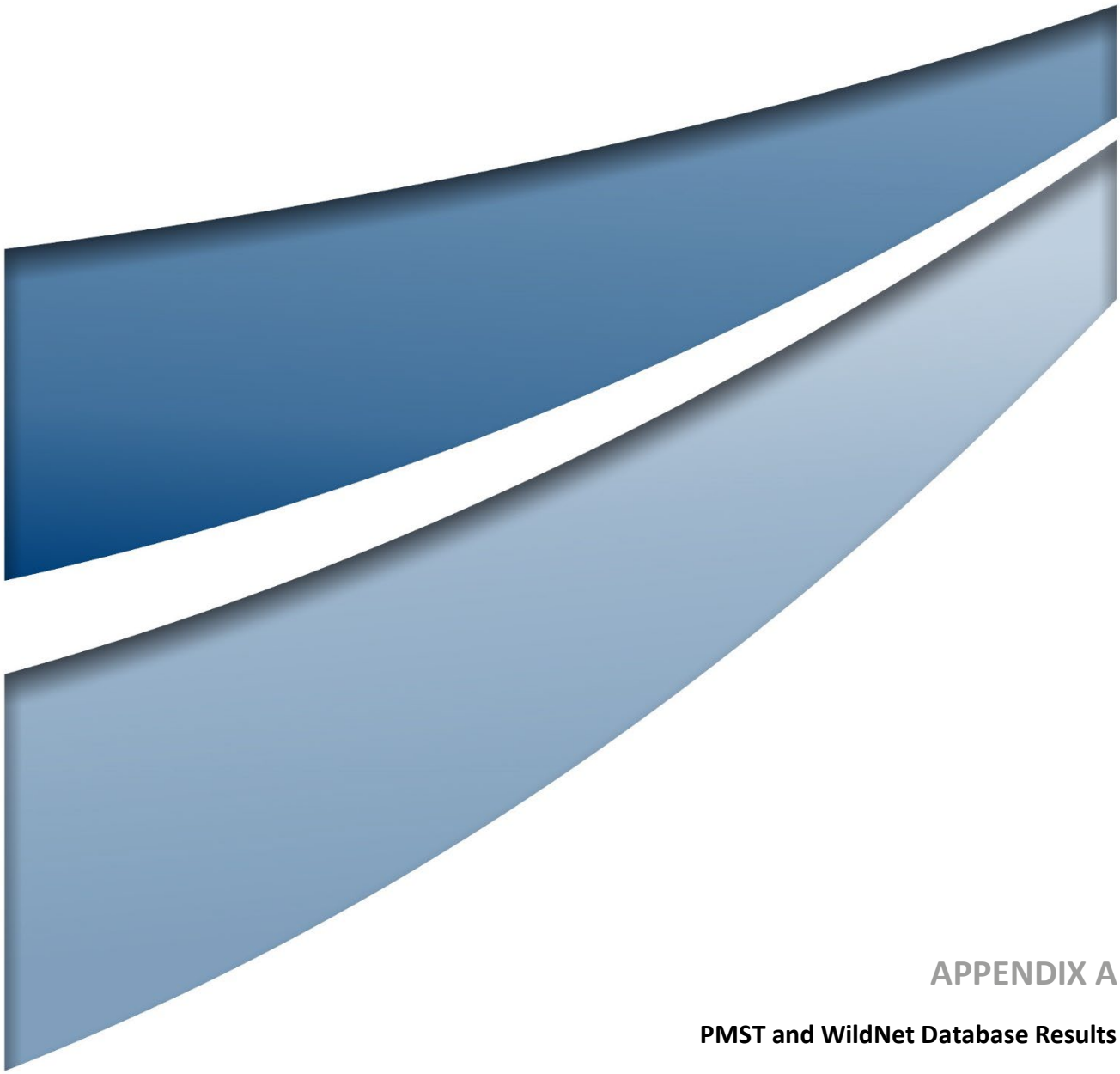

# APPENDIX A

**PMST and WildNet Database Results**

# EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 25-Sep-2022

# 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 | 3 |
| Great Barrier Reef Marine Park: | None |
| Commonwealth Marine Area: | None |
| Listed Threatened Ecological Communities: | 5 |
| Listed Threatened Species: | 31 |
| 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

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

| | |
|---|---|
| Commonwealth Lands: | None |
| Commonwealth Heritage Places: | None |
| Listed Marine Species: | 15 |
| 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: | 5 |
| 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 | Buffer Status |
|---|---|---|
| Banrock station wetland complex | 1100 - 1200km upstream from Ramsar site | In feature area |
| Riverland | 1100 - 1200km upstream from Ramsar site | In feature area |
| The coorong, and lakes alexandrina and albert wetland | 1300 - 1400km upstream from Ramsar site | In feature area |

### Listed Threatened Ecological Communities [ Resource Information ]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

| Community Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| Brigalow (Acacia harpophylla dominant and co-dominant) | Endangered | Community known to occur within area | In buffer area only |
| Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions | Endangered | Community may occur within area | In feature area |
| Poplar Box Grassy Woodland on Alluvial Plains | Endangered | Community likely to occur within area | In feature area |
| Weeping Myall Woodlands | Endangered | Community likely to occur within area | In feature area |
| White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland | Critically Endangered | Community may occur within area | In feature area |

### Listed Threatened Species [ Resource Information ]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| BIRD | | | |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| Anthochaera phrygia<br>Regent Honeyeater [82338] | Critically Endangered | Foraging, feeding or related behaviour may occur within area | In feature area |
| Calidris ferruginea<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area | In feature area |
| Calyptorhynchus lathami lathami<br>South-eastern Glossy Black-Cockatoo [67036] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| Erythrotriorchis radiatus<br>Red Goshawk [942] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Falco hypoleucos<br>Grey Falcon [929] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| Geophaps scripta scripta<br>Squatter Pigeon (southern) [64440] | Vulnerable | Species or species habitat known to occur within area | In feature area |
| Grantiella picta<br>Painted Honeyeater [470] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| Hirundapus caudacutus<br>White-throated Needletail [682] | Vulnerable | Species or species habitat known to occur within area | In feature area |
| Rostratula australis<br>Australian Painted Snipe [77037] | Endangered | Species or species habitat likely to occur within area | In feature area |
| FISH | | | |
| Maccullochella peelii<br>Murray Cod [66633] | Vulnerable | Species or species habitat may occur within area | In feature area |
| MAMMAL | | | |
| Chalinolobus dwyeri<br>Large-eared Pied Bat, Large Pied Bat [183] | Vulnerable | Species or species habitat likely to occur within area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| Dasyurus maculatus maculatus (SE mainland population) | | | |
| Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184] | Endangered | Species or species habitat may occur within area | In feature area |
| Nyctophilus corbeni | | | |
| Corben's Long-eared Bat, South-eastern Long-eared Bat [83395] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| Petauroides volans | | | |
| Greater Glider (southern and central) [254] | Endangered | Species or species habitat likely to occur within area | In feature area |
| 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 | In feature area |
| Pteropus poliocephalus | | | |
| Grey-headed Flying-fox [186] | Vulnerable | Foraging, feeding or related behaviour may occur within area | In feature area |
| PLANT | | | |
| Acacia lauta | | | |
| Tara Wattle [4165] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Androcalva procumbens | | | |
| [87153] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| Cadellia pentastylis | | | |
| Ooline [9828] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Dichanthium setosum | | | |
| bluegrass [14159] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| Homopholis belsonii | | | |
| Belson's Panic [2406] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Lepidium monoplocoides | | | |
| Winged Pepper-cress [9190] | Endangered | Species or species habitat likely to occur within area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| Thesium australe | | | |
| Austral Toadflax, Toadflax [15202] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Vincetoxicum forsteri listed as Tylophora linearis | | | |
| [92384] | Endangered | Species or species habitat may occur within area | In feature area |
| Westringia parvifolia | | | |
| [4822] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| Xerothamnella herbacea | | | |
| [4146] | Endangered | Species or species habitat likely to occur within area | In buffer area only |
| REPTILE | | | |
| Anomalopus mackayi | | | |
| Five-clawed Worm-skink, Long-legged Worm-skink [25934] | Vulnerable | Species or species habitat may occur within area | In buffer area only |
| Delma torquata | | | |
| Adorned Delma, Collared Delma [1656] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Egernia rugosa | | | |
| Yakka Skink [1420] | Vulnerable | Species or species habitat may occur within area | In buffer area only |
| Furina dunmalli | | | |
| Dunmall's Snake [59254] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Uvidicolus sphyrurus | | | |
| Border Thick-tailed Gecko, Granite Belt Thick-tailed Gecko [84578] | Vulnerable | Species or species habitat may occur within area | In buffer area only |

## Listed Migratory Species [ Resource Information ]

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| Migratory Marine Birds | | | |
| Apus pacificus | | | |
| Fork-tailed Swift [678] | | Species or species habitat likely to occur within area | In feature area |
| Migratory Terrestrial Species | | | |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| Hirundapus caudacutus<br>White-throated Needletail [682] | Vulnerable | Species or species habitat known to occur within area | In feature area |
| Motacilla flava<br>Yellow Wagtail [644] | | Species or species habitat may occur within area | In feature area |
| Myiagra cyanoleuca<br>Satin Flycatcher [612] | | Species or species habitat likely to occur within area | In feature area |
| **Migratory Wetlands Species** | | | |
| Actitis hypoleucos<br>Common Sandpiper [59309] | | Species or species habitat may occur within area | In feature area |
| Calidris acuminata<br>Sharp-tailed Sandpiper [874] | | Species or species habitat may occur within area | In feature area |
| Calidris ferruginea<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area | In feature area |
| Calidris melanotos<br>Pectoral Sandpiper [858] | | Species or species habitat may occur within area | In feature area |
| Gallinago hardwickii<br>Latham's Snipe, Japanese Snipe [863] | | Species or species habitat may occur within area | In feature area |

## Other Matters Protected by the EPBC Act

| Listed Marine Species | | | [ Resource Information ] |
|---|---|---|---|
| Scientific Name | Threatened Category | Presence Text | Buffer Status |
| **Bird** | | | |
| Actitis hypoleucos<br>Common Sandpiper [59309] | | Species or species habitat may occur within area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| Apus pacificus<br>Fork-tailed Swift [678] | | Species or species habitat likely to occur within area overfly marine area | In feature area |
| Bubulcus ibis as Ardea ibis<br>Cattle Egret [66521] | | Species or species habitat may occur within area overfly marine area | In feature area |
| Calidris acuminata<br>Sharp-tailed Sandpiper [874] | | Species or species habitat may occur within area | In feature area |
| Calidris ferruginea<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area overfly marine area | In feature area |
| Calidris melanotos<br>Pectoral Sandpiper [858] | | Species or species habitat may occur within area overfly marine area | In feature area |
| Chalcites osculans as Chrysococcyx osculans<br>Black-eared Cuckoo [83425] | | Species or species habitat likely to occur within area overfly marine area | In feature area |
| Gallinago hardwickii<br>Latham's Snipe, Japanese Snipe [863] | | Species or species habitat may occur within area overfly marine area | In feature area |
| Haliaeetus leucogaster<br>White-bellied Sea-Eagle [943] | | Species or species habitat likely to occur within area | In feature area |
| Hirundapus caudacutus<br>White-throated Needletail [682] | Vulnerable | Species or species habitat known to occur within area overfly marine area | In feature area |
| Merops ornatus<br>Rainbow Bee-eater [670] | | Species or species habitat may occur within area overfly marine area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| Motacilla flava<br>Yellow Wagtail [644] | | Species or species habitat may occur within area overfly marine area | In feature area |
| Myiagra cyanoleuca<br>Satin Flycatcher [612] | | Species or species habitat likely to occur within area overfly marine area | In feature area |
| Neophema chrysostoma<br>Blue-winged Parrot [726] | | Species or species habitat may occur within area overfly marine area | In feature area |
| Rostratula australis as Rostratula benghalensis (sensu lato)<br>Australian Painted Snipe [77037] | Endangered | Species or species habitat likely to occur within area overfly marine area | In feature area |

## Extra Information

### EPBC Act Referrals [ Resource Information ]

| Title of referral | Reference | Referral Outcome | Assessment Status | Buffer Status |
|---|---|---|---|---|
| Controlled action | | | | |
| ARG Border Rail Project Moree to Toowoomba QLD | 2013/7061 | Controlled Action | Further Information Request | In feature area |
| Inland Rail Border to Gowrie Project, QLD | 2018/8165 | Controlled Action | Assessment Approach | In feature area |
| Not controlled action | | | | |
| Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia | 2015/7522 | Not Controlled Action | Completed | In feature area |
| Inland Rail Border to Gowrie Geotechnical Investigations | 2021/8911 | Not Controlled Action | Completed | In feature area |
| Not controlled action (particular manner) | | | | |
| 132kV transmission line | 2003/1024 | Not Controlled Action (Particular Manner) | Post-Approval | In feature area |

## Bioregional Assessments

| SubRegion | BioRegion | Website | Buffer Status |
|---|---|---|---|
| Maranoa-Balonne-Condamine | Northern Inland Catchments | BA website | In feature area |

# Caveat

## 1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

## 2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

## 3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

## 4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

# Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.


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# WildNet Records
## Species List

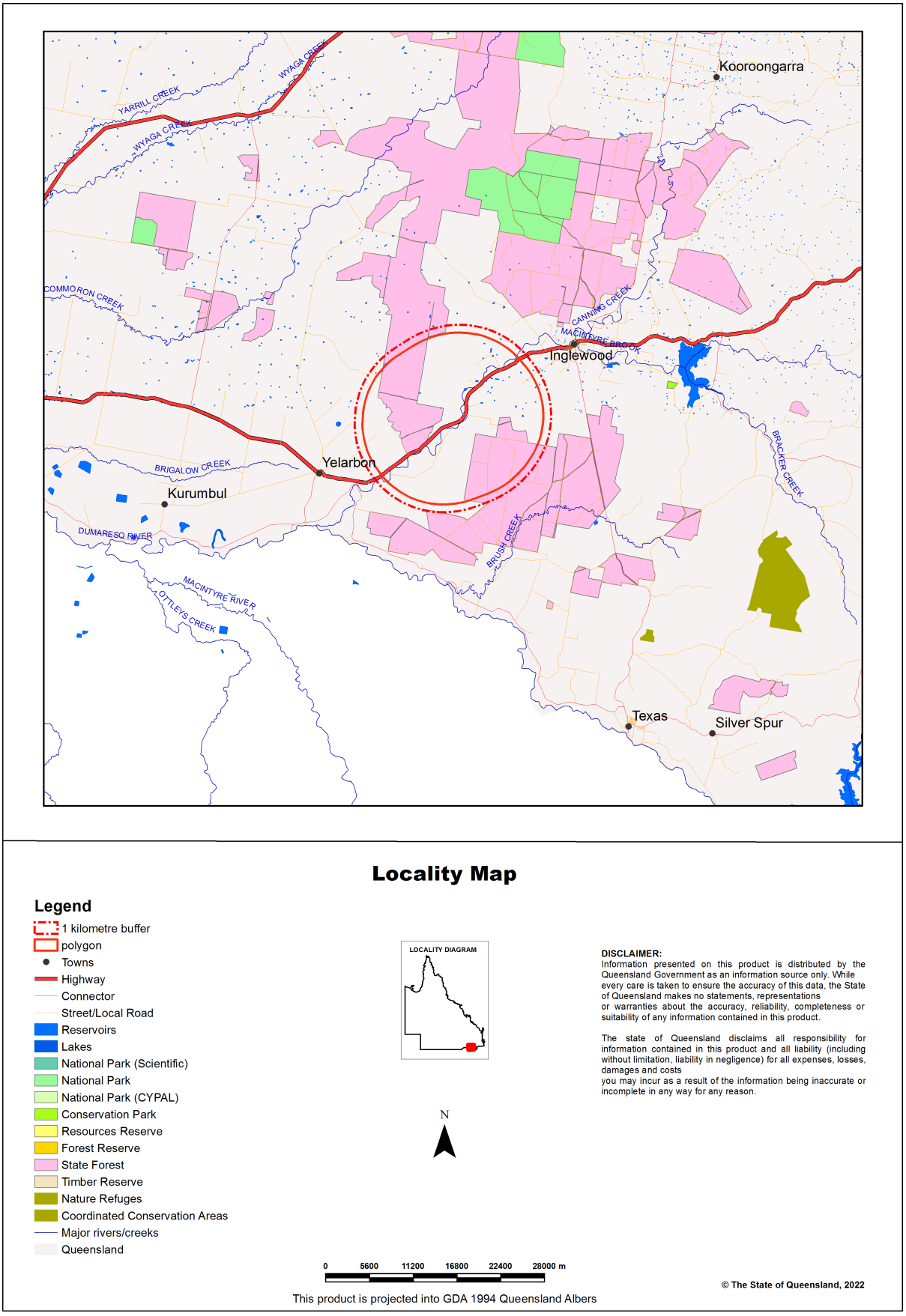
For the selected area of interest 39512.95ha Custom Geometry

Current as at 25/09/2022

Whetstone-AllSpecies10kmBuffer

Queensland Government

## Map 1. Locality Map



## Summary Information

The following table provides an overview of the area of interest Custom Geometry.

**Table 1. Area of interest details**

| | |
|---|---|
| Size (ha) | 39,512.95 |
| Local Government(s) | Goondiwindi Regional |
| Bioregion(s) | Brigalow Belt |
| Subregion(s) | Inglewood Sandstones, Moonie R. - Commoron Creek Floodout |
| Catchment(s) | Border Rivers |

**Protected Area(s)**

The following estates and/or reserves are located in the area of interest:

Whetstone State Forest

Yelarbon 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.

## Species List

**Introduction**

This report is derived from a spatial layer generated from the WildNet database managed by the Department of Environment and Science. The layer which is generated weekly contains the 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.

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 (Refer Links and Support).

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.

**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 |
|---|---|---|---|---|---|---|---|---|---|
| 624 | Amphibia | Hylidae | *Cyclorana alboguttata* | greenstripe frog | C | None | 0 | 1 | 07/01/2005 |
| 614 | Amphibia | Hylidae | *Litoria latopalmata* | broad palmed rocketfrog | C | None | 2 | 6 | 07/01/2005 |
| 596 | Amphibia | Hylidae | *Litoria peronii* | emerald spotted treefrog | C | None | 1 | 4 | 03/09/1996 |
| 600 | Amphibia | Hylidae | *Litoria rubella* | ruddy treefrog | C | None | 1 | 3 | 07/01/2005 |
| 679 | Amphibia | Limnodynastidae | *Limnodynastes fletcheri* | barking frog | C | None | 0 | 1 | 07/01/2005 |

| Taxon Id | Class | Family | Scientific Name | Common Name | NCA | EPBC | Specimens | Records | Last record |
|---|---|---|---|---|---|---|---|---|---|
| 684 | Amphibia | Limnodynastidae | *Limnodynastes tasmaniensis* | spotted grassfrog | C | None | 0 | 1 | 07/01/2005 |
| 680 | Amphibia | Limnodynastidae | *Platyplectrum ornatum* | ornate burrowing frog | C | None | 0 | 2 | 07/01/2005 |
| 696 | Amphibia | Myobatrachidae | *Crinia parinsignifera* | beeping froglet | C | None | 0 | 1 | 03/09/1996 |
| 1419 | Aves | Acanthizidae | *Acanthiza chrysorrhoa* | yellow-rumped thornbill | C | None | 0 | 5 | 28/09/2001 |
| 1422 | Aves | Acanthizidae | *Acanthiza nana* | yellow thornbill | C | None | 0 | 5 | 09/08/2009 |
| 1423 | Aves | Acanthizidae | *Acanthiza pusilla* | brown thornbill | C | None | 0 | 1 | 04/07/1999 |
| 1425 | Aves | Acanthizidae | *Acanthiza reguloides* | buff-rumped thornbill | C | None | 0 | 1 | 20/12/1994 |
| 1396 | Aves | Acanthizidae | *Gerygone olivacea* | white-throated gerygone | C | None | 0 | 5 | 28/09/2001 |
| 1403 | Aves | Acanthizidae | *Pyrrholaemus sagittatus* | speckled warbler | C | None | 0 | 3 | 09/08/2009 |
| 1371 | Aves | Acanthizidae | *Smicrornis brevirostris* | weebill | C | None | 0 | 9 | 09/08/2009 |
| 1742 | Aves | Accipitridae | *Accipiter cirrocephalus* | collared sparrowhawk | C | None | 0 | 3 | 22/06/1999 |
| 1729 | Aves | Accipitridae | *Accipiter fasciatus* | brown goshawk | C | None | 0 | 2 | 29/09/1999 |
| 1732 | Aves | Accipitridae | *Aquila audax* | wedge-tailed eagle | C | None | 0 | 1 | 24/08/1999 |
| 1721 | Aves | Accipitridae | *Aviceda subcristata* | Pacific baza | C | None | 0 | 2 | 27/01/2001 |
| 1707 | Aves | Accipitridae | *Haliastur sphenurus* | whistling kite | C | None | 0 | 2 | 29/09/1999 |
| 1712 | Aves | Accipitridae | *Lophoictinia isura* | square-tailed kite | C | None | 0 | 1 | 18/08/2017 |
| 1714 | Aves | Accipitridae | *Milvus migrans* | black kite | C | None | 0 | 5 | 24/08/1999 |
| 1776 | Aves | Alcedinidae | *Ceyx azureus* | azure kingfisher | C | None | 0 | 19 | 27/01/2001 |
| 1993 | Aves | Anatidae | *Anas gracilis* | grey teal | C | None | 0 | 1 | 27/06/2000 |
| 1998 | Aves | Anatidae | *Anas superciliosa* | Pacific black duck | C | None | 0 | 18 | 09/08/2009 |
| 2003 | Aves | Anatidae | *Chenonetta jubata* | Australian wood duck | C | None | 0 | 15 | 07/01/2001 |
| 1977 | Aves | Anatidae | *Dendrocygna arcuata* | wandering whistling-duck | C | None | 0 | 1 | 27/06/2000 |
| 1279 | Aves | Anhingidae | *Anhinga novaehollandiae* | Australasian darter | C | None | 0 | 8 | 01/06/2000 |
| 1829 | Aves | Ardeidae | *Ardea alba modesta* | eastern great egret | C | None | 0 | 2 | 30/05/1999 |
| 1832 | Aves | Ardeidae | *Ardea pacifica* | white-necked heron | C | None | 0 | 13 | 24/01/2000 |
| 1830 | Aves | Ardeidae | *Bubulcus ibis* | cattle egret | C | None | 0 | 11 | 01/11/2000 |
| 1826 | Aves | Ardeidae | *Egretta novaehollandiae* | white-faced heron | C | None | 0 | 7 | 26/09/2000 |
| 1659 | Aves | Artamidae | *Artamus cyanopterus* | dusky woodswallow | C | None | 0 | 2 | 09/08/2009 |

| Taxon Id | Class | Family | Scientific Name | Common Name | NCA | EPBC | Specimens | Records | Last record |
|---|---|---|---|---|---|---|---|---|---|
| 1660 | Aves | Artamidae | *Artamus leucorynchus* | white-breasted woodswallow | C | None | 0 | 2 | 24/01/2000 |
| 1654 | Aves | Artamidae | *Cracticus nigrogularis* | pied butcherbird | C | None | 0 | 5 | 28/09/2001 |
| 1656 | Aves | Artamidae | *Cracticus torquatus* | grey butcherbird | C | None | 0 | 12 | 05/07/2020 |
| 1644 | Aves | Artamidae | *Gymnorhina tibicen* | Australian magpie | C | None | 0 | 22 | 28/09/2001 |
| 1645 | Aves | Artamidae | *Strepera graculina* | pied currawong | C | None | 0 | 21 | 05/07/2020 |
| 1191 | Aves | Cacatuidae | *Cacatua galerita* | sulphur-crested cockatoo | C | None | 0 | 31 | 09/08/2009 |
| 1194 | Aves | Cacatuidae | *Cacatua sanguinea* | little corella | C | None | 0 | 13 | 14/11/2017 |
| 1185 | Aves | Cacatuidae | *Calyptorhynchus funereus* | yellow-tailed black-cockatoo | C | None | 0 | 1 | 17/02/1993 |
| 22494 | Aves | Cacatuidae | *Calyptorhynchus lathami lathami* | glossy black-cockatoo (eastern) | V | V | 0 | 1 | 17/02/1993 |
| 1193 | Aves | Cacatuidae | *Eolophus roseicapilla* | galah | C | None | 0 | 33 | 09/08/2009 |
| 1173 | Aves | Cacatuidae | *Nymphicus hollandicus* | cockatiel | C | None | 0 | 16 | 02/08/2001 |
| 1636 | Aves | Campephagidae | *Coracina novaehollandiae* | black-faced cuckoo-shrike | C | None | 0 | 7 | 27/06/2000 |
| 1637 | Aves | Campephagidae | *Coracina papuensis* | white-bellied cuckoo-shrike | C | None | 0 | 3 | 09/08/2009 |
| 1639 | Aves | Campephagidae | *Edolisoma tenuirostre* | common cicadabird | C | None | 0 | 1 | 20/12/1994 |
| 1089 | Aves | Casuariidae | *Dromaius novaehollandiae* | emu | C | None | 0 | 6 | 08/09/2021 |
| 1933 | Aves | Charadriidae | *Vanellus miles novaehollandiae* | masked lapwing (southern subspecies) | C | None | 0 | 1 | 24/01/2000 |
| 1628 | Aves | Climacteridae | *Climacteris picumnus* | brown treecreeper | C | None | 0 | 23 | 02/08/2001 |
| 18293 | Aves | Climacteridae | *Cormobates leucophaea metastasis* | white-throated treecreeper (southern) | C | None | 0 | 4 | 12/01/1998 |
| 1809 | Aves | Columbidae | *Geopelia cuneata* | diamond dove | C | None | 0 | 1 | 31/07/2000 |
| 1810 | Aves | Columbidae | *Geopelia humeralis* | bar-shouldered dove | C | None | 0 | 21 | 09/08/2009 |
| 18323 | Aves | Columbidae | *Geopelia placida* | peaceful dove | C | None | 0 | 27 | 28/09/2001 |
| 1793 | Aves | Columbidae | *Ocyphaps lophotes* | crested pigeon | C | None | 0 | 30 | 23/11/2001 |
| 1795 | Aves | Columbidae | *Phaps chalcoptera* | common bronzewing | C | None | 0 | 3 | 12/01/1998 |
| 1774 | Aves | Columbidae | *Streptopelia chinensis* | spotted dove | None | None | 0 | 1 | 30/04/1999 |
| 1779 | Aves | Coraciidae | *Eurystomus orientalis* | dollarbird | C | None | 0 | 21 | 28/03/2001 |

| Taxon Id | Class | Family | Scientific Name | Common Name | NCA | EPBC | Specimens | Records | Last record |
|---|---|---|---|---|---|---|---|---|---|
| 1603 | Aves | Corcoracidae | *Corcorax melanorhamphos* | white-winged chough | C | None | 0 | 5 | 05/07/2020 |
| 1605 | Aves | Corcoracidae | *Struthidea cinerea* | apostlebird | C | None | 0 | 15 | 23/11/2001 |
| 1607 | Aves | Corvidae | *Corvus bennetti* | little crow | C | None | 0 | 1 | 22/12/1998 |
| 1608 | Aves | Corvidae | *Corvus coronoides* | Australian raven | C | None | 0 | 4 | 27/06/2000 |
| 1609 | Aves | Corvidae | *Corvus orru* | Torresian crow | C | None | 0 | 7 | 09/08/2009 |
| 1610 | Aves | Corvidae | *Corvus sp.* | None | C | None | 0 | 1 | 28/03/2001 |
| 1754 | Aves | Cuculidae | *Cacomantis flabelliformis* | fan-tailed cuckoo | C | None | 0 | 1 | 03/09/1996 |
| 1751 | Aves | Cuculidae | *Centropus phasianinus* | pheasant coucal | C | None | 0 | 1 | 07/01/2001 |
| 1738 | Aves | Cuculidae | *Eudynamys orientalis* | eastern koel | C | None | 0 | 2 | 24/01/2000 |
| 1369 | Aves | Estrildidae | *Neochmia modesta* | plum-headed finch | C | None | 0 | 17 | 02/08/2001 |
| 1342 | Aves | Estrildidae | *Taeniopygia bichenovii* | double-barred finch | C | None | 0 | 29 | 28/09/2001 |
| 1343 | Aves | Estrildidae | *Taeniopygia guttata* | zebra finch | C | None | 0 | 10 | 02/08/2001 |
| 1704 | Aves | Falconidae | *Falco cenchroides* | nankeen kestrel | C | None | 0 | 3 | 28/09/2001 |
| 1691 | Aves | Falconidae | *Falco longipennis* | Australian hobby | C | None | 0 | 1 | 12/05/2000 |
| 1692 | Aves | Falconidae | *Falco peregrinus* | peregrine falcon | C | None | 0 | 4 | 28/03/2000 |
| 1767 | Aves | Halcyonidae | *Dacelo novaeguineae* | laughing kookaburra | C | None | 0 | 30 | 05/07/2020 |
| 1760 | Aves | Halcyonidae | *Todiramphus macleayii* | forest kingfisher | C | None | 0 | 1 | 22/12/1998 |
| 1762 | Aves | Halcyonidae | *Todiramphus sanctus* | sacred kingfisher | C | None | 0 | 3 | 23/11/2001 |
| 1572 | Aves | Hirundinidae | *Hirundo neoxena* | welcome swallow | C | None | 0 | 27 | 05/07/2006 |
| 1570 | Aves | Maluridae | *Malurus cyaneus* | superb fairy-wren | C | None | 0 | 35 | 05/07/2020 |
| 1556 | Aves | Maluridae | *Malurus lamberti sensu lato* | variegated fairy-wren | C | None | 0 | 3 | 05/07/2006 |
| 1291 | Aves | Megaluridae | *Cincloramphus cruralis* | brown songlark | C | None | 0 | 1 | 08/09/2021 |
| 1292 | Aves | Megaluridae | *Cincloramphus mathewsi* | rufous songlark | C | None | 0 | 1 | 28/09/2001 |
| 1552 | Aves | Meliphagidae | *Acanthagenys rufogularis* | spiny-cheeked honeyeater | C | None | 0 | 3 | 27/01/2001 |
| 1542 | Aves | Meliphagidae | *Anthochaera chrysoptera* | little wattlebird | C | None | 0 | 1 | 30/05/1999 |
| 1523 | Aves | Meliphagidae | *Caligavis chrysops* | yellow-faced honeyeater | C | None | 0 | 4 | 09/08/2009 |

| Taxon Id | Class | Family | Scientific Name | Common Name | NCA | EPBC | Specimens | Records | Last record |
|---|---|---|---|---|---|---|---|---|---|
| 1539 | Aves | Meliphagidae | *Entomyzon cyanotis* | blue-faced honeyeater | C | None | 0 | 9 | 07/01/2001 |
| 1497 | Aves | Meliphagidae | *Lichmera indistincta* | brown honeyeater | C | None | 0 | 1 | 12/01/1998 |
| 1499 | Aves | Meliphagidae | *Manorina flavigula* | yellow-throated miner | C | None | 0 | 2 | 05/07/2006 |
| 1500 | Aves | Meliphagidae | *Manorina melanocephala* | noisy miner | C | None | 0 | 6 | 09/08/2009 |
| 1504 | Aves | Meliphagidae | *Meliphaga lewinii* | Lewin's honeyeater | C | None | 0 | 1 | 04/07/1999 |
| 1507 | Aves | Meliphagidae | *Melithreptus albogularis* | white-throated honeyeater | C | None | 0 | 1 | 03/09/1996 |
| 1508 | Aves | Meliphagidae | *Melithreptus brevirostris* | brown-headed honeyeater | C | None | 0 | 4 | 03/09/1996 |
| 1489 | Aves | Meliphagidae | *Myzomela sanguinolenta* | scarlet honeyeater | C | None | 0 | 1 | 17/02/1993 |
| 1516 | Aves | Meliphagidae | *Nesoptilotis leucotis* | white-eared honeyeater | C | None | 0 | 17 | 05/07/2020 |
| 1493 | Aves | Meliphagidae | *Philemon citreogularis* | little friarbird | C | None | 0 | 4 | 11/11/2000 |
| 1494 | Aves | Meliphagidae | *Philemon corniculatus* | noisy friarbird | C | None | 0 | 16 | 09/08/2009 |
| 1471 | Aves | Meliphagidae | *Plectorhyncha lanceolata* | striped honeyeater | C | None | 0 | 6 | 14/11/2017 |
| 1513 | Aves | Meliphagidae | *Ptilotula fusca* | fuscous honeyeater | C | None | 0 | 2 | 20/12/1994 |
| 1518 | Aves | Meliphagidae | *Ptilotula penicillata* | white-plumed honeyeater | C | None | 0 | 16 | 09/08/2009 |
| 1589 | Aves | Monarchidae | *Grallina cyanoleuca* | magpie-lark | C | None | 0 | 34 | 09/08/2009 |
| 1600 | Aves | Monarchidae | *Myiagra inquieta* | restless flycatcher | C | None | 0 | 8 | 14/11/2017 |
| 1586 | Aves | Monarchidae | *Myiagra rubecula* | leaden flycatcher | C | None | 0 | 2 | 14/11/2017 |
| 1611 | Aves | Nectariniidae | *Dicaeum hirundinaceum* | mistletoebird | C | None | 0 | 6 | 12/05/2000 |
| 1453 | Aves | Neosittidae | *Daphoenositta chrysoptera* | varied sittella | C | None | 0 | 4 | 12/01/1998 |
| 1442 | Aves | Oriolidae | *Oriolus sagittatus* | olive-backed oriole | C | None | 0 | 4 | 24/02/2000 |
| 1444 | Aves | Oriolidae | *Sphecotheres vieilloti* | Australasian figbird | C | None | 0 | 4 | 27/01/2001 |
| 1449 | Aves | Pachycephalidae | *Colluricincla harmonica* | grey shrike-thrush | C | None | 0 | 30 | 23/11/2001 |
| 1436 | Aves | Pachycephalidae | *Pachycephala pectoralis* | golden whistler | C | None | 0 | 2 | 04/07/1999 |
| 1437 | Aves | Pachycephalidae | *Pachycephala rufiventris* | rufous whistler | C | None | 0 | 10 | 09/08/2009 |
| 1389 | Aves | Pardalotidae | *Pardalotus punctatus* | spotted pardalote | C | None | 0 | 4 | 03/09/1996 |
| 1392 | Aves | Pardalotidae | *Pardalotus striatus* | striated pardalote | C | None | 0 | 19 | 09/08/2009 |

| Taxon Id | Class | Family | Scientific Name | Common Name | NCA | EPBC | Specimens | Records | Last record |
|---|---|---|---|---|---|---|---|---|---|
| 1284 | Aves | Pelecanidae | *Pelecanus conspicillatus* | Australian pelican | C | None | 0 | 14 | 02/08/2001 |
| 1347 | Aves | Petroicidae | *Eopsaltria australis* | eastern yellow robin | C | None | 0 | 9 | 05/07/2020 |
| 1337 | Aves | Petroicidae | *Melanodryas cucullata* | hooded robin | C | None | 0 | 1 | 20/12/1994 |
| 1339 | Aves | Petroicidae | *Microeca fascinans* | jacky winter | C | None | 0 | 3 | 28/09/2001 |
| 1261 | Aves | Phalacrocoracidae | *Microcarbo melanoleucos* | little pied cormorant | C | None | 0 | 2 | 29/09/1999 |
| 1263 | Aves | Phalacrocoracidae | *Phalacrocorax sulcirostris* | little black cormorant | C | None | 0 | 5 | 04/01/2000 |
| 1687 | Aves | Phasianidae | *Synoicus ypsilophorus* | brown quail | C | None | 0 | 1 | 28/03/2000 |
| 1955 | Aves | Podargidae | *Podargus strigoides* | tawny frogmouth | C | None | 0 | 7 | 29/09/1999 |
| 1249 | Aves | Podicipedidae | *Tachybaptus no vaehollandiae* | Australasian grebe | C | None | 0 | 1 | 09/08/2009 |
| 1317 | Aves | Pomatostomidae | *Pomatostomus superciliosus* | white-browed babbler | C | None | 0 | 2 | 14/01/1998 |
| 1318 | Aves | Pomatostomidae | *Pomatostomus temporalis* | grey-crowned babbler | C | None | 0 | 5 | 09/08/2009 |
| 1180 | Aves | Psittacidae | *Alisterus scapularis* | Australian king-parrot | C | None | 0 | 4 | 04/12/2000 |
| 1182 | Aves | Psittacidae | *Aprosmictus erythropterus* | red-winged parrot | C | None | 0 | 26 | 02/08/2001 |
| 1154 | Aves | Psittacidae | *Neophema pulchella* | turquoise parrot | C | None | 0 | 1 | 09/09/2021 |
| 1147 | Aves | Psittacidae | *Parvipsitta pusilla* | little lorikeet | C | None | 0 | 8 | 23/11/1999 |
| 1136 | Aves | Psittacidae | *Platycercus adscitus* | pale-headed rosella | C | None | 0 | 17 | 09/08/2009 |
| 1139 | Aves | Psittacidae | *Platycercus eximius* | eastern rosella | C | None | 0 | 1 | 27/06/2000 |
| 1118 | Aves | Psittacidae | *Psephotus haematonotus* | red-rumped parrot | C | None | 0 | 10 | 28/09/2001 |
| 1124 | Aves | Psittacidae | *Trichoglossus chlorolepidotus* | scaly-breasted lorikeet | C | None | 0 | 1 | 28/09/2001 |
| 1125 | Aves | Psittacidae | *Trichoglossus moluccanus* | rainbow lorikeet | C | None | 0 | 3 | 03/09/1996 |
| 1160 | Aves | Ptilonorhynchidae | *Chlamydera maculata* | spotted bowerbird | C | None | 0 | 6 | 07/01/2001 |
| 1662 | Aves | Rallidae | *Porphyrio melanotus* | purple swamphen | C | None | 0 | 1 | 24/02/2000 |
| 1575 | Aves | Rhipiduridae | *Rhipidura albiscapa* | grey fantail | C | None | 0 | 8 | 05/07/2020 |
| 1576 | Aves | Rhipiduridae | *Rhipidura leucophrys* | willie wagtail | C | None | 0 | 32 | 05/07/2020 |
| 1853 | Aves | Scolopacidae | *Tringa nebularia* | common greenshank | SL | None | 0 | 1 | 22/12/1998 |
| 1102 | Aves | Strigidae | *Ninox boobook* | southern boobook | C | None | 0 | 1 | 24/01/2000 |

| Taxon Id | Class | Family | Scientific Name | Common Name | NCA | EPBC | Specimens | Records | Last record |
|---|---|---|---|---|---|---|---|---|---|
| 1314 | Aves | Sturnidae | *Acridotheres tristis* | common myna | None | None | 0 | 1 | 21/08/2011 |
| 1303 | Aves | Sturnidae | *Sturnus vulgaris* | common starling | None | None | 0 | 3 | 28/09/2001 |
| 1822 | Aves | Threskiornithidae | *Platalea flavipes* | yellow-billed spoonbill | C | None | 0 | 5 | 23/11/1999 |
| 1823 | Aves | Threskiornithidae | *Platalea regia* | royal spoonbill | C | None | 0 | 1 | 14/01/1998 |
| 1812 | Aves | Threskiornithidae | *Threskiornis molucca* | Australian white ibis | C | None | 0 | 3 | 24/01/2000 |
| 1800 | Aves | Threskiornithidae | *Threskiornis spinicollis* | straw-necked ibis | C | None | 0 | 18 | 28/09/2001 |
| 1276 | Aves | Timaliidae | *Zosterops lateralis* | silvereye | C | None | 0 | 7 | 04/12/2000 |
| 1081 | Aves | Turnicidae | *Turnix varius* | painted button-quail | C | None | 0 | 1 | 03/09/1996 |
| 1108 | Aves | Tytonidae | *Tyto javanica* | eastern barn owl | C | None | 0 | 5 | 29/09/1999 |
| 35081 | Insecta | Aeshnidae | *Anax papuensis* | Australian Emperor | None | None | 0 | 1 | 08/09/2021 |
| 35176 | Insecta | Lestidae | *Austrolestes aridus* | inland ringtail | None | None | 0 | 1 | 08/09/2021 |
| 35199 | Insecta | Libellulidae | *Diplacodes bipunctata* | wandering percher | None | None | 0 | 1 | 08/09/2021 |
| 1071 | Mammalia | Canidae | *Vulpes vulpes* | red fox | None | None | 0 | 5 | 05/07/2020 |
| 22485 | Mammalia | Dasyuridae | *Antechinus flavipes flavipes* | yellow-footed antechinus (south-east Queensland) | C | None | 0 | 1 | 31/12/1997 |
| 793 | Mammalia | Dasyuridae | *Sminthopsis murina* | common dunnart | C | None | 0 | 1 | 31/12/1997 |
| 1056 | Mammalia | Felidae | *Felis catus* | cat | None | None | 0 | 4 | 05/07/2020 |
| 901 | Mammalia | Macropodidae | *Macropus giganteus* | eastern grey kangaroo | C | None | 0 | 3 | 05/07/2020 |
| 885 | Mammalia | Macropodidae | *Wallabia bicolor* | swamp wallaby | C | None | 0 | 1 | 03/09/1996 |
| 764 | Mammalia | Muridae | *Mus musculus* | house mouse | None | None | 0 | 1 | 31/12/1997 |
| 747 | Mammalia | Muridae | *Pseudomys delicatulus* | delicate mouse | C | None | 1 | 1 | 31/12/1997 |
| 1080 | Mammalia | Suidae | *Sus scrofa* | pig | None | None | 0 | 3 | 05/07/2020 |
| 838 | Mammalia | Tachyglossidae | *Tachyglossus aculeatus* | short-beaked echidna | SL | None | 0 | 4 | 05/07/2020 |
| 561 | Reptilia | Agamidae | *Diporiphora nobbi* | nobbi | C | None | 0 | 1 | 16/02/1993 |
| 512 | Reptilia | Colubridae | *Dendrelaphis punctulatus* | green tree snake | C | None | 0 | 1 | 10/03/2006 |
| 482 | Reptilia | Elapidae | *Denisonia devisi* | De Vis' banded snake | C | None | 1 | 1 | 31/12/1996 |
| 420 | Reptilia | Gekkonidae | *Gehyra dubia* | dubious dtella | C | None | 0 | 2 | 03/09/1996 |
| 413 | Reptilia | Gekkonidae | *Heteronotia binoei* | Bynoe's gecko | C | None | 0 | 1 | 03/09/1996 |
| 304 | Reptilia | Scincidae | *Anomalopus leuckartii* | two-clawed worm-skink | C | None | 0 | 2 | 03/09/1996 |
| 226 | Reptilia | Scincidae | *Liopholis modesta* | eastern ranges rock-skink | C | None | 5 | 5 | 01/12/1948 |
| 127 | Reptilia | Scincidae | *Menetia greyii* | common dwarf skink | C | None | 0 | 1 | 03/09/1996 |

| Taxon Id | Class | Family | Scientific Name | Common Name | NCA | EPBC | Specimens | Records | Last record |
|---|---|---|---|---|---|---|---|---|---|
| 134 | Reptilia | Scincidae | *Morethia boulengeri* | south-eastern morethia skink | C | None | 0 | 3 | 03/09/1996 |
| 103 | Reptilia | Scincidae | *Tiliqua rugosa* | shingle-back | C | None | 0 | 1 | 09/09/2021 |
| 78 | Reptilia | Varanidae | *Varanus gouldii* | sand monitor | C | None | 0 | 1 | 03/09/1996 |
| 61 | Reptilia | Varanidae | *Varanus varius* | lace monitor | C | None | 0 | 1 | 31/01/1999 |

**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 |
|---|---|---|---|---|---|---|---|---|---|
| 9086 | Equisetopsida | Aizoaceae | *Zaleya galericulata subsp. galericulata* | None | C | None | 1 | 1 | 24/03/1969 |
| 35564 | Equisetopsida | Asteraceae | *Brachyscome casstiana* | None | C | None | 1 | 1 | 07/10/1993 |
| 35554 | Equisetopsida | Asteraceae | *Brachyscome whitei subsp. whitei* | None | C | None | 2 | 2 | 10/05/1994 |
| 10061 | Equisetopsida | Asteraceae | *Calocephalus sonderi* | palebeauty heads | C | None | 1 | 1 | 07/10/2007 |
| 14738 | Equisetopsida | Asteraceae | *Cassinia laevis* | None | C | None | 0 | 1 | 14/09/2000 |
| 26775 | Equisetopsida | Asteraceae | *Leiocarpa panaetioides* | None | C | None | 1 | 1 | 11/10/2020 |
| 10465 | Equisetopsida | Asteraceae | *Olearia ramosissima* | None | C | None | 1 | 1 | 08/07/1997 |
| 36235 | Equisetopsida | Asteraceae | *Verbesina encelioides var. encelioides* | None | None | None | 1 | 1 | 28/03/2010 |
| 11201 | Equisetopsida | Boraginaceae | *Heliotropium europaeum* | common heliotrope | None | None | 1 | 1 | 31/01/1999 |
| 18389 | Equisetopsida | Cactaceae | *Cereus uruguayanus* | None | None | None | 0 | 1 | 14/11/2017 |
| 26344 | Equisetopsida | Cactaceae | *Harrisia martinii* | None | None | None | 0 | 3 | 07/10/2015 |
| 16549 | Equisetopsida | Cactaceae | *Opuntia aurantiaca* | tiger pear | None | None | 0 | 5 | 07/10/2015 |
| 9011 | Equisetopsida | Cactaceae | *Opuntia ficus-indica* | Indian fig | None | None | 1 | 2 | 14/11/2017 |
| 9535 | Equisetopsida | Cactaceae | *Opuntia tomentosa* | velvety tree pear | None | None | 0 | 1 | 22/02/2016 |
| 18011 | Equisetopsida | Casuarinaceae | *Allocasuarina inophloia* | None | C | None | 1 | 2 | 14/09/2000 |
| 18013 | Equisetopsida | Casuarinaceae | *Allocasuarina luehmannii* | bull oak | C | None | 0 | 3 | 31/01/2002 |
| 17707 | Equisetopsida | Casuarinaceae | *Casuarina cristata* | belah | C | None | 0 | 1 | 01/04/1990 |
| 14431 | Equisetopsida | Chenopodiaceae | *Maireana microphylla* | None | C | None | 1 | 1 | 29/09/1986 |
| 10937 | Equisetopsida | Chenopodiaceae | *Sclerolaena tetracuspis* | brigalow burr | C | None | 1 | 1 | 24/10/1994 |
| 7047 | Equisetopsida | Convolvulaceae | *Dichondra sp. (Inglewood J.M.Dalby 86/93)* | None | C | None | 1 | 1 | 20/09/1986 |
| 17757 | Equisetopsida | Cupressaceae | *Callitris endlicheri* | black cypress pine | C | None | 1 | 1 | 22/06/1994 |
| 8221 | Equisetopsida | Cupressaceae | *Callitris glaucophylla* | white cypress pine | C | None | 1 | 4 | 31/01/2002 |
| 13965 | Equisetopsida | Cyperaceae | *Cyperus bowmanni* | None | C | None | 1 | 1 | 28/03/2010 |

| Taxon Id | Class | Family | Scientific Name | Common Name | NCA | EPBC | Specimens | Records | Last record |
|---|---|---|---|---|---|---|---|---|---|
| 17078 | Equisetopsida | Cyperaceae | *Gahnia aspera* | None | C | None | 0 | 1 | 14/09/2000 |
| 13593 | Equisetopsida | Ericaceae | *Melichrus adpressus* | None | C | None | 1 | 1 | 08/07/1997 |
| 16844 | Equisetopsida | Juncaceae | *Juncus continuus* | None | C | None | 1 | 1 | 06/10/1994 |
| 16776 | Equisetopsida | Laxmanniaceae | *Lomandra longifolia* | None | C | None | 1 | 1 | 06/10/1994 |
| 15827 | Equisetopsida | Leguminosae | *Acacia aulacocarpa* | None | C | None | 0 | 1 | 31/01/2002 |
| 15780 | Equisetopsida | Leguminosae | *Acacia burrowii* | None | C | None | 1 | 1 | 22/06/1994 |
| 14932 | Equisetopsida | Leguminosae | *Acacia conferta* | None | C | None | 1 | 2 | 14/09/2000 |
| 15792 | Equisetopsida | Leguminosae | *Acacia crassa subsp. crassa* | None | C | None | 1 | 1 | 21/09/1993 |
| 11842 | Equisetopsida | Leguminosae | *Acacia cultriformis* | None | C | None | 1 | 1 | 30/11/1984 |
| 15752 | Equisetopsida | Leguminosae | *Acacia harpophylla* | brigalow | C | None | 0 | 1 | 01/04/1990 |
| 14864 | Equisetopsida | Leguminosae | *Acacia lineata* | streaked wattle | C | None | 1 | 1 | 09/07/1975 |
| 15727 | Equisetopsida | Leguminosae | *Acacia neriifolia* | pechey wattle | C | None | 0 | 1 | 14/09/2000 |
| 14872 | Equisetopsida | Leguminosae | *Acacia polybotrya* | western silver wattle | C | None | 2 | 2 | 06/10/1994 |
| 14891 | Equisetopsida | Leguminosae | *Acacia spectabilis* | pilliga wattle | C | None | 1 | 1 | 30/11/1984 |
| 14085 | Equisetopsida | Leguminosae | *Acacia striatifolia* | None | C | None | 0 | 1 | 14/09/2000 |
| 13705 | Equisetopsida | Leguminosae | *Aotus subglauca var. filiformis* | None | C | None | 1 | 1 | 06/10/1994 |
| 15260 | Equisetopsida | Leguminosae | *Jacksonia scoparia* | None | C | None | 0 | 1 | 31/01/2002 |
| 15014 | Equisetopsida | Leguminosae | *Swainsona galegifolia* | smooth Darling pea | C | None | 1 | 1 | 02/10/1964 |
| 8254 | Equisetopsida | Leguminosae | *Swainsona queenslandica* | None | C | None | 1 | 1 | 02/10/1964 |
| 34114 | Equisetopsida | Leguminosae | *Vachellia farnesiana* | None | None | None | 0 | 2 | 07/10/2015 |
| 14847 | Equisetopsida | Loranthaceae | *Amyema cambagei* | None | C | None | 1 | 1 | 24/10/1994 |
| 16727 | Equisetopsida | Macarthuriaceae | *Macarthuria neocambrica* | None | C | None | 1 | 1 | 07/10/1993 |
| 13307 | Equisetopsida | Menyanthaceae | *Nymphoides crenata* | wavy marshwort | SL | None | 1 | 1 | 17/09/1968 |
| 17999 | Equisetopsida | Myrtaceae | *Angophora leiocarpa* | rusty gum | C | None | 0 | 2 | 31/01/2002 |
| 17766 | Equisetopsida | Myrtaceae | *Calytrix tetragona* | fringe myrtle | C | None | 2 | 2 | 06/10/1994 |
| 6443 | Equisetopsida | Myrtaceae | *Corymbia trachyphloia subsp. trachyphloia* | None | C | None | 0 | 2 | 31/01/2002 |
| 13610 | Equisetopsida | Myrtaceae | *Eucalyptus bakeri* | Baker's mallee | C | None | 1 | 1 | 16/02/1969 |
| 17249 | Equisetopsida | Myrtaceae | *Eucalyptus chloroclada* | Baradine red gum | C | None | 1 | 3 | 31/01/2002 |
| 17252 | Equisetopsida | Myrtaceae | *Eucalyptus crebra* | narrow-leaved red ironbark | C | None | 0 | 2 | 13/07/1999 |
| 30502 | Equisetopsida | Myrtaceae | *Eucalyptus elegans* | None | C | None | 1 | 1 | 22/06/1994 |
| 17188 | Equisetopsida | Myrtaceae | *Eucalyptus populnea* | poplar box | C | None | 1 | 1 | 06/10/1994 |
| 26471 | Equisetopsida | Myrtaceae | *Eucalyptus tereticornis subsp. tereticornis* | None | C | None | 1 | 1 | 06/10/1994 |
| 13609 | Equisetopsida | Myrtaceae | *Eucalyptus viridis* | None | C | None | 2 | 2 | 22/06/1994 |

| Taxon Id | Class | Family | Scientific Name | Common Name | NCA | EPBC | Specimens | Records | Last record |
|---|---|---|---|---|---|---|---|---|---|
| 31943 | Equisetopsida | Myrtaceae | *Eucalyptus woollsiana* | None | C | None | 1 | 2 | 06/10/1994 |
| 18863 | Equisetopsida | Myrtaceae | *Kunzea opposita var. opposita* | None | C | None | 2 | 2 | 06/10/1994 |
| 13465 | Equisetopsida | Myrtaceae | *Leptospermum brevipes* | None | C | None | 1 | 1 | 22/06/1994 |
| 16685 | Equisetopsida | Myrtaceae | *Melaleuca densispicata* | None | C | None | 1 | 1 | 11/07/1994 |
| 29765 | Equisetopsida | Nymphaeaceae | *Nymphaea gigantea* | None | SL | None | 2 | 2 | 01/04/2005 |
| 26012 | Equisetopsida | Pittosporaceae | *Pittosporum angustifolium* | None | C | None | 1 | 1 | 29/09/1986 |
| 5965 | Equisetopsida | Poaceae | *Austrostipa verticillata* | slender bamboo grass | C | None | 1 | 1 | 02/05/1976 |
| 33785 | Equisetopsida | Poaceae | *Cenchrus spinifex* | None | None | None | 1 | 1 | 28/03/2010 |
| 15490 | Equisetopsida | Poaceae | *Dactyloctenium radulans* | button grass | C | None | 1 | 1 | 28/03/2010 |
| 18913 | Equisetopsida | Poaceae | *Digitaria eriantha* | None | None | None | 1 | 1 | 28/03/2010 |
| 15391 | Equisetopsida | Poaceae | *Eragrostis cilianensis* | None | None | None | 1 | 1 | 21/03/2006 |
| 32007 | Equisetopsida | Poaceae | *Eragrostis trichophora* | None | None | None | 1 | 1 | 21/03/2006 |
| 18061 | Equisetopsida | Poaceae | *Poaceae* | None | None | None | 0 | 1 | 14/09/2000 |
| 14978 | Equisetopsida | Poaceae | *Thyridolepis xerophila* | None | C | None | 1 | 1 | 14/11/1994 |
| 17012 | Equisetopsida | Proteaceae | *Hakea purpurea* | None | C | None | 3 | 3 | 10/05/1994 |
| 9070 | Equisetopsida | Proteaceae | *Persoonia terminalis subsp. recurva* | None | C | None | 1 | 1 | 13/12/1990 |
| 18819 | Equisetopsida | Rutaceae | *Citrus glauca* | None | C | None | 0 | 1 | 01/04/1990 |
| 17085 | Equisetopsida | Rutaceae | *Geijera parviflora* | wilga | C | None | 0 | 1 | 01/04/1990 |
| 11943 | Equisetopsida | Rutaceae | *Philotheca ciliata* | None | C | None | 1 | 1 | 22/06/1994 |
| 17640 | Equisetopsida | Santalaceae | *Choretrum candollei* | white sour bush | C | None | 1 | 2 | 14/09/2003 |
| 16237 | Equisetopsida | Santalaceae | *Santalum lanceolatum* | None | SL | None | 0 | 1 | 01/04/1990 |
| 18054 | Equisetopsida | Sapindaceae | *Alectryon diversifolius* | scrub boonaree | C | None | 0 | 1 | 01/04/1990 |
| 13655 | Equisetopsida | Sapindaceae | *Dodonaea macrossanii* | None | C | None | 2 | 2 | 11/07/1994 |
| 17391 | Equisetopsida | Sapindaceae | *Dodonaea viscosa* | None | C | None | 0 | 1 | 01/04/1990 |
| 17278 | Equisetopsida | Scrophulariaceae | *Eremophila mitchellii* | None | C | None | 2 | 3 | 23/07/2007 |
| 16736 | Equisetopsida | Solanaceae | *Lycium ferocissimum* | African boxthorn | None | None | 0 | 7 | 07/10/2015 |
| 12654 | Equisetopsida | Ulmaceae | *Celtis sinensis* | Chinese elm | None | None | 0 | 5 | 07/10/2015 |
| 34284 | Equisetopsida | Verbenaceae | *Glandularia aristigera* | None | None | None | 1 | 2 | 14/09/2003 |

**Table 4. Fungi 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 |
|---|---|---|---|---|---|---|---|---|---|
| 29414 | Eurotiomycetes | Verrucariaceae | *Endocarpon simplicatum* | None | C | None | 1 | 1 | 23/09/2004 |
| 34915 | Lecanoromycetes | Caliciaceae | *Buellia epigaella* | None | C | None | 1 | 1 | 23/09/2004 |
| 23239 | Lecanoromycetes | Lecideaceae | *Lecidea ochroleuca* | None | C | None | 1 | 1 | 23/09/2004 |

**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 latest record of the taxon.

## Links and Support

Other sites that deliver species information from the WildNet database include:

- Species profile search - access species information approved for publication including species names, statuses, notes, images, distribution maps and records
- Species lists - generate species lists for Queensland protected areas, forestry areas, local governments and areas defined using coordinates
- 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 wildlife 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.

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)
- Australia's Virtual Herbarium (AVH)
- Protected Matters Search Tool

## Disclaimer

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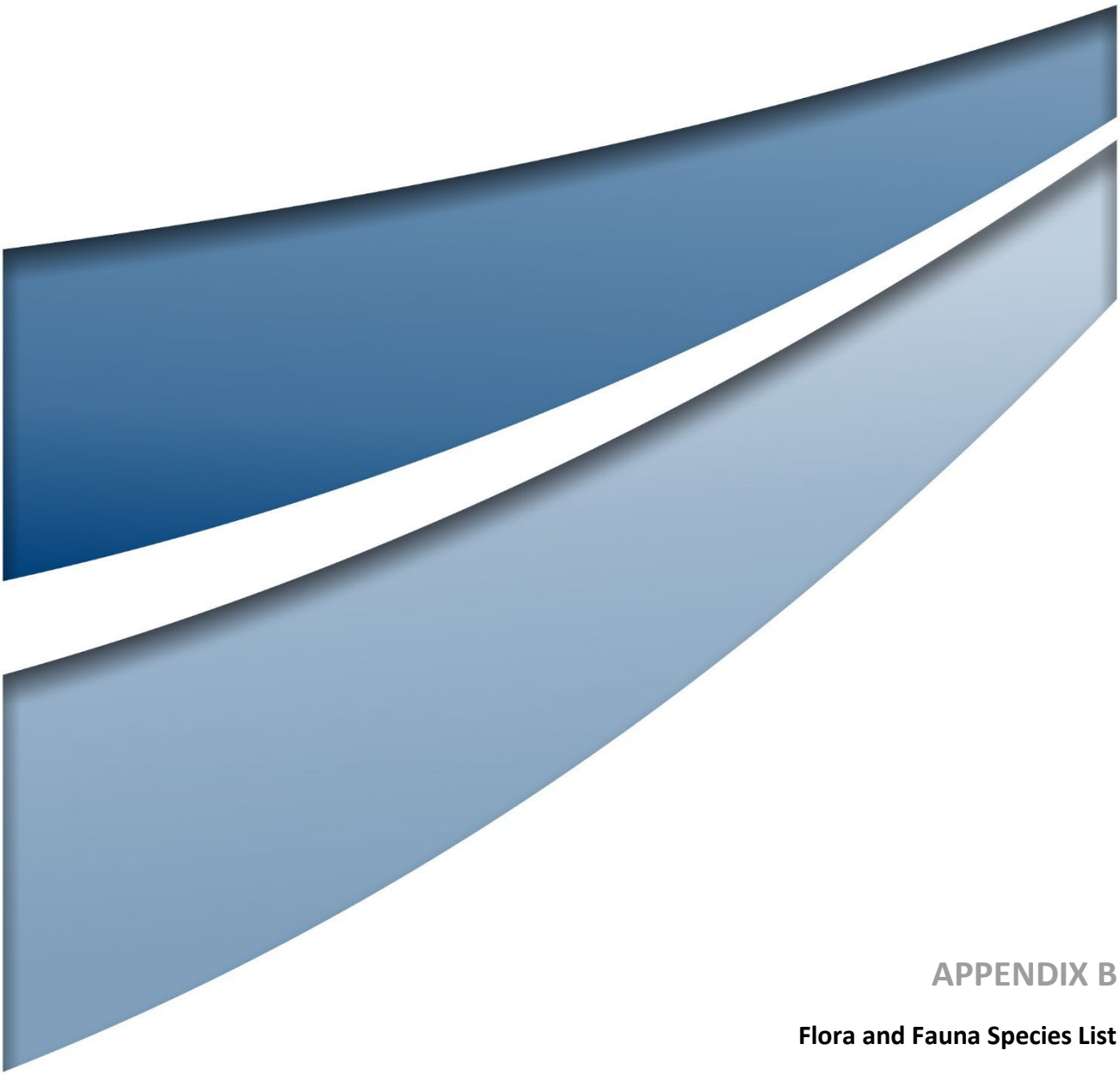

# APPENDIX B

**Flora and Fauna Species List**

## B.1 Flora Species List

| Scientific Name | Family | NC Act Status | EPBC Act Status | Biosecurity Act Status |
|---|---|---|---|---|
| ***Tetragonia tetragonoides*** | Aizoaceae | Least Concern | Not Listed | - |
| ***Vittadinia sp.*** | Asteraceae | Least Concern | Not Listed | - |
| ***Opuntia tomentosa**** | Cactaceae | - | Not Listed | Category 3 Restricted Matter |
| ***Allocasuarina luehmannii*** | Casuarinaceae | Least Concern | Not Listed | - |
| ***Einadia nutans ssp. nutans*** | Chenopodiaceae | Least Concern | Not Listed | - |
| ***Maireana microphylla*** | Chenopodiaceae | Least Concern | Not Listed | - |
| ***Cyperus sp.*** | Cyperaceae | Least Concern | Not Listed | - |
| ***Juncus continuus*** | Juncaceae | Least Concern | Not Listed | - |
| ***Corymbia tessellaris*** | Myrtaceae | Least Concern | Not Listed | - |
| ***Eucalyptus melanophloia*** | Myrtaceae | Least Concern | Not Listed | - |
| ***Eucalyptus moluccana*** | Myrtaceae | Least Concern | Not Listed | - |
| ***Eucalyptus populnea*** | Myrtaceae | Least Concern | Not Listed | - |
| ***Eucalyptus tereticornis*** | Myrtaceae | Least Concern | Not Listed | - |
| ***Austrostipa sp.*** | Poaceae | Least concern | Not Listed | - |
| ***Cenchrus ciliaris**** | Poaceae | - | Not Listed | - |
| ***Chloris divaricata*** | Poaceae | Least concern | Not Listed | - |
| ***Cynodon dactylon*** | Poaceae | Least Concern | Not Listed | - |
| ***Cymbopogon refractus*** | Poaceae | Least Concern | Not Listed | - |
| ***Heteropogon contortus*** | Poaceae | Least Concern | Not Listed | - |
| ***Sporobolus sp.*** | Poaceae | Least Concern | Not Listed | - |
| ***Themeda quadrivalvis**** | Poaceae | - | Not Listed | - |
| ***Geijera parviflora*** | Rutaceae | Least Concern | Not Listed | - |
| ***Glandularia aristigera**** | Verbenaceae | - | Not Listed | - |
| ***Phyla canescens**** | Verbenaceae | - | Not Listed | - |
| ***Verbena bonariensis**** | Verbenaceae | - | Not Listed | - |

## B.2 Fauna Species List

| Common Name | Scientific Name | Type | NC Act Status | EPBC Act Status |
|---|---|---|---|---|
| **northern laughing treefrog** | *Litoria rothii* | Amphibian | Least Concern | Not Listed |
| **red-necked wallaby** | *Macropus rufogriseus* | Mammal | Least Concern | Not Listed |
| **spotted black snake** | *Pseudechis guttatus* | Reptile | Least Concern | Not Listed |
| **black-fronted dotterel** | *Elseyornis melanops* | Bird | Least Concern | Not Listed |
| **straw-necked ibis** | *Threskiornis spinicollis* | Bird | Least Concern | Not Listed |
| **grey teal** | *Anas gracilis* | Bird | Least Concern | Not Listed |
| **Pacific black duck** | *Anas superciliosa* | Bird | Least Concern | Not Listed |
| **white-faced heron** | *Egretta novaehollandiae* | Bird | Least Concern | Not Listed |
| **willie wagtail** | *Rhipidura leucophrys* | Bird | Least Concern | Not Listed |

| Common Name | Scientific Name | Type | NC Act Status | EPBC Act Status |
|---|---|---|---|---|
| **welcome swallow** | *Hirundo neoxena* | Bird | Least Concern | Not Listed |
| **masked lapwing** | *Vanellus miles* | Bird | Least Concern | Not Listed |
| **pied cormorant** | *Phalacrocorax varius* | Bird | Least Concern | Not Listed |
| **dollarbird** | *Eurystomus orientalis* | Bird | Least Concern | Not Listed |
| **crested pigeon** | *Ocyphaps lophotes* | Bird | Least Concern | Not Listed |
| **noisy miner** | *Manorina melanocephala* | Bird | Least Concern | Not Listed |
| **sulphur-crested cockatoo** | *Cacatua galerita* | Bird | Least Concern | Not Listed |
| **emu** | *Dromaius novaehollandiae* | Bird | Least Concern | Not Listed |
| **intermediate egret** | *Ardea intermedia* | Bird | Least Concern | Not Listed |
| **magpie-lark** | *Grallina cyanoleuca* | Bird | Least Concern | Not Listed |
| **Australasian grebe** | *Tachybaptus novaehollandiae* | Bird | Least Concern | Not Listed |
| **Australian wood duck** | *Chenonetta jubata* | Bird | Least Concern | Not Listed |
| **mistletoebird** | *Dicaeum hirundinaceum* | Bird | Least Concern | Not Listed |
| **eastern koel** | *Eudynamys orientalis* | Bird | Least Concern | Not Listed |
| **black-faced cuckoo-shrike** | *Coracina novaehollandiae* | Bird | Least Concern | Not Listed |
| **black-shouldered kite** | *Elanus axillaris* | Bird | Least Concern | Not Listed |
| **superb fairy-wren** | *Malurus cyaneus* | Bird | Least Concern | Not Listed |
| **little corella** | *Cacatua sanguinea* | Bird | Least Concern | Not Listed |
| **white-breasted woodswallow** | *Artamus leucorynchus* | Bird | Least Concern | Not Listed |
| **red-winged parrot** | *Aprosmictus erythropterus* | Bird | Least Concern | Not Listed |
| **Australian magpie** | *Gymnorhina tibicen* | Bird | Least Concern | Not Listed |
| **galah** | *Eolophus roseicapilla* | Bird | Least Concern | Not Listed |
| **red-backed fairy-wren** | *Malurus melanocephalus* | Bird | Least Concern | Not Listed |
| **nankeen kestrel** | *Falco cenchroides* | Bird | Least Concern | Not Listed |
| **apostlebird** | *Struthidea cinerea* | Bird | Least Concern | Not Listed |
| **noisy friarbird** | *Philemon corniculatus* | Bird | Least Concern | Not Listed |
| **white-throated gerygone** | *Gerygone olivacea* | Bird | Least Concern | Not Listed |
| **pied currawong** | *Strepera graculina* | Bird | Least Concern | Not Listed |
| **Torresian crow** | *Corvus orru* | Bird | Least Concern | Not Listed |
| **red-rumped parrot** | *Psephotus haematonotus* | Bird | Least Concern | Not Listed |
| **pied butcherbird** | *Cracticus nigrogularis* | Bird | Least Concern | Not Listed |