BHP

Carrapateena Operation

PEPR Compliance Report 2025

31 March 2026

ML 6471	MINERAL LEASE
MPL 149	AIRSTRIP AND WORKERS' ACCOMMODATION VILLAGE, ACCESS ROAD AND ANCILLARY INFRASTRUCTURE
MPL 152	WESTERN INFRASTRUCTURE CORRIDOR
MPL 153	EASTERN RADIAL WELLFIELD
MPL 154	SOUTHERN ACCESS ROAD AND RADIAL WELLFIELD
MPL 156	NORTHERN WELLFIELD



Acknowledgements

Acknowledgements go to all staff across the Carrapateena Operation for their contributions to the overall report and for undertaking all activities in a safe and effective manner. We also acknowledge the Kokatha People for their ongoing support and assistance provided.

Document control

CA-0000-ENV-REP-1054

Version	Description	Author	Approval	Date
1	PEPR Compliance Report 2025	Luke Boehm Specialist Environment Trent Anderson Specialist Environment Josh Allen Superintendent Environment Operations	Sally Durandt Manager Asset Environment Approvals and Sustainability	31/03/2026

Executive summary

BHP Carrapateena submits this Program for Environment Protection and Rehabilitation (PEPR) Compliance Report for the period January 2025 to December 2025 (Compliance Report); as required by the *Mining Act 1971* (SA) and associated regulations and conditions of the Carrapateena Mining Lease (ML 6471), and Miscellaneous Purposes Licences (MPL 149, MPL 152, MPL 153, MPL 154 and MPL 156). This Compliance Report demonstrates compliance with the ML and MPL conditions, Environmental Outcomes and Outcome Measurement Criteria committed to in the PEPR. This Compliance Report has been completed in general accordance with the Determination Terms of Reference 009 (TOR 009) – Mining Compliance Reports.

The following tenements have been granted:

- MPL 149 was granted on 15 September 2017
- ML 6471, MPL 152, MPL 153 and MPL 154 were granted on 3 January 2018
- MPL 156 was granted 11 December 2018.

The initial PEPRs related to these tenements include:

- PEPR2017/028, for MPL 149, was approved on 15 September 2017
- PEPR2018/019, which covered all works proposed in the Mining Lease Proposal and included ML 6471, MPL 152, MPL 153 and MPL 154, was approved on 5 July 2018.
- PEPR2019/001, for MPL 156, was approved 13 February 2019.

The subsequent revised PEPRs for these tenements include:

- MPEPR2019/026, which consolidated the three aforementioned PEPRs into a single document encompassing ML 6471, MPL 149, MPL 152, MPL 153, MPL 154 and MPL 156, was approved on 12 November 2020.
- MPEPR2024/009 was approved on 1 October 2024, superceding MPEPR2019/026
- MPEPR2025/011 was approved on 18 September 2025, superceding MPEPR2024/009, and is the current approved PEPR.

This Compliance Report addresses compliance for tenements listed under MPEPR2025/011, with MPEPR2024/009 as the regulatory document prior to 18 September 2025, within the 2025 reporting period.

On 2 May 2023 BHP Group Limited completed the acquisition of OZ Minerals Limited. The Carrapateena operation has been developed and operated by OZM Carrapateena Pty Ltd and OZ Minerals Carrapateena Pty Ltd, wholly owned by OZ Minerals Limited. The Carrapateena site has been integrated into the BHP Copper South Australia (SA) asset, also incorporating BHP's Prominent Hill mine, Olympic Dam mine and Oak Dam advanced exploration site. Copper SA forms part of BHP's Australian business portfolio, which also includes Western Australia Iron Ore, Western Australia Nickel, Coal, Mt Arthur Coal and Operations Services.

Carrapateena achieved higher productivity from the sub-level cave during FY25 resulting in strong annual copper production and record payable gold concentrate of 99k troy oz (91k troy oz FY24). Hydrofloat technology was commissioned in Quarter 4 FY25 and is a key enabler to uplifting processing throughput rates up to 7 Mtpa of mined ore.

During the reporting period, two incidents triggered regulatory reporting to the Government of South Australia's Department for Energy and Mining (DEM). Both events were managed in accordance with the relevant Outcome Measurement Criteria and Environmental Outcomes outlined in the PEPR.

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1 Introduction

BHP Carrapateena submits this Program for Environment Protection and Rehabilitation (PEPR) Compliance Report (Compliance Report) as required by the *Mining Act 1971* (SA) (Mining Act) and associated Regulations, conditions of the Carrapateena Mining Lease (ML) (ML 6471) and Miscellaneous Purposes Licences (MPL) (MPL 149, MPL 152, MPL 153, MPL 154 and MPL 156).

This Compliance Report demonstrates compliance with the ML and MPL conditions and Environmental Outcomes committed to in the approved PEPR for the associated tenements. During the 2025 reporting period MPEPR2024/009 (BHP 2024) was the regulatory document from 1 January 2025 to 17 September 2025, with MPEPR2025/011 (BHP 2025a) approved on 18 September 2025 (DEM 2025) as the current approved PEPR. Proponent details are provided in Table 1.1.

Table 1.1 | Proponent details

Mine name	Carrapateena	ML 6471 MPL 149 MPL 152 MPL 153 MPL 154 MPL 156	MPEPR2025/011 Date approved: 18/09/2025
Lease holder	OZ Minerals Carrapateena Pty Ltd (42%) and OZM Carrapateena Pty Ltd (58%)		
Operator	BHP		
Mining lease approval date	3 January 2018		
Tenements	• ML 6471 Mineral Lease • MPL 149 Airstrip, Workers' Accommodation Village, Access Road and Ancillary Infrastructure • MPL 152 Western Infrastructure Corridor • MPL 153 Eastern Radial Wellfield • MPL 154 Southern Access Road and Radial Wellfield • MPL 156 Northern Wellfield		
Approval document	PEPR: MPEPR2025/011		
Ministerial determination	The Compliance Report has been completed in general accordance with the Determination Terms of Reference 009 (TOR 009) Mining Compliance Reports (DEM 2020) and associated Mineral Regulatory Guideline (MG3) (DEM 2021)		
Site location details	Located approximately 160 km north of Port Augusta, in close proximity to the Carrapateena Arm on the western boundary of Lake Torrens. Nearby townships include Woomera (approximately 65 km west) and Roxby Downs (approximately 90 km north-west). Refer to Figure 1.1.		
Site contact	Vinod Perera, General Manager, Carrapateena		
	Email	vinod.perera@bhp.com	
	Phone number	08 8422 3713	
Reporting period	January 2025 – December 2025		
Date of compliance report preparation	March 2026		

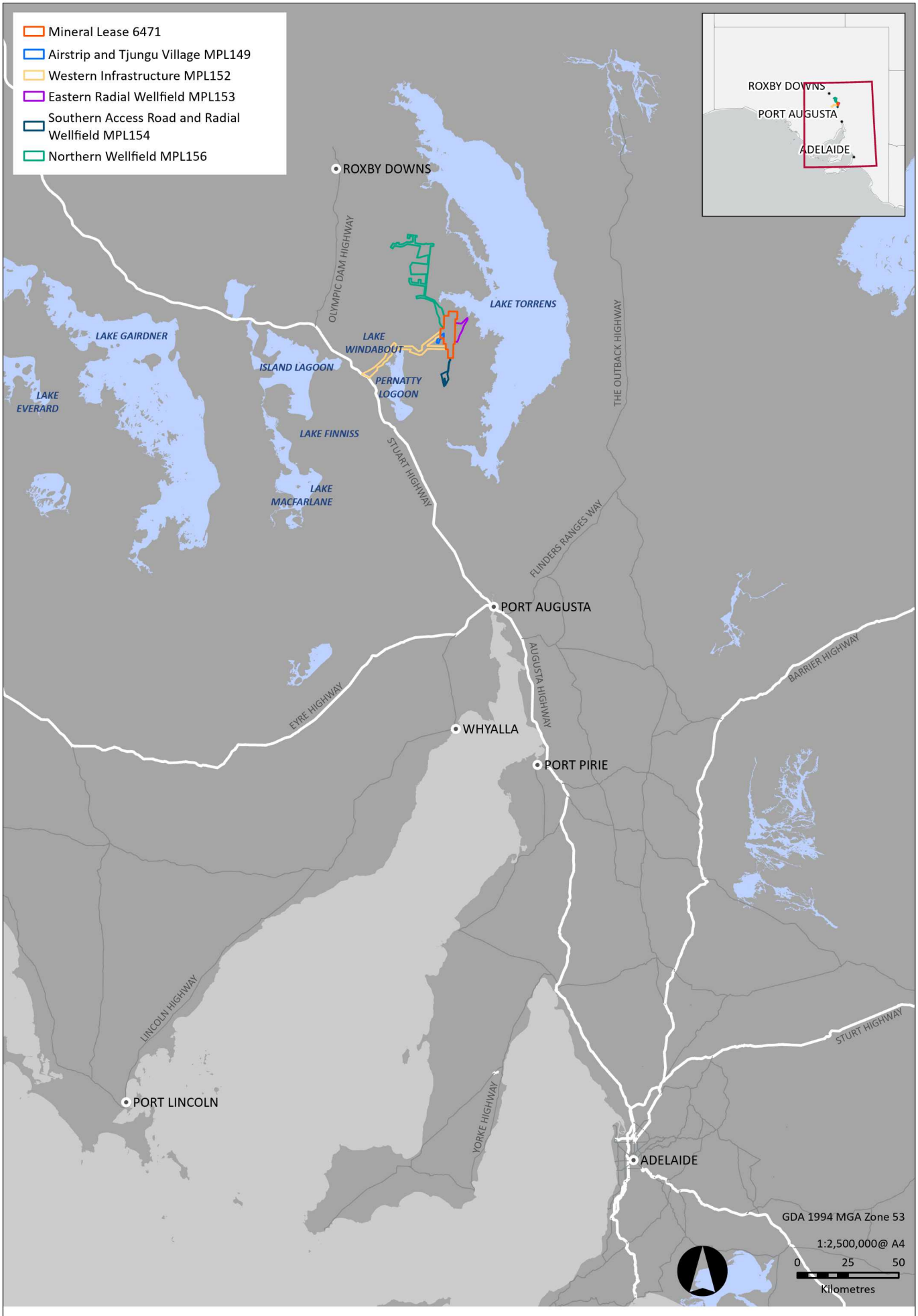


Figure 1.1 | Operation location

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2 Declaration of accuracy

Person responsible for the preparation of the Compliance Report			
This document has been prepared to fulfil the requirement under sub-regulation 77(3)(b) of Mining Regulations 2020 (SA) for the tenements listed herein. The information contained in this report is to the best of my knowledge a true and accurate record of the mining activities and compliance status for the reporting period.			
Name	**Position or Agent**	**Signature**	**Date**
Anna Wiley	Asset President Copper South Australia		27 March 2026
Company/Agent			
Report prepared by tenement holder			
Summary of steps undertaken to review the compliance to ensure report accuracy			
This report has been prepared by the Carrapateena Environment Team. Information and judgment pertaining to compliance in the areas of ecology, air quality and radiation have been provided by external subject matter experts.			

3 Public liability insurance

Details of the public liability insurance for the Carrapateena Operation are provided in Table 3.1. A copy of the cover note for the public liability insurance and/or a copy of the policy of insurance is included in Appendix A.

Table 3.1 | Public liability insurance details

Certificate of currency general liability	
Principal insured	BHP Group Limited and all subsidiaries' companies and all/or related and/or affiliated and/or controlled, managed, administered and associated companies or corporation and/or related joint ventures and/or partnerships and other entities.
Start date	1 July 2025
Finish date	30 June 2026
Limits of liability	US$20,000,000
Company/Agent	
Report prepared by tenement holder	
Summary of steps undertaken to review the compliance to ensure report accuracy	
This report has been prepared by the Carrapateena Environment Team. Information and judgment pertaining to compliance in the areas of ecology, air quality and radiation have been provided by external subject matter experts.	

4 Tenements

A summary of the existing tenements for the Carrapateena Operation is provided in Table 4.1. The locations of these tenements are shown on Figure 4.1.

Table 4.1 | Tenement summary

Tenement	Tenement number	Tenement grant date	Tenement expiry date	Status of currency
Carrapateena Mining Lease	ML 6471	3 January 2018	2 January 2039	Current
Airstrip, Workers' Accommodation Village, Access Road and Ancillary Infrastructure	MPL 149	5 July 2017	4 July 2038	Current
Western Infrastructure Corridor	MPL 152	3 January 2018	2 January 2039	Current
Eastern Radial Wellfield	MPL 153	3 January 2018	2 January 2039	Current
Southern Access Road and Radial Wellfield	MPL 154	3 January 2018	2 January 2039	Current
Northern Wellfield	MPL 156	11 December 2018	2 January 2039	Current

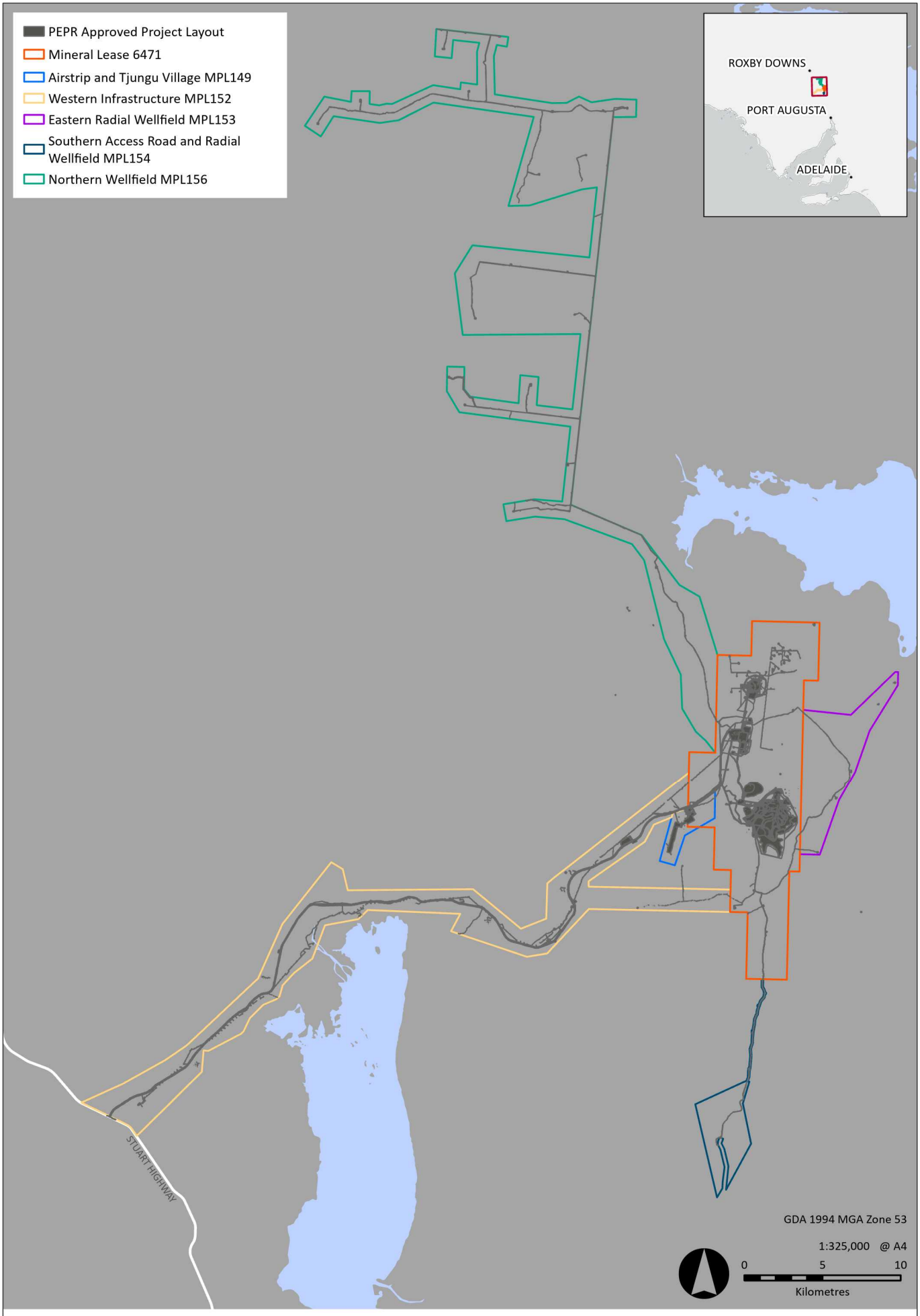


Figure 4.1 | Carrapateena operation showing all tenement boundaries covered by approved PEPR

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5 Other approvals, licences, permits, waivers, native title and agreements

Approval document	Regulatory authority or other	Supporting document	Relevant outcome or tenement condition	Status of currency
Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) CA-APR-NOT-1008 Approval of a controlled action Ref: 2017/7895	Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW)	001375 Biodiversity Management Plan CA-0000-ENV-REP-1045 Native Vegetation Management Plan 001377 EPBC Offset Management Plan	NV1, NV2, NV3, WP1, WP2, WP3, WP6, NF1, EPBC1, EPBC2, EPBC3	Expires on 31 December 2056
Government of South Australia's Environment Protection Authority (EPA) • CA-REC-00000436 Licence to Undertake Prescribed Activities (Ref: 50463) • 1(1) Chemical storage and warehousing facilities • 1(2)(a)(i) Chemical works (inorganic) • 2(1) Abrasive blasting • 2(5) Concrete batching works • 2(9) Mineral works • 3(4)(b) Wastewater treatment works (outside MLR WPA) • 3(5)(a) Activity producing listed waste • 7(7) Extractive industries • 8(2)(a) Fuel burning not coal or wood • 8(6a)(b) Desalination plant that discharges wastewater to a wastewater lagoon	EPA	CA-ENV-REP-1023 IS4 Disposal Operations Review and Permitting	LS1, LS2, LS3, LS4	Expires on 30 April 2028
Radiation Licence CA-REC-00000628 Licence to Carry Out Mining or Mineral Processing (Ref: 51113)	EPA	CA-ENV-PLN-1002 Radiation Management Plan CA-ENV-PLN-1003 Radioactive Waste Management Plan	RAD1, RAD2, RAD3, RAD4	Expires on 31 March 2026
Registration and Approval of a Risk Management Plan under the *Safe Drinking Water Act 2011* (SA) OZ Minerals Carrapateena Pty Ltd (Exploration Village)	Department for Health and Wellbeing (SA Health)	CA-4120-OHS-LET-0001 Registration under the *Safe Drinking Water Act 2011* CA-6920-ENV-PLN-003 Exploration Camp Drinking Water Risk Management Plan	NA	For the life of the system
Registration and Approval of a Risk Management Plan under the *Safe Drinking Water Act 2011* (SA) OZ Minerals Carrapateena Pty Ltd (Tjungu Village)	Department for Health and Wellbeing (SA Health)	CA-APR-LET-1112 Registration and approval of a risk management plan under the *Safe Drinking Water Act 2011* CA-4900-WTR-PLN-1001 Tjungu Village Drinking Water Risk Management Plan	NA	For the life of the system
Registration and Approval of a Risk Management Plan under the *Safe Drinking Water Act 2011* (SA) OZ Minerals Carrapateena Pty Ltd (Mineral Processing Plant (MPP))	Department for Health and Wellbeing (SA Health)	CA-APR-LET-1171 Registration and approval of a risk management plan under the *Safe Drinking Water Act 2011* Management Plan 001090 Mineral Processing Plant and Non-Process Infrastructure Drinking Water Risk Management Plan	NA	For the life of the system
Wastewater Treatment Plant (WWTP) Licence 2013-04020 Exploration Camp WWTP	Department for Health and Wellbeing (SA Health)	CA-7130-ENV-LET-0008 Upgrade of Wastewater Works at Carrapateena Mining Camp	NA	For the life of the system
WWTP (Licence WWI-10557) Exploration Camp Phase 2 Part A Upgrade	Department for Health and Wellbeing (SA Health)	CA-APR-LET-1139 Carrapateena Exploration Camp Wastewater System Phase 2 Part A	NA	For the life of the system
WWTP Licence WWI-10185 Tjungu Village WWTP, CAR-APR-LET-1065	Department for Health and Wellbeing (SA Health)	CA-APR-LET-1066 Tjungu Village Wastewater Treatment System – Updated Proposed Staged Commissioning Methodology	NA	For the life of the system
Agreement to Supply Recycled Wastewater to Pernatty Station	Department of Primary Industries and Regions, South Australia (PIRSA)	CA-APR-LET-1126 Use of recycled wastewater from the Carrapateena mine site to Pernatty Station for use by livestock	NA	For the life of the operation
Water Affecting Activity – Water Permit to Drill Various purposes (water supply, investigation and monitoring)	Department for Environment and Water (DEW)	Documents recorded in the Carrapateena Well Register, Carrapateena Env	GW1, GW2, GW3, GW4, GW5	Well Permits are active for a period of three (3) years

Approval document	Regulatory authority or other	Supporting document	Relevant outcome or tenement condition	Status of currency
Licence for Security Sensitive Substances (AN – SCER000379)	SafeWork SA	CA-MIN-LIC-1004 Licence for Security Sensitive Substances – Ammonium Nitrate (AN) Quantity: 50 tonnes	NA	Expires on 30 April 2026
Licence for Magazine (675245)	SafeWork SA	CA-MIN-LIC-1008 Licence for Magazine Quantity 1: 10,000 kg Blasting Explosives (high explosives (HE) and ammonium nitrate fuel oil (ANFO))	NA	Expires on 30 June 2026
Licence for Magazine (741074)	SafeWork SA	CA-MIN-LIC-1006 Licence for Magazine Quantity 1: 5,000 kg packaged HE Quantity 2: 160 kg detonators (equivalent to 10,000 #8 size detonators) Total Qty: 5,000 kg packaged HE and 160 kg detonators	NA	Expires on 30 November 2026
Licence for Magazine (716210)	SafeWork SA	CA-MIN-LIC-1009 Licence for Magazine Quantity 1: 640 kg detonators (equivalent to 40,000 #8 size detonators) Total Qty: 640 kg detonators	NA	Expires on 30 November 2026
Dangerous Substance Licence (698371) – Liquefied Petroleum Gas (LPG)	SafeWork SA	CA-0000-OPS-LIC-1000 Quantity: 15 kL LPG	NA	Expires on 29 December 2026
Native Title Mining Agreement (NTMA) between OZ Minerals Carrapateena Pty Ltd and Kokatha Aboriginal Corporation	Kokatha Aboriginal Corporation	CA-CRL-LET-1003 NTMA – Confidential	Schedule C1. The Lessee must, in constructing and operating the Lease, ensure that there is no disturbance to Aboriginal or European sites, objects or remains unless prior approval under the relevant legislation is obtained.	Active for the life of the Carrapateena Operation
Pernatty Pastoral Access and Compensation Agreement	Billa Kalina Pastoral Pty Ltd, Colin and Jillian Greenfield	CA-APR-AGR-1033 – Confidential	NA	Active for the life of the Carrapateena Operation
Arcoona Pastoral Access and Compensation Agreement	Handbury Asset Management Pty Ltd	CA-APR-AGR-1042 – Confidential	NA	Active for the life of the Carrapateena Operation
Bosworth Pastoral Access and Compensation Agreement	Handbury Asset Management Pty Ltd	CA-APR-AGR-1035 – Confidential	NA	Active for the life of the Carrapateena Operation
Oakden Hills Pastoral Access and Compensation Agreement	Nutt Bros Nominees Pty Ltd	CA-APR-AGR-1054 – Confidential	NA	Active for the life of the Carrapateena Operation
BHP Access and Consent Deed (Western Infrastructure Corridor)	BHP Billiton Olympic Dam Corporation Pty Ltd (BHP)	CA-CPS-AGR-1083 – Confidential	NA	Active for the life of the Carrapateena Operation

6 Ore reserves and mineral resources

6.1 Ore reserves

The 2025 Mineral Resources and Ore Reserves can be found in the BHP Annual Report 2025, Additional Information; Section 6, which is located on the BHP website at bhp.com/investors/annual-reporting (BHP 2025b).

6.2 Estimated mine life

The estimated life-of-mine (LoM) for Carrapateena is 23 years (2049).

6.3 Exploration activities

No exploration activities were undertaken in 2025.

7 Mining, processing and waste storage activities

7.1 Ore mining

Ore mined – mine life (t)	Ore mined – reporting period (t)	Expected quantity of ore to be mined during next reporting period (Mt)	Quantity of ore stockpiled on the tenement at the end of the reporting period (t)
28,225,198	5,728,450	6.5 – 6.7	137,422

7.2 Ore processing

Ore processed – mine life (t)	Ore processed – reporting period (t)	Expected quantity to be processed during next reporting period (t)
28,072,607	5,789,116	Refer to BHP Operational Review for FY26 guidance (BHP 2026)

7.3 Concentrate or other product exported

Concentrate or other product exported – mine life (dmt)	Amount of concentrate or other product exported – reporting period (dmt)	Expected amount of ore to be processed during next reporting period (t)
965,873	215,156	Refer to BHP Operational Review for FY26 guidance (BHP 2026)

7.4 Overburden/waste

Overburden mined – mine Life (t)	Reporting period – overburden mined (t)	Next reporting period – overburden to be mined (t)
6,942,572	973,811	1,046,217
Production notes: In the figures above, overburden is defined as anything that is not processed by the mill. All raisebore waste is trucked to surface to remove the risk of a potential raisebore cutter head through the crusher.		

Volume of PAF and NAF material mined during reporting period (t)	Remaining capacity of current waste facilities or planned future waste facilities as per approved PEPR
Potentially-acid forming (PAF): 0* Non-acid forming (NAF): 973,811 t *In CY22, change management was implemented to ensure PAF waste was blended with ore and processed though the mill.	Current waste rock stockpile has a LoM capacity of 5,087,053 t based on current height (10 to 20 m) and footprint constraints.

Will the remaining quantities of overburden to be mined be accommodated in the current or planned waste facilities (waste rock dump (WRD), tailings storage facility (TSF))? If not included, what future work?
Where available, LoM run-of-mine (ROM) waste rock will be used in future TSF lifts and closure activities (e.g. subsidence zone abandonment bund and backfill of boxcuts). WRD work completed in March/April 2024 indicated 4.3 Mt of waste rock remains to be mined at Carrapateena. The third lift of the TSF (2026/2027) is expected to require 5.4 Mt of material.
Are your waste facilities sufficient to deal with the volume of PAF material generated annually? If not, include what future work is required? *(Include any identification of PAF and NAF in the preceding reporting period and strategies to minimise the environmental impacts of this material.)*
Currently PAF is being sent through the mill and processed as part of underground material movement. Processes remain in place to identify areas of PAF.

8 Compliance summary

Throughout the reporting period, two incidents triggered regulatory reporting to the Government of South Australia's Department for Energy and Mining (DEM). Both events were managed in accordance with the relevant Outcome Measurement Criteria and Environmental Outcomes outlined in the PEPR. A brief summary of the reported incidents is provided in Table 8.1 with rectification of the non-compliances summarised in Section 11.

Table 8.1 | Summary of non-compliances reported in 2025

Licence permit tenement	Type of non-compliance *Notes: e.g. lease condition or OMC*	Brief description *Notes: e.g. Noise limits exceeded on four occasions*	Status *Notes: 'rectified' or 'currently being addressed'*	Section of report for further detail
ML 6471	**Environmental Outcome (Schedule 6 Condition 11)** The Tenement Holder must during construction, operation and post Completion ensure that there is no loss of abundance and/or diversity of native vegetation on or off the land unless a significant environmental benefit has been approved in accordance with the relevant legislation. **OMC (LS1)** Achievement value: Spill reported to the Director of Mines (or other authorised officer) as soon as reasonably practicable after becoming aware of the harm or threatened harm.	A section of the pipeline conveying water from the Mine Settling Ponds ruptured adjacent to a contracting yard. The failure occurred after the line warped due to over-pressurisation, causing it to dislodge from the bunded pipe-trace footprint. Approximately 35 kL of saline underground mine water was released. Saline water was observed up to 30 m into previously undisturbed ground.	Rectified	Section 11. Reported to DEM.
ML 6471	**Environmental Outcome (Schedule 6 Condition 11)** The Tenement Holder must during construction, operation and post Completion ensure that there is no loss of abundance and/or diversity of native vegetation on or off the land unless a significant environmental benefit has been approved in accordance with the relevant legislation. **OMC (TSF5)** Achievement value: Spills are reported to the Director of Mines (or other authorised officer) as soon as reasonably practicable after becoming aware of the harm or threatened harm. Frequency: Triggered as a result of an accidental spill from tailings delivery infrastructure or seepage from the TSF that results or threaten to result in material or serious environmental harm (as defined in Section 5(3) of the *Environment Protection Act 1993* (SA)) to native vegetation, native fauna and/or groundwater. **OMC (LS1)** Achievement value: Spill reported to the Director of Mines (or other authorised officer) as soon as reasonably practicable after becoming aware of the harm or threatened harm.	A flange on the second tailings pipeline near Scout Pit 1 failed causing slurry to discharge. The tailings slurry was predominantly contained within Scour Pit 1 and the pipeline corridor. However, due to the pressurised line and high winds, slurry dispersed up to 175 m from the pipeline into previously undisturbed ground.	Rectified	Section 11. Reported to DEM.

9 Compliance tables

Compliance for the 2025 reporting period is summarised from Section 9.1 to Section 9.19. Regarding the column headings for each table, the following explanations or assessment drivers apply:

- **Environmental Outcome:** provides a copy of the regulatory outcome provided in the relevant tenement document.
- **Sixth Schedule lease conditions**: provides the tenement number and pertinent condition number associated with the Sixth Schedule Environmental Outcome. Where the condition is related to a different schedule that detail is also provided.
- **Regulatory commitment**: provides the OMC, Leading Indicator, Strategy or Future Works commitment related to the Environmental Outcome.
- **Compliance status:** provides the status of the regulatory commitment as one of the following:
  - Compliant (to OMC or Leading Indicator)
  - Non-compliant
  - Unable to determine
  - No longer relevant to risk profile of Operation.
- **Evidence:**
  - For each criterion, states what measurements have been taken to monitor compliance and provides an interpretation of the results (i.e. compliant or non-compliant).
  - Provides a summary of the key measurements (using a graph to summarise data where possible) and refers to a summary of the detailed/raw data (if necessary) in an appendix but only to the extent necessary to verify the compliance conclusion reached.
  - Where graphs are used to illustrate compliance, the relevant compliance limits are clearly included on the graph.
  - Evidence where applicable document control number of the report or technical memo is included.
- **Forward work plan:**
  - If non-compliant, Leading Indicator triggered or any alterations to Outcomes or OMC are recommended, with a summary of actions being undertaken to rectify the non-compliance.
  - If unable to demonstrate compliance, states reasons and relevance of the OMC to the current risk profile of the Operation or current stage of the Operation.
  - States whether OMC or lease condition amendments are required.
  - Quantifies the risks associated with the non-compliance if applicable.
  - States whether the Leading Indicator is adequate to pick up the non-compliance or if it needs to be amended.

9.1 Aboriginal heritage

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
The Tenement Holder must during construction, operation and post Completion ensure that there is no damage, disturbance or interference to Aboriginal heritage sites, objects or remains unless it is authorised under the relevant legislation	ML 6471 Condition 1 MPL 149 Condition 7 MPL 152 Condition 1 MPL 153 Condition 1 MPL 154 Condition 1 MPL 156 Condition 1	**Outcome Measurement Criteria – AH1** Annual audit of land disturbance permits demonstrate that infrastructure locations are within approved work areas, cultural heritage survey report conditions and have authorisation in accordance with the *Aboriginal Heritage Act 1988* (SA) prior to any ground disturbance occurring	Compliant	All land disturbance is spatially audited against Global Land Use Permit (GLUP) boundaries using survey data, drone and satellite imagery in ArcGIS to ensure works were completed within approved work areas, cultural heritage survey report conditions and have authorisation in accordance with the *Aboriginal Heritage Act 1988* (SA).
		Outcome Measurement Criteria – AH2 Annual audit of cultural heritage survey records demonstrate that upon discovery of new Aboriginal heritage sites, objects or remains at infrastructure locations were treated in accordance with the Cultural Heritage Management Plan until authorisation under the *Aboriginal Heritage Act 1988* (SA) was obtained	Compliant	New Aboriginal heritage sites discovered were treated in accordance with the Cultural Heritage Management Plan (CA-CRL-PLN-1016). Existing sites are demarcated to ensure operations don't encroach.
		Leading Indicator – AH3 Inspection following completion of land clearance (ground survey, drone flyover or suitable alternative method) of a selected infrastructure location during construction or operation demonstrates land clearing has not been undertaken outside of areas defined in the associated land disturbance permit# # Alternative locations must be selected until all locations have been complete. Or on a demonstrated risk-based approach	Compliant	Regular on-ground inspections were undertaken on active Land Use Permit (LUP) areas. Land clearing has not been undertaken outside of areas defined in the associated LUP in 2025.

9.2 Public nuisance

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
The Tenement Holder must during construction and operation ensure that there are no public nuisance impacts from dust and noise generated by mining operations or mining-related traffic	ML 6471 Condition 4 MPL 149 Condition 5* MPL 152 Condition 4 MPL 153 Condition 4 MPL 154 Condition 4	**Outcome Measurement Criteria – PN1** Audit of stakeholder engagement records undertaken quarterly demonstrates that all traffic related dust and noise concerns associated with access roads are responded to in accordance with the Local Area Agreement - Operating Protocols within 24 hours upon notification and any corrective actions are closed out within 14 days or as agreed with the Director of Mines (or other authorised officer)	Compliant	Stakeholder engagement records for Borealis indicate that no formal noise or dust concerns were raised. Operational stakeholder consultation meetings were conducted in 2025, addressing all aspects of the stakeholder land access agreements as required through face-to-face discussions.
	ML 6471 Condition 4 MPL 149 Condition 5*	**Outcome Measurement Criteria – PN2** Annual laboratory analysis of continuous dust deposition collected quarterly at monitoring site adjacent to Pernatty Homestead (ERML09) demonstrates dust deposition rates do not exceed 4 g/m^2/month (total) as per Table 7.1 of Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales	Not relevant	Annual deposition dust at Pernatty Homestead (Environmental Radiation Monitoring Location (ERML09) ceased in May 2022 following the cessation of use of the Southern Access Road.
		Leading Indicator – PN3 Continuous dust deposition rate monitoring undertaken at Pernatty Homestead (ERML09) is analysed monthly during construction and demonstrates a trend of continual exceedances of baseline levels of 1.6 g/m^2/month	Not relevant	Monthly deposition dust at Pernatty Homestead (ERML09) ceased in May 2022 following the cessation of use of the Southern Access Road.

* Intent of MPL 149 PEPR (OZ Minerals 2017b)

9.3 Traffic

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
The Tenement Holder must during construction and operations, ensure that there are no traffic accidents involving members of the public and mine related traffic that could have been reasonably prevented by the Tenement Holder	ML 6471 Condition 5 MPL 149 Condition 5* MPL 152 Condition 5 MPL 153 Condition 5 MPL 154 Condition 5	Construction and Operation Criteria **Outcome Measurement Criteria – INC1** Investigation and corrective actions triggered as a result of an accident associated with mine related traffic demonstrates that the incident could not have been reasonably prevented and that any corrective actions are closed out within 30 days or as agreed with the Director of Mines (or other authorised officer)	Compliant	No traffic accidents involving members of the public or surface interaction were reported.

* Intent of MPL 149 PEPR (OZ Minerals 2017b)

9.4 Public safety

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
The Tenement Holder must during construction and operation ensure that unauthorised entry to the Land does not result in public injuries and or deaths that could have been reasonably prevented	ML 6471 Condition 2 MPL 149 Condition 3 MPL 152 Condition 2 MPL 153 Condition 2 MPL 154 Condition 2	**Construction and Operation** **Outcome Measurement Criteria – PS1** Investigation and review of incident report records triggered as a result of an incident associated with unauthorised entry to infrastructure locations demonstrates that the incident could not have been reasonably prevented and that any corrective actions are closed out within 30 days or as agreed with the Director of Mines (or other authorised officer)	Compliant	No occurrences of unauthorised access by members of the public resulting in public injury or death were recorded during the reporting period.
	ML 6471 Condition 3	**Completion** **Outcome Measurement Criteria – PS2** Audit undertaken by an independent and suitably qualified expert approved by the Director of Mines (or other authorised officer) prior to application of lease surrender including a review of the underground caving system, geotechnical data and other relevant data from the Cave Monitoring Plan demonstrates that at cessation of operations, the underground mine has been operated within design parameters and the predicted vertical and lateral extent of the Sub level cave Subsidence Zone is validated and the abandonment bund is adequately located outside of the subsidence zone	Not relevant	Carrapateena is in operational phase, this is a completion criteria, and as such, is not relevant.
		Outcome Measurement Criteria – PS3 Electronic and hard copies of a topographical survey of the sub level cave subsidence zone are provided to the Director of Mines (or other authorised officer) prior to application of lease surrender to confirm the extent of the surface expression at mine completion	Not relevant	Carrapateena is in operational phase, this is a completion criteria, and as such, is not relevant.
		Outcome Measurement Criteria – PS4 Audit undertaken by an independent and suitably qualified expert approved by the Director of Mines (or other authorised officer) prior to application of lease surrender confirms by a construct to design audit that the decline portals and box cut have been closed in accordance with the basis of design	Not relevant	Carrapateena is in operational phase, this is a completion criteria, and as such, is not relevant.
		Outcome Measurement Criteria – PS5 Audit undertaken by an independent and suitably qualified expert approved by the Director of Mines (or other authorised officer) prior to application of lease surrender confirms by a construct to design audit of the vent rise plug against the design Vent rise and confirms vent rise closure has been undertaken in accordance with the basis of design	Not relevant	Carrapateena is in operational phase, this is a completion criteria, and as such, is not relevant.
		Outcome Measurement Criteria – PS6 Audit undertaken by an independent and suitably qualified expert approved by the Director of Mines (or other authorised officer) prior to application of lease	Not relevant	Carrapateena is in operational phase, this is a completion criteria, and as such, is not relevant.

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
		surrender confirms by a construct to design audit that the abandonment bund around the subsidence zone and quarries have been constructed in accordance with Western Australia Department of Industry and Resources Guideline 'Safety Bund Walls Around Abandoned Open Pit Mines'		
		Outcome Measurement Criteria – PS8 Construct to design audit undertaken by an independent and suitably qualified expert approved by the Director of Mines (or other authorised officer) prior to application of lease surrender confirms that the Mine Area Borrow Pit has been closed in accordance with a closure design endorsed by DEM. The closure design will be provided to DEM through a future PEPR update, prior to completion.	Not relevant	Carrapateena is in operational phase, this is a completion criteria, and as such, is not relevant.
The Tenement Holder must demonstrate that post completion, the risks to the health and safety of the public so far as it may be affected by mining-related activities are as low as reasonably practicable	MPL 149 Condition 4* MPL 152 Condition 3 MPL 153 Condition 3 MPL 154 Condition 3	**Closure** **Outcome Measurement Criteria – PS7** Audit undertaken by an independent and suitably qualified expert approved by the Director of Mines (or other authorised officer) prior to application of lease surrender demonstrates that all infrastructure is removed or left in-situ as agreed with stakeholders (Outcome Measurement Criteria – LUP2) in a manner that risks to the health and safety of the public so far as it may be affected by mining-related activities are as low as reasonably practicable	Not relevant	Carrapateena is in operational phase, this is a completion criteria, and as such, is not relevant.

* Intent of MPL 149 PEPR (OZ Minerals 2017b)

9.5 Native vegetation

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
Tenement Holder must, during construction and operation, ensure that there is no permanent loss of abundance and/or diversity of native vegetation on or off the Land as a result of mining-related activities unless a significant environmental benefit has been approved in accordance with the relevant legislation	ML 6471 Condition 11 MPL 149 Condition 9* MPL 152 Condition 11 MPL 153 Condition 11 MPL 154 Condition 11 MPL 156 Condition 8	**Construction and Operation** **Outcome Measurement Criteria – NV1** Annual audit (reconciliation) of land disturbance register for infrastructure locations demonstrates native vegetation clearance does not exceed the significant environmental benefit approved under the *Native Vegetation Act 1991* (SA) and Plains Mouse habitat clearance does not exceed that approved under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth)	Compliant	Total disturbance is less than the amount approved in Native Vegetation Management Plans. Refer to Figure 12.1 to Figure 12.6. Gateway 1: • 476.15 ha approved • 281.33 ha disturbed (2013 to 2018) Gateway 2: • 708.22 ha approved • 708.19 ha disturbed Gateway 3: • 1,012.38 ha approved • 500.57 ha disturbed Gateway 4: • 20.46 ha approved • 16.82 ha disturbed Northern Wellfield: • 237.50 ha approved • 160.37 ha disturbed Total Operation footprint as of 31 December 2025: 1,669.82 ha
		Leading Indicator – NV2 Following completion of land clearance, inspections (ground survey, drone flyover or suitable alternative) demonstrates land clearing has not been undertaken outside of areas defined in the associated land disturbance permit	Compliant	A combination of drone imagery captured at site and satellite imagery was utilised to verify ground disturbance footprint. No unauthorised land disturbance occurred in 2025.

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
	MPL 156 Condition 9 MPL 156 Condition 9.1	**Outcome Measurement Criteria – EC01** Baseline ecological surveys must be undertaken at water dependent ecosystems including, but not limited to SW-6 and SW-7 prior to the impact of mining operations or mining-related activities on the existing environment	Compliant	Baseline vegetation health surveys (Rangeland Assessment Methodology) completed during October 2019 at SW6, SW7 and SW15. Refer to 2019 Annual Compliance Report, Appendix E Bosworth Creek Baseline Assessment (CA-0000-ENV-REP-0013).

* Intent of MPL 149 PEPR (OZ Minerals 2017b)

9.6 Weeds and pests

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
Tenement Holder must, during construction and operation, ensure that there is no permanent loss of abundance and/or diversity of native vegetation on or off the Land as a result of mining-related activities unless a significant environmental benefit has been approved in accordance with the relevant legislation	ML 6471 Condition 6 and Schedule 2 Condition 28 MPL 149 Condition 10* MPL 152 Condition 6 MPL 153 Condition 6 MPL 154 Condition 6 MPL 156 Condition 3	**Construction and Operation** **Outcome Measurement Criteria – WP1** Annual spring flora and fauna surveys undertaken by independent and suitably qualified ecologists at flora (including weeds) and fauna monitoring locations demonstrates no introduction of new species of weeds declared or listed under relevant legislation, plant pathogens or pests (including feral animals) as a result of mining-related activities when compared to previously recorded weed species and introduced fauna	Compliant	There were no new weed species recorded in 2025 and no overall increase in abundance or extent of weed declared under relevant legislation. The existing populations of two Weeds of National Significance are currently being managed. Both invasive species have been contained and reduced. A notable example of effective management is the isolated Prickly Pear (*Opuntia* sp.) population near the Yeltacowie Homestead, which has been under biological control using cochineal since 2021. The cochineal population has been actively managed, with ongoing harvesting and re-distribution of the control agent to unaffected areas. Additionally, control efforts for Athel Pine (*Tamarix aphylla*) at Yeltacowie Homestead have shown success, with most trees dead or dying. In 2025, no new populations were recorded, and only three mature trees remained. Ongoing efforts continue to eradicate the remaining live trees. Refer to Appendix D 2025 Carrapateena Flora and Fauna Survey (CA-0000-ENV-REP-1056)
		Outcome Measurement Criteria – WP2 Annual spring flora and fauna surveys undertaken by independent and suitably qualified ecologists at flora (including weeds) and fauna monitoring locations demonstrates no increase in the abundance of existing weeds or pest species in the land compared to previous survey records as a result of mining-related activities	Compliant	Refer to Appendix D 2025 Carrapateena Flora and Fauna Survey (CA-0000-ENV-REP-1056)
		Leading Indicator – WP3 Monthly inspection (including photographic evidence of a selected infrastructure location identifies weeds listed in the Weed Red Alert List and triggers a review of the effectiveness of management strategies# # Alternative locations must be selected until all locations have been complete. or on a demonstrated risk-based approach	Compliant	Weed inspections are conducted routinely as part of the GLUP Inspections and General Environmental Inspection processes. During this reporting period, 13 GLUP Inspections and 46 General Environmental Inspections were completed. No new Priority Weed species were identified in 2025. In 2025, cochineal continued to be deployed on two prickly pear populations located off-tenure on Pernatty Station. The cochineal remains active on both specimens, and while many plants appear to be dying, some parts remain alive, and numerous potentially viable propagules are present on the ground. Weed management efforts are ongoing in these areas to limit spread.
	ML 6471 Condition 6 and Schedule 2 Condition 28	**Leading Indicator – WP4** Quarterly audit of inspection records (including photographic evidence) maintained at the site by the waste contractor demonstrate that prior to collection food waste containers that service the accommodation village kitchen are closed to prevent feral animal scavenging	Compliant	Inspections of waste handling areas are routinely undertaken by the camp services contractor and routine inspections are completed by BHP Carrapateena personnel. Bin/skip lids are mandatory across the Carrapateena Operation and any non-conformance is addressed when identified.
		Leading Indicator – WP5 Quarterly audit of inspections records (including photographic evidence) maintained at the site by the waste contractor demonstrate that the tip face has been covered at the end of each day to prevent feral animal scavenging	Not relevant	Landfill not constructed.
	ML 6471 Condition 6 and Schedule 2 Condition 28	**Leading Indicator – WP6** Quarterly audit of records maintained at the site by all contractors demonstrates that all incoming vehicle, plant and equipment have been subject to weed hygiene procedures	Compliant	Weed hygiene certificates are completed as a compulsory deliverable within the General Induction before new vehicles are permitted to mobilise. Targeted inspections are also undertaken at the

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
	MPL 149 Condition 10* MPL 152 Condition 6 MPL 153 Condition 6 MPL 154 Condition 6 MPL 156 Condition 3			Western Access Road on entry to the site focusing on ground disturbing equipment and vehicles that leave the main mine and non-process infrastructure (NPI) footprint. During the reporting period monthly weed hygiene audits were undertaken with no gaps identified. One hundred and forty-seven (147) inspections were completed on vehicles entering site during the reporting period.

* Intent of MPL 149 PEPR (OZ Minerals 2017b)

9.7 Native fauna

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
The Tenement Holder must ensure during construction, operation and post completion that there are no native fauna injuries or deaths due to mining-related activities that could reasonably have been prevented. Provide data from any future sightings and records of the Plains Mouse to the Biological Database of South Australia (BDBSA) to enable effective monitoring and record keeping, as per the Recovery Plan Actions	ML 6471 Condition 13 MPL 149 Condition 8* MPL 152 Condition 12 MPL 153 Condition 12 MPL 154 Condition 12 MPL 156 Condition 10	**Construction and Operation** **Outcome Measurement Criteria – NF1** Investigation and review of incident report records triggered as a result of serious harm or death of native fauna at infrastructure location demonstrates that the incident could not have been reasonably prevented, animal welfare was handled in accordance with the Animal Welfare Act 1985 and that any corrective actions are closed out within 30 days or as agreed with the Director of Mines (or authorised officer)# # serious harm is defined in the *Animal Welfare Act 1985*	Compliant	At BHP Carrapateena, a site firearm is used to humanely euthanize sick or injured fauna, in compliance with the *Animal Welfare Act 1985* (SA). All fauna interactions (sightings, mortalities, and/or relocations) are recorded in a register maintained by BHP Carrapateena environment personnel. In 2025, there were 120 recorded fauna interactions, including 109 mortalities (including 36 euthanized animals), 8 relocations, and 3 sightings. The primary cause of fauna mortality was vehicle collisions involving kangaroos which are not considered reasonably preventable with existing controls in place at the operation to reduce fauna – vehicle interactions. Throughout the year, site communications are distributed during periods of heightened fauna activity (e.g. summer) to increase awareness of potential interactions and reinforce the correct reporting procedures.
	MPL 149* Schedule 6 Condition 8	**Outcome Measurement Criteria – NF4** Monthly inspections (ground survey) of the wildlife and stock control fence surrounding the airstrip demonstrates that the integrity of the fence is maintained	Compliant	Aerodrome inspections are undertaken by the Aerodrome Reporting Officer prior to the arrival of all incoming flights to ensure that no wildlife have entered the fenced complex and pose a risk of interaction with landing aircraft. No occurrences of fauna identification within the fenced aerodrome compound were recorded in 2025. Inspections were documented and retained on file.
	MPL 152 Condition 12	**Leading Indicator – NF2 Audit** of the Transmission Line undertaken at the completion of construction and signed by construction manager demonstrates infrastructure has been constructed in accordance with the transmission line design including: Line spacing between phase and ground conductors greater than 150 cm Insulation of phase and/or ground conductors where necessary Installation of perch discourages	Compliant	Transmission line completed with: • 1,593 mm line spacing and 2 m spacing to Optical Ground Wire • insulation installed where required • perch discouragers deemed not required under design review due to adequate line spacing.
		Leading Indicator – NF3 Audit of the Western Access Road undertaken at the completion of construction and signed by construction manager demonstrates speed limit signage has been installed at entry points and at a minimum of 5 km intervals in accordance with the design plans	Compliant	Construction of Western Access Road was completed in December 2021. Signage was installed as per NF3 following completion. Evidenced by Western Access Road – Inspection and Test Plan (ITP) 017 Road Furniture (CA-5410-QAC-ITP-1017).
	MPL 149*	**Leading Indicator – NF5** Airstrip clearance and foreign object inspections prior to the landing and take-off of aircraft identify a rising trend in kangaroo, emu and stock access to the internal perimeter of the wildlife and stock control fence surrounding the airstrip.	Compliant	Aerodrome inspections are undertaken by the Aerodrome Reporting Officer prior to the arrival of all incoming flights to ensure that no wildlife have entered the fenced complex and pose a risk of interaction with landing aircraft. No occurrences of fauna identification within the fenced aerodrome compound were recorded in 2025. Inspections were documented and retained on file.

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
	ML 6471 Schedule 2 Condition 28.2 Schedule 2 Condition 28.3 Schedule 2 Condition 28.4 MPL 149 Condition 6* MPL 152 Schedule 2 Condition 13.2 Schedule 2 Condition 13.3 Schedule 2 Condition 13.4 MPL 153 Schedule 2 Condition 13.2 Schedule 2 Condition 13.3 Schedule 2 Condition 13.4 MPL 154 Schedule 2 Condition 13.2 Schedule 2 Condition 13.3 Schedule 2 Condition 13.4	**Operations** **Outcome Measurement Criteria – EPBC1** Records of the Thick-billed Grasswren are to be provided to the Biological Database of South Australia (BDSA) to enable effective monitoring and record keeping if observed during annual flora and fauna surveys at monitoring sites# # Linked to MNES Condition (Schedule 2 Condition 28.2)	Compliant	Refer to Appendix D 2025 Carrapateena Flora and Fauna Survey (CA-0000-ENV-REP-1056)
		Outcome Measurement Criteria – EPBC2 Records of the Plains Mouse are to be provided to the Biological Database of South Australia (BDSA) to enable effective monitoring and record keeping if observed during annual flora and fauna surveys at monitoring sites# # Linked to MNES Condition (Schedule 2 Condition 28.4)	Compliant	Plains Mouse (Plains Rat) observation records will be reported to the BDBSA by Nature Foundation on behalf of BHP Carrapateena as a data submission in their annual report to enable effective monitoring and record keeping, as per the Recovery Plan Actions. Appendix G 2025 South Gap Offset Annual Report (CA-0000-ENV-REP-1059) Appendix D 2025 Carrapateena Flora and Fauna Survey (CA-0000-ENV-REP-1056)
		Outcome Measurement Criteria – EPBC3 Records of the Night Parrot are provided to the Night Parrot Recovery Team to enable effective monitoring and record keeping if observed during annual flora and fauna surveys at monitoring sites# # Linked to MNES Condition (Schedule 2 Condition 28.3)	Compliant	Appendix D 2025 Carrapateena Flora and Fauna Survey (CA-0000-ENV-REP-1056)

* Intent of MPL 149 PEPR (OZ Minerals 2017b)

9.8 Land use and property

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
The Tenement Holder must during construction and operation ensure there are no impacts to third-party land use or property on or off the Land as a result of mining-related activities other than those agreed between the Tenement Holder and the affected user or determined by an appropriate court as evidenced in its order(s) (and the Tenement Holder must provide the Director of Mines (or other authorised officer) with a copy of the order(s), which shall be placed on the Mining Register). Before Completion, the Tenement Holder must satisfy the Director of Mines (or other authorised officer) that where practicable, the pre-Tenement land use of the Land can be recommenced post Completion The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use	ML 6471 Condition 7 MPL 149* MPL 152 Condition 7 MPL 153 Condition 7 MPL 154 Condition 7 MPL 156 Condition 4	**Construction and Operation Criteria** **Outcome Measurement Criteria – LUP1** Audit of stakeholder engagement records undertaken quarterly demonstrates that concerns associated with agricultural productivity of Pernatty, Arcoona or Bosworth Pastoral Lease or adjacent pastoral leases as a result of ML-activities are responded to in accordance with the Local Area Agreement - Operating Protocol within 24 hours and any corrective actions are closed out within 14 days or as agreed with the Director of Mines (or other authorised officer)	Compliant	Quarterly reviews of Borealis identified no formal concerns related to pastoral productivity during the reporting period.
	ML 6471 Condition 8 and Condition 9 MPL 149* MPL 152 Condition 8 and Condition 9 MPL 153 Condition 8 and Condition 9 MPL 154 Condition 8 and Condition 9 MPL 156 Condition 5 and Condition 6	**Completion** **Outcome Measurement Criteria – LUP2** Audit undertaken prior to application of lease surrender of all infrastructure locations against any relevant third-party liability legal transfer agreements and Government agreements demonstrates that all infrastructure have been removed, unless otherwise agreed with Government or signed legal documentation to transfer on going liability of the infrastructure to third parties is provided prior to the relinquishment of the tenement(s)	Not relevant	Carrapateena is in operational phase, this is a completion criteria, and as such, is not relevant.
		Outcome Measurement Criteria – LUP3 Audit undertaken by an independent and suitably qualified expert approved by the Director of Mines (or other authorised officer) prior to application of lease surrender verifies at infrastructure locations the Landscape Function Analysis (LFA) monitoring results indicate that the LFA	Not relevant	Carrapateena is in operational phase, this is a completion criteria, and as such, is not relevant.

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
		curve has moved above, or is likely to move above the critical threshold of sustainability at infrastructure locations		
		Leading Indicator – LUP4 Rehabilitation trials shall be undertaken at infrastructure locations no longer required and ongoing assessment at LFA monitoring at sites (CEF1 – CEF7) are assessed annually demonstrating development of trends and annual improvement of rehabilitation through LFA methodology. Should the data indicate rehabilitation not trending towards sustainability route cause, investigations will be undertaken and rectification methods be identified and implemented.	Compliant	Baseline LFA data established from analogue sites. Site rehabilitation commenced in 2019. LFA sites established at two locations (LFA01-AL1 and LFA02-VOL1). Use of Point Centred Quarter (PCQ) method and Established Method enabled. Two new sites were established in spring 2022, both on the Western Access Road, one adjacent the Midway Quarry and one near the Tjungu Village. The current status and trend in landscape function measured at the four rehabilitation sites indicated a positive trend in the number and area of plants per hectare. Plant colonisation is currently dominated by short-lived perennial species, although several longer-lived perennials were also recorded. OMC LUP4 is considered to be in-progress/compliant. Appendix D 2025 Carrapateena Flora and Fauna Survey (CA-0000-ENV-REP-1056)
		Leading Indicator – LUP6 Airstrip clearance and foreign object inspections prior to the landing and take-off of aircraft identify a rising trend in kangaroo, emu and stock access to the internal perimeter of the wildlife and stock control fence surrounding the airstrip	Compliant	Aerodrome inspections are undertaken by the Aerodrome Reporting Officer prior to the arrival of all incoming flights to ensure that no wildlife have entered the fenced complex and pose a risk of interaction with landing aircraft. No occurrences of fauna identification within the fenced aerodrome compound were recorded in 2025. Inspections are documented and retained on file.

* Intent of MPL 149 PEPR (OZ Minerals 2017b)

9.9 Land and soil

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
The Tenement Holder must ensure that there is no contamination of land and soils either on or off the Land as a result of mining operations or mining-related activities The Tenement Holder must ensure that no contamination of land and soils either on or off the Land post Completion occurs as a result of mining operations or mining-related activities	ML 6471 Condition 10.1 MPL 149 Schedule 2 Condition 9* MPL 152 Condition 10.1 MPL 153 Condition 10.1 MPL 154 Condition 10.1 MPL 156 Condition 7.1	**Construction and Operation** **Outcome Measurement Criteria – LS1** Investigation and corrective actions triggered as a result of an accidental spill at infrastructure locations that triggers the notification provisions of Part 9 of the Environment Protection Act 1993 (SA) demonstrates that the spill was reported to the Director of Mines (or other authorised office) as soon as reasonably practicable after becoming aware of the harm or threatened harm, all risks were minimised so far as is reasonably practicable and that any corrective actions are closed out within 30 days or as agreed with the Director of Mines (or other authorised officer) # # Material and Serious Environmental Harm are defined in *the Environment Protection Act 1993* (SA), Section 5(3). The act does not apply a definition for 'trivial', which is included within the definitions. Therefore, for the purpose of this criteria, any spills below 250 L are considered to be trivial or unlikely to result in material or serious environmental harm	Compliant	Two (2) spills triggered notification requirements to DEM during the reporting period. For evidence, refer to the provision of reports to DEM: • Mine Settling Pond Water – Pipeline Spill (EMS #1001306124) • Tailings Pipeline Spill (EMS #1001448219) Both events were managed in accordance with the relevant Outcome Measurement Criteria and Environmental Outcomes outlined in the PEPR. Refer to Section 8 for further information on the non-compliances.
		Leading Indicator – LS2 Annual audit of waste disposal records, maintained at the site demonstrates that commercial and/or industrial wastes have been disposed of to an EPA licenced facility	Compliant	Monthly waste disposal records are provided by Cleanaway Pty Ltd to BHP Carrapateena and site contractors for all waste leaving the Carrapateena site. Transport certificates are generated by BHP Carrapateena personnel for waste types listed in Schedule 1 of the *Environment Protection Act 1993* (SA).

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
		Leading Indicator – LS3 Monthly audit of chemical storages at a selected infrastructure location demonstrates they have been constructed and are operating in accordance with the SA EPA Guideline 080/16 Bunding and Spill Management (2016)# # Alternative locations are to be selected until all locations have been completed or on a demonstrated risk-based approach	Compliant	Forty-six (46) general environmental compliance inspections were undertaken at selected infrastructure locations in 2025. Actions raised during the year pertained to operational hygiene and were closed out within prescribed deadlines: • hazardous/chemical waste storage • vehicle wash pad hygiene • fuel bay cleanliness • waste segregation • housekeeping practices.
		Leading Indicator – LS4 Monthly audit of chemical storages at a selected infrastructure location demonstrates that all chemicals are recorded (including volumes) in the chemical database# # Alternative locations are to be selected until all locations have been completed or on a demonstrated risk-based approach	Compliant	BHP Carrapateena tracks the location and volumes of chemicals via the ChemAlert Database. Chemical storage areas are routinely audited as part of the environment inspection process to ensure that storage is acceptable and that safety data sheets (SDS) are maintained on file within the immediate area. Evidence is stored within INX InControl and Event Management System.
	ML 6471 Condition 10.2 MPL 149 Schedule 2 Condition 9* MPL 152 Condition 10.2 MPL 153 Condition 10.2 MPL 154 Condition 10.2 MPL 156 Condition 7.2	**Completion** **Outcome Measurement Criteria – LS5** Audit of rehabilitation activities at infrastructure locations and waste disposal records prior to application of lease surrender demonstrates that commercial and/or industrial wastes have been disposed of to an EPA licenced facility and no soil contamination (as defined in the National Environment Protection (assessment of Site Contamination) Measure 2013) remains in areas used for the handling and storage of hazardous materials	Not relevant	Carrapateena is in operational phase, this is a completion criteria and as such, is not relevant.

* Intent of MPL 149 PEPR (OZ Minerals 2017b)

9.10 Air quality

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
The Tenement Holder must during construction, operation and post Completion ensure no adverse change to the environment as a result of particulate emissions and/or dust generated by mining operations or mining-related activities	ML 6471 Condition 14	**Construction and Operation** **Outcome Measurement Criteria – AQ1** Quarterly gravimetric analysis and review of continuous dust deposition collected quarterly at monitoring sites adjacent to the Tailings Storage Facility (ERML16–ERML19) demonstrates dust deposition rates do not exceed 4 g/m^2/month (total) as per Table 7.1 of Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (DEC 2005)	Compliant	The average rate of dust deposition at ERML16 to ERML19 (inclusive) in 2025 was 1.3 g/m^2/month. This is significantly below the OMC value of an annual average of 4 g/m^2/month in accordance with DEC (2005) guidance. Dust deposition rates increased during Q4 2024 and Q1 2025, however for the remainder of the reporting period, were found to be generally consistent with results from previous years. Appendix E 2025 Air Quality Monitoring Report (CA-0000-ENV-REP-1057)
		Outcome Measurement Criteria – AQ2 Annual (spring) surveys undertaken by a suitably qualified and experienced expert demonstrates no adverse impact on the diversity and abundance of native vegetation at monitoring sites directly attributed to dust deposition from mining operations or mining-related activities when compared to baseline native vegetation conditions	Compliant	The annual ecology survey was undertaken in September 2025 by Lathwida Environmental. No adverse impacts on the diversity or abundance of native vegetation were attributed to dust deposition from mining operations. Appendix D 2025 Carrapateena Flora and Fauna Survey (CA-0000-ENV-REP-1056)
		Outcome Measurement Criteria – AQ3 Audit (TSF Closure Strategy Verification Report) undertaken by an independent suitably qualified expert approved by the Director of Mines (or other authorised officer) demonstrates#: • that data has been collected for the calibration of the Air Quality Model and Landform Evolution Model as per Leading Indicators AQ5, AQ6, TSF8 and TSF9	Compliant	The frequency/timing for the TSF Closure Strategy Verification Report for OMC AQ3/TSF7 is 6/8/10 years after lease grant. The Verification Report was not completed in 2024 (6 years after lease grant) as there was insufficient time to collect meaningful erosion data from an erosion field study since construction of the Stage 2 Tailings embankment. As agreed with DEM, the TSF Closure Strategy Verification Report was subsequently completed in 2025.

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
		• that data collected as per Leading Indicators AQ5, AQ6, TSF8 and TSF9 (and any other relevant data) demonstrates that the TSF closure strategies set out in the PEPR (Section 4.17.3), specifically the requirement for no TSF cover system, would be effective in achieving the relevant environmental outcomes. The audit must also include the following information in each TSF closure strategy verification report: • recommendations for any changes to existing TSF closure strategies to ensure achievement of the relevant environmental outcomes; and • recommendations for any new TSF closure strategies to ensure achievement of the relevant environmental outcomes; The audit will be provided to the Mining Regulator at the following frequencies: • an initial report at 6 years after lease grant (allowing for 2 years to reach first tailings deposition, and 4 years to conduct the relevant scientific investigations); and • 8 years after lease grant; and • 10 years after lease grant; or • any other timeframe as agreed between the Tenement Holder and Director of Mines (or other authorised officer) Demonstration of achievement of the outcome will be met through the independent and suitably qualified expert verifying the requirement for no TSF cover system at any of the time intervals stated above. If the independent and suitably qualified expert can not verify the requirement for no TSF cover system, demonstration of achievement of the outcome will be met through: • PEPR review which details the changed and/or new TSF closure strategies; and • payment of a Bond (or top up to the existing Bond) to reflect the rehabilitation liability of the changed and/or new TSF closure strategies. # The scope of the audit will be agreed by the Tenement Holder and the Director of Mines (or other authorised officer) at an appropriate time ahead of delivery of the initial report.		Appendix H TSF Closure Strategy Verification Report
		Leading Indicator – AQ4 Annual laboratory analysis of continuous metals in dust at sites adjacent to the Tailings Storage Facility (ERML16 –ERML19) demonstrates a rising trend in metals concentrations when compared to previous monitoring results (ERML1–ERML15)	Compliant	Metals in deposited dust concentrations for most analysis were generally similar or on a downwards trajectory to that of previous reporting periods. Further, metal concentrations at sites surrounding the TSF continue to be, in general, elevated as compared to the other monitoring locations across the Operation; with exception for cobalt, titanium and uranium. Appendix E 2025 Air Quality Monitoring Report (CA-0000-ENV-REP-1057)
		Leading Indicator – AQ5 Calibration of the air quality model (Air Quality Modelling and Assessment of Effects, PEPR Appendix C1) is undertaken at years 6/8/10 of the Tailings Storage Facility operation with operational monitoring data and dust threshold lift data established in the tailings beach trials and validates modelling outputs (Table 9.10 PEPR).	Compliant	Stage 1 of the TSF commenced operation on December 2019. Calibration of the air quality model occurred in 2024 (year 6 of TSF operation) and will be calibrated again in 2026 (year 8 of TSF operation).
		Leading Indicator – AQ6 Annual audit by an independent and suitably qualified expert of dust threshold lift data from the tailings beach trials at the Tailings Storage Facility is compared to the Air Quality Model (Appendix C1) dust threshold lift speed of 5.4m/s. Should the threshold lift speed is <5.4m/s an assessment will be undertaken by an independent and suitably qualified expert to determine if there is a material deviation expected on modelling outputs that triggers a model calibration. # Linked to Outcome Measurement Criteria – AQ3	Compliant	Operation of the TSF continued in its sixth year during 2025. The Air Quality Model was updated in 2024 conservatively using the dust threshold lift off speed of 5.4 m/s and although in-field validation of wind erosion parameters demonstrated that actual velocities are higher, updated velocities can be reincorporated into future air quality assessments.
		Leading Indicator – AQ7 Annual soil sampling and laboratory analysis undertaken at monitoring sites adjacent to the Tailings Storage Facility (ERML16–ERML19) demonstrates a rising trend in metals concentrations when compared to previous monitoring results# # Linked to Land and Soil Outcome (Schedule 6 Condition 10.1)	Compliant	The average concentration of metals in soil sediments was presented in Appendix B1 to the MLP (OZ Minerals 2017a), with sites SED2, SED6 and SED8 occurring in the Eliza Creek catchment. Comparison against monitoring undertaken during 2025 is presented withinAppendix E 2025 Air Quality Monitoring Report (CA-0000-ENV-REP-1057) This demonstrates that measured concentrations at the ERML sites are consistent with previous reporting periods. The measured concentrations remain (generally) orders of magnitude less than the relevant National Environment Protection (Assessment of Soil Contamination) Measure 1999

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
				guidelines for commercial/industrial environments. The 2019 values are considered to represent baseline conditions at the ERML sites as no tailings deposition occurred prior to the soil sampling in 2019. Refer to Section 2.2 of Appendix E 2025 Air Quality Monitoring Report (CA-0000-ENV-REP-1057)
		Leading Indicator – AQ8 Quarterly iso-kinetic sampling of the Flash Steam Heat Recovery Stack, Plant Extraction Scrubber Stack and Nonox Vent Scrubber Stack at the Concentrate Treatment Plant demonstrates compliance with Schedule 1 of the Environment Protection (Air Quality) Policy 2016 (SA) (Table 8.3 PEPR)# # Linked to CTP Condition (Schedule 2 Condition 15)	Not relevant	Concentrate Treatment Plant (CTP) is no longer under consideration
		Leading Indicator – AQ9 Monthly analysis of the trends associated with the Concentrate Treatment Plant scrubber efficiencies (continuous data logging) indicates a decrease in the performance of the scrubbing systems when compared to previous months# # Linked to CTP Condition (Schedule 2 Condition 15)	Not relevant	CTP is no longer under consideration
		Leading Indicator – AQ10 Quarterly audit of inspection records (including photographic evidence) maintained at the site by the transport contractor demonstrate the integrity of containers have been checked prior to departure to ensure no release of concentrate to the environment# # Linked to Concentrate Transport Condition (Schedule 2 Condition 16)	Not relevant	CTP is no longer under consideration
		Completion **Outcome Measurement Criteria – AQ11** Laboratory analysis of continuous dust deposition collected monthly at monitoring sites adjacent to the Tailings Storage Facility (ERML16–ERML19) post completion for a period of no less than one (1) year (dry weather cycle and tailings must be of a moisture content and crust thickness as per the air quality model inputs) demonstrates dust deposition rates do not exceed 4 g/m^2/month as per Table 7.1 of Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (DEC, 2005)	Not relevant	CTP is no longer under consideration
		Outcome Measurement Criteria – AQ12 An ecological risk assessment including soil sampling at monitoring sites adjacent to the Tailings Storage Facility (ERML16–ERML19) undertaken in accordance with NEPM (Assessment of Site Contamination 1999) by an independent and suitably qualified expert approved by the Director of Mines (or other authorised officer) prior to application of lease surrender verifies concentrations of metals are within the site specific Ecological Investigation Levels. Ecological Investigation levels to be derived based on the ecological risk assessment framework detailed in Schedule B5a "Guideline on Ecological Risk Assessment# # Linked to Land and Soil Outcome (Schedule 6 Condition 10.2)	Not relevant	Carrapateena is in operational phase, this is a completion criteria and as such, is not relevant.

9.11 Radiation

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
The Tenement Holder, must during construction, operation and post Completion ensure no public health or environmental impacts from radionuclides (including radon) as a result of mining operations or mining-related activities	ML 6471 Condition 16	**Operations** **Outcome Measurement Criteria – RAD1** Annual audit undertaken by an independent and suitably qualified expert of radon and radionuclides data (methods outlined Appendix E Radioactive Waste Management Plan) at monitoring locations (ERML1–ERML19) demonstrates total radiation doses do not exceed 1 mSv/annum for members of the public (Appendix C7 PEPR Radioactive Waste Management Plan)	Compliant	Estimated maximum annual dose to the public was 0.046 mSv. When referring to the 'public' it pertains to a scenario where the public were able to access the mining lease after institutional control. Quarterly monitoring for radon, gamma and radionuclides in dust was undertaken in 2025. The annual monitoring period July 2024 – June 2025 is compliant. Appendix F 2025 Environmental Radiation Impact Assessment (CA-0000-ENV-REP-1058)

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
		Outcome Measurement Criteria – RAD2 Annual audit undertaken by an independent and suitably qualified expert of radon and radionuclides data (methods outlined Appendix E Radioactive Waste Management Plan) at monitoring locations adjacent to the Tailings Storage Facility (ERML16–ERML19) demonstrates total radiation doses do not exceed 10 µGy/hour for non-human biota (Appendix C7 PEPR Radioactive Waste Management Plan)	Compliant	Quarterly monitoring for radon, gamma and radionuclides in dust was undertaken in 2025. The annual monitoring period July 2024 – June 2025 is compliant. Total dose rate per organism fell well below the 10 µGy/hour no effect threshold: • Red Kangaroo (*Macropus rufus*) – 0.0204 µGy/hour • Emu (*Dromaius novaehollandiae*) – 0.0015 µGy/hour • Sand Goanna (*Varanus gouldii*) – 0.0464 µGy/hour. Appendix F 2025 Environmental Radiation Impact Assessment (CA-0000-ENV-REP-1058)
		Completion **Outcome Measurement Criteria – RAD3** Annual audit undertaken by an independent and suitably qualified expert of radon and radionuclides data (methods outlined Appendix E Radioactive Waste Management Plan) at monitoring locations adjacent to the Tailings Storage Facility (ERML16–ERML19) post completion for a period of no less than one (1) year (dry weather) cycle and tailings must be of a moisture content and crust thickness as per the air quality model inputs) demonstrates total radiation doses do not exceed 1 mSv/annum for members of the public (Appendix C7 PEPR Radioactive Waste Management Plan)	Not relevant	Carrapateena is in operational phase, this is a completion criteria and as such, is not relevant.
		Outcome Measurement Criteria – RAD4 Annual audit undertaken by an independent and suitably qualified expert of radon and radionuclides data (methods outlined Appendix E Radioactive Waste Management Plan) at monitoring locations (ERML1–ERML19) post completion for a period of no less than one (1) year (dry weather cycle and tailings must be of a moisture content and crust thickness as per the air quality model inputs) demonstrates total radiation doses do not exceed 10 µGy/hour for non-human biota (Appendix C7 PEPR Radioactive Waste Management Plan)	Not relevant	Carrapateena is in operational phase, this is a completion criteria and as such, is not relevant.

9.12 Surface water – erosion and sedimentation

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
The Tenement Holder must during construction, operation and post completion ensure no adverse impact to surface water quality and water dependent ecosystems (excluding surface water in the mine subsidence zone), on or off the Land, as a result of contamination and sedimentation caused by mining operations or mining-related activities	ML 6471 Condition 17 MPL 149* MPL 152 Condition 13 and 14 MPL 153 Condition 13 and 14 MPL 154 Condition 13 and 14 MPL 156 Condition 11	**Construction and Operation** **Outcome Measurement Criteria – SWES1** Opportunistic surface water sampling and laboratory analysis (rising stage samplers or grab samples) at surface water sampling sites (SW05–SW09) at least once a year within seven days of a rainfall event required to create flows demonstrates water quality does not exceed the ANZECC/ARMCANZ (2000) Freshwater Guidelines or baseline ranges (whichever is greater) (PEPR Table 8.7; pH, EC, SS and hydrocarbons) whichever is greater	Compliant	Due to significantly low rainfall experienced throughout the year, sampling was limited to three sampling locations during the monitoring period. Appendix C 2025 Groundwater and Surface Water (CA-0000-ENV-REP-1055)
	ML 6471 Condition 17 MPL 152 Condition 13 and 14 MPL 153 Condition 13 and 14 MPL 154 Condition 13 and 14 MPL 149*	**Leading Indicator – SWES2** Audit of surface water management infrastructure undertaken annually (prior to summer) demonstrates surface water management infrastructure is as constructed and have been maintained in accordance with the design and corrective actions closed out within 14 days	Compliant	Annual surface water management infrastructure audit completed in October 2025 (INX #33764). A combination of drone imagery captured by BHP Carrapateena personnel and on-ground inspection were utilised to assess the integrity of surface water infrastructure: • subsidence zone diversion drain • WRD containment ponds (A, B, C) • aerodrome diversion drains and • MPP and NPI event ponds. Observations are summarised below: • no major damage to key infrastructure which would impact the ability to manage flows

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
				• minor erosion observed within internal drains • no seepage/lateral expression of water in WRD containment ponds • negligible silting of WRD containment ponds • event pond outfall intact, no evidence of scouring • minor sedimentation from diversion drain outfall (aerodrome/subsidence zone).
		Leading Indicator – SWES3 Audit of surface water management infrastructure undertaken at least once a year within seven days of a rainfall event required to create flows demonstrates surface water management infrastructure have performed in accordance with the design and corrective actions closed out within 14 days	Compliant	As no rainfall events generating flow occurred during 2025, the audit was not undertaken. Key infrastructure inspected as part of previous surface water infrastructure audits include: • subsidence zone diversion drain • WRD containment ponds • aerodrome • Western Access Road creek crossings (Yelatcowie Creek and Elizabeth Creek) • general NPI.
	ML 6471 Condition 17	**Outcome Measurement Criteria – SWES4** Audit undertaken by an independent and suitably qualified expert approved by the Director of Mines (or other authorised officer) prior to application of lease surrender confirms by a construct to design audit that the abandonment bund around the subsidence zone and the Tailings Storage Facility Final Embankment have been rock armoured in accordance with the identification of material types identified in detailed design# # Linked to strategies SWES13 and SWES14	Not relevant	Carrapateena is in operational phase, this is a completion criteria and as such, is not relevant.
	ML 6471 Condition 17 MPL 149* MPL 152 Condition 13 and 14 MPL 153 Condition 13 and 14 MPL 154 Condition 13 and 14	**Outcome Measurement Criteria – SWES5** Audit undertaken by an independent and suitably qualified expert approved by the Director of Mines (or other authorised officer) prior to application of lease surrender demonstrates that all culverts, fords, and surface water management infrastructure that is not required post completion is removed in a manner to ensure long term physical stability in consideration of potential erosion and sedimentation and natural flow regimes have been restored	Not relevant	Carrapateena is in operational phase, this is a completion criteria and as such, is not relevant.
	ML 6471 Condition 17	**Outcome Measurement Criteria – SWES6** Audit undertaken by an independent and suitably qualified expert approved by the Director of Mines (or other authorised officer) prior to application of lease surrender demonstrates waste rock, ore stockpiles and soil stockpiles have been removed from the ground surface	Not relevant	Carrapateena is in operational phase, this is a completion criteria and as such, is not relevant.
	MPL 156 Condition 11 and 12	**Outcome Measurement Criteria – EC01** Baseline ecological surveys must be undertaken at water dependent ecosystems including, but not limited to SW-6 and SW-7 prior to the impact of mining operations or mining-related activities on the existing environment	Compliant	Refer to Appendix D 2025 Carrapateena Flora and Fauna Survey (CA-0000-ENV-REP-1056)

* Intent of MPL 149 PEPR (OZ Minerals 2017b)

9.13 Surface water – reduced flows

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
The Tenement Holder must during construction, operation and post Completion ensure no adverse impact to surface water quality and water dependent ecosystems (excluding surface water in the mine subsidence zone), on or off the Land, as a result of contamination and sedimentation caused by mining operations or mining-related activities	ML 6471 Condition 17	**Operations** **Outcome Measurement Criteria – SWRF1** Annual surveys undertaken by an independent and suitably qualified expert demonstrates no adverse impact on the diversity and abundance of native vegetation and water dependent ecosystems at Eliza Creek monitoring attributed to reduced surface water flows caused by mining operations when compared to baseline conditions (PEPR Appendix C6 Ecological Baseline) unless a significant environmental benefit has been approved in accordance with the relevant legislation# # Linked to Native Vegetation Outcome (Schedule 6 Condition 11) – If surveys show that there is a permanent loss of abundance and/or diversity of native vegetation on or off the Land as a result of mining-related activities, a significant environmental benefit must be established approved in accordance with the relevant legislation)	Compliant	Refer to Appendix D 2025 Carrapateena Flora and Fauna Survey (CA-0000-ENV-REP-1056)

9.14 Surface water – tailings storage facility

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
The Tenement Holder must during construction, operation and post Completion ensure no adverse impact to surface water quality and water dependent ecosystems (excluding surface water in the mine subsidence zone), on or off the Land, as a result of contamination and sedimentation caused by mining operations or mining-related activities	ML 6471 Condition 17	**Construction and Operation** **Outcome Measurement Criteria – TSF1** Quarterly sampling and laboratory analysis of shallow monitoring wells downstream of the Tailings Storage Facility (TSFMB1s–TSFMB4s) and analysis of pH, Metals and EC demonstrates water quality does not exceed the ANZECC/ARMCANZ (2000) Freshwater Guidelines or baseline ranges (PEPR Table 9.22; pH, EC and metals) whichever is greater	Non-compliant	TSFMB3s recorded exceedances of Electrical Conductivity, along with elevated concentrations of aluminium, barium, cobalt, copper, iron, strontium, and uranium which are above the ANZG (2018) guidelines (supersedes the OMC defined ANZECC/ARMCANZ (2000) Freshwater Guidelines) or baseline values for shallow alluvial weathered Proterozoic groundwater. TSFMB1s presented its first occurrence of obtainable groundwater in September 2025 whilst TSFMB2s and TSFMB4s remain dry. Refer to Section 23 for forward works plan for OMC TSF1. Appendix C 2025 Groundwater and Surface Water (CA-0000-ENV-REP-1055)
		Outcome Measurement Criteria – TSF2 Quarterly monitoring of shallow monitoring wells downstream of the Tailings Storage Facility (TSFMB1s–TSFMB4s) demonstrates that the standing water levels are trending in accordance with modelled predictions and do not exceed the maximum predicted drawdown at each well (PEPR Table 9.21).	Non-compliant	Standing water levels at TSFMB3s are not trending in accordance with modelled predictions and have exceeded the maximum forecast groundwater rise by approximately 7.5 m. This deviation is attributed to elevated pre-TSF water levels influenced by rainfall driven recharge, and more recently, by lateral seepage from TSF operations. In 2025, the standing water level increased by 1.87 m, reaching 107.5 mAHD. TSFMB1s recorded its first measurable standing water level in September 2025 whilst TSFMB2s and TSFMB4s remain dry and remain unable to be sampled. Refer to Section 23 for forward works plan for OMC TSF2. Appendix C 2025 Groundwater and Surface Water (CA-0000-ENV-REP-1055)
		Outcome Measurement Criteria – TSF3 Opportunistic surface water sampling and laboratory analysis (rising stage samplers or grab samples) within Eliza Creek (SW05–SW09) at least once a year within seven days of a rainfall event required to create flows demonstrates water quality does not exceed the ANZECC/ARMCANZ (2000) Freshwater Guidelines or baseline ranges (PEPR Table 9.16; pH, EC and metals) whichever is greater	Compliant	Throughout the monitoring period surface water flow did not occur in Eliza Creek therefore no samples were available for analysis. A rainfall event occurred in March 2025 however it was not sufficient to generate flow adequate for sampling. Appendix C 2025 Groundwater and Surface Water (CA-0000-ENV-REP-1055)
		Outcome Measurement Criteria – TSF4 Annual sediment sampling and laboratory analysis for metals shall be undertaken within Eliza Creek (IT01–IT03) and demonstrates sediments meet ANZECC/ARMCANZ (2000) Sediment Quality Guidelines or baseline ranges (determined prior to commencement Stage 1 Tailings commissioning) whichever is greater.	Compliant	All sites remain within the adopted Sediment Quality Guidelines, with results showing only slight elevations above the established baseline range. Appendix C 2025 Groundwater and Surface Water (CA-0000-ENV-REP-1055)

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
		Outcome Measurement Criteria – TSF5 Reporting, investigation and corrective actions triggered as a result of an accidental spill from Tailings Delivery Infrastructure or seepage from the Tailings Storage Facility as identified through Leading Indicators TSF7, TSF10 or TSF11 that relate to serious or material environmental harm demonstrates that spills are reported to the Director of Mines (or other authorised office) as soon as reasonably practicable after becoming aware of the harm or threatened harm, all risks were minimised so far as is reasonably practicable and that any corrective actions are closed out within 30 days or as agreed with the Director (or other authorised officer).	Compliant	During the monitoring period, a flange on the second tailings pipeline near Scout Pit 1 failed causing slurry to discharge. The tailings slurry was predominantly contained within Scour Pit 1 and the pipeline corridor. However, due to the pressurised line and high winds, slurry dispersed up to 175 m from the pipeline into previously undisturbed ground. The incident was managed in accordance with TSF5. Refer to Section 11 for further details.
		Outcome Measurement Criteria – TSF6 Annual surveys undertaken by an independent and suitably qualified expert demonstrates no adverse impact on the diversity and abundance of native vegetation and water dependent ecosystems at Eliza Creek monitoring sites attributed to tailings seepage when compared to baseline conditions (PEPR Appendix C6 – Ecological Baseline)# # Linked to Native Vegetation Outcome (Schedule 6 Condition 11) – If surveys show that there is a permanent loss of abundance and/or diversity of native vegetation on or off the Land as a result of mining-related activities a significant environmental benefit must be established approved in accordance with the relevant legislation	Compliant	Refer to Appendix D 2025 Carrapateena Flora and Fauna Survey (CA-0000-ENV-REP-1056)
		Outcome Measurement Criteria – TSF7 Audit (TSF Closure Strategy Verification Report) undertaken by an independent suitably qualified expert approved by the Director of Mines (or other authorised officer) demonstrates#: that data has been collected for the calibration of the Air Quality Model and Landform Evolution Model as per Leading Indicators AQ5, AQ6, TSF8 and TSF9 that data collected as per Leading Indicators AQ5, AQ6, TSF8 and TSF9 (and any other relevant data) demonstrates that the TSF closure strategies set out in the PEPR (Section 4.17.3), specifically the requirement for no TSF cover system, would be effective in achieving the relevant environmental outcomes. The audit must also include the following information in each TSF closure strategy verification report: • recommendations for any changes to existing TSF closure strategies to ensure achievement of the relevant environmental outcomes; and • recommendations for any new TSF closure strategies to ensure achievement of the relevant environmental outcomes; The audit will be provided to the Mining Regulator at the following frequencies: • an initial report at 6 years after lease grant (allowing for 2 years to reach first tailings deposition, and 4 years to conduct the relevant scientific investigations); and • 8 years after lease grant; and • 10 years after lease grant; or • any other timeframe as agreed between the Tenement Holder and Director of Mines (or other authorised officer) Demonstration of achievement of the outcome will be met through the independent and suitably qualified expert verifying the requirement for no TSF cover system at any of the time intervals stated above.	Compliant	The frequency/timing for the TSF Closure Strategy Verification Report for OMC AQ3/TSF7 is 6/8/10 years after lease grant. The Verification Report was not completed in 2024 (6 years after lease grant) as there was insufficient time to collect meaningful erosion data from an erosion field study since construction of the Stage 2 Tailings embankment. As agreed with DEM, the TSF Closure Strategy Verification Report was subsequently completed in 2025. Appendix H TSF Closure Strategy Verification Report

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
		If the independent and suitably qualified expert can not verify the requirement for no TSF cover system, demonstration of achievement of the outcome will be met through: • PEPR review which details the changed and/or new TSF closure strategies; and • payment of a Bond (or top up to the existing Bond) to reflect the rehabilitation liability of the changed and/or new TSF closure strategies. # The scope of the audit will be agreed by the Tenement Holder and the Director of Mines (or other authorised officer) at an appropriate time ahead of delivery of the initial report.		
		Leading Indicator – TSF8 Calibration of the Landform Evolution Model is undertaken 2 years after Stage 3 embankment construction and year 8 to 10 of TSF operation and validates modelling outputs (PEPR Appendix B1 Tailings Storage Facility Design (Landform Evolution Modelling)# # Linked to Outcome Measurement Criteria – TS7	Not relevant	Calibration of the TSF landform evolution model (LEM) was last executed in 2022 using TSF Stage 2 embankment construction material and refined tailings properties. Key findings included: • The water storage capacity of the closed TSF would be reduced over time, but it is unlikely the TSF would spill during extreme storm events. • It would not result in tailings discharge to the environment. • It would result in minor erosion of the embankment. The next calibration of the LEM will occur two years after Stage 3 embankment construction is completed.
		Leading Indicator – TSF9 Annual audit by an independent and suitably qualified expert of laboratory and field data including rainfall intensity, tailings particle sizes, in-channel lateral erosion parameters, 'm' from the tailings beach trials at the Tailings Storage Facility is compared to the Landform Evolution Model (PEPR Appendix B1 – Tailings Storage Facility Design (Landform Evolution Modelling) input assumptions. Should values deviate outside of the sensitivities in Table 9.9, an assessment will be undertaken by an independent and suitably qualified expert to determine if there is a material deviation expected on modelling outputs that model calibration# # Linked to Outcome Measurement Criteria – TS7	Compliant	Golder Associates reviewed the LEM inputs as described within TSF9 as a deliverable within the scope of the Annual Dam Safety review conducted in January 2022 (CA-3630-PRM-REP-1516). Key findings include: • Future updates to the LEM should also consider less frequent and higher intensity rainfall events. • A review of tailings particle size distribution (PSD) data shows consistency between the adopted PSD (the annual average was slight lower (3.12 g/m^3) compared with the 2020 period (3.29 g/m^3). • Conservative assumption that PSD of rockfill diminishes over time to that of tailings.
		Leading Indicator – TSF10 Inspection (including photographic evidence) of the Eliza Creek bed (IT01–IT03) undertaken quarterly demonstrates visual evidence of shallow lateral seepage surface expressions (salt crystals, salinisation or water logging) and triggers further investigation (Outcome Measurement Criteria TSF5)	Compliant	Quarterly inspections of the Eliza Creek bed (IT01–IT03) were undertaken using both drone and on-ground methodology. No evidence of new seepage/salt expression at surface was observed during the reporting period.
		Leading Indicator – TSF11 Audit undertaken by a suitably qualified expert approved by the Director of Mines (or other authorised officer), including quality assurance inspections undertaken during construction prior to commissioning of Stage 1 of the Tailings Storage Facility and signed by construction manager demonstrates that seepage design controls and TSF and Decant embankment foundation preparation have been constructed in accordance with the design (PEPR Appendix B1 – Tailings Storage Facility Design)# # Tailings Storage Facility Audits (Schedule 2 Condition 4.1). The expert reports for the audits of Stage 1 of TSF embankment construction must address all items as specified in Schedule 2 Condition 10	Compliant	Works completed in accordance with the design and documented in TSF Stage 1 construction reports: • CA-3630-CIV-REP-1018 (TSF Stage 1) Independent audit completed by ATC Williams prior to operation: • CA-3630-QAC-REP-2016 (TSF Stage 1)
		Leading Indicator – TSF15 Audit undertaken by a suitably qualified expert approved by the Director of Mines (or other authorised officer), including quality assurance inspections undertaken during construction prior to commissioning of Stages 2, 3, 4 and 5 of the Tailings Storage Facility and signed by construction manager demonstrates embankment foundation preparation have been constructed in accordance with the design (PEPR Appendix B1 – Tailings Storage Facility Design)#	Compliant	Construction of TSF Stage 2 was completed in May 2022 under the technical guidance from Engineer of Record WSP.

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
		# Tailings Storage Facility Audits (Schedule 2 Condition 4.2). The expert reports for the audits of Stages 2, 3, 4 and 5 of TSF embankment construction must address all items as specified in Schedule 2 Condition 10		
		Leading Indicator – TSF16 Audit undertaken by a suitably qualified expert approved by the Director of Mines (or other authorised officer), including quality assurance inspections and audit of records of the Operations, Maintenance and Surveillance Manual of the Tailings Storage Facility undertaken every 3 months during Stage 1 and 2 every 6 months for Stage 3, 4, 5 and 6 demonstrates that the TSF is being operated in accordance with design (PEPR Appendix B1 – Tailings Storage Facility Design) and the Operations, Maintenance and Surveillance Manual# # Tailings Storage Facility Audits (Schedule 2 Condition 4.3 and 4.4)	Compliant	During 2025, prescribed TSF audits were undertaken at the required frequency outlined within the TSF Operations, Maintenance and Surveillance Manual (CA-3630-CIV-MNL-1000). Five inspections were undertaken pertaining to operation of the TSF during the reporting period: • Tailings Storage Facility, Q1 2025 Site Visit and Monitoring Report, June 2025 (WSP) (CA-3630-CIV-REP-1127). • Tailings Storage Facility, Q2 2025 Site Visit and Monitoring Report, September 2025 (WSP) (CA-3630-CIV-REP-1134). • Tailings Storage Facility, Q3 2025 Site Visit and Monitoring Report, December 2025 (WSP) (CA-3630-CIV-REP-1139). • Tailings Storage Facility, Engineer of Record Comprehensive Annual Report, January 2025 to January 2026 (WSP). Annual audit completed in January 2026, final report pending. • ATC Williams annual independent audit completed in February 2026 (CA-3630-CIV-REP-1132).
		Leading Indicator – TSF21 Monthly water sampling and laboratory analysis from the TSF supernatant pond and lined decant pond of pH, EC, and, metals validates geochemical modelling predictions (PEPR Table 9.17; pH, EC and metals). Should values deviate by +/- 10% an investigation will be undertaken and seepage model re-run# # Surface Water Strategy (Schedule 6 Condition 22) and Groundwater Strategy (Schedule 6 Condition 26.2)	Compliant	Monthly samples were obtained as per the frequency prescribed by TSF21 during the reporting period. Supernatant and decant water was within 10% of the maximum range of PEPR Table 9.17.
		Leading Indicator – TSF23 Quarterly water sampling in the seepage cut-off drain (SCD1) and analysis of pH, EC and metals is compared to geochemical modelling prediction (PEPR Table 9.17; pH, EC and metals). Should values deviate by +/- 10% an investigation will be undertaken and seepage model re-run# # Groundwater Strategy (Schedule 6 Condition 26.2)	Compliant	Quarterly samples were obtained as per the frequency prescribed by TSF23. Seepage cut off drain samples were within 10% of the maximum range of PEPR Table 9.17.
		Leading Indicator – TSF24 Water sampling and analysis of pH, metals and EC in the seepage cutoff drain after a rainfall event that results in the activation of the flood storage area of the decant dam will be undertaken and compared to geochemical modelling prediction (PEPR Table 9.17; pH, EC and metals). Should values deviate by +/- 10% an investigation will be undertaken and seepage model re-run	Compliant	As no rainfall events flooded the decant storage area in 2025, samples were unable to be taken.
		Completion **Outcome Measurement Criteria – TSF35** Audit undertaken by an independent and suitably qualified expert approved by the Director of Mines (or other authorised officer) after the final discharge of tailings into the TSF and prior to commencement of final rehabilitation, closure and decommissioning of the TSF and Decant Dam including a review of the operational TSF audit reports and other relevant information and demonstrates that the Tailings Storage Facility has been operated within design (PEPR Appendix B1 – Tailings Storage Facility Design) or any operational deviations from design parameters have been assessed and addressed appropriately and therefore can be expected function in the long term as per the design# # Tailings Storage Facility Audits (Schedule 2 Condition 4.5). The expert reports for the audits of Stage 1 of TSF embankment construction must address all items as specified in Schedule 2 Condition 10	Not relevant	TSF is in operational phase.
		Outcome Measurement Criteria – TSF36 Audit undertaken by an independent and suitably qualified expert approved by the Director of Mines (or other authorised officer) after the final TSF and Decant Dam	Not relevant	TSF is in operational phase.

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
		rehabilitation, closure and decommissioning works have been completed, demonstrates that the Tailings Storage Facility embankment and spillways have been constructed to design (PEPR Appendix B1 – Tailings Storage Facility Design) to ensure long term physical stability in consideration of potential erosion and sedimentation of the downstream environment# # Tailings Storage Facility Audits (Schedule 2 Condition 4.6). The expert reports for the audits of Stage 1 of TSF embankment construction must address all items as specified in Schedule 2 Condition 11		
		Outcome Measurement Criteria – TSF37 Quarterly sampling of shallow monitoring wells downstream of the Tailings Storage Facility (TSFMB1S– TSFMB4S) at the cessation of tailings discharge for a period of no less than one (1) year and analysis of pH, Metals and EC demonstrates water quality does not exceed the ANZECC/ARMCANZ (2000) Freshwater Guidelines or baseline ranges (PEPR Table 8.15; pH, EC and metals) whichever is greater	Not relevant	TSF is in operational phase.

9.15 Surface water – acid and metalliferous drainage

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
The Tenement Holder must during construction, operation and post Completion ensure no adverse impact to surface water quality and water dependent ecosystems (excluding surface water in the mine subsidence zone), on or off the Land, as a result of contamination and sedimentation caused by mining operations or mining-related activities	ML 6471 Condition 17	**Construction and Operation** **Outcome Measurement Criteria – AMD1** Opportunistic surface water sampling and laboratory analysis (rising stage samplers or grab samples) within Eliza Creek at least once a year within seven days of a rainfall event required to create flows demonstrates water quality does not exceed the ANZECC/ARMCANZ (2000) Freshwater Guidelines or baseline ranges (PEPR Table 9.16; pH, EC and metals) whichever is greater.	Compliant	Throughout the monitoring period surface water flow did not occur in Eliza Creek therefore no samples were available for analysis. Appendix C 2025 Groundwater and Surface Water (CA-0000-ENV-REP-1055)
		Leading Indicator – AMD2 Audit of the production stockpile pad undertaken at the completion of construction and prior to the placement of material above the sulphur cut-off grade and signed by construction manager demonstrates the production stockpile pad has been constructed in accordance with the basis of design	Compliant	Construction of the pre-production stockpile pad was completed to design (CA-2800-CIV-GAR-1005). As-built pavement layout includes 400 mm layer of quartzite overlaying, 400 mm layer of Woomera Shale (NAF – acid consuming) overlaying, 450 mm CBR 45 and a 300 mm re-worked clay subgrade base. Completion and handover to BHP Carrapateena is evidenced in CA-2800-QAC-CRT-1001.
		Leading Indicator – AMD3 Annual audit of the block model maintained at the site with updated geological and sulphur assay data to determine the sulphur distribution of all waste for the forward year to estimate the distribution and estimation of volume of AMD material using the sulphur cut-off grade and develop or adjust management requirements if needed	Compliant	The block model is maintained and continuously updated to identify PAF areas, which are delineated, managed and reported in accordance with the Carrapateena Acid and Metalliferous Drainage Management Plan (CA-ENV-PLN-1013) and associated procedures. PAF waste is currently blended with ore and processed in the mill.
		Leading Indicator – AMD4 Audit of waste rock and ore stockpiles at the surface including reconciliation of volumes undertaken annually demonstrates that all potential AMD material has been handled in accordance with the management requirements determined by the annual block model review and in accordance with the AMD Management Plan	Compliant	Audits are regularly conducted to confirm and identify PAF material is directed to the processing mill, rather than the waste rock dump. The delineation, handling and reporting of PAF waste complied with the Carrapateena Acid and Metalliferous Drainage Management Plan (CA-ENV-PLN-1013) and associated procedures.
		Outcome Measurement Criteria – AMD5 Audit undertaken by an independent and suitably qualified expert approved by the Director of Mines (or other authorised officer) prior to application of lease surrender demonstrates ore stockpiles have been removed from the ground surface# # Surface Water Strategy (Schedule 6 Condition 21.12)	Not relevant	Carrapateena is in operational phase, this is a completion criteria and as such, is not relevant.

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
		Outcome Measurement Criteria – AMD6 Audit undertaken by an independent and suitably qualified expert approved by the Director of Mines (or other authorised officer) prior to application of lease surrender including a review of mine block model records, reconciliation records, geological and sulphur assay data, updates of sulphur cut-off grade and other relevant information demonstrates that waste rock and ore stockpiles have been managed appropriately to prevent AMD	Not relevant	Carrapateena is in operational phase, this is a completion criteria and as such, is not relevant.

9.16 Groundwater – tailings storage facility

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
The Tenement Holder must during construction, operation and post Completion ensure that there is no adverse change to groundwater quality within aquifers outside of the TSF seepage zone of influence area delineated by the groundwater model as a result of mining operations or mining-related activities.	ML 6471 Condition 17	**Construction and Operation** **Outcome Measurement Criteria – GW1** Quarterly sampling and laboratory analysis of THA Wells downstream of the Tailings Storage Facility (TSFMB1d – TSFMB4d) and analysis of pH, EC and metals demonstrates water quality are within the site groundwater baseline composition ranges (PEPR Table 8.15)# # Groundwater Criteria (Schedule 6 Condition 27.2)	Non-compliant	Quarterly sampling of the Tent Hill Aquifer (THA) wells was undertaken at the prescribed frequency throughout 2025 with exceedances of baseline ranges recorded at all three wells. Refer to Section 23 for forward works plan for OMC GW1. Appendix C 2025 Groundwater and Surface Water (CA-0000-ENV-REP-1055)
		Outcome Measurement Criteria – GW2 Quarterly monitoring of THA monitoring wells downstream of the Tailings Storage Facility (TSFMB1d – TSFMB4d) demonstrates that the standing water levels are trending in accordance with modelled predictions and do not exceed the maximum predicted drawdown at each well. # Groundwater Criteria (Schedule 6 Condition 27.1)	Non-compliant	Quarterly monitoring of the THA wells was undertaken at the prescribed frequency throughout 2025 where standing water levels (SWLs) recorded at all three wells were higher than the modelled predictions. Refer to Section 23 for forward works plan for OMC GW2. Appendix C 2025 Groundwater and Surface Water (CA-0000-ENV-REP-1055)

9.17 Groundwater – drawdown

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
The Tenement Holder must during construction, operation and post Completion ensure that there is no adverse change to groundwater quantity within aquifers outside of the predicted extent of groundwater drawdown delineated by the groundwater model as a result of mining operations or mining-related activities.	ML 6471 Condition 25 ML 6471 Condition 26 MPL 152 Condition 15 MPL 153 Condition 15 MPL 154 Condition 15 MPL 156 Condition 14	**Construction and Operation** **Outcome Measurement Criteria – GW3** Quarterly monitoring of groundwater compliance monitoring wells demonstrates that the standing water levels are trending in accordance with modelled predictions and do not exceed the maximum predicted drawdown at each well (PEPR Table 8.12).	Compliant	Groundwater compliance wells comprise ENV S2, ENV W3, ENV N4, ENV N8, MS2, MS3 and MD3. All compliance wells met the quarterly monitoring requirements of OMC GW3 during the monitoring period. Groundwater levels remained stable across all compliance wells and in line with modelling. Appendix C 2025 Groundwater and Surface Water (CA-0000-ENV-REP-1055)
		Leading Indicator – GW4 Quarterly analysis of groundwater abstraction volumes from flow meter reading confirms abstraction is not trending to exceed the predicted water demand (12.9 ML/d) and no more than an average of 7 ML/d was abstracted from the Northern Wellfield.	Compliant	Groundwater extraction averaged 7.41 ML/day across all wells for the monitoring period, with 5.59 ML/day extracted from the Northern Wellfield. Appendix C 2025 Groundwater and Surface Water (CA-0000-ENV-REP-1055)
		Leading Indicator – GW5 Quarterly monitoring of groundwater leading indicator monitoring wells demonstrates that the standing water levels are trending in accordance with modelled predictions and do not exceed the maximum predicted drawdown at each well (Table 9.20) and demonstrate that no evidence of a trend in standing water levels over three consecutive quarters.	Compliant	All Leading Indicator wells met the quarterly monitoring requirements of OMC GW5 during the monitoring period. In 2025, all wells were trending in accordance with modelled predictions and did not exceed maximum predicted drawdown. Appendix C 2025 Groundwater and Surface Water (CA-0000-ENV-REP-1055)

9.18 Groundwater – contamination

Environmental Outcome	Sixth Schedule lease conditions	Regulatory commitment	Compliance status	Evidence and forward work plan
The Tenement Holder must during construction, operation and post Completion ensure that there is no adverse change to the Environmental Values of the groundwater within the shallow perched aquifer within the Land as a result of chemicals or hydrocarbons from mining operations or mining-related activities	ML 6471 Condition 23 ML 6471 Condition 17 MPL 149*	**Construction and Operation** **Outcome Measurement Criteria – GW7** Investigation and corrective actions triggered as a result of an accidental spill at infrastructure locations that triggers the notification provisions of Part 9 of the Environment Protection Act 1993 (SA) relating to serious or material environmental harm demonstrates that the spill was reported to the Director of Mine (or other authorised officer) as soon as reasonably practicable after becoming aware of the harm or threatened harm, and all risks were minimised so far as is reasonably practicable and that any corrective actions are closed out within 30 days or as agreed with the Director of Mines (or other authorised officer)# # Material and Serious Environmental Harm are defined in the *Environment Protection Act 1993* (SA), Section 5(3). The act does not apply a definition for 'trivial', which is included within the definitions. Therefore, for the purpose of this criteria any spills below 250 L are considered to be trivial or unlikely to result in material or serious environmental harm Land and Soil relating to the transport, storage and handling of hydrocarbons and chemicals and associated Leading Indicator – LS2, Leading Indicator – LS3, Leading Indicator – LS4 and Outcome Measurement Criteria – LS5	Compliant	Two (2) spills triggered notification requirements to DEM during the reporting period. For evidence, refer to the provision of reports to DEM: • Mine Settling Pond Water – Pipeline Spill (EMS #1001306124) • Tailings Pipeline Spill (EMS #1001448219) Both events were managed in accordance with the relevant Outcome Measurement Criteria and Environmental Outcomes outlined in the PEPR. Refer to Section 8 for further information on the non-compliances.

* Intent of MPL 149 PEPR (OZ Minerals 2017b)

9.19 Effectiveness of Design Strategies and Management Strategies

Environmental Aspect	Design and management strategy	Effectiveness of existing control strategies
Aboriginal heritage	**Design Strategies** • Avoidance of sites of cultural heritage significance as determined in consultation with the Kokatha People **Management Strategies** • Cultural heritage surveys with the Kokatha People • Cultural Heritage Obligations Register and supporting GIS information (shapefiles) to record/identify clearance areas and status • Land disturbance approval process • Cultural respect training • Area-specific and site inductions and training • Employment of suitably qualified people • Cultural Heritage Management Plan, including new discovery reporting procedures* • Identification and fencing of sites of cultural heritage significance • Monthly (construction) or annual (operations) land disturbance reconciliation*	Cultural heritage sites are identified through cultural heritage surveys prior to the commencement of any work. All known sites are recorded and issued in Cultural Heritage Survey Reports with associated spatial data. The Cultural Heritage Survey Reports are document controlled in InEight. The master cultural heritage spatial data is updated upon receipt of reports identifying all ground that has been culturally surveyed, sites identified as culturally cleared, sites identified as not culturally cleared and any specific obligations. Prior to works commencing, the master cultural heritage spatial data is used to plan works to avoid any cultural sites. Any cultural sites deemed at risk due to proximity of works are flagged off and identified on LUPs and within area-specific cultural heritage management plans. LUPs were not approved or issued until the cultural heritage aspects have been reviewed by the BHP Heritage Advisor. Kokatha Aboriginal Corporation Cultural Monitors are present during initial land disturbance. Site specific cultural heritage plans have been developed for each construction area. There has been no disturbance of these sites to date.
Public nuisance	**Design Strategies** • Pernatty Station Homestead bypass road **Management Strategies** • Maintenance of unsealed roads. • Dust suppression on unsealed roads* • Speed limit restrictions at homestead* • Operating Protocols • Heavy vehicle transport movements adjacent to the Pernatty Homestead limited to hours between 7 am and 7 pm without prior agreement	Use of the Southern Access Road ceased in 2022 following the opening of the Western Access Road. Speed limits adhered to as evidenced by fixed speed cameras. Offending vehicles are notified of any breaches and an incident is logged in the Event Management System (EMS). Road opening and closing times are enforced by Access Road Controllers based at the Carrapateena gatehouse. Evidence of visual dust was minimal and no complaints due to dust were reported as outlined in Section 16.

Environmental Aspect	Design and management strategy	Effectiveness of existing control strategies
Traffic	**Design Strategies** • Intersections with the Stuart Highway constructed in accordance with appropriate standards and other requirements established in consultation with DPTI **Management Strategies** • Traffic Management Plans and speed limits • Area-specific and site inductions and training	Stuart Highway – Western Access Road turn off construction was completed in December 2021. No incidents of vehicle interactions were recorded on the Southern Access Road or Western Access Road.
Public safety	**Design Strategies (Schedule 6 Condition 2)** • Access area gatehouse and signage at site access points • Exclusion fencing around mine compounds • Livestock fencing around TSF • Security gatehouse would be established at the entry to the proposed Mining Lease area • Signage at mine access points **Design Strategies (Schedule 6 Condition 3)** • Design measures to minimise risks at closure (e.g. SLC abandonment bund, decline portal plug, boxcut backfilled, ventilation raises capped) **Management Strategies** • Decommissioning and Rehabilitation Plan • Removal of infrastructure • Cave Monitoring Plan	No unauthorised access to site beyond gatehouse or to active areas. Fences established around the mine, MPP, airstrip and Tjungu Village.
Native vegetation	**Design Strategies** • Avoidance of critical habitat during site selection • Completing pre-construction ‘clearance’ surveys to identify any critical and preferred habitat of Plains Mouse (e.g. cracking clays on run-ons, drainage channels or gilgais), Thick-Billed Grasswrens (e.g. patches of taller and dense shrubland habitat, often associated with drainage channels) and Night Parrots (e.g. spinifex hummock grasslands) by a suitably qualified and experienced ecologist • Flag off any populations or preferred habitat identified in close proximity to the disturbance footprint identified during the pre-construction ‘clearance’ surveys • Access track upgrade or construction will include flow disruptors and diversion drains to minimise erosion **Management Strategies** • Land disturbance approval process* • Area-specific and site inductions and training • Monthly (construction) or annual (operations) land disturbance reconciliation* • Land Disturbance Register and supporting GIS information (shapefiles) to record/identify clearance areas and status* • Including awareness training regarding the conservation significance of flora and fauna species in the area as part of the induction process	No unauthorised land disturbance occurred in 2025. Avoidance of critical and preferred habitat of Plains Mouse, Thick-Billed Grasswren and Night Parrot is checked off during generation of LUPs. Spatial data for vegetation association is interrogated to ensure that proposed disturbance avoids potential Plains Mouse, Thick-Billed Grasswren and Night Parrot habitat where possible. No populations of Plains Mouse, Thick-Billed Grasswren and Night Parrot identified during pre-clearance surveys. Installation and maintenance of flow disruptors and/or diversion drains will be undertaken during operations where high risk areas are delineated.
Weeds and pests	**Management Strategies** • Vehicle inspections and wash-down procedures* • Weed inspection program within disturbance footprint* • Weed “Red Alert” List for quick identification • Weed and pest eradication programmes* • Waste Management Plan and practices • Landfill Environment Management Plan • Pest eradication program • Waste Management Plan and practices • Daily cover of landfill face	Vehicle wash down bay operational for entire reporting period. Vehicle inspections prior to commencement of works identifies any potential for weeds/seeds. Vehicles sent straight to wash down bay if required. New populations of Bathurst Burr (Priority Weed species) were identified in 2019, one (1) which is believed to be a result of mining activities. This population (~20 stems) was destroyed by BHP Carrapateena personnel (CA-ENV-REP-1103). Cat trapping continued throughout 2025 to manage numbers on mining tenure. Landfill not established on site.

Environmental Aspect	Design and management strategy	Effectiveness of existing control strategies
Native fauna	**Management Strategies** • Traffic Management Plan and speed limits • Area-specific and site inductions and training • Wherever possible, open excavations and drill holes will be covered as soon as practicable or managed to ensure no entrapment can occur through the use of ramps • Incident reporting procedures • Land disturbance approval process* • Land Disturbance Register and supporting GIS information (shapefiles) to record/identify clearance areas and status* • Area-specific and site inductions and training • Monthly (construction) or annual (operations) land disturbance reconciliation* • Design Strategies • Avoidance of critical habitat during site selection	BHP Carrapateena personnel monitor scour pits and turkey's nests infrastructure (including fences) on a fortnightly basis and identified issues are reported in the BHP EMS and rectified.
Land use and property	**Design Strategies** • Rehabilitation of land to achieve a landscape function equivalent to the surrounding landscape • Separation of overland surface water flows originating from undisturbed areas of the Operation Area from the surface water run-off that has interacted with stockpiles and access roads • Provision of sediment basins/ponds and appropriate drainage on roadways adjacent to surface water bodies or catchments for the collection of sediments in surface water transported along the roadway (longitudinal flows) • Fords, culverts, diversion drains, bunding and sedimentation/event basins designed and installed in accordance with Best Practice Operating Procedures endorsed by the SA Arid Lands Natural Resources Management Board or a Water Affecting Activity Permit under the *Natural Resources Management Act 2004* (SA) • Infrastructure designed with consideration to facilitating closure and permitting progressive rehabilitation (e.g. layout of temporary and permanent site infrastructure, placement of stockpiles, design of plant and equipment modules etc.) **Management Strategies** • Local Area Agreement - Operating Protocol • Regular meetings with pastoral land managers • Waivers in place for any water point infrastructure in close proximity to Operation activities • Destocking infrastructure locations • Traffic Management Plan • Area-specific and site inductions and training • Decommissioning and Rehabilitation Plan • All commercial or industrial waste is disposed of in an EPA licensed facility • Rehabilitation procedures* • Rehabilitation trials • Stockpile management procedures to ensure quantity and quality is maintained	Operating protocols are established with Pernatty, South Gap, Bosworth, Arcoona and Oakden Hills Pastoral Stations. Regular operational updates provided to local Pastoralist stakeholders. Waivers of exemption are in place and evidenced in LUPs. Exempt land is barricaded off if a waiver of exemption is not in place. Northern Wellfield trunk line is buried at major creek crossings (Salt Creek and Bosworth Creek) to preserve flows. Northern Wellfield bore pads are rehabilitated to infrastructure boundaries where possible.
Land and soil	**Design Strategies** **(Schedule 6 Condition 10.1)** • Hydrocarbon and chemical storage facilities designed in accordance with Australian Standards. • Storages bunded in accordance with EPA Bunding Guidelines and/or relevant Australian Standards* **Management Strategies** • All commercial or industrial waste is disposed of in an EPA licensed facility • Licenced chemical and waste transporters • Establishment of Chemical Database including copies of SDS and storage, handling and disposal requirements* • Contaminated land register • Contracts contain conditions relevant to the bringing of chemicals and hydrocarbons onto site	Standards for hydrocarbon storage and fuel facilities included in all relevant contracts. Environmental Inspection template addresses compliance to EPA guidelines and Australian Standards. Consignment Authority and Tracking Certificates generated for removal of all listed Schedule 1 wastes on site. No landfill onsite. ChemAlert serves as the system for managing and authorising requests to bring chemicals onto the site.

Environmental Aspect	Design and management strategy	Effectiveness of existing control strategies
	• Induction contains process for bringing chemicals and hydrocarbons onsite including requirements for storage, handling and disposal • Contracts contain conditions relevant to design, management of the storage and handling of chemicals and hydrocarbons • Spill and emergency response procedures • Equipment maintenance to prevent spills • Incident reporting procedures • Regular inspection programs where bunding either temporary or permanent is installed to ensure appropriate use, placement of spill kits, clean up procedures and handling procedures **Design Strategies** **(Schedule 6 Condition 10.2)** • Landfill is constructed and operated in accordance with EPA Guidelines and is appropriately licensed under the *Environment Protection Act 1993* (SA). **Management Strategies** • All commercial or industrial waste is disposed of in an EPA licensed facility, which is closed in accordance with relevant EPA Guidelines* • Licenced chemical and waste transporters* • Establishment of Chemical Database including copies of SDS and storage, handling and disposal requirements • Induction contains process for bringing chemicals and hydrocarbons onsite including requirements for storage, handling and disposal • Landfill Environmental Management Plan • Waste Management Plan and practices, including daily covering of the landfill face	
Air quality	**Design Strategies** • Buffer applied to disturbance footprint to account for edge effects on native vegetation and habitat. • 25 km distance to homestead and water tanks. • Progressive rehabilitation of disturbed areas (primary, secondary rehabilitation and/or revegetation). • Enclosure of concentrate storage and handling facilities • Copper concentrate transport containers*	Vegetation condition assessed annually to determine when and where buffer for land disturbance is to be applied. Haulage of copper concentrate is undertaken using dedicated purpose-built trailers by a suitably qualified contractor. Routine inspections of containers before they leave site are carried out by the contractor and quarterly audits of these inspections are undertaken by the Environment Team.
	Design Strategies for TSF • Rock armouring of final landforms external slopes • Progressive rehabilitation of disturbed areas (primary, secondary rehabilitation and/or revegetation) • No-cover capping for TSF surface	Construction of Stage 1 (starter embankment) of the TSF was completed in September 2019. Construction of Stage 2 (downstream raise) was completed in May 2022 and constitutes the final rock armoured embankment. Construction of TSF Stage 2 embankment was completed in May 2022 with tailings deposition commencing on 22 March 2023.
	Design Strategies for Disturbed Operational Areas • Progressive rehabilitation of disturbed areas • All disturbed areas rehabilitated except for TSF top surface and subsidence zone crater	Rehabilitation of TSF borrow pits, haul roads and surplus open areas completed post-construction of Stage 1. Progressive rehabilitation of disturbed areas completed during construction of Stage 2. Infrastructure associated with construction of the Western Access Road including the Tjungu Village temporary access road and Midway Quarry stockpile areas were rehabilitated in 2022.

Environmental Aspect	Design and management strategy	Effectiveness of existing control strategies
	Design Strategies for CTP • Acid mist scrubbers fitted to the CTP flash steam discharge vents* (Fundamental Design Control) **Management Strategies** • Dust suppression on disturbed land and unsealed roads • Dust suppression systems on crushing operations • Dust suppression at conveyor transfer points • Maintenance of unsealed roads • Dust suppression water sprays on Course Ore Stockpile • Destocking infrastructure areas • Waivers will be in place for any water point infrastructure in close proximity to Operation activities • Field trials to confirm outputs of the air quality modelling outputs* • Acid mist scrubber maintenance and monitoring program including • Continuous monitoring of scrubber performance through the site Process Control System (PCS) • Implementation of preventative maintenance and/or condition monitoring processes Regular verification of scrubber performance through third-party isokinetic sampling of the stack vent gases (pre- and post-scrubber) • Copper concentrate transport container maintenance and monitoring program including regular visual inspection of the containers, including the sealing of the lids • Establishing container filling procedures, with appropriate training and supervision for personnel involved in this task, and the use of container weighing/load information to inform loading activities	Not applicable
Radiation	**Design Strategies** • Buffer applied to disturbance footprint to account for edge effects on native vegetation and habitat • Progressive rehabilitation of disturbed areas (primary, secondary rehabilitation and/or revegetation) • Enclosure of concentrate storage and handling facilities • No mineralised material left on the surface post closure • No-capping for TSF surface	Radiation risks are managed in accordance with the Radioactive Waste Environmental Management Plan (000792).
Surface water – erosion and sedimentation	**Design Strategies** • Separation of overland surface water flows originating from undisturbed areas of the Operation area from the surface water run-off that has interacted with stockpiles, MPP and Mining infrastructure • Provision of sediment basins/ponds and appropriate drainage on roadways adjacent to surface water bodies or catchments for the collection of sediments in surface water transported along the roadway (longitudinal flows)* • TSF embankment and decant collection dam and ponds • Fords, culverts, diversion drains, bunding and sedimentation/event basins design and installed in accordance with Best Practice Operating Procedures endorsed by the SA Arid Lands Natural Resources Management Board or a Water Affecting Activity Permit under the *Natural Resources Management Act 2004* (SA) • Rehabilitation of land to achieve a landscape function equivalent to the surrounding landscape **Management Strategies** • Best Practice Operating Procedures • Temporary sediment and erosion controls (e.g. mobile sediment booms, sediment fencing) • Surface water management infrastructure maintenance and inspection programs • Culvert and ford maintenance and inspection programs • Rehabilitation procedures and inspection program	Life of Mine surface water management infrastructure was completed at the end of 2020. All key management features include: • subsidence zone diversion drain • MPP and NPI internal drain network and event ponds • pre-production stockpile drainage • WRD environmental ponds (x3) • aerodrome diversion drain. Construction of a network of internal (dirty water) swale drains traversing north/south between the pre-production stockpile and the quartzite stockpile was completed in 2021. This catchment is contained within an internal footprint, therefore the risk of contaminated water leaving this area is negligible.
Surface water – reduced flows	**Design Strategies** • TSF site selection considered 12 sites with the minimisation of footprint and catchment disturbance of Eliza Creek a key consideration • Diversion Infrastructure	Construction of Stage 1 of the TSF completed in September 2019 in the upper reaches of Eliza Creek catchment. Diversion infrastructure around cave established before the cave breakthrough in December 2022.

Environmental Aspect	Design and management strategy	Effectiveness of existing control strategies
Surface water – TSF	**Fundamental Design Control*** • TSF embankment and decant collection dam and ponds* • Final detailed TSF design in accordance with ANCOLD design criteria* • Flood storage capacity (1-in-100 AEP Rain Event including wave freeboard)* • Freeboard capacity (1-in-1000 AEP critical duration event)* • A central compacted clay core, extending into a cut-off key trench where in situ soil is present* • Dental concrete on fractured bedrock at the contact of the central clay core with the watercourse i.e., where in situ soil is not present* • An upstream sloping zone of compacted clay in the Stage 1 (and Stage 2) TSF embankment, extending into a cut-off key at the toe, where in situ soil is present* • A geosynthetic lined cell in the Decant Dam, at the upstream toe of the embankment to manage seepage and decant water from the TSF* **Design Strategies** • A clay liner in the drainage channel where exposed bedrock exists. Approximately 3500 m by 1 m thick by 30 m wide in the Stage 1 Footprint. Extra disturbance footprint around the TSF has been included to allow additional extraction of material* • A seepage cut-off drain at the downstream toe of the embankment. A geosynthetic liner on the upstream slope of the Stage 1 TSF embankment* • Decant outfall pipe extension from the TSF embankment to the lined decant cell* **Management Strategies** • Embankment foundation assessments* • Embankment stability assessment* • Dam Safety Monitoring Program* • QA/QC Procedures* • Daily inspections* • Alarmed pressure indicators • Remote isolation valves on delivery infrastructure* • QA QC Procedures* • Auditing of critical stages* • Detailed final design* • Seepage collection and volume monitoring in cut-off drain • Continual characterisation of chemical and physical properties of the tailings*	Construction of TSF Stage 1 completed in September 2019, in accordance with the design (OZ Minerals 2020; Appendix B1 Tailings Storage Facility Design), evidenced in: • Construction Report for Tailings Stage 1 Works, Golder Associates (CA-3630-CIV-REP-1018) • TSF Stage 1 – Final Independent Auditor Report, ATC Williams (CA-3630-QAC-REP-2016). TSF Stage 2 Construction Reports prepared by the Engineer of Record (WSP Golder) and Independent Auditor (ATC Williams) are evidenced in: • WSP Golder TSF Stage 2 Construction Report (CA-3630-CIV-REP-1054) • ATC Williams TSF Stage 2 Construction Independent Audits of Tailings Storage Facility (CA-3630-PRM-REP-1524).
Surface water – acid mine drainage (AMD)	**Design Strategies** • Pre-Production stockpile pad* • Separation of overland surface water flows originating from undisturbed areas of the Operation area from the surface water run-off that has interacted with stockpiles, MPP and Mining infrastructure. **Management Strategies** • PAF material (marginal ore) would be preferentially left underground where possible if brought to surface, marginal ore would be stored on the ROM stockpile (ex-Development Pre-Production Ore Stockpile)* • Block modelling of ore and waste units* • Sulphur cut-off grade determined* • QA/QC procedures and record keeping* • Development of an AMD Management Plan	Life of Mine surface water management completed at the end of 2020. All key management features completed: • subsidence zone diversion drain • MPP and NPI internal drain network and event ponds • pre-production stockpile drainage • WRD environmental ponds (x3). Acid and Metalliferous Drainage Management Plan (CA-ENV-PLN-1013) and associated procedures provide framework for handling PAF material. Geological block model underpins delineation non-desirable waste (PAF) using an AMD Classification System: sulphur (>0.3 wt%) and copper (<0.2 wt%) assay data. Further interrogation of the Classification System is being undertaken through (QA/QC) sampling in accordance with CA-PRO-ENV-1002 Operational Characterisation. In 2025, the overall understanding of PAF material and its location was considered sufficient, leading to a commissioning of a review of the acid base accounting (ABA) sampling program to ensure its continued effectiveness.

Environmental Aspect	Design and management strategy	Effectiveness of existing control strategies
Groundwater – TSF	Design Strategies • Lining of water-holding ponds and barren liquor evaporation ponds. • Design of a thickened tailings disposal system (65% w/w solids). • TSF located upstream of the sub level cave subsidence zone. **Management Strategies** • TSF Water balance to be updated in accordance with Life-Of Mine Plan and verified against modelling inputs. • Continued tailings physical and geochemical characterisation undertaken and verified against modelling inputs. • Flow and sump meters to monitor tailings inputs and outputs. • Ongoing calibration of the groundwater model using data obtained from groundwater monitoring	Stage 1 of the TSF was completed in September 2019 and commenced operation in December 2019. Construction of TSF Stage 2 embankment was completed in May 2022 and deposition commenced on 22 March 2023. Thickened tailings disposal averaged approximately 61% density (w/w, %) continuing in a steady state during the reporting period. Whilst this falls below the predicted 65% (w/w, %), dry density averaged 2 t/m^3 which aligned to the 1.9 t/m^3 adopted during early operation of TSF Stage 2. Decant return pumps were operational throughout the reporting period (average rate of return 95.7 ML/month) and peaked at 7,000 m^3/day.
Groundwater – drawdown	**Design Strategies** • Site Water Balance based on modelling inputs and LoM plan* • Production wellfield and mine dewatering will not exceed maximum daily abstraction rate (PEPR Table 4.67)* • Abstraction rates designed to sustainable yields • Telemetric controls/headwork engineering and flow meters to monitor abstraction rates **Management Strategies** • Water balance to be updated in conjunction with Life of Mine Plans • Flow/sump meters to monitor abstraction and mine dewatering rates • Ongoing calibration of the groundwater model using data obtained from groundwater monitoring*	Continuous monitoring of daily abstraction rate to ensure average borefield demand is not exceeded. Current mine inflows are within modelled parameters. This dataset is collated and reported internally within Aquifer Resource Assessment Reports. Water transactions are metered with data reporting to Pi Historian via telemetry. Quarterly Aquifer Resource Assessment Reports are issued by the site environmental team reporting on assessed pumping data, SWL and projected drawdown against hydrographs. New groundwater model developed using observed data i.e. history matched.
Groundwater – contamination	**Design Strategies** • Hydrocarbon and chemical storage facilities designed in accordance with relevant Australian Standards • Landfill is constructed and operated in accordance with EPA Guidelines and is appropriately licensed under the *Environment Protection Act 1993* (SA) • Storages bunded in accordance with EPA Bunding Guidelines and/or relevant Australian Standards **Management Strategies** • Spill and emergency response procedures • Equipment maintenance to prevent accidental releases • Licenced chemical and waste transporters • Incident reporting procedures • Regular inspection programs where bunding either temporary or permanent is installed to ensure appropriate use, placement of spill kits, clean up procedures and handling procedures • Induction contains process for bringing chemicals and hydrocarbons onsite including requirements for storage, handling and disposal • Contracts contain conditions relevant to design, management of the storage and handling of chemicals and hydrocarbons • Establishment of Chemical Database including copies of SDS and storage, handling and disposal requirements	Standards for hydrocarbon storage and fuel facilities is included in all relevant contracts. Environmental Inspection template addresses compliance to EPA guidelines and Australian Standards. Waste Tracking Forms are provided by waste management contractor for all listed Schedule 1 wastes. No landfill onsite. Chemical Request Form and Risk Assessment process established for operations.

* If there is a high reliance on a control strategy or management strategy to prevent or minimise an impact a Leading Indicator has been proposed

10 Non-outcome based lease conditions

Tenement/Schedule 2 Licence Condition #	Tenement Condition	Compliance Status	Evidence demonstrating compliance with tenement condition
ML 6471, MPL 149, MPL 152, MPL 153, MPL 154, MPL 156 Cond 1	The Tenement holder must during construction, operation and post Completion ensure there is no damage, disturbance or interference to Aboriginal heritage sites, objects or remains unless it is authorised under the relevant legislation.	Compliant	All land disturbance is spatially audited against LUP boundaries using survey data, drone and satellite imagery in ArcGIS to ensure works were completed within approved work areas, cultural heritage survey report conditions and have authorisation in accordance with the *Aboriginal Heritage Act 1988* (SA). All land disturbance activities complied with authorisation requirements during the reporting period.
ML 6471 Cond 2	The Tenement Holder must ensure that post Completion, all final mine landforms (including the TSF) will be chemically and physically stable in the long term.	In progress	TSF design provided as Appendix B1 of Mining Lease PEPR (OZ Minerals 2020). Updated geochemical characterisation for waste rock and ore completed in 2024. Life of Mine TSF design updated in 2024.
ML 6471 Cond 3	Following completion of detailed design of the TSF and Decant Dam, the following documentation for the TSF and Decant Dam must be developed and maintained: • 3.1 Construction documentation; • 3.2 Design drawings and quantity schedule; • 3.3 Technical specifications; • 3.4 Construction Quality Assurance (CQA) Manual; • 3.5 Operations, Maintenance and Surveillance (OMS) Manual; and • 3.6 Dam Safety Emergency Plan (DSEP)	Compliant	TSF Stage 1 completed construction. Conditions 3.1, 3.2, 3.3 and 3.4 provided to DEM via email dated 12/11/18. TSF design provided as Appendix B1 of Mining Lease PEPR (OZ Minerals 2020). Final copies of OMS (Condition 3.5) (CA-PRO-MNL-1001) and DSEP (Condition 3.6) (CA-PRO-PLN-1000) provided to DEM 13/12/2019, prior to commissioning.
ML 6471 Cond 4	The TSF and Decant Dam construction, operation and closure must be audited against (i) the design, the design criteria and plans that have been adopted for the TSF and Decant Dam construction, operation and closure, (ii) all of the documentation listed in Second Schedule Condition 3 and (iii) the most recent version of the ANCOLD Tailings Dam Guideline: • 4.1 For the Stage 1 TSF and Decant Dam embankment foundation preparation and embankment construction; and • 4.2 For each subsequent stage of the TSF and Decant Dam embankment construction; and • 4.3 On a three (3) monthly basis during Stages 1 and 2 of TSF and Decant Dam operations or at a frequency as the Director of Mines (or other authorised officer) may specify in writing; and • 4.4 On a six (6) monthly basis during Stages 3, 4, 5 and 6 (and any subsequent stages) of TSF and Decant Dam operations or at a frequency as the Director of Mines (or other authorised officer) may specify by notice in writing; and • 4.6 After the final TSF and Decant Dam rehabilitation, closure and decommissioning works have been completed.	Compliant (4.1) Complaint (4.3) Compliant (4.2), (4.4) and (4.6)	TSF Stage 1 completed construction and in operation. Suitably qualified expert (ATC Williams), endorsed by DEM, engaged for Construction Quality Assurance as required by Condition 4.1. Final version of Stage 1 Construction Independent Audit Report provided to DEM on 6/12/19 (CA-3630-QAC-REP-2016[2]). Final version of Stage 2 Construction Independent Audit Report provided to DEM on 20/03/23 (CA-3630-PRM-REP-1524) Condition 4.2: ATC Williams TSF Stage 2 Construction Independent Audits of Tailings Storage Facility (CA-3630-PRM-REP-1524). Five (5) audits were undertaken pertaining to operation of the TSF during the reporting period, which meet the requirements of ML 6471 Condition 4: • Tailings Storage Facility, Q1 2025 Site Visit and Monitoring Report, June 2025 (WSP) (CA-3630-CIV-REP-1127) • Tailings Storage Facility, Q2 2025 Site Visit and Monitoring Report, September 2025 (WSP) (CA-3630-CIV-REP-1134) • Tailings Storage Facility, Q3 2025 Site Visit and Monitoring Report, December 2025 (WSP) (CA-3630-CIV-REP-1139) • Tailings Storage Facility, Engineer of Record Comprehensive Annual Report, January 2025 to January 2026 (WSP). Annual audit completed in January 2026, final report pending. • ATC Williams annual independent audit completed in February 2026, final report pending.
ML 6471 Cond 5	Following audit of the Tailings Storage Facility the expert must prepare reports of the findings of each audit.	Compliant	Refer to ML 6471 Condition 4 for relevant documents.
ML 6471 Cond 6	The initial expert report for the audit of the Stage 1 TSF and Decant Dam foundation preparation and embankment construction must be provided to the Director of Mines (or other authorised officer) prior to the placement of tailings and waste into the TSF.	Compliant	Final version of Construction Independent Audit Report provided to DEM on 6/12/19 (CA-3630-QAC-REP-2016[2]).
ML 6471 Cond 7	The expert report for the audit which occurs after the final discharge of tailings into the TSF must be provided to the Director of Mines (or other authorised officer) prior to the commencement of final rehabilitation of the TSF and Decant Dam.	Not relevant	TSF is in operational phase. This is a completion criteria and as such, is not relevant.

Tenement/Schedule 2 Licence Condition #	Tenement Condition	Compliance Status	Evidence demonstrating compliance with tenement condition
ML 6471 Cond 8	All other expert reports must be provided to the Director of Mines (or other authorised officer) within forty-five (45) days or such longer period approved by the Director of Mines (or other authorised officer) of completion of the audit.	Compliant	Final version of Construction Independent Audit Report provided to DEM on 6/12/19 (CA-3630-QAC-REP-2016[2]).
ML 6471 Cond 9	All expert reports will be made publicly available.	Compliant	Reports are publicly available on the DEM website.
ML 6471 Cond 10	The expert reports for the audits of Stage 1 and each subsequent stage of TSF embankment construction must address the following matters (but not limited to): • 10.1 Demonstrate that sufficient freeboard has been achieved to ensure flood storage capacity for a 1-in-100 AEP rainfall event including wave freeboards (1 in 10 AEP winds) and contingency freeboard of 0.5m; • 10.2 Demonstrate emergency spillways for each stage of the operation have the capacity for flow resulting from 1-in-100 AEP critical duration event including wave freeboard; • 10.3 Demonstrate that tailings properties in operations are consistent with the adopted tailings properties, including density and strength as specified in the detailed final design: • 10.3.1 Should tailings density or strength be inconsistent, undertake an assessment of the potential impact on the TSF (including, but not limited to, TSF storage capacity) and propose any remediation to the design if deemed necessary; • 10.4 Liquefaction assessment based on in-situ test work of the tailings prior to upstream raises; • 10.5 A seismic hazard assessment (SHA) to provide site-specific peak ground acceleration (PGA) parameters for stability assessments; • 10.6 The geometry of upstream raises and foundation treatment has been confirmed prior to each upstream raise; • 10.7 The suitability and compatibility of the various embankment fill materials has been assessed; and • 10.8 Assessment of all of the documentation listed in Second Schedule Condition 3 to ensure that the content of the documents is appropriate for the next stage of TSF embankment construction.	Compliant	Final version of Construction Independent Audit Report provided to DEM on 6/12/19 (CA-3630-QAC-REP-2016[2]). ATC Williams TSF Stage 2 Construction Independent Audits of Tailings Storage Facility (CA-3630-PRM-REP-1524).
ML 6471 Cond 11	The expert report for the audit which occurs after the final TSF and Decant Dam rehabilitation, closure and decommissioning works have been completed must address the following matters (but not limited to): • 11.1 Spillway designed for the seventy-two (72) hour PMP critical duration event and in accordance with ANCOLD; • 11.2 Decant system is decommissioned in accordance with the design; and • 11.3 Reshaping of the TSF embankment in accordance with the design to provide a profile that is resistant to erosion.	Not relevant	TSF is in operational phase. This is a completion criteria and as such, is not relevant.
ML 6471 Cond 12	The audits required by Second Schedule Conditions 4.1, 4.2, 4.5, 4.6 and associated reports required by Second Schedule Condition 5 must be conducted and provided by an independent and suitable qualified expert approved by the Director of Mines (or other authorised officer).	Compliant	Suitably qualified expert (ATC Williams), endorsed by DEM, was engaged for Operation Quality Assurance as per Condition 4.1.
ML 6471 Cond 13	The audits required by Second Schedule Conditions 4.3, 4.4 and associated reports required by Second Schedule Condition 5 must be conducted and provided by an independent and suitably qualified expert approved by the Director of Mines (or other authorised officer) at least once for each twelve (12) month period.	Compliant	Suitably qualified expert (ATC Williams), endorsed by DEM, was engaged for Operation Quality Assurance as per Condition 4.1.
ML 6471 Cond 14	An audit required by Second Schedule Conditions 4.3, 4.4 and associated reports required by the Second Schedule Condition 5 may be conducted and provided by a suitably qualified Tenement Holder employee previously approved by the Director of Mines (or other authorised officer). To apply for approval the Tenement Holder must: • 14.1 Apply in writing; and • 14.2 Provide the employee's Curriculum Vitae showing their academic qualifications, publications (if any) and practical experience.	Not relevant	BHP Carrapateena is not using a Tenement Holder employee to undertake relevant audits.
ML 6471 Cond 15	The Tenement Holder must during operations ensure that any CTP constructed on the Land is equipped with scrubbers which are designed appropriately to prevent acid mist emissions.	Not relevant	CTP is no longer under consideration.

Tenement/Schedule 2 Licence Condition #	Tenement Condition	Compliance Status	Evidence demonstrating compliance with tenement condition
ML 6471 Cond 16	The Tenement Holder must during operations ensure that copper concentrate is transported in fit for purpose sealed containers to prevent copper concentrate release to the environment.	Compliant	Haulage of copper concentrate is undertaken using dedicated purpose-built trailers by a suitably qualified contractor. Routine inspections of containers before they leave site are carried out by the contractor and quarterly audits of these inspections are undertaken by the Environment Team.
ML 6471 Cond 17 MPL 149 Cond 2 MPL 152 Cond 3 MPL 153 Cond 2 MPL 154 Cond 3 MPL 156 Cond 2	The Tenement Holder must ensure that all commercial or industrial waste (which does not include CTP process residue, tailings and waste rock) is disposed of in an EPA licenced facility.	Compliant	Monthly waste disposal records are provided by Cleanaway Pty Ltd for BHP Carrapateena and site contractors for all waste leaving the Carrapateena site. Waste Tracking Forms are provided for wastes listed in Schedule 1 of the *Environment Protection Act 1993* (SA).
ML 6471 Cond 18 MPL 149 Cond 2 MPL 152 Cond 4 MPL 153 Cond 3 MPL 154 Cond 4 MPL 156 Cond 3	The Tenement Holder must ensure that all mining related infrastructure is decommissioned and removed from, the Land at Completion unless the Director of Mines (or other authorised officer) has approved, in writing, for the infrastructure to remain.	Not relevant	Carrapateena is in operational phase. This is a completion criteria and as such, is not relevant.
ML 6471 Cond 19 MPL 149 Cond 4 MPL 152 Cond 5 MPL 153 Cond 4 MPL 154 Cond 5 MPL 156 Cond 4	The Tenement Holder agrees to the Approved PEPR and any compliance reports and reportable incident reports, submitted in accordance with the Regulations, being made available for public inspection.	Compliant	Details of reportable incidents in 2025 are provided in Section 8.
ML 6471 Cond 20 MPL 149 Cond 2 MPL 152 Cond 6 MPL 153 Cond 5 MPL 154 Cond 6 MPL 156 Cond 5	Within thirty (30) days of becoming aware of any event or decision which is likely to give rise to the cessation of mining operations or mining related activities for a period of more than seven (7) days and where possible prior to the cessation of mining operations or mining related activities, the Tenement Holder must notify the Director of Mines in writing of the event or decision. The notice must specify the date upon which the mining operations or mining related activities are expected to cease or have ceased, an estimate of the period of cessation and an outline of the steps to develop any required DRP under Second Schedule	Not relevant	
ML 6471 Cond 21 MPL 149 Cond 6 MPL 152 Cond 7 MPL 153 Cond 6 MPL 154 Cond 7 MPL 156 Cond 6	The Tenement Holder must comply with a Decommissioning and Rehabilitation Plan (DRP) approved in accordance with Second Schedule when decommissioning or rehabilitating the Mining Tenement.	Not relevant	
ML 6471 Cond 22 MPL 149 Cond 7 MPL 152 Cond 8 MPL 153 Cond 7 MPL 154 Cond 8 MPL 156 Cond 7	Unless the Director of Mines (or other authorised officer) otherwise directs, a DRP must be submitted to the Director of Mines (or other authorised officer) for approval within sixty (60) days or such longer period which is approved by the Director of Mines (or other authorised officer) of any notification provided to the Director of Mines in relation to the notification of cessation of operations under Second Schedule, and that DRP must: • Set out the activities and scheduling required for the carrying out of the rehabilitation works specified in the Approved PEPR; • Be prepared in accordance with any guidelines provided by the Director of Mines (or other authorised officer).	Not relevant	
ML 6471 Cond 23 MPL 149 Cond 8 MPL 152 Cond 9 MPL 153 Cond 8	If, in the opinion of the Director of Mines (or other authorised officer), mining operations or mining related activities on the mining Tenement have substantially ceased for two (2) consecutive years or more, the Director of Mines (or other authorised officer) may:	Not relevant	

Tenement/Schedule 2 Licence Condition #	Tenement Condition	Compliance Status	Evidence demonstrating compliance with tenement condition
MPL 154 Cond 9 MPL 156 Cond 8	• Require that the Tenement Holder submit a DRP for approval dealing with the requirements set out in Second Schedule; and/or • Direct the Tenement Holder to rehabilitate the Mining Tenement in accordance with the Approved PEPR and/or any DRP.		
ML 6471 Cond 24 MPL 149 Cond 6 MPL 152 Cond 10 MPL 153 Cond 9 MPL 154 Cond 10 MPL 156 Cond 9	The Tenement Holder must develop (in consultation with the owners of land and to the satisfaction of the Director of Mines (or other authorised officer)) a communication and operating protocol, or an agreement incorporating such a protocol, between itself and owners of land adjacent to and on the Land prior to the commencement of mining operations and mining related activities that includes, unless the Director of Mines (or other authorised officer) is otherwise satisfied, the following matters: • Interaction with landowner operations; • emergency procedures; • Communications and issue management processes; • Land management; • Dispute resolution; • Ongoing communication about the Tenement Holder's operations; • Receiving and considering feedback; • safety procedures; • Access protocols; and • Any matters identified by the Director of Mines (or other authorised officer) in writing.	Compliant	Protocols developed and agreed to in 2018. Protocols submitted to DEM in March 2019. Refer also to Community Engagement in Section 22 for details of consultation undertaken with landowners.
ML 6471 Cond 25 MPL 149 Cond 7 MPL 152 Cond 11 MPL 153 Cond 10 MPL 154 Cond 11	The Tenement Holder must: • Provide the protocol(s) to the Director of Mines (or other authorised officer) within six (6) months of the grant of the Mining Tenement or such longer period that the Director of Mines (or other authorised officer) may allow; and	Compliant	Protocols developed and agreed to in 2018. Protocols submitted to DEM in March 2019.
ML 6471 Cond 25 MPL 149 Cond 7 MPL 152 Cond 11 MPL 153 Cond 10 MPL 154 Cond 11 MPL 156 Cond 10	Maintain and adhere to the protocol(s) to the satisfaction of the Director of Mines (or other authorised officer) for the term of the Mining Tenement.	Compliant	The protocols are managed through the obligation management database (LandFolio) and the BHP Corporate Affairs team ensure obligations are adhered to. BHP Carrapateena utilises SAP EMS to record non-compliances with the protocols.
ML 6471 Cond 26 MPL 149 Cond 11 MPL 152 Cond 12 MPL 153 Cond 11 MPL 154 Cond 12 MPL 156 Cond 11	A notification required by regulation 98(1) must be in writing.	Compliant	No notifications required under regulation 98(1).
ML 6471 Cond 27	For the purpose of this Additional Condition: • 27.1 ‘Plains Mouse’ means *Pseudomys australis*; • 27.2 ‘Existing population’ means an area of suitable habitat for Plains Mouse where the species has been observed/recorded; • 27.3 ‘Existing habitat’ means an area of suitable habitat for the Plains Mouse; • 27.4 ‘Suitable habitat’ means large open gypseous cracking clay areas associated with minor drainage features, and depressions within gibber stony plains (National Recovery Plan for the Plains Mouse *Pseudomys australis* 2012). • 27.5 To compensate for the residual impact from mining operations on the existing Plains Mouse habitat, the Tenement holder must provide an environmental offset that:	Compliant	EPBC 2017/7895 Compliance Report 2026. Refer to Section 14.

Tenement/Schedule 2 Licence Condition #	Tenement Condition	Compliance Status	Evidence demonstrating compliance with tenement condition
	• 27.5.1 Contains suitable habitat for the Plains Mouse or is known to have existing population of Plains Mouse; • 27.5.2 Contains no less than 750ha of suitable habitat to offset the permanent loss of the existing Plains Mouse habitat; • 27.5.3 The quality of suitable habitat must be at least equal to that of the quality of existing habitat that will be permanently lost; • 27.5.4 Is connected to existing habitat of Plains Mouse by biodiversity corridors to ensure the Plains Mouse can utilise the environmental offset; • 27.5.5 Is direct on-ground offset located on land using an appropriate legal mechanism (to the satisfaction of the Director of Mines (or other authorised officer)) that ensures the environmental offset is secured for conservation purposes for the life of the Mining Tenement or longer; • 27.5.6 Is located as close as practical to the existing habitat that will be permanently lost; • 27.5.7 The implementation of which is commenced either before, or at the same point in time as, the impact to the Plains Mouse habitat arising from the mining operations; and • 27.5.8 Is managed for the life of the Mining Tenement or longer to maintain or improve the existing suitable habitat quality.		
ML 6471 Cond 28 MPL 152 Cond 13 MPL 153 Cond 12 MPL 154 Cond 13	To ensure the protection of Matters of National Environmental Significance, the Tenement Holder must: • 28.1 Develop, implement and maintain appropriate management actions to ensure the control of feral animal populations, including cats and foxes; • 28.2 Provide data from any future sightings and records of the Thick-billed Grasswren to the Biological Database of South Australia (BDBSA) to enable effective monitoring and record keeping, as per the National Recovery Plan Actions; • 28.3 Provide data from any future sightings and records of the Night Parrot to the Night Parrot Recovery Team; and • 28.4 Provide data from any future sightings and records of the Plains Mouse to the Biological Database of South Australia (BDBSA) to enable effective monitoring and record keeping, as per the Recovery Plan Actions.	Compliant	Weed inspections were routinely completed as inspection criteria within the Land Disturbance Inspection and General Environmental Inspection template. No new Priority Weed species were identified in 2025. Annual ecology survey targets sightings of species of National Environmental Significance, namely Thick-Billed Grasswren, Plains Mouse, Night Parrot and Curlew Sandpiper. Refer to Appendix D 2025 Carrapateena Flora and Fauna Survey (CA-0000-ENV-REP-1056).
ML 6471 Cond 29 MPL 149 Cond 8 MPL 152 Cond 14 MPL 153 Cond 13 MPL 154 Cond 14 MPL 156 Cond 12	The Tenement Holder must comply with all State and Commonwealth legislation and regulations applicable to the activities undertaken pursuant to the Mining Tenement.	Compliant	All State and Commonwealth legislation is identified in the PEPR and Environment and Social Performance Management Plans. All licenses, permits and agreements are tracked through the obligations management database (LandFolio). The Carrapateena Environment department ensures compliance with all State and Commonwealth legislation and Mining Tenement regulations. A subscription to the online service Environment Essentials is available to all staff at Carrapateena to support and inform compliance to State and Commonwealth legislation. BHP EMS is used to record any non-compliance with the protocols.

11 Rectification of non-compliance

Table 11.1 | Rectification of current non-compliances

Tenement	Date of Incident	Detected by operator or DEM	Reportable under Regulation 79?	Date reported to Minister	Date written repot to Minster	Non-complaince Environmental outcome or tenement condition breached	Cause of non-compliance, OMC or lease condition breach	Status	Further Work Planned Actions to rectify non-compliance and prevent reoccurrence	Actions Status
ML 6471	N/A	Operator	Yes	Comprehensive incident report submitted 09 October 2023	09/08/23	Non achievement of Outcome Measurement Criteria **OMC – TSF1, GW1, TSF2, GW2.**	Groundwater and Surface Water OMCs associated with the TSF have not been achieved predominantly due to higher than predicted lateral and vertical seepage from the TSF during early operation. SWLs in groundwater monitoring locations within the TSF seepage zone are outside of OMC Achievement Values determined by the groundwater model. Water quality at TSFMB1d is in exceedance of OMC Achievement Values determined by the TSF Surface Water and Groundwater Geochemical Effects Assessment. It is important to note that the Outcome is anticipated to be achieved and this reflects the OMC being established with limited data at the time of the original PEPR development. The groundwater monitoring wells are located within the zone of influence (the Outcome relates to groundwater outside of the zone of influence) and therefore a review of the location of the OMC monitoring locations is required and the monitoring locations inside the zone of influence may be better suited for a Leading Indicator. This is supported by information that demonstrates that the operation is and will continue to have the ability to achieve the Environmental Outcomes.	Currently being addressed	• **Completed:** update the assumptions and inputs in the Tailings Storage Facility: Surface Water and Groundwater Geochemical Effects Assessment 2017 to determine if there is likely to be any ongoing change to the predicted effects and impacts. Use updated model to derive new water quality targets in shallow and deep TSF monitoring wells. • **Completed:** review seepage modelling with observed rates, new assumptions and new parameters from TSF Stage 2 operations. • **Completed:** review the Seepage Fate Analysis to confirm that vertical seepage still reports to the subsidence zone. • **Completed:** develop site specific guideline values for groundwater and surface water as an alternative to ANZECC/ARMCANZ (2000) freshwater and limited baseline ranges to update relevant leading indicators. • **Completed:** review relevant OMCs to determine suitability of existing monitoring locations and achievement values. • **In Progress:** Updated groundwater and geochemical modelling that inform impact assessment are included in the Change in Operations (CiO) currently under assessment. Once CiO is approved, the PEPR will be updated to reflect new controls, Leading Indicators and OMCs where relevant. • **In Progress:** Hydrogeological and geophysics investigations underway at TSF to inform future monitoring and controls.	The models used for the groundwater and geochemical effects assessments have been updated with observed seepage rates and supernatant and seepage quality. The outcomes of the updated modelling demonstrate that the relevant Environmental Outcomes can be achieved and provide updated predictions for Leading Indicators and OMC in terms of observed seepage quality and groundwater response. Ongoing – present in future PEPR
ML 6471	N/A	Operator	No	Leading Indicator Report submitted 10 February 2022	N/A	Breach of Leading Indicator **Leading Indicator TSF21, TSF23 and TSF24**	The metals composition of supernatant and decant water remain outside of the +/-10% range adopted within MPEPR 2024/009 in 2024. The Leading Indicator is based on the metals composition that was used for the Geochemical Effects Assessment (OZ Minerals 2017c, Appendix F). If observed water quality is different to the inputs to the geochemical model then additional work is required to ensure that observed/actual water quality does not change the outcomes of the Assessment of Effects nor cause new or increased impacts. BHP Carrapateena engaged LWC to review the data and comment on whether the risk profile adopted in development of the MPEPR2019/026 had changed.	Rectified	Key assumptions of an Assessment of Effects was reviewed and a preliminary impact assessment has been completed which determined to not represent an increased likelihood of actual or potential environmental harm. The concentrations of tailings water metals, as determined and assessed, are not considered to represent a risk of actual or potential based on the nature and magnitude of reported concentrations and Tier 2 toxicology considerations. No significant elevation of risk profile is evident relative to previous works (CA-ENV-REP-1120). The geochemical and seepage models have been updated with observed data and an updated geochemical assessment of effects has determined that the supernatant and decant water quality observed do not change the outcomes of the original impact assessment. The updated assessments was presented in the MPEPR 2025/011 (BHP 2025a).	Completed
MPL 152	17/01/24	Operator	Yes	17/01/24	Initial incident report submitted on 17 January	Environmental Outcome	Recirculation return pipe dislodged from RP3 bore caused approximately 150 kL of saline water to discharge to the environment. The spill emanated approximately 250 m from the production bore into a	Rectified	• **Completed:** Undertake audit of existing production bore cleaning process and review minimum requirements for securing recirculation infrastructure to all wells.	Completed

Tenement	Date of Incident	Detected by operator or DEM	Reportable under Regulation 79?	Date reported to Minister	Date written repot to Minster	Non-complaince Environmental outcome or tenement condition breached	Cause of non-compliance, OMC or lease condition breach	Status	Further Work Planned Actions to rectify non-compliance and prevent reoccurrence	Actions Status
					2025 and Comprehensive incident report submitted 15 February 2024	**MPL 152 Schedule 6 Condition 11** OMC **LS1**	creek line dotted with Western Myall (*Acacia papryocarpa*) trees. Non-compliance was reported as an SEB was not in place for the impacted area at the time of the spill.		• **Completed:** Install permanent recirculation infrastructure at all production bores in Southern Borefield to eliminate need to install temporary infrastructure each cleaning cycle. • **Completed:** Establish leak detection system at bores when recirculation is in progress • **Completed:** Update relevant procedures to reflect above changes. • **Completed:** Communicate impact of saline water spills on environment with relevant work groups to ensure shared understanding of risk. • **Completed:** Include impact area in 2024 annual ecology survey to assess the extent of the potential impact to native vegetation. • **Completed:** Undertake final vegetation assessment to measure extent of vegetation loss and establish significant environment benefit if required.	
MPL 153	29/11/24	Operator	Yes	29/11/24	Initial incident report submitted on 29 November 2024 and Comprehensive incident report submitted 29 December 2024	Environmental Outcome **MPL 153 Schedule 6 Condition 12** OMC **LS1**	Failure of standpipe infrastructure at Turkey Nest 47 on the Western Access Road resulted in approximately 96 to 192 kL of saline water discharging to the environment and potentially impacting native vegetation. Non-compliance was reported as an SEB was not in place for the impacted area at the time of the spill.	Rectified	• **Completed:** Installation of additional isolation valve. • **Completed:** Repair of the existing knife gate valve, along with an assessment for buildup and contamination. • **Completed:** Update work instructions for poly work on-site to ensure pipes are capped. • **Completed:** Inspection of the Western Access Road infrastructure for open piping. • **Completed:** Evaluation of the feasibility of installing a leak detection device on the gravitational line for the hard stand to alert in the event of a leak. • **Completed:** Assessment of the potential for installing leak detection devices on other saline water lines that may be affected. • **Completed:** Include impact area in 2025 annual ecology survey to assess the extent of the potential impact to native vegetation. • **Completed:** Undertake final vegetation assessment to measure extent of vegetation loss and establish significant environment benefit if required.	Completed
ML 6471	2024	Operator	No	Monthly compliance meeting 28/11/2024	12/03/25	Non achievement of OMC **AQ3/TSF7**	The frequency/timing for the TSF Closure Strategy Verification Report for OMC AQ3/TSF7 is 6/8/10 years after lease grant. The Verification Report was not completed in 2024 (6 years after lease grant) as there has been insufficient time to collect meaningful erosion data from an erosion field study since construction of the Stage 2 Tailings embankment. The other work that is required to be audited as per this OMC (i.e dust lift-off study, air quality update and landform evolution model update) have all demonstrated that the proposed closure strategy remains valid.	Rectified	• **Completed:** AQ5 – Calibration of the air quality model with operational monitoring data and dust threshold lift data established in the tailings beach trials. • **Completed:** AQ6 – Audit by an independent and suitably qualified expert of dust threshold lift data from the tailings beach trials. • **Completed:** TSF8/9 – Closure audit report to review timing, method and data requirements for calibration of the Landform Evolution Model with actual erosion data. • **Completed:** Finalise the TSF Closure Strategy Verification report and use the report to advise on appropriate erosion field trials, likely to be implemented during Stage 3 operation of the TSF.	Completed – refer to Appendix H.
ML6471	22/02/25	Operator	Yes	23/02/25	Initial incident report submitted on	Environmental Outcome	A section of the pipeline conveying water from the Mine Settling Ponds ruptured adjacent to a contracting yard. The failure occurred after the line warped due to	Rectified	• **Completed:** Substitute PRV for PSV on mine pond pipeline.	Completed

Tenement	Date of Incident	Detected by operator or DEM	Reportable under Regulation 79?	Date reported to Minister	Date written repot to Minster	Non-complaince Environmental outcome or tenement condition breached	Cause of non-compliance, OMC or lease condition breach	Status	Further Work Planned Actions to rectify non-compliance and prevent reoccurrence	Actions Status
					23 February 2025 and Comprehensive incident report submitted 21 March 2025	**ML 6471 Schedule 6 Condition 11** OMC **LS1**	over-pressurisation, causing it to dislodge from the bunded pipe-trace footprint. Approximately 35 kL of saline underground mine water was released. Saline water was observed up to 30 meters into previously undisturbed ground. Non-compliance was reported as an SEB was not in place for the impacted area at the time of the spill.		• **Completed:** Deliver training on Bermad Valve (PRV) installation and operation to Maintenance personell. • **Completed:** Develop specification and associated engineering drawings for Bermad Valve. • **Completed:** Formalise expectations with Supervisors for tasks relating to Bermad Valve installation and operation. • **Completed:** Include impact area in 2025 annual ecology survey to assess the extent of potential damage and establish preliminary SEB	
ML6471	09/07/25	Operator	Yes	09/07/25	Initial incident report submitted on 9 July 2025 and Comprehensive incident report submitted 6 August 2025	Environmental Outcome **ML 6471 Schedule 6 Condition 11** OMC **TSF5 & LS1**	A flange on the second tailings pipeline near Scout Pit 1 failed causing slurry to discharge. The tailings slurry was predominantly contained within Scour Pit 1 and the pipeline corridor. However, due to the pressurised line and high winds, slurry dispersed up to 175 m from the pipeline into previously undisturbed ground. Non-compliance was reported as an SEB was not in place for the impacted area at the time of the spill.	Rectified	• **Completed:** Inspect 10% of flange bolts centrifugal tailings delivery line and re-torque as required to ensure integrity. • **Completed:** Implement a flange maintenance strategy for pipelines following handover from construction/commissioning to operations. • **Completed:** Implement flange mainten • ance strategy for pipelines during operations. • **Completed:** Ensure all accessible tailings resulting from the spill is removed when conditions permit. • **Completed:** Ensure all accessible tailings resulting from the spill is removed when conditions permit. • **Completed:** Conduct a review of alarm settings to confirm that leak detection mechanisms are properly configured and operational • **Completed:** Include impact area in 2025 annual ecology survey to assess the extent of potential damage and establish preliminary SEB	Completed

12 Disturbance and rehabilitation activities

The current PEPR includes a Native Vegetation Management Plan (NVMP) (BHP 2025a; Appendix D) for disturbance under four gateways and Northern Wellfield:

- Gateway 1 allows for 476.15 ha of disturbance. Gateway 1 covers works associated with Retention Lease (RL) 127, MPL 149 and ML 6471 through to approval of PEPR2018/007 in March 2019. Some credits have been allocated in-kind from Gateway 1 to disturbance undertaken outside the RL 127 boundary.
- Gateway 2 allows for 708.22 ha of disturbance.
- Gateway 3 allows for 1,012.38 ha of disturbance.
- Gateway 4 allows for 20.46 ha of disturbance.
- Northern Wellfield allows for 237.50 ha of disturbance.

During 2021, OZ Minerals engaged Nature Foundation to assign significant environmental benefit (SEB) points for 203 ha of Gateway 3 to accommodate remaining construction activities associated with the Carrapateena sub-level cave (SLC). Following significant delay finalising the application due to a range of issues associated with the pastoral lease for Witchelina, which the relevant government departments were seeking to resolve, the assignment of credits was completed in June 2022.

BHP conducts an annual audit of the land disturbance database to review and reconcile recorded disturbance data. During the reporting period, final vegetation assessments were completed for multiple spill events to support the establishment of Significant Environmental Benefits (SEBs), including for the Eliza Creek saline water seepage incident.

BHP conducts an annual audit of the land disturbance database to review and reconcile recorded disturbance data. During the reporting period, final vegetation assessments were completed for multiple spill events to support the establishment of Significant Environmental Benefits (SEBs), including for the Eliza Creek saline water seepage incident.Updated land disturbance areas for this reporting period can be found in Table 12.1 with land disturbance areas over the NVMP Gateway stages provided from Figure 12.1 to Figure 12.6.

Table 12.1 | Land disturbance summary

Area where disturbance and rehabilitation activity occurred (ha)	Description of rehabilitation works carried out in the reporting period (ha)	Amount of land disturbed during the reporting period (ha)	Estimated amount of land to be rehabilitated in the next reporting period (ha)	Total amount of land where rehabilitation works are completed (ha)
RL 127, off lease or now accounted for on MPL 152, MPL 153, MPL 154 and MPL 156	0	0 (Gateway 1)	0	0
ML 6471, MPL 152, MPL 153 and MPL 154	0	0 (Gateway 2)	0	61.8
ML 6471, MPL 152, MPL 153 and MPL 154	0	117.31 (Gateway 3) 4.72 (Gateway 4)	~10	11.2
MPL 156	0	1.33 (Northern Wellfield)	0	0
All tenements (total)	**0**	**123.37**	**~10**	**73.0**

Strategies implemented to avoid or minimise disturbance:
Land Disturbance Permitting process ensures that work areas are safely minimised, and already disturbed land is used for new works as much as reasonably possible. For temporary works the stripping of topsoil is avoided. Land Disturbance Areas are surveyed and barricaded to avoid any disturbance outside of the allowed area.

Strategies implemented to avoid or minimise disturbance:
Rehabilitation trials under RL 127 have indicated that no additional treatment is necessary to achieve successful rehabilitation. Formal trials were completed in early stages of ML 6471 to confirm methodology. Two LFA transects are being monitored with additional sites installed in 2022 on the temporary access road from Tjungu Village to the Southern Access Road and at Midway Quarry.

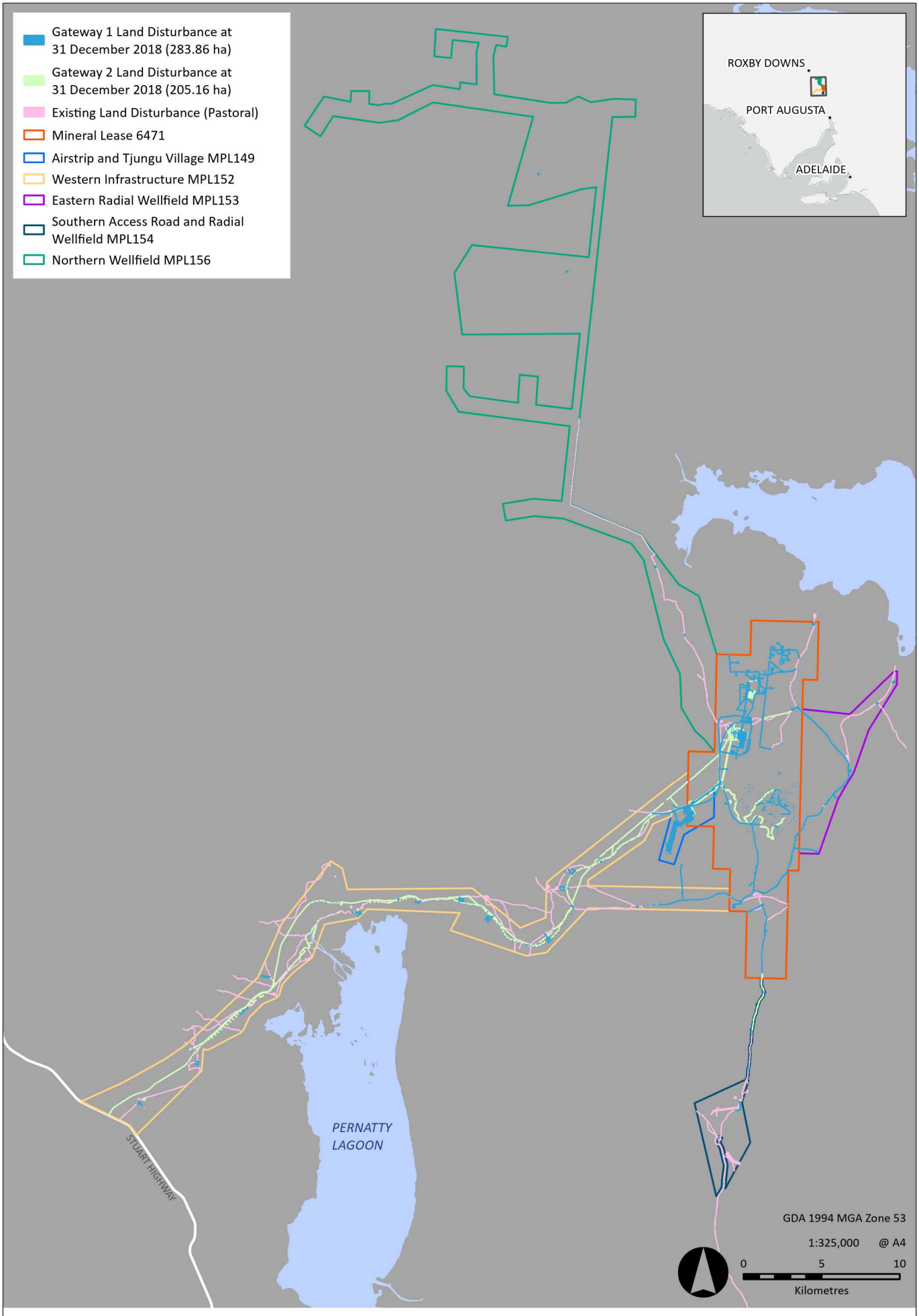


Figure 12.1 | Land disturbed under NVMP Gateway 1 and 2 (March 2013 – December 2018)

Carrapateena BHP

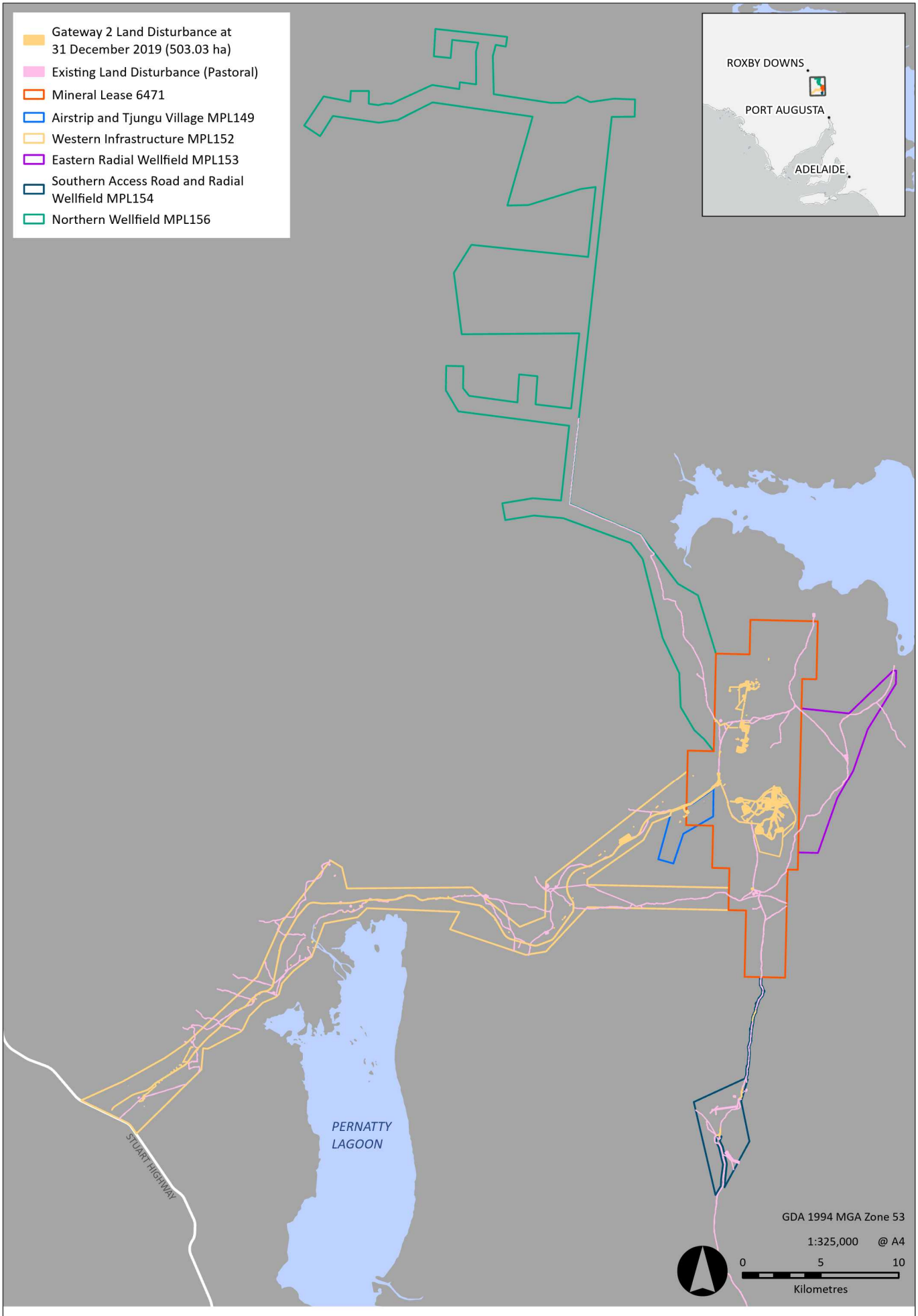


Figure 12.2 | Land disturbed under NVMP Gateway 2 (January 2019 – December 2019)

Carrapateena BHP

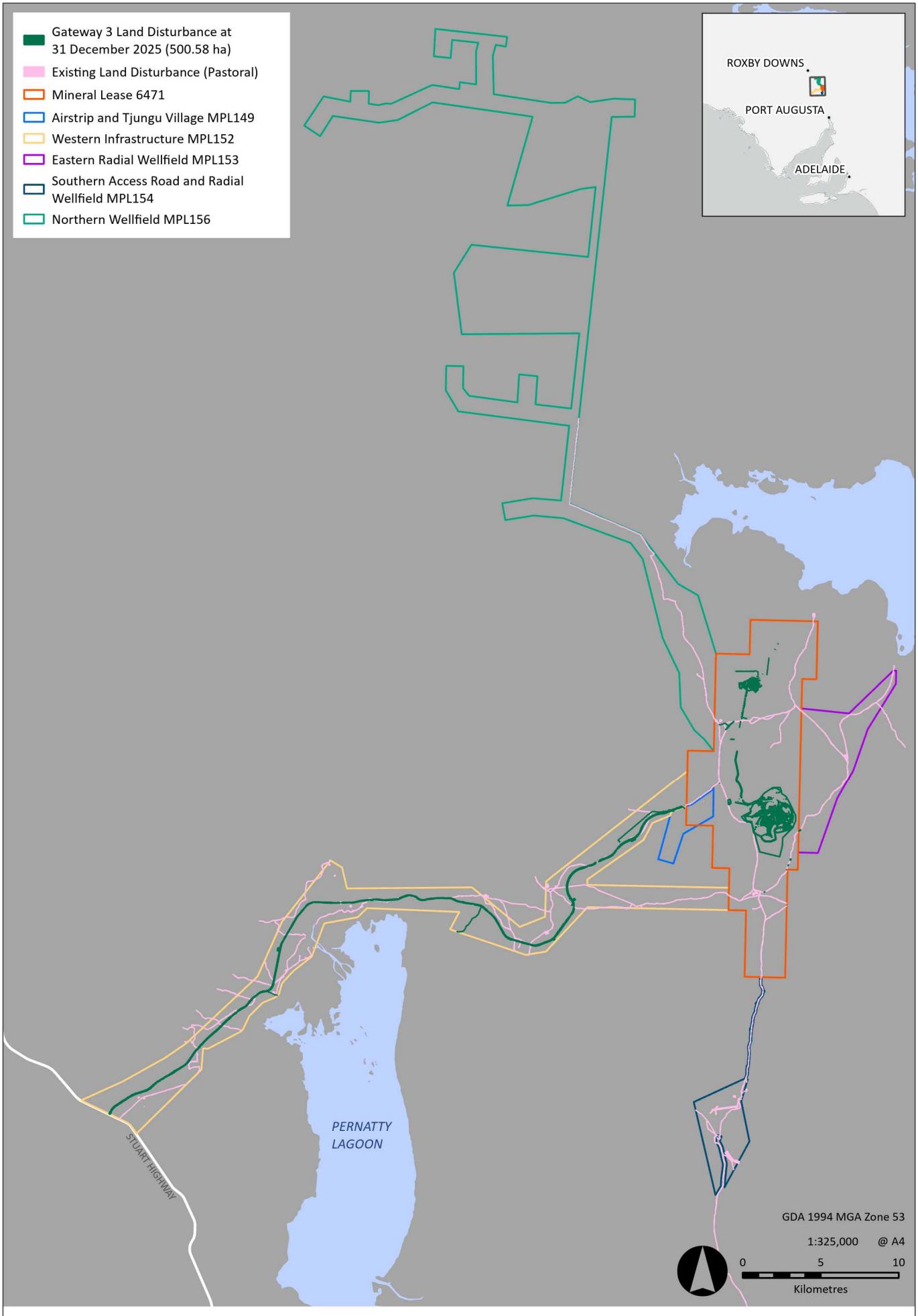


Figure 12.3 | Land disturbed under NVMP Gateway 3 (January 2020 – December 2025)

Carrapateena BHP

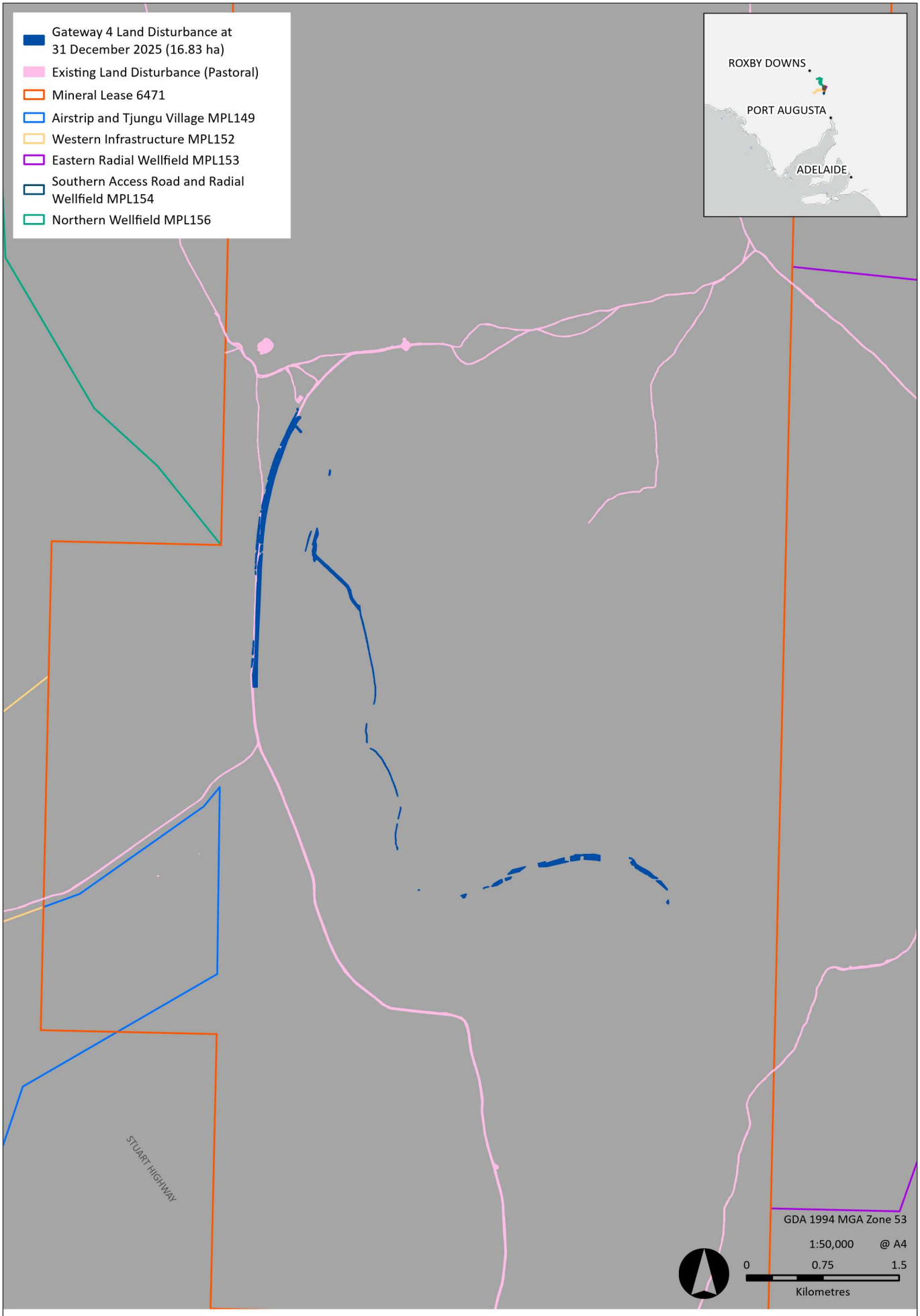


Figure 12.4 | Land disturbed under NVMP Gateway 4 (January 2020 – December 2025)

Carrapateena BHP

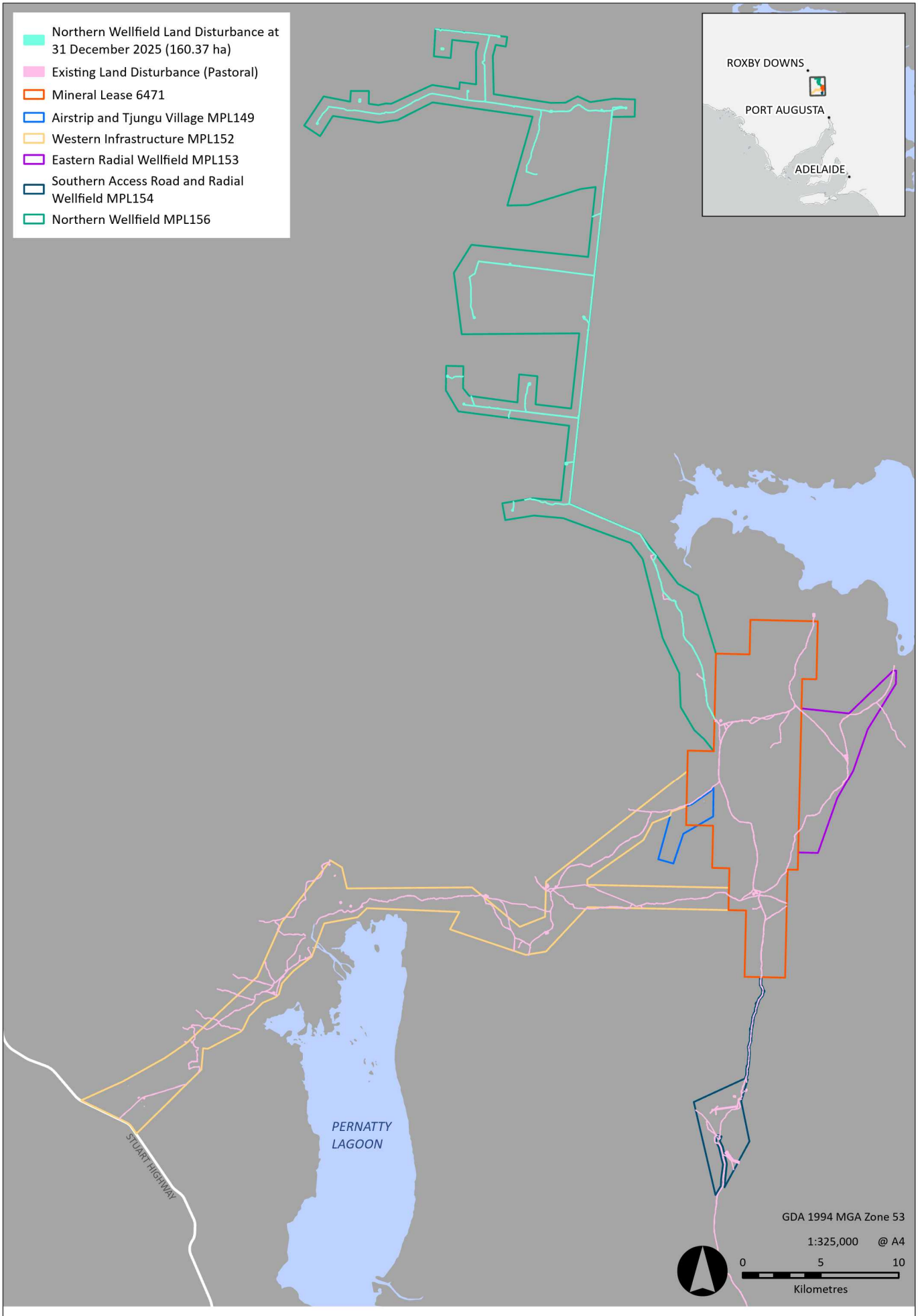


Figure 12.5 | Northern Wellfield gateway land disturbance NVMP (January 2019 – December 2025)

Carrapateena BHP

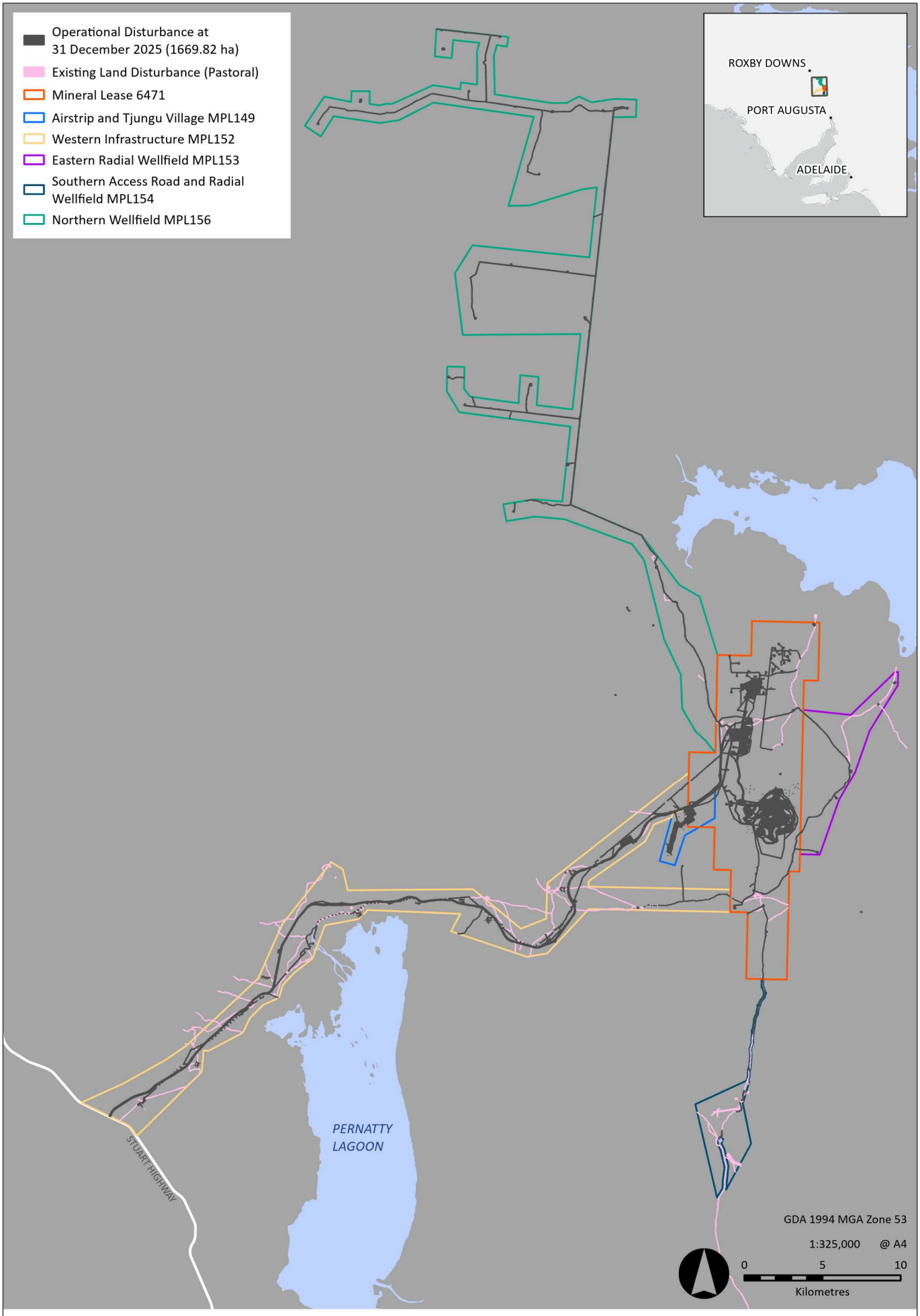


Figure 12.6 | Operation disturbance footprint (2013 – December 2025)

Carrapateena BHP

13 Reconciliation of native vegetation clearance

Table 13.1 | Land disturbance under NVMP

NVMP Category	Tenement	Approval	Approved maximum clearance (ha)	Total amount cleared in the reporting period (ha)	Estimated amount to be cleared in the next reporting period (ha)
Gateway 1	RL 127, MPL 149, ML 6471	MPEPR2013/003 MPEPR2016/007 PEPR2017/028 PEPR2017/028 PEPR2018/003	476.15	0	0
Gateway 2	MPL 149, ML 6471, MPL 152, MPL 153, MPL 154	PEPR2017/003 PEPR2018/007 PEPR2018/019	708.23	0	0
Gateway 3	MPL 149, ML 6471, MPL 152, MPL 153, MPL 154	MPEPR2019/026	1012.38	117.31	~50.0
Gateway 4	Haul Road Expansion, Tailings pipeline duplication, WAT-49	MPEPR2025/011	20.46	4.72	0
Northern Wellfield	MPL 156	MPEPR2019/026	237.51	1.33	0

Table 13.2 | Disturbance by vegetation association

Veg Association	Description	Area Approved NVMP (ha)	Area Disturbed Gateway 2 (ha)	Area Disturbed Gateway 3 (ha)	Area Disturbed Gateway 4 (ha)	Area Disturbed NW (ha)
1	*Atriplex vesicaria* (Bladder Salt Bush) +/- *Tecticornia medullosa* (Samphire) Low Open Shrubland	1,847.2	503.68	353.62	16.76	138.41
2	*Acacia ligulata* (Umbrella Bush)/*Dodonaea viscosa* var. *angustissimus* (Narrow-leaf Hop Bush) Low Open Shrubland +/-*Zygochloa paradoxa* (Sandhill Canegrass)	0	29.81	18.10	0	2.05
3	*Acacia aneura* (Mulga) Open Woodland over *Maireana sedifolia*/*Maireana pyramidata*/*Maireana astrotricha*/*Atriplex vesicaria*	47.2	15.79	18.70	0	NA
4	*Acacia papyrocarpa* (Western Myall) Woodland over *Maireana astrotricha* (Low Bluebush)	67.4	23.26	22.06	0	NA
5	*Acacia aneura* (Mulga) +/- *Dodonaea viscosa* ssp. *angustissimus* (Narrow-leaf Hop Bush) Shrubland over *Maireana pyramidata* (Black Bluebush), *Maireana astrotricha* (Low Bluebush)	26.2	10.79	10.32	0	NA
6	*Atriplex vesicaria* (Bladder Saltbush)/*Maireana astrotricha* (Low Bluebush) Low Open Shrubland	182.5	53.27	44.46	0	NA
7	*Acacia papyrocarpa* (Western Myall ssp.) Vey Low Woodland over *Atriplex vesicaria* (Bladder Saltbush) +/- *Ptilotus obovatus* (Silver Mulla Mulla), *Dodonaea lobulata* (Lobe-leafed Hop Bush), *Acacia tetragonophylla* (Dead Finish) and *Eremophila* spp. (Emu Bush) in drainage depressions	95.7	47.65	9.82	0.06	16.99
8	*Eucalyptus camaldulensis* var. (River Red Gum) +/- *Acacia papyrocarpa (*Western Myall ssp.*)* Low Woodland	16.3	4.47	1.56	0	NA
9	*Zygochloa paradoxa* (Sandhill Canegrass) Grassland	20.5	6.45	5.59	0	NA
10	*Casuarina pauper* (Black Oak) Open Woodland on calcrete outcrops and sand dune rises	4	1.62	0.87	0	NA
11	*Atriplex vesicaria* (Bladder Saltbush) Shrubland +/- *Dodonaea viscosa* var. *angustissimus* (Narrow-leaf Hop Bush) Open Shrubland	8.4	3.05	1.30	0	NA
12	*Acacia papyrocarpa* (Western Myall) Woodland over *Maireana pyramidata* (Black Bluebush)/*Callitris gracilis* (Native Pine)	10.2	1.18	3.47	0	NA
13	*Tecticornia pergranulata* (Black Seed Samphire) +/- *Melaleuca xerophila* (Boree) Low Shrubland	0	0.27	0.14	0	NA
14	*Eragrostis australasica* (Swamp Canegrass) Tussock Grassland	2.2	0.19	0.13	0	2.9
15	*Duma florulenta* (Lignum) *Tecticornia pergranulata* (Black Seed Samphire) *Maireana pyramidata* (Black Bluebush) Shrubland in flood out zones and alluvial fans	0.4	0.13	0	0	NA
16	*Dodonaea viscosa* ssp. *angustissimus* (Narrow-leaf Hop Bush)/*Acacia ligulata* (Umbrella Bush) Low Shrubland in drainage channels	88.9	0	1.29	0	NA
17	*Callitris glaucophylla* (Native Pine) Woodland	0.6	0.62	0.32	0	NA
18	*Acacia papyrocarpa* (Western Myall ssp.)/*Eucalyptus camaldulensis* (River Red Gum) Low Woodland	0.3	0	1.56	0	NA
19	*Melaleuca xerophila* (Boree) Shrubland	0	0	0.00	0	NA
20	*Tecticornia medullosa* (Samphire) Low Open Shrubland	0.5	0	0.00	0	NA
21	Claypan	0	1.85	1.07	0	NA
-	No data	38.3	4.12	0	0	NA
Total		**2,456.8**	**708.19**	**491.69**	**16.82**	**160.37**

14 EPBC Act

Condition number	Condition	Compliance status	Evidence demonstrating compliance with condition
1	To manage the impacts of the action on the environment, the person taking the action must implement the conditions of the SA approval.	Compliant	The Compliance Report associated with the granting of the Carrapateena tenements under the *Mining Act 1971* (SA) will be submitted to DEM by 31 March 2026 indicating compliance with the conditions of the state approval. This Compliance Report will be publicly available on the DEM website at: http://www.energymining.sa.gov.au/minerals/mining/mines_and_quarries/carrapateena
2	The person taking the action must not impact more than 1,740 hectares of Plains Rat habitat within the disturbance footprint.	Compliant	Total disturbance since the commencement of the referred action is 1,669.82 ha, including 313.18 ha of Plains Mouse habitat, as shown in Figure 14.1 and Figure 14.2, respectively.
3	Prior to commencement of the action, to compensate for residual impacts to the Plains Rat, the person taking the action must acquire an offset property which must contain: a population of the Plains Rat no less than 1,740 hectares of Plains Rat habitat habitat quality equal to that of the Plains Rat habitat within the disturbance footprint.	Compliant	Following on from an 'Agreement to Underlease' (CA-APR-AGR-1037) with the Pastoral Lessee of South Gap Pastoral Station two offset areas, OZ Minerals established two individual Underlease Agreements, one for each offset area, securing a total of 3,251 ha of suitable Plains Mouse habitat (Northern Offset Underlease Agreement 1,882 ha and Southern Offset Underlease Agreement 1,369 ha (CA-APR-LET-1178). The Underlease Agreements have a 10-year expiry term, with successive Agreements to be established totaling the required duration as per the approval conditions. The offset areas consist of Arcoona Tablelands habitat that is similar in quality and structure to the land disturbed at Carrapateena and are considered to represent equally viable Plains Mouse habitat. Historical observations of Plains Mouse have been recorded nearby the northern offset, and within the same stretch of continuous tablelands habitat connecting disturbed Plains Mouse habitat at Carrapateena, to the offset areas on South Gap Station.
4	The person taking the action must maintain or improve the habitat quality of the existing Plains Rat habitat at the acquired offset property for the life of this approval.	Compliant	BHP Carrapateena has developed an Environmental Offset Management Plan (CA-0000-ENV-PLN-1004) (the Plan) which aims to: • Establish baseline conditions, including the distribution and condition of Plains Mouse habitat, the presence and distribution of target species, and the identification and prioritisation of local threats. • Define the potential presence, distribution and abundance of other target species within the offset (i.e. Thick-billed Grasswren and Night Parrot). • Manage total predation pressure (fox, cat, wild dog/dingo). • Enhance the condition of habitat for the benefit of Plains Mouse, through the management of total grazing pressure (i.e. stock exclusion) and invasive weeds. • Improve knowledge of local target species populations including an understanding of how they respond to management locally. The Plan presents fourteen (14) individual objectives grouped under eleven (11) management strategies to address EPBC Act offset liability, and associated legislative and policy obligations, for the first ten (10)-year period of management.
5	Within 2 years from commencement of the action, the person taking the action must change the tenure of the offset property for conservation purposes using an appropriate legal mechanism for long term protection.	Compliant	Underlease agreements signed, executed and back-dated from 21 April 2020 (2 years from the commencement of the action) for the Northern Offset Area and the Southern Offset Area. The areas have been officially registered with the Lands Titles Office: two registrations as associated with each offset area. The Agreements to Underlease clearly define that the areas are to be set aside for environmental offset purposes. The change in land use will apply for ten (10) years, after which the change in land use will need to be renewed (permission granted from the Commonwealth Government to manage as rolling terms to achieve the total required tenure).
6	Prior to the commencement of the action, the person taking the action must engage a suitably qualified expert to undertake a Night Parrot survey within the development envelope. The Night Parrot survey must be undertaken in' accordance with the EPBC Act Night Parrot survey guidelines. Within three months of the Night Parrot survey being completed, the person taking the action must provide the Department with the Night Parrot survey results.	Compliant	OZ Minerals completed a targeted Threatened Species Survey for Night Parrot in March 2018 (CA-ENV-REP-1040). There were no Night Parrots or evidence of Night Parrots detected during the survey. The results of the survey were forwarded to the Australian Government's Department of the Environment and Energy (DoEE, now DCCEEW) in April 2018 (DoEE: CA-APR-EML-1077). Night Parrot has not been reconfirmed as locally extinct within South Australia.
7	Should the Night Parrot or evidence of the Night Parrot be recorded during the survey, the person taking the action must submit for the Minister's approval, a Night Parrot Management Plan that must include: c. Details of the Night Parrot survey results, including the methodology, timing and area surveyed. d. An assessment of the impacts to the Night Parrot that will result from the action. e. Management actions that will avoid, minimise and/or offset both the immediate and long-term impacts of the action on the Night Parrot.	Not Applicable	The targeted survey (CA-ENV-REP-1040) did not find evidence of the Night Parrot in the Operation area. Night Parrot has not been reconfirmed as locally extinct within South Australia.

Condition number	Condition	Compliance status	Evidence demonstrating compliance with condition
	f. Monitoring and reporting requirements that demonstrate the management actions are effectively being implemented and achieve the intended results. This should include the frequency, intensity and duration of monitoring. The person taking the action must not commence the action prior to the Minister approving the Night Parrot Management Plan. The approved Night Parrot Management Plan must be implemented.		
8	Prior to the commencement of the action, the person taking the action must engage a suitably qualified expert to undertake a *Frankenia plicata* survey within the development envelope. The *Frankenia plicata* survey must be undertaken in accordance with contemporary survey methods. Within three months of the *Frankenia plicata* survey being completed, the person taking the action must provide the Department with the *Frankenia plicata* survey results.	Compliant	OZ Minerals completed a targeted Threatened Species Survey for *Frankenia plicata* in March 2018 (CA-ENV-REP-1040). Frankenia plicata was not detected during the survey. The results of the survey were forwarded to DoEE in April 2018 (CA-APR-EML-1077). Follow-up work by the engaged consultant uncovered the incorrect classification of locally collected *Frankenia plicata* samples lodged with the SA Herbarium. Consultation with the SA Herbarium coupled with extensive survey work within the Carrapateena tenements and more broadly within the region has failed to detect this species, which is more likely to occur much further north of the Operation.
9	Should the Frankenia plicata be recorded during the survey, the person taking the action must submit for the Minister's approval, a Frankenia plicata Management Plan that must include: g. Details of the *Frankenia plicata* survey results, including the methodology, timing and area surveyed. h. An assessment of the impacts to the *Frankenia plicata* that will result from the action. i. Management actions that will avoid, minimise and/or offset both the immediate and long-term impacts of the action on the Frankenia plicata. j. Monitoring and reporting requirements that demonstrate the management actions are effectively being implemented and achieve the intended results. This should include the frequency, intensity and duration of monitoring. The person taking the action must not commence the action prior to the Minister approving the *Frankenia plicata* Management Plan. The approved *Frankenia plicata* Management Plan must be implemented.	Not Applicable	The targeted survey (CA-ENV-REP-1040) did not find evidence of *Frankenia plicata* in the operational area. Follow-up work by the engaged consultant uncovered the incorrect classification of locally collected Frankenia samples lodged with the South Australian Herbarium.
10	Within 3 months following the change of tenure referred to in condition 5) the person taking the action must provide the Department with written evidence that the offset property has been secured for conservation purposes using an appropriate legal mechanism.	Compliant	Written evidence provided to DoEE via letter dated 16 December 2020 (CA-APR-LET-1178).
11	Within 30 days after the commencement of the action, the person taking the action must advise the Department in writing of the actual date of commencement.	Compliant	OZ Minerals advised DoEE of the commencement of the action on 21 April 2018 (CA-ENV-LET-1001).
12	The person taking the action must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, and make them available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Department's website. The results of audits may also be publicised through the general media.	Compliant	BHP Carrapateena maintains an Environmental Management System that includes electronic data management systems for document control (InEight), obligations management and land access (LandFolio) and consultation/correspondence (Borealis). Data collected during Carrapateena monitoring is recorded on the site environmental data management system (MonitorPro) or within ArcGIS. Data collected for the environmental offsets on South Gap pastoral station will be collected, managed and reported on by a third party engaged to manage the offset (Nature Foundation) with select information captured back into the Carrapateena systems.
13	Within 30 days after completion of the action, the person taking the action must advise the Department in writing of the actual date of completion and provide a map clearly defining the date, location and actual impact within the Disturbance footprint of the action and be accompanied with a shapefile.	Not Applicable	BHP Carrapateena is currently undertaking the action.
14	The approval holder must prepare a compliance report for each 12-month period following the date of commencement of the action, or as otherwise agreed to in writing by the Minister. The approval holder must: k. publish each compliance report on the website within 60 business days following the relevant 12-month period; l. notify the Department by email that a compliance report has been published on the website within five business days of the date of publication; m. keep all compliance reports publicly available on the website until this approval expires; n. exclude or redact sensitive ecological data from compliance reports published on the website; and o. where any sensitive ecological data has been excluded from the version published, submit the full compliance report to the Department within 5 business days of publication. NOTE: The first compliance report may report a period less than 12 months so that it and subsequent compliance reports align with the similar requirement under state approval.	Compliant	The EPBC 2017/7895 Compliance Report is posted annually in April to BHP's website where copies of previous Compliance Reports can also be located.

Condition number	Condition	Compliance status	Evidence demonstrating compliance with condition
15	Upon the direction of the Minister, the person taking the action must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Minister. The independent auditor must be approved by the Minister prior to the commencement of the audit. Audit criteria must be agreed to by the Minister and the audit report must address the criteria to the satisfaction of the Minister.	Not Applicable	BHP Carrapateena has not been directed by the Minister to commission an independent audit of compliance with the conditions of approval associated with EPBC 2017/7895.
16	If, at any time after 5 years from the date of this approval, the person taking the action has not commenced the action, then the person taking the action must not commence the action without the written agreement of the Minister.	Not Applicable	OZ Minerals commenced the action in late March 2018, as communicated to DoEE in April 2018 (CA-ENV-LET-1001).
17	The approval holder must notify the Department in writing of any: incident; non-compliance with the conditions; or non-compliance with the commitments made in plans. The notification must be given as soon as practicable and no later than two business days after becoming aware of the incident or non-compliance. The notification must specify: the condition which is or may be in breach; and a short description of the incident and/or non-compliance.	Compliant	There were no non-compliances with the EPBC 2017/7895 conditions of approval, nor non-compliances with commitments described in any plans required therein during the reporting period. There were no incidents associated with the action during the reporting period that caused, or had the potential to cause, significant impacts to matters of national environmental significance (MNES).
18	The approval holder must provide to the Department details of any incident or non-compliance with the conditions or commitments made in plans as soon as practicable and no later than 30 days after becoming aware of the incident or non-compliance, specifying: Any corrective action or investigation which the approval holder has already taken or intends to take in the immediate future; the potential impacts of the incident or non-compliance; and the method and timing of any remedial action that will be undertaken by the approval holder.	Compliant	There were no non-compliances with the EPBC 2017/7895 conditions of approval, nor non-compliances with commitments described in any plans required therein during the reporting period. There were no incidents associated with the action during the reporting period that caused, or had the potential to cause, significant impacts to MNES.

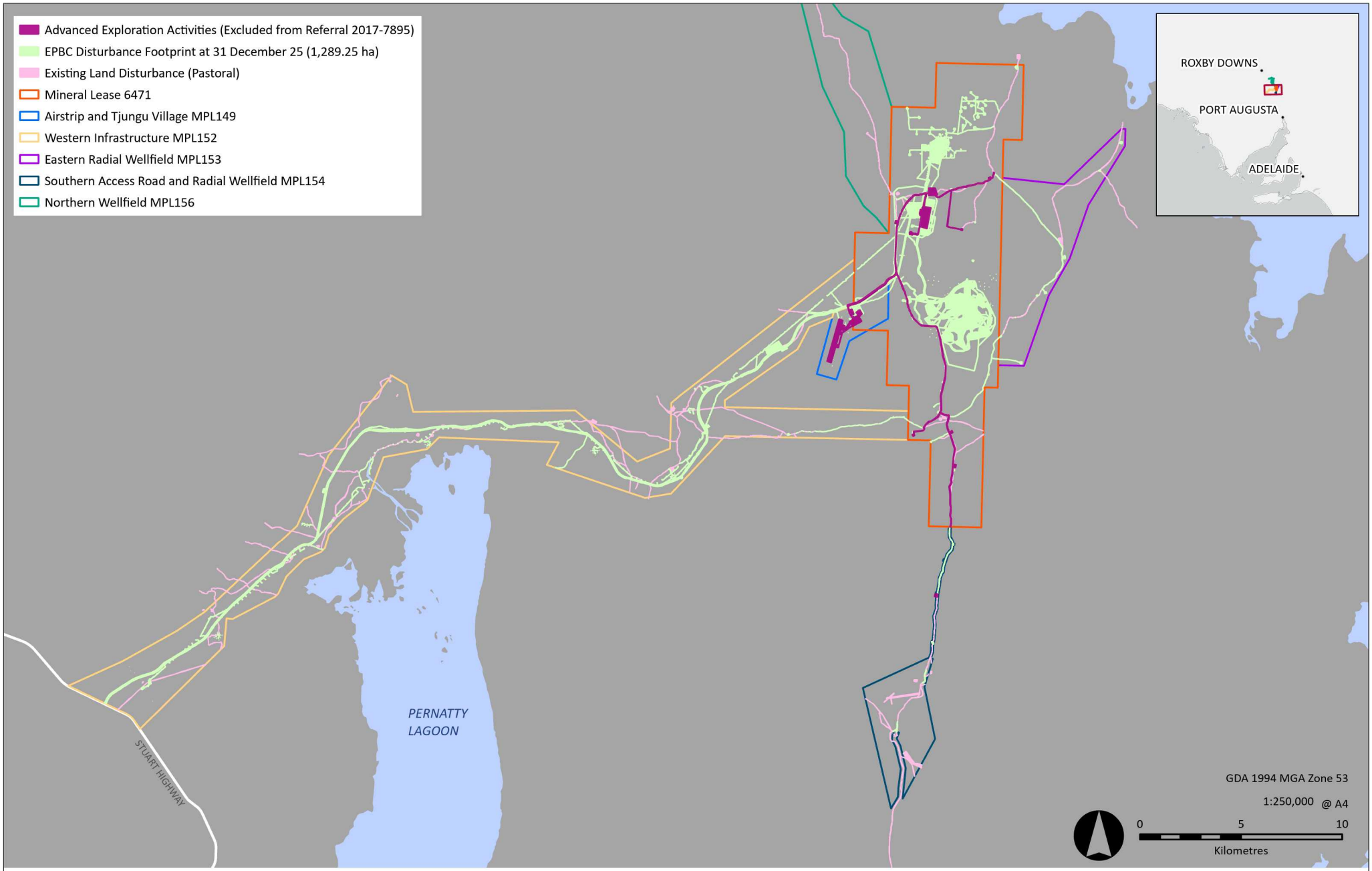


Figure 14.1 | EPBC disturbance footprint (December 2025)

Carrapateena BHP

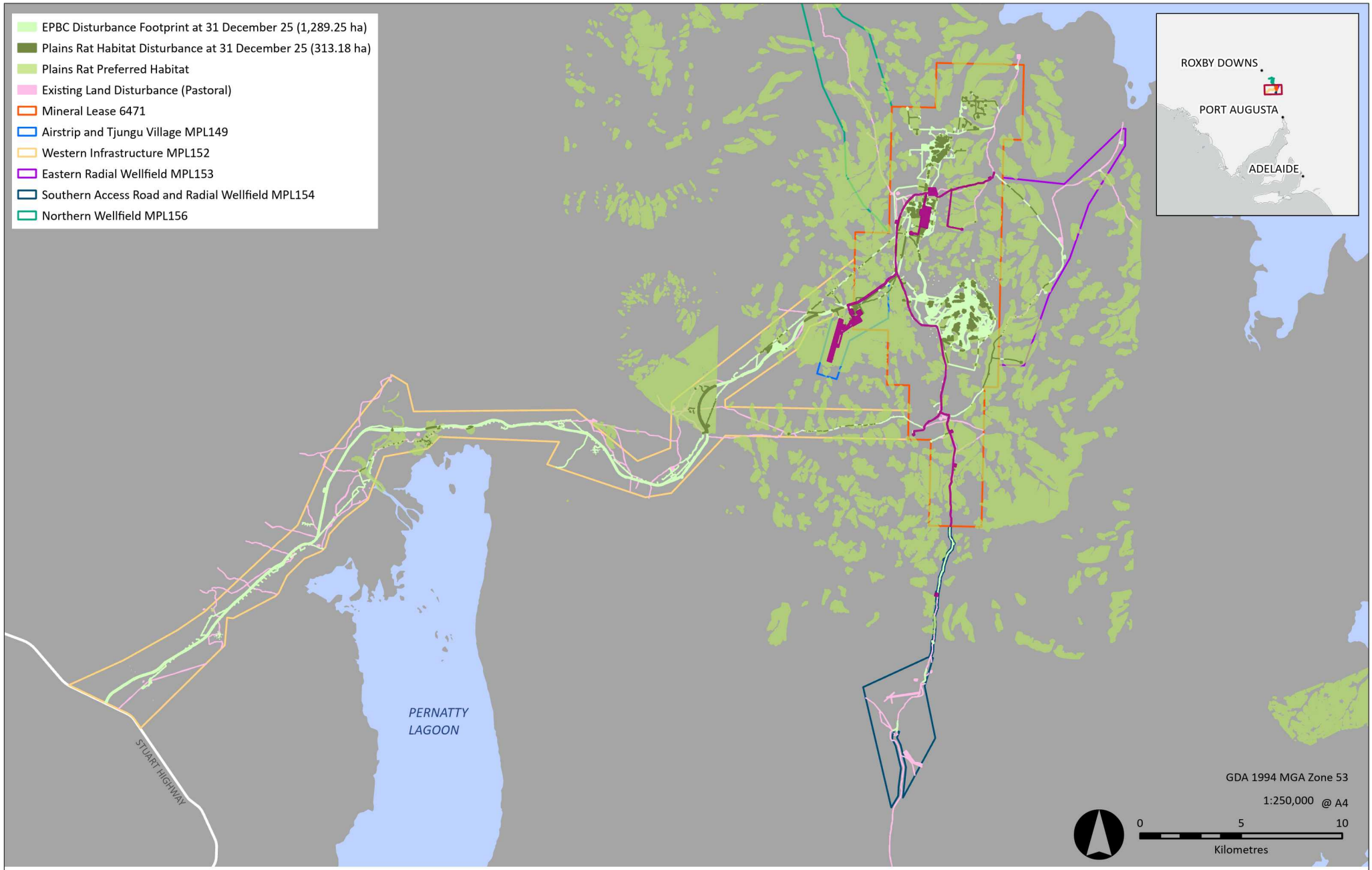


Figure 14.2 | Plains Rat (*Pseudomys australis*) habitat disturbance at 31 December 2025

Carrapateena BHP

15 Exempt land

It is required that a statement is provided that all waivers for land relevant to the mining operations are in place and compliant with exempt land provisions in accordance with Section 9 of the *Mining Act 1971* (SA). These statements are provided below.

All required waivers of exemption required for the work undertaken during the compliance period are in place as summarised in Table 15.1 to Table 15.5 and all exempt land is shown on Figure 15.1.

Table 15.1 | Northen Wellfield MPL 156 exempt land

ID	Person entitled to exemption	Structure	Area of exemption (ha)*	Date waiver registered/ obtained	Reason	Relevant conditions
CL1330/26						
1	Pernatty Pastoral Lease	South Eliza Hut and Dams	27.5	16/7/2018	Located within 150 m of existing Southern Access Road and borefield road and pipeline.	Contained in land access and compensation agreement CA-APR-1033
2		Stockyard	10.1		Located within 150 m of access road and common services trench near the MPP and mine surface infrastructure. Location of infrastructure is required in this location to provide mines access and services.	
3		North Eliza Dam	19.7	Not required	Distance between mining operations and structure is greater than 150 m.	Not applicable
4		Well	7.6			
5		Well or borehole	7.7			
6		Dawson Dam	15.5			

* Area of exemption includes the footprint of the structure and the buffer of exemption as per Part 9(d) of the *Mining Act 1971* (SA)

Table 15.2 | Western Infrastructure Corridor MPL 152 exempt land

ID	Person entitled to exemption	Structure	Area of exemption (ha)*	Date waiver registered/ obtained	Reason	Relevant conditions
CL1330/26						
16	Pernatty Pastoral Lease	Parkes Dam	13.1	16/7/2018	Location optimised to take advantage of existing pastoral tracks.	Contained in land access and compensation agreement CA-APR-1033
17		Camel Dam	18.2		Located within 150 m of existing pastoral track within tenement.	
18		Cattle Yard, Shed and Dam	25.2			
19		Kyolia Dam	14.4		Located within 150 m of Western Access Road.	
20		Elizabeth Dam	14.3			
21		Yeltacowie Racecourse Dam	18.2	Not required	Located inside tenement but distance between mining operations and structure is greater than 150 m.	Not applicable
22		Cattle yard and sheds	14.0			
23		Canegrass Dam and Trap Yard	15.6			
24		Stockyard	9.4			
25		Cement Bank	8.4			
26		Wilsons Tank	7.6			
27		Pressure tank	7.6			
28		Yeltacowie Homestead and outbuildings	105.5			
29		Surface Waterhole 9	11.1			
30		Elizabeth Catch Waterhole	11.9			

ID	Person entitled to exemption	Structure	Area of exemption (ha)*	Date waiver registered/ obtained	Reason	Relevant conditions
CL6178/725						
31	Oakden Hills Pastoral Lease	Electrical transmission pole	104.9	In progress	Located within 150 m of mining operations.	To be provided in relevant land access and compensation agreement
32		Borrow pit	10.4		Western Access Road and 132 kV transmission intersects Electrical transmission line – ElectraNet.	
33		Electrical transmission line – ElectraNet	11.6			
34		Solar Monitoring Station	7.3	Not required	Distance between mining operations and structure is greater than 150 m.	Not applicable
35		Tower	7.3			
CT6135/25						
36	WMC (Olympic Dam Corp) Pty Ltd	Substation	10.3	In progress	Location optimised next to existing transmission infrastructure (within 150 m).	To be provided in relevant land access and compensation agreement
37	WMC (Olympic Dam Corp) Pty Ltd	Electrical transmission line – WMC	115.3		Western Access Road and 132 kV transmission intersects Electrical transmission line – WMC.	

* Area of exemption includes the footprint of the structure and the buffer of exemption as per Part 9(d) of the *Mining Act 1971* (SA)

Table 15.3 | Eastern Radial Wellfield MPL 153 exempt land

ID	Person entitled to exemption	Structure	Area of exemption (ha)*	Date waiver registered/ obtained	Reason	Relevant conditions
CL1330/26						
7	Pernatty Pastoral Lease	Anzac Dam and stock yard	21.4	16/7/2018	Located within 150 m of existing pastoral track and existing groundwater supply wells.	Contained in land access and compensation agreement CA-APR-1033
8		Tadpole Waterhole	14.7	16/7/2018	Located outside the tenement and distance between mining operations and structure is greater than 150 m.	Not applicable

* Area of exemption includes the footprint of the structure and the buffer of exemption as per Part 9(d) of the *Mining Act 1971* (SA)

Table 15.4 | Southern Access Road and Radial Wellfield MPL 154 exempt land

ID	Person entitled to exemption	Structure	Area of exemption (ha)*	Date waiver registered/ obtained	Reason	Relevant conditions
CL1330/26						
9	Pernatty Pastoral Lease	Airstrip	87.2	16/7/2018	Located within 150 m of existing pastoral track and existing groundwater supply wells.	Contained in land access and compensation agreement CA-APR-1033
10		Pernatty Homestead and outbuildings	83.8			
11		Accommodation, stock yard and sheds	75.9			
12		Waterhole	15.6	Not required	Distance between mining operations and structure is greater than 150 m.	Not applicable
13		Pernatty Dam	60.0			
14		Tank	7.5			
15		Pernatty Well and tanks	18.6			

* Area of exemption includes the footprint of the structure and the buffer of exemption as per Part 9(d) of the *Mining Act 1971* (SA)

Table 15.5 | Northern Wellfield MPL 156 exempt land

ID	Person entitled to exemption	Structure	Area of exemption (ha)*	Date waiver registered/ obtained	Reason	Relevant conditions
CL 6213/627						
38	Pernatty Pastoral Lease	Hogan Dam	25.87	16/7/2018	Proposed well access/pipeline near Hogan Dam	Contained in land access and compensation agreement CA-APR-1033
CL 6211/35						
39	Arcoona Pastoral Lease	Bosworth Hut, Stockyard, Tank and Well NC	18.11	13/12/2018	Proposed well access/pipeline near Bosworth Hut, stockyard, tank, Well NC	Contained in land access and compensation agreement CA-APR-1046
40		Hilda Tank and Infrastructure	7.76		Proposed well access/pipeline near Hilda Tank/Infrastructure	
41		Alexander Tank	8.36		Proposed well access/pipeline near Alexander Tank	
42		White Dam, Stockyard, Tank and Pipeline	37.58		Proposed well access/pipeline near White Dam, stockyard, tank, pipeline	

* Area of exemption includes the footprint of the structure and the buffer of exemption as per Part 9(d) of the *Mining Act 1971* (SA)

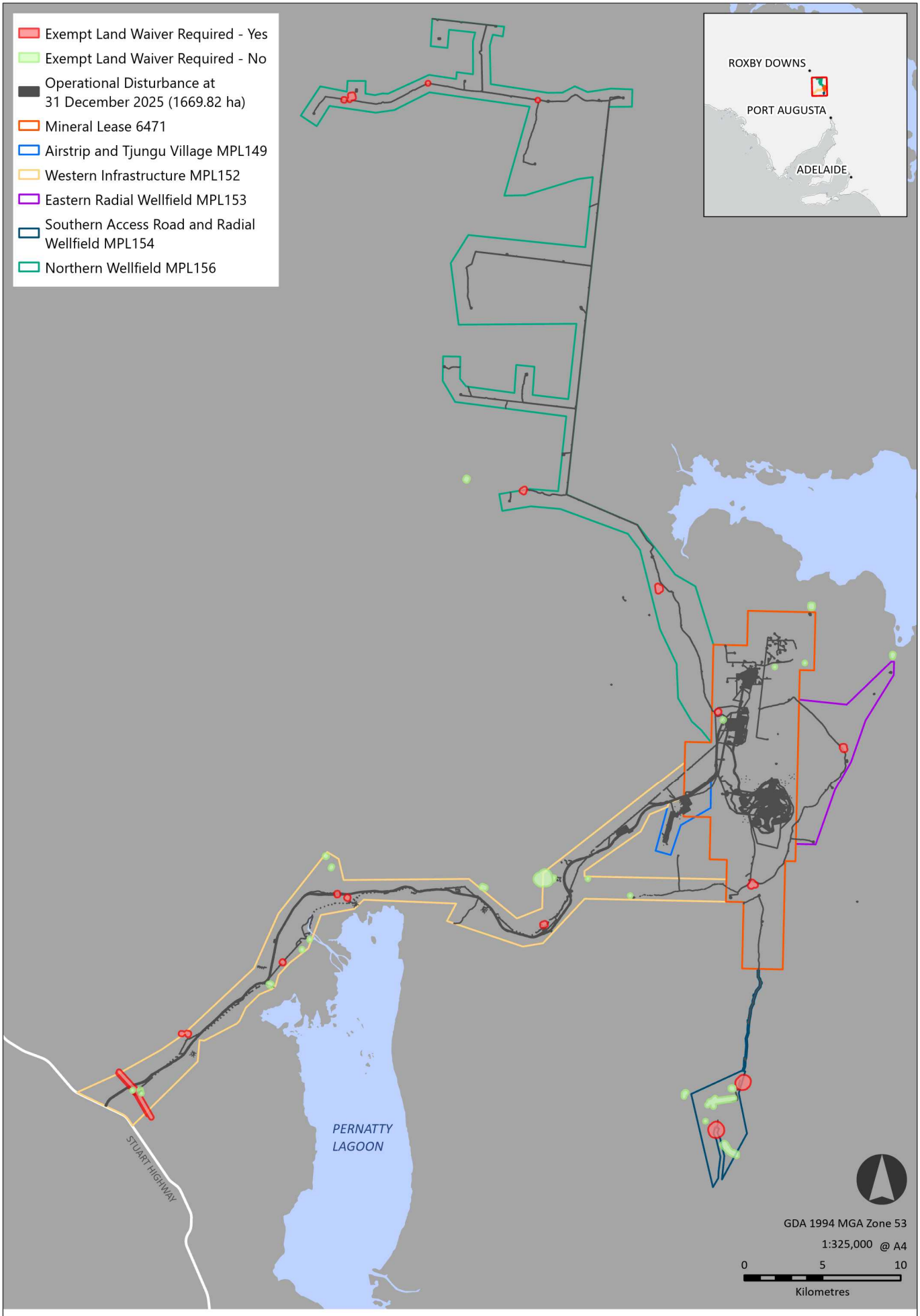


Figure 15.1 | Exempt land and operation footprint 2025

Carrapateena BHP

16 Complaints

No complaints were received in the 2025 reporting period.

17 Management system reviews

There were no management system reviews undertaken at Carrapateena during the reporting period.

18 Verification of uncertainties

Description of assumption or uncertainty	Estimated date to resolve	Progress in reporting period	Confirmed	Forward work plan
Air Quality – Modelling **Strategy – AQ13** Develop an appropriate tailings beach trial methodology (air quality) to the satisfaction of the Director of Mines (or other authorised officer) prior to Stage 1 of the Tailings Storage Facility to establish dust threshold lift off speed for tailings including monitoring of tailings change over time and representation of final landform including modelling input assumptions of moisture content, crust thickness, wind speed, and particle size (Appendix C1 Air Quality Modelling and Assessment of Effects)# # **Air Quality Strategy (Schedule 6 Condition 15)** **Strategy – AQ14** Implement the tailings beach trial to the satisfaction of the Director of Mines (or other authorised officer) during Stage 1 of the Tailings Storage Facility to establish dust threshold lift off speed including monitoring of tailings change over time including modelling input assumptions of moisture content, crust thickness, wind speed, and particle size (Appendix C1 Air Quality Modelling and Assessment of Effects)# # Air Quality Strategy (Schedule 6 Condition 15)	Completed	BHP Carrapateena developed an in-field dust lift off trial methodology in conjunction with Engineer of Record, WSP Golder, which was completed in March 2024. Originally developed for a similar study at Glencore's Integrated Nickel Operation in Sudbury, Ontario Canada, the Carrapateena study includes deployment of a PI-SWERL at the TSF to characterise wind erosion emissions parameters. Preliminary data was presented to DEM and EPA in January 2024 and a final report was submitted in June 2024. The Air Quality Model was updated in 2024 and in-field validation of wind erosion parameters can be reincorporated into future air quality assessments.	Yes	NA
Surface Water – Design Detail **Strategy – SWES7 Detailed design of the surface water management infrastructure (Figure 4.40) undertaken by a suitably qualified expert is undertaken prior to the commencement of construction and demonstrates the surface water management infrastructure basis of design (Section 4.12) has been achieved and will adopt strategies to ensure erosion and sedimentation is suitably managed#** # Surface Water Strategy (Schedule 6 Condition 19.1, 19.2 and 19.3)	Completed	Detailed design of the MPP and above-ground mining infrastructure completed by a suitably qualified expert.	Yes	NA
Topsoils **Strategy – SWES8 During land clearing activities topsoil must be stockpiled and measure adopted to preserve stockpiled materials until the material is reused or determined to be no longer required#** # Surface Water Strategy (Schedule 6 Condition 19.4)	Ongoing	Topsoil is progressively stockpiled near infrastructure and mapped in spatial database. LFAs progressing to determine future need for topsoil during rehabilitation.	Ongoing	Updated locations as operations progress. LFA will determine future need of topsoil.
Surface Water Modelling **Strategy – SWRF2 Develop an appropriate methodology for the ongoing review and calibration of the surface water model (Appendix C3 Surface Water Monitoring and Assessment of Effects) associated with reduced flows in Eliza Creek as a result of the Sub Level Cave Subsidence Zone and Tailings Storage Facility (Figure 4.1) prior to the commencement of construction activities to address modelling uncertainty including long-term site-specific rainfall and evaporation data#** # Surface Water Strategy (Schedule 6 Condition 18) **Strategy – SWRF3 Implement the surface water model Appendix C3 Surface Water Monitoring and Assessment of Effects) calibration methodology from the commencement of construction activities associated with reduced flows in Eliza Creek as a result of the Sub Level Cave Subsidence Zone and Tailings Storage Facility (Figure 4.1) to establish long-term site-specific rainfall and evaporation data#** # Surface Water Strategy (Schedule 6 Condition 18) **Strategy – SWRF4** Calibration of the surface water model (Appendix C3 Surface Water Monitoring and Assessment of Effects) undertaken at year 2022 using site specific rainfall and evaporation data and validates modelling outputs associated with reduced flows in Eliza Creek as a result of the Sub Level Cave Subsidence Zone and Tailings Storage Facility (Figure 4.1 and Table 8.1). Any significant variations in surface water modelling during operations from those must result in a review of the effectiveness of surface water strategies to demonstrate that the outcomes are achievable# # Surface Water Strategy (Schedule 6 Condition 18)	Completed	BHP completed SWRF2 in 2018 and subsequently engaged a suitably qualified consultant to update the Eliza Creek Surface Water Model in 2020. In alignment with SWRF4 a stream gauge was installed in Eliza Creek in November 2021 to reduce modelling uncertainty and validate outputs. BHP engaged EMM to update the Eliza Creek Surface Water Model in 2022 (Calibration Methodology for Eliza Creek Models), as referenced in Appendix H of the 2022 Carrapateena PEPR Compliance Report.	Yes	N/A

Description of assumption or uncertainty	Estimated date to resolve	Progress in reporting period	Confirmed	Forward work plan
Tailings Storage Facility – Design Update **Strategy – TSF30 The design (Appendix B1 Tailings Storage Facility Design) of the Tailings Storage Facility (Figure 4.1) must be updated prior to the commencement of construction and address the various items.** Also related to strategies identified in SWES9, SWED10, SWES11, SWES12	Completed	Updated TSF Design was provided on 17 July 2018 addressing the design items listed in Strategy TSF30. The Tailings Pipeline Detailed Design, Construction Quality Assurance Plan, Seepage Assessment and TSF Design Independent Peer Review undertaken by ATC Williams were sent to DEM on 12 November 2018 to support the design. One matter remains unresolved relating to the size of the lined decant cell. Updated seepage modelling was provided to support the current size of the decant cell and DEM have identified residual uncertainty. Detailed design to increase the size of the lined decant cell completed in February 2019 and construction completed before end of 2019. DEM approved the design via approval of the 2020 PEPR (OZ Minerals 2020).	Yes	Detailed design to increase the size of the lined decant cell completed in February 2019 and construction completed before end of 2019. DEM approved design through 2025 PEPR review.
Tailings Storage Facility – Landform Evolution Modelling **Strategy – TSF33 Develop an appropriate erosion field study methodology to the satisfaction of the Director of Mines (or other authorised officer) prior to Stage 1 of the Tailings Storage Facility for the Stage 2 embankment surface and isolated areas of the tailing beach to establish run-off and sediment load including modelling input assumptions of embankment geometry, rock armouring, particle sizes, and rainfall intensity (Appendix B1 Tailings Storage Facility Design (Landform Evolution Modelling))#** # Surface Water Strategy (Schedule 6 Condition 19.5) **Strategy –TSF34 Implement the erosion field study during Stage 2 of the Tailings Storage Facility to establish run-off and sediment load including modelling input assumptions of embankment geometry, rock armouring, particle sizes, and rainfall intensity (Appendix B1 Tailings Storage Facility Design (Landform Evolution Modelling))#** # Surface Water Strategy (Schedule 6 Condition 19.5)	Completed	Draft methodology developed by SRK Consulting. Model parameters to be validated using TSF Stage 2 Embankment construction material and operational tailings parameters. Update of the Landform Evolution Model was undertaken in 2022 and presented as Appendix G to the 2022 Carrapateena PEPR Compliance Report. Engagement with DEM and EPA undertaken to confirm adequacy of the methodology. Implementation of methodology during TSF Stage 2.	Yes	Engagement with DEM and EPA undertaken to confirm adequacy of the methodology. Implementation of methodology during Stage 2 TSF.
Acid and Metalliferous Drainage **Strategy – AMD7 Develop an appropriate AMD Management Plan for stockpile locations (Figure 4.32) prior to the commencement of construction activities that includes the following:** • Develop a program to investigate the potential for metalliferous drainage to be generated by NAF material which contains sulphides (Surface Water Strategy (Schedule 6 Condition 21.4.2)) • Refine the sulphur cut-off grade for PAF material through further testing of waste units (Surface Water Strategy (Schedule 6 Condition 21.4.3)) • Develop an ore, waste rock and sulphur block model (Surface Water Strategy (Schedule 6 Condition 21.4.4)) • Develop the block model to include the sulphur distribution of all waste and ore to be mined for the purpose of determining the distribution and estimating the volume of NAF and PAF using the sulphur cut-off grade (Surface Water Strategy (Schedule 6 Condition 21.4.5)) • Regular updating of the block model with new geological and sulphur assay data in the course of operations and aligning to the materials handling program (Surface Water Strategy (Schedule 6 Condition 21.4.6)) • Develop a QA/QC process for validation of Acid Base Accounting (ABA) characteristics (Surface Water Strategy (Schedule 6 Condition 21.4.7)) • Develop a QA/QC process for the waste rock block model and testing to ensure the correct rock is placed in the correct destination (Surface Water Strategy (Schedule 6 Condition 21.4.8)) • Segregation of PAF waste rock, NAF waste rock, and waste rock with the potential for metalliferous drainage (based on a classification process) and a mining schedule for each (Surface Water Strategy (Schedule 6 Condition 21.4.9)) • Ensure stockpiles containing PAF material are appropriately located (Surface Water Strategy (Schedule 6 Condition 21.4.10)) • Develop appropriate stockpile management strategies (Surface Water Strategy (Schedule 6 Condition 21.4.11)) • Confirm final end uses for waste rock and marginal ore based on geochemical classification (Surface Water Strategy (Schedule 6 Condition 21.4.12))	Completed	Review of AMD Management Plan and remove uncertainty around low potential for metalliferous drainage of NAF to simplify stockpile management. EGI completed review of the AMD database in Q1 2024.	Yes	Continuous review of AMD Management Plan and remove uncertainty around low potential for metalliferous drainage of NAF to simplify stockpile management.

Description of assumption or uncertainty	Estimated date to resolve	Progress in reporting period	Confirmed	Forward work plan
Groundwater Modelling **Strategy – GW6** Calibration of the Groundwater Model (Appendix C5 Groundwater Modelling and Assessment of Effects) is undertaken in 2022 with operational monitoring data from monitoring sites (Figure 8.7) and validates modelling outputs. If modelling outputs vary an assessment will be undertaken to consider whether strategies are still appropriate# # Groundwater Strategy (Schedule 6 Condition 26.4)	Completed	Monitoring well network installed and continuation of groundwater monitoring data collection. Groundwater model reviewed by CDM Smith in 2021 using groundwater abstraction/monitoring data. As per GW6 another review was undertaken by EMM and reported as Appendix I to the 2022 PEPR Compliance Report (OZ Minerals 2023).	Yes	Monitoring of established groundwater well network
Tailings AMD Geochemistry **Strategy – TSF31** Undertake stage two geochemical assessment program involving kinetic testing of the tailings prior to the commencement of construction of the Tailings Storage Facility (Figure 4.1) and update the Tailings Storage Facility Design (Appendix B1 Tailings Storage Facility Design) and Geochemical model (Appendix C4 Tailings Discharge and Seepage Geochemical Model) in the event that tailings properties and solute parameters vary when compared to Appendix B2 Geochemical Characterisation of Tailings (Surface Water Strategy (Schedule 6 Condition 21.1 and 21.4.1)).	Completed	Updated surface water and geochemical assessment of effects was provided on 18 December 2019.	Yes	NA
Seepage and Discharge **Strategy – TSF32 Review the Geochemical model (Appendix C4 Tailings Discharge and Seepage Geochemical Model) prior to the commencement of construction of the Tailings Storage Facility (Figure 4.1) and address the following items#:** • Review the input concentrations for elements and metals used. • Based on the review provide an updated or revised solute transport geochemical model. • Revise strategies associated with seepage and discharge if required. # Surface Water Strategy (Schedule 6 Condition 20.5) and Groundwater Strategy (Schedule 6 Condition 26.2)	Completed	Updated surface water and geochemical assessment of effects was provided on 18 December 2019.	Yes	NA

19 Changes to mining operations

Description of change to existing mining operation	Significance level (1–4)	Date submitted to DEM	Date endorsed by DEM	Current status at the end of the reporting period
Miscellaneous Purposes License Management Plan – Airstrip, Workers' Accommodation Village and Ancillary Infrastructure	4	December 2016	15/09/2017 (PEPR)	PEPR2017/028 approved for MPL 149
TSF Stage 1 Construction Sequencing Amendment (April 2018), CA-APR-REP-1001	4	05/07/2018	16/08/2018	Approved – Completed
Updated TSF Design Report, CA-APR-REP-1003	4	05/07/2018	16/08/2018	Approved – Completed
Tenement Reduction ML 6471, MPL 149, MPL 152, MPL 153 and MPL 154, CA-APR-REP-1008	4	12/12/2018	14/12/2018	Approved – Completed
Minor Change Notification – Mine Water Storage Dams and Pipeline to the TSF. OZ Minerals sought approval to construct a pipeline from the mine water storage dams to the TSF to utilise surplus mine dewater for construction activities. CA-APR-NOT-1028	4	08/12/2018	14/12/2018	Approved – Completed
Minor Change Notification – TSF Borrow Pit Excavation Depth. OZ Minerals sought approval to expand the excavation depth at the TSF Borrow Pit from 3 m to 8 mBGL for the purpose of winning suitable material for construction of the TSF Stage 1 embankment. CA-APR-NOT-1032	4	07/02/2019	08/02/2019	Approved – Completed
TSF Stage 1 Temporary Sprinkler Farm CA-APR-NOT-1038	4	15/04/2019	9/5/2019	Approved – Activity completed and decommissioned
Injection Well Water Management CA-APR-NOT-1041	4	8/05/2019	28/5/2019	Approved – Secondary approval gained, not yet implemented
TSF Lined Decant Cell Expansion and Borrow Pit 1 Expansion CA-APR-NOT-1044	4	26/06/2019	12/11/2020	Approved – Completed
TSF Second Sprinkler Bed CA-APR-NOT-1045	4	12/07/2019	15/8/2019	Approved – Completed
Temporary Concentrate Haulage CA-APR-NOT-1047	4	9/09/2019	11/10/2019	Approved – Completed
Sourcing clay for Mine Water Environmental Dam	4	5/08/2019	12/08/2019	Approved – Completed
Program Notification Temporary Accommodation Camp at Yeltacowie – MPL 152	4	28/10/2020	26/11/2020	Approved – Completed
Program Notification Extension to Midway Quarry	4	30/10/2020	26/11/2020	Approved – Completed
Program Notification Midway Quarry Temporary Batch Plant CA-ENV-LET-1022	3	21/01/2021	04/02/2021	Approved – Completed
Program Notification Midway Quarry Eastern Stockpile Extension	3	20/04/2021	7/05/2021	Approved – Completed
Program Notification Stage 1 Tailings Storage Facility Interim Bund Works	3	30/04/2021	24/05/2021	Approved – Completed
Program Notification Waste Dump to Tailings Storage Facility Haul Road and TSF Stage 2 Design Amendments	3	17/08/2021	28/09/2021	Approved – Completed
Program Notification Temporary Concentrate Storage Pad	3	22/02/2022	22/03/2022	Approved – Completed

Provide a description of any new or emerging environmental hazards that apply, or appear to be arising, in relation to mining operations
No new or emerging environmental hazards have been identified that relate to mining operations

20 Technical reports

The following table outlines the management system reviews undertaken at Carrapateena for the reporting period.

Report Title	Authors
Appendix C 2025 Groundwater and Surface Water	BHP
Appendix D 2025 Carrapateena Flora and Fauna Survey	Lathwida Environmental
Appendix E 2025 Air Quality Monitoring Report	Lathwida Environmental
Appendix F 2025 Environmental Radiation Impact Assessment	BHP
Appendix G 2025 South Gap Offset Annual Report	Nature Foundation
Appendix H TSF Closure Strategy Verification Report	Landloch

21 Voluntary information

The following table outlines the management system reviews undertaken at Carrapateena for the reporting period.

Item	Description
Operation footprint	1,669.82 ha
Greenhouse gas emissions	BHP triggers reporting thresholds for greenhouse gas emissions under the *National Greenhouse and Energy Reporting Act 2007* (Cth) (NGER Act). Carrapateena's energy and emissions are included in the total emissions and energy published for BHP, available at Corporate emissions and energy data (cleanenergyregulator.gov.au)
No. of employees (company and contractors)	**Tjungu Village** Average personnel on site per day for the 2025 reporting period totalled 717 employees and contractors (peaking at 756 in February and August 2025 during major shutdown and project works). An additional 68 rooms were installed in 2025, total rooms is now 856. **Exploration Village** Average personnel on site per day for the 2025 reporting period totaled 82 employees and contractors (peaking at 129 in January 2025). Personnel on-site is expected to average approximately 100 per day in 2026, peaking every quarter for MPP shutdowns. Total rooms is 176.
Resource development	The 2025 Mineral Resources and Ore Reserves can be found in the BHP Annual Report 2025, Additional Information; Section 6, which is located on the BHP website at bhp.com/investors/annual-reporting (BHP 2025b).
Community or wider environment support activities	BHP Carrapateena provides extensive sponsorship opportunities for local community groups particularly for those with an educational and/or sustainable focus. BHP Carrapateena works closely with the Kokatha Aboriginal Corporation (KAC) and as part of our NTMA obligations to oversee education, training and employment opportunities via the Partnering Management Committee (PMC). The PMC is made up of BHP Carrapateena employees, KAC Board members and staff and meets quarterly. In 2016 a Partnering Agreement was signed between KAC and OZ Minerals. The agreement states that KAC and OZ Minerals will work together to create suitable benefits by leveraging, developing and building on our shared values aspirations, whilst protecting and respecting country and culture. Carrapateena is represented on numerous government, industry and community groups within the area including the Gawler Ranges District Landscapes Australia Group as well as being a major sponsor for the Royal Flying Doctor Service (RFDS), Clontarf Foundation, Shooting Stars, Uni Hub Spencer Gulf and the Remote and Isolated Children's Exercise activity days.
Community engagement activities	The operation has immediate neighbours on Pastoral Land and has ongoing communication with them. BHP Carrapateena participates in presentations with community groups and provides formal and informal updates to local councils and industry chambers groups. Operational and local sourcing opportunity updates were given at various conferences and events throughout the reporting period.
Environmental research information	Activities have been ongoing at site as part of our monitoring to improve our understanding of the natural environment. We continue to collect data around air quality, flora and fauna, surface water flows and groundwater. This will further support our understanding of the environment and further expand on the baseline data collected in previous years.

22 Community engagement

The following table summarises community engagement activities during the reporting period.

Report Title	Authors
Pernatty Pastoral Station consultation	Operating Protocol annual meeting 03/04/2025
	Ad hoc and regular emails and phone calls recorded into Borealis
South Gap Pastoral Station consultation	Meetings in field relating to EPBC offsets on South Gap Station
	Ongoing meetings and in-person engagements across 2025
Arcoona Pastoral Station and Bosworth Pastoral Station consultation	It was agreed that the Operating Protocol annual meeting will not be held in 2025 due to availability constraints. Ad hoc and regular emails and phone calls to provide operational and updates recorded in Borealis
Regular (~monthly) email updates to all pastoralists connected to Carrapateena	Email to pastoralists providing an update on each work element of the operation and other additional relevant information
Regular Kokatha Operations (LEAN) meetings	Regular (~monthly) meetings with Kokatha operational personnel
Kokatha PMC – quarterly	Review of compliance with NTMA including business development, employment and training, heritage safety and environment for KAC. PMC numbers 29, 30 and 31 held in 2025.Carrapateena growth strategy and detailed reviews of tailings management were facilitated in these sessions
Kokatha Partnering Health Check	Partnering Health Check held with Kokatha members in December 2025. Various site inspections (including the TSF, Western Access Road and subsidence zone) undertaken.
Local supply engagements	Continued strategic relationship with TACTIC. Continued regular local engagement through tours and workplace visits. Sponsored and attended the annual TACTIC Conference and Trade Expo in Port Augusta in August.
Local government engagements	Engaged with Spencer Gulf Cities (Independent association of Upper Spencer Gulf (USG) councils) on the Northern Water Project, local economic conditions, industry developments (particularly hydrogen) and community issues.
Remote and Isolated Children's Exercise communications and conference	Ongoing support of events for 2025
Caltowie Music Festival	Sponsors of community event 2025
Glendambo Gymkhana	Sponsors of community event 2025
Steel City Nats (Whyalla)	Sponsors of community event 2025
Carrieton Rodeo	Sponsors of community event 2025
UniHub Graduation	Sponsors of community event 2025
Copley Gymkhana	Sponsors of community event 2025
Chilled Out Music Festival	Sponsors of community event 2025

23 Forward works plan

The following table summarises the actions raised throughout this Compliance Report. These actions will form the basis of the forward work plan for BHP Carrapateena during the 2025 reporting period. These actions are the responsibility of various operational departments at Carrapateena.

Action No.	Action description	Proposed completion date	Report reference
1	Undertake expert audits of TSF every 3 months as per **ML 6471 Second Schedule Condition 4.3 (in accordance with Conditions 12, 13 and 14)**	Ongoing	Section 10
2	Audit (TSF Closure Strategy Verification Report) undertaken by an independent suitably qualified expert approved by the Director of Mines (or other authorised officer). Report completed in 2025 including options for in-field erosion validation. **Strategy AQ3/TSF7**	Completed 2025	Section 9.10, 9.14, 11, Appendix H.
3	Undertake final vegetation assessment for saline water spill at RP3 bore and Turkey Nest 47 to determine required offset with SEB credits. **Strategy LS1**	Completed 2025	Section 8 and 11
4	The models used for the groundwater and geochemical effects assessments have been updated with observed seepage rates and supernatant and seepage quality and are presented in the CiO currently under assessment. Update PEPR to reflect new controls, Leading Indicators and OMCs where relevant once CiO is approved. **Strategy TSF1, TSF2, GW1, GW2**	2026	Section 9

24 Ministerial checklist

This Compliance Report has been completed in general accordance with the TOR 009 Mining Compliance Reports (DEM 2020) and associated Mineral Regulatory Guideline (MG3) (DEM 2021). Table 24.1 provides a cross-reference of the requirements of MG3 (DEM 2021) with the associated section of the Compliance Report for the required information.

Table 24.1: Checklist of Compliance Report against the Ministerial Determination requirements

Section	Included? Or N/A
Public liability insurance	
Provide a copy of the cover note	Section 3
Identification	
Tenement number(s)	Section 4
Name of the mine operation	Section 1
General location details	Section 1
Name(s) of the mine owner and mine operator(s)	Section 1
Site Contact	Section 1
Reference and approved date of relevant PEPR being reported against	Section 1
Dates of the reporting period for the report	Section 1
Date of preparation of the report.	Section 1
Tenements	
Summary table of all tenements including ML, MPL, EML etc.	Section 4
Plan of the mining operations showing all tenement boundaries covered by the approved PEPR	Section 4
Other Licences, Permits, Waivers, Native Title and Agreements	
Summary table of all licences, permits, waivers, native title and other agreements relevant to the PEPR.	Section 5
Ore reserves and mineral resources	
Summary of mineral resource and ore reserves	Section 6
New delineation or exploration drilling activities on or off the lease (if required)	Section 6
Estimated mine life	Section 6
Mining processing and waste storage activities	
Quantity of ore mined and stockpiled	Section 7
Amount of overburden/waste	Section 7
Volumes of concentrate produced	Section 7

Section	Included? Or N/A
7. Compliance with environmental outcomes and leading indicators	
Provide a summary of compliance for each environmental outcome specified in the tenement conditions or approved PEPR	Section 8/Section 9
Summarise data relating to any leading indicator criteria in the approved PEPR	Section 8/Section 9
8. Compliance with non-outcome based tenement conditions	
If you have any lease conditions which do not have an outcome measurement criteria relating to it please list the compliance status and evidence against each condition in a summary table	Section 10
9. Rectification of non-compliance	
If a 'not complied' is recorded, the following must be included:	Section 11
Date of the incident	Section 11
What environmental outcome or tenement condition was breached	Section 11
The date of incident was reported under Regulation 87 of the Mining Regulation	Section 11
The cause of non-compliance	Section 11
Actions taken to rectify the non-compliance	Section 11
Where non-compliance under Regulation 86 or initial incident reports under Regulation 87 of the Mining Regulations have previously been reported in compliance reports and not fully rectified at the time of reporting, a progress report must be included to assess the effectiveness of rectification	Section 11
10. Disturbance and rehabilitation activities	
The amount of land disturbed and activity that created disturbance in the reporting period	Section 12
Rehabilitation worked carried out in the reporting period	Section 12
The amount of land where rehabilitation works are completed	Section 12
An estimated amount of land to be rehabilitated in the next reporting period	Section 12
Any potential improvements learned from previous rehabilitation activities	Section 12
Reconciliation of native vegetation clearance	
Where the PEPR includes an approved native vegetation management plan for clearance of native vegetation under the *Native Vegetation Act 1991*, include:	Section 13
The approved maximum vegetation clearance	Section 13
The amount of native vegetation cleared in the reporting period	Section 13
The total amount cleared to date	Section 13
An estimated amount proposed to be cleared in the next reported period	Section 13
Provision of information, including annual monitoring and progress reports to demonstrate compliance with the NVMP where SEB is being provided	Section 13
12. *Environment Protection and Biodiversity Conservation Act 1999* reporting	
Demonstration of compliance with EPBC conditions (if required)	Section 14

Section	Included? Or N/A
13. Exempt land	
Provide a statement that waivers for land relevant to the mining operation are in place and compliance with exempt land provisions in accordance with Section 9 of the Mining Act	Section 15
The status of exempt land, including name of person entitled to exemption, certificate of title, reason for exemption, area of exemption, date waiver registered and any relevant conditions	Section 15
A plan showing all exempt land relevant to the mining operations	Section 15
14. Complaints	
Summary table of complaints made by members of the public during the reporting period and include: the date of complaint the nature of complaint whether or not it related to non-compliance what action was taken to address the complaint the date the complaint was resolved	Section 16
15. Management system reviews	
Provide a summary of any management system review undertaken during the reporting period in order to ensure compliance with relevant tenement conditions and environmental outcomes, including:	Section 17
When the audit ore review was undertaken	Section 17
Who undertook the audit or review	Section 17
What aspect(s) of the management system was/were audited/reviewed	Section 17
What issues, or recommendations for improvement, were noted	Section 17
An assessment of the potential for any issues identified in the audit/ review to lead to a noncompliance with approved environmental outcomes	Section 17
What corrective action that has or will be taken to address any issues.	Section 17
16. Verification of uncertainties	
Provide a description and status of works undertaken during the reporting period or proposed undertaken to address any identified uncertainties made in the approved PEPR (or any additional uncertainties or assumptions identified since PEPR approval)	Section 18
17. Technical Reports	
Summary of technical data studies and reports generated in reporting period	Section 20

25 References

ANZG (Australian and New Zealand Guidelines) (2018) *Australian and New Zealand Guidelines for Fresh & Marine Water Quality. Default guideline values*. Australian Government Initiative. Accessed at www.waterquality.gov.au/anz-guidelines/guideline-values/default.

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BHP (2026) *BHP Operational review for the half year ended 31 December 2025*. 20 January 2026. Accessed at: https://www.bhp.com/-/media/documents/media/reports-and-presentations/2026/bhp-operational-review-for-the-half-year-ended-31-december-2025.pdf

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OZ Minerals (2017a) *Carrapateena Project Mining Lease Proposal and Miscellaneous Purposes Licence Management Plans*. May 2017. Version A. OZ Minerals, South Australia, Adelaide.

OZ Minerals (2017b) *Carrapateena Project Program for Environment Protection and Rehabilitation, Miscellaneous Purposes Licence 149, Airstrip, Workers' Accommodation Village and Ancillary Infrastructure*. August 2017.

OZ Minerals (2017c) *Carrapateena Project Mining Lease Proposal and Miscellaneous Purposes Licence Management Plans Response Document*. September 2017. Version A. OZ Minerals, South Australia, Adelaide.

OZ Minerals (2020) *Carrapateena Project Program for Environment Protection and Rehabilitation. ML 6471 Mineral Lease, MPL 149 Airstrip, Workers' Accommodation Village, Access Road and Ancillary Infrastructure, MPL 152 Western Infrastructure Corridor, MPL 153 Eastern Radial Wellfield, MPL 154 Southern Access Road and Radial Wellfield, MPL 156 Northern Wellfield, MPEPR2019/026*. February 2020. OZ Minerals, South Australia, Adelaide.

OZ Minerals (2023) *Carrapateena Operation PEPR Compliance Report 2022*. Issue date March 2023. Dated 31 March 2023. OZ Minerals, South Australia, Adelaide.

26 Abbreviations and units of measure

26.1 Definition of acronyms

Acronym	Expansion
ABA	acid base accounting
AMD	acid mine drainage
AN	ammonium nitrate
ANFO	ammonium nitrate fuel oil
BDSA	Biological Database of South Australia
CiO	Change in Operations
CQA	Construction Quality Assurance
CTP	Concentrate Treatment Plant
CY	calendar year
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEM	Department for Energy and Mining
DEW	Department for Environment and Water
DoEE	Australian Government's Department of the Environment and Energy (now DCCEEW)
DPTI	Department of Planning, Transport and Infrastructure (now Department for Infrastructure and Transport (DIT)
DSEP	Dam Safety Emergency Plan
EC	electrical conductivity
EMS	Event Management System
EPA	Government of South Australia's Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
ERML	Environmental Radiation Monitoring Location
FY	financial year
GLUP	Global Land Use Permit
HE	high explosives
ITP	Inspection and Test Plan
KAC	Kokatha Aboriginal Corporation
LEM	landform evolution model
LFA	landscape function analysis
LoM	life-of-mine
LPG	liquefied petroleum gas
Mining Act	*Mining Act 1971* (SA)
ML	Mining Lease
MPL	Miscellaneous Purposes Licence
MPP	mineral processing plant

Acronym	Expansion
MNES	matters of national environmental significance
NAF	non-acid forming
NEPM	National Environment Protection Measure
NGER Act	*National Greenhouse and Energy Reporting Act 2007* (Cth)
NPI	non-process infrastructure
NTMA	Native Title Mining Agreement
NVMP	Native Vegetation Management Plan
OMC	Outcome Measurement Criteria
OMS	Operations, Maintenance and Surveillance
PAF	potentially-acid forming
PCQ	Point Centred Quarter
PEPR	Program for Environment Protection and Rehabilitation
PIRSA	Department of Primary Industries and Regions, South Australia
PMC	Partnering Management Committee
PSD	particle size distribution
QA/QC	quality assurance/quality control
RFDS	Royal Flying Doctor Service
RL	Retention Lease
ROM	run-of-mine
SDS	safety data sheet
SEB	significant environmental benefit
SLC	sub-level cave
SWL	standing water level
THA	Tent Hill Aquifer
TOR	Terms of Reference
TSF	tailings storage facility
USG	Upper Spencer Gulf
WRD	waste rock dump
WWTP	wastewater treatment plant

26.2 Units of measure

Acronym	Expansion	Acronym	Expansion
$	Australian dollars(s)	m^2	square metre
US$	United States dollar(s)	m^3	cubic metres
%	percent	m	metre
µGy	microgray	mAHD	metres Australian Height Datum
cm	centimetre	mBGL	metres below ground level
d	day	ML	megalitre
dmt	dry metric tonne	mSv	millisieverts
g	gram	Mt	million tonnes
ha	hectare	pH	measure of acidity or basicity
kg	kilogram	s	second
kL	kilolitre	t	tonnes
km	kilometre	wt%	weight percentage
L	litre	w/w	weight per weight

Appendices

Appendix A Public liability insurance

STEIN INSURANCE COMPANY LIMITED

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Le Marchant Street
St Peter Port
Guernsey GY1 4JH
Telephone +44 (0) 1481 737100
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26 June 2025

To Whom It May Concern

Certificate of Placement – Public & Products Liability

This certificate is issued as a matter of information only and confers no rights upon the holder. It does not amend, extend or alter the coverage afforded by the policy/policies listed. It is issued as a summary only of the cover provided and is current only at the date of issue. For full particulars reference should be made to the current policy wording.

Named Insured:	BHP Group Limited and all subsidiary companies and all related and/or affiliated and/or controlled, managed, administered and associated companies or corporations (now existing or hereinafter acquired, formed or incorporated) and/or related joint ventures and/or partnerships and other entities named or described herein for their respective rights and interests.
Insurer(s):	Stein Insurance Co. – a Captive Insurance Company and wholly owned subsidiary of BHP Group Ltd currently rated A- by Standard & Poor's
Policy Number:	PL/0001/25
Period of Insurance:	1st July 2025 to 30th June 2026, both days inclusive, local standard time at the location of the property, operations or activities insured.
Interest Insured:	The Insurers will indemnify the Insured up to the Limit of Liability stated in the Schedule for all amounts which the Insured shall become legally liable to pay by way of compensation (including claimants' costs and expenses) for and/or arising out of Personal Injury (including death) and/or Property Damage occurring during the Period of Insurance in connection with the Business of the Insured and/or the Insured's Products and/or Completed Operations

STEIN INSURANCE COMPANY LIMITED

Including the Insured's Liability arising out of the ownership, possession or use by or on behalf of the Insured of any Automobile excluding claims which are the subject of statutory or similar legislation controlling the use of Automobiles for which the Insured is compelled to effect insurance

Situation and/or Premises: Anywhere in the world but the Insurers shall not be liable to pay any claim or indemnity hereunder to the extent that payment of such would expose the Insurers to any sanction, prohibition or restriction under any United Nations resolutions or any trade or economic sanctions, laws or regulations of any applicable jurisdiction.

Limit of Liability:

US$20,000,000 any one occurrence in respect of Public Liability

US$20,000,000 any one occurrence and in the annual aggregate in respect of Products Liability

US$20,000,000 any one occurrence and in the annual aggregate in respect of Medical Malpractice

US$20,000,000 any one occurrence and in the annual aggregate in respect of Professional Indemnity

Notice of Occurrence: The Insured shall promptly furnish the Insurers with all information available respecting any Claim, and the Insurers shall have the right to appoint adjusters, assessors or surveyors and to control all negotiations, adjustments and settlements in connection with such Claim, subject always to the terms and conditions of the policy wording.

All other terms and conditions as per the full policy wording.



Signed for and on behalf of
Stein Insurance Company
J. Stewart - Manager

Appendix B Exploration on ML 6471

Appendix B1 Exploration liabilities

Has Exploration, Exploration Rehabilitation, or Do Outstanding Exploration Liabilities Exist on the Mining Lease

Have any exploration activities been conducted during the current reporting period?	**No**/Yes	<If yes, complete all sections of form.>
Have rehabilitation activities been undertaken during the reporting period?	**No**/Yes	<If yes, complete all sections of form.>
Is there any outstanding rehabilitation from current or previous reporting periods to be undertaken?	**No**/Yes	<If yes, complete all sections of form.>
	If NO to all of above, no further information on exploration activities required.	

Appendix C

2025 Groundwater and Surface Water Monitoring Report

BHP

CARRAPATEENA OPERATION

2025 Groundwater and Surface Water Monitoring Report



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1 Introduction

The purpose of this report is to demonstrate compliance with Groundwater and Surface Water Outcome Measurement Criteria in accordance with MPEPR2025. This report will be submitted as an Appendix to the Program for Environment Protection and Rehabilitation (PEPR) Compliance Report 2025/011.

2 Surface water

2.1 Erosion and sedimentation

The Outcome Measurement Criteria (OMC) below relates to surface water sampling to monitor the potential for erosion and sedimentation downstream of the mine.

ID	Outcome Measurement Criteria	Result
Outcome Measurement Criteria – SWES1	Opportunistic surface water sampling and laboratory analysis (rising stage samplers or grab samples) at surface water sampling sites (SW01 to SW12, SW-1 to SW-7, SW-14 to SW-17, Gorge Spring and Euro Spring) at least once a year within seven days of a rainfall event required to create flows demonstrates water quality does not exceed the ANZECC/ARMCANZ (2000) Freshwater Guidelines or baseline ranges (whichever is greater); pH, EC, SS, and hydrocarbons).	Due to the significantly low rainfall experienced throughout the year, sampling was limited to three monitoring locations during the monitoring period in contrast to the 32 locations sampled in 2024. • Exceedances: Electrical conductivity (2).

Opportunistic surface water sampling is required at least once a year at surface water monitoring locations SW01 to SW12, SW-1 to SW-7, SW-14 to SW-17, Gorge Spring and Euro Spring (Figure 2). As a guideline, surface water collection is possible when rainfall intensity is >20 mm as this can induce overland & streamflow into ephemeral creek systems, tributaries, floodplains, culverts and dams.

No significant rainfall events greater than 20 mm were recorded throughout 2025 (the monitoring period). Monthly rainfall and evaporation is summarised in Table 1.

As an indication of the drought like conditions, rainfall was ~35% less than average in the region (based on Woomera records) and that recorded during 2024. Total rainfall for the reporting period was 123.0 mm, and the maximum daily rainfall at the TSF All Weather Station (AWS) was observed on 8 March 2025 of 18.6 mm. Total evaporation for the year was 3387.6 mm.

There was no recorded flow (m^3/s) or recorded stream height (m) at the South Eliza Creek Gauging Station which supports the below average rainfall reported across site.

The requirement for sampling within seven days of a rain event in March 2025 was not possible as no flow was created, and any pooled surface water from rainfall was rapidly dispersed due to evaporation, evapotranspiration and seepage. As a result no samples were submitted or analysed by a NATA accredited facility (Australian Laboratory Services). Three sites were opportunistically sampled for field parameters only, and this occurred at Salt Creek monitoring location SW08, and Bosworth Creek SW-6 & SW-15.

SW08 in Salt Creek was outside the Electrical Conductivity (EC) (µS/cm) guideline limits for ANZECC Freshwater (2000) but within baseline surface water quality range (Table 5).

Site SW-6 exceeded the ANZECC Freshwater guideline for EC. In the absence of a baseline range, both SW-6 and SW-15 aligns with pH & EC results obtained from neighbouring ephemeral creek systems (

Table 8).

There were no exceedances of suspended solids (SS) or hydrocarbons as no analysis was possible or undertaken.

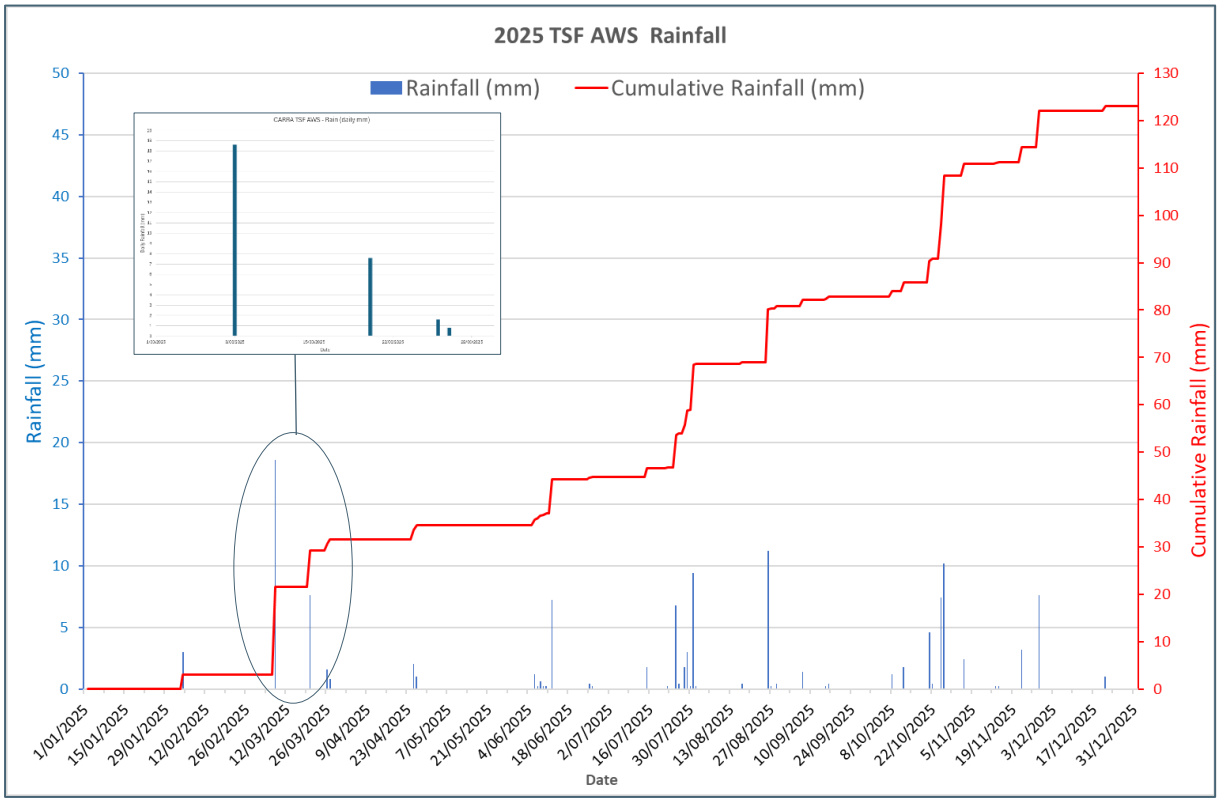


Figure 1: Carrapateena Rainfall TSF AWS – 2025

Table 1: Monthly Summary of Cumulative Rainfall & Evaporation 2025 (TSF AWS)

Month	Monthly Rainfall (mm)	Monthly Evaporation (mm)	Maximum Daily Rainfall Event (mm)
January	0	498.13	0
February	3	377.27	3
March	28.6	294.08	18.6
April	3	210.59	2
May	0	160.91	0
June	10.2	124.54	7.2
July	23.6	143.33	9.4
August	12.4	169.18	11.2
September	2	265.45	1.4
October	25.6	296.43	10.2
November	13.6	345.31	7.6
December	1	502.38	1
Total	123	3387.6	-

Variable	ANZECC / ARMCANZ (2000) Freshwater Guideline	Baseline range	SW05	SW06	SW07
No. of samples	-	-	0	0	0
pH (units)	6.5 – 9	-	-	-	-
EC (µS/cm)	100 – 5,000	-	-	-	-
Suspended solids (mg/L)	-	26 - 164	-	-	-
Hydrocarbons (>C10 - C40 fraction) (µg/L)	0	Not tested	-	-	-

Table 2: Water quality results from Eliza Creek monitoring locations

Table 3: Water quality results from SW02

Variable	ANZECC / ARMCANZ (2000) Freshwater Guideline	Baseline range	SW02
No. of samples	-	-	0
pH (units)	6.5 – 9	-	-
EC (µS/cm)	100 – 5,000	-	-
Suspended solids (mg/L)	-	26 – 164	-
Hydrocarbons (>C10-C40 fraction) (µg/L)	0	Not tested	-

Table 4: Water quality results from Salt Creek tributaries monitoring locations

Variable	ANZECC / ARMCANZ (2000) Freshwater Guidelines	Baseline range	SW01	SW03
No. of samples	-	-	0	0
pH (units)	6.5 – 9	7.6 – 10.3	-	-
EC (µS/cm)	100 – 5,000	265 – 24,800	-	-
Suspended solids (mg/L)	-	8 - 604	-	-
Hydrocarbons (>C10-C40 fraction) (µg/L)	0	Not tested	-	-

Table 5: Water quality results from Salt Creek monitoring locations

Variable (mg/L)	ANZECC / ARMCANZ (2000) Freshwater Guideline	Baseline range	SW08	SW09
No. of samples	-	-	1	0
pH (units)	6.5 – 9	7.6 – 10.3	8.76	-
EC (µS/cm)	100 – 5,000	265 – 24,800	8,340	-
Suspended solids (mg/L)	-	8 - 604	Not analysed	-
Hydrocarbons (>C10 - C40 fraction) (µg/L)	0	Not tested	Not analysed	-

Table 6: Water quality results from Salt Creek monitoring locations

Variable (mg/L)	ANZECC / ARMCANZ (2000) Freshwater Guideline	Baseline range	Euro Spring	Gorge Spring
No. of samples	-	-	0	0
pH (units)	6.5 – 9	7.6 – 10.3	-	-
EC (µS/cm)	100 – 5,000	265 – 24,800	-	-
Suspended solids (mg/L)	-	8 - 604	-	-
Hydrocarbons (>C10 - C40 fraction) (µg/L)	0	Not tested	-	-

Table 7: Water quality results from Yeltacowie Creek monitoring locations

Variable (mg/L)	ANZECC / ARMCANZ (2000) Freshwater Guideline	Baseline range	SW10	SW11	SW12
No. of samples	-	-	0	0	0
pH (units)	6.5 – 9	-	-	-	-
EC (µS/cm)	100 – 5,000	-	-	-	-
Suspended solids (mg/L)	-	25 - 350	-	-	-
Hydrocarbons (>C10 - C40 fraction) (µg/L)	0	Not tested	-	-	-

Table 8: Water quality results from Bosworth Creek monitoring locations

Variable (mg/L)	ANZECC / ARMCANZ (2000) Freshwater Guideline	Baseline range	SW-6	SW-15
No. of samples	-	-	1	1
pH (units)	6.5 – 9	-	8.82	9.0
EC (µS/cm)	100 – 5,000	-	8.56	2.27
Suspended solids (mg/L)	-	-	Not analysed	Not analysed
Hydrocarbons (>C10 -C40 fraction) (µg/L)	0	-	Not analysed	Not analysed

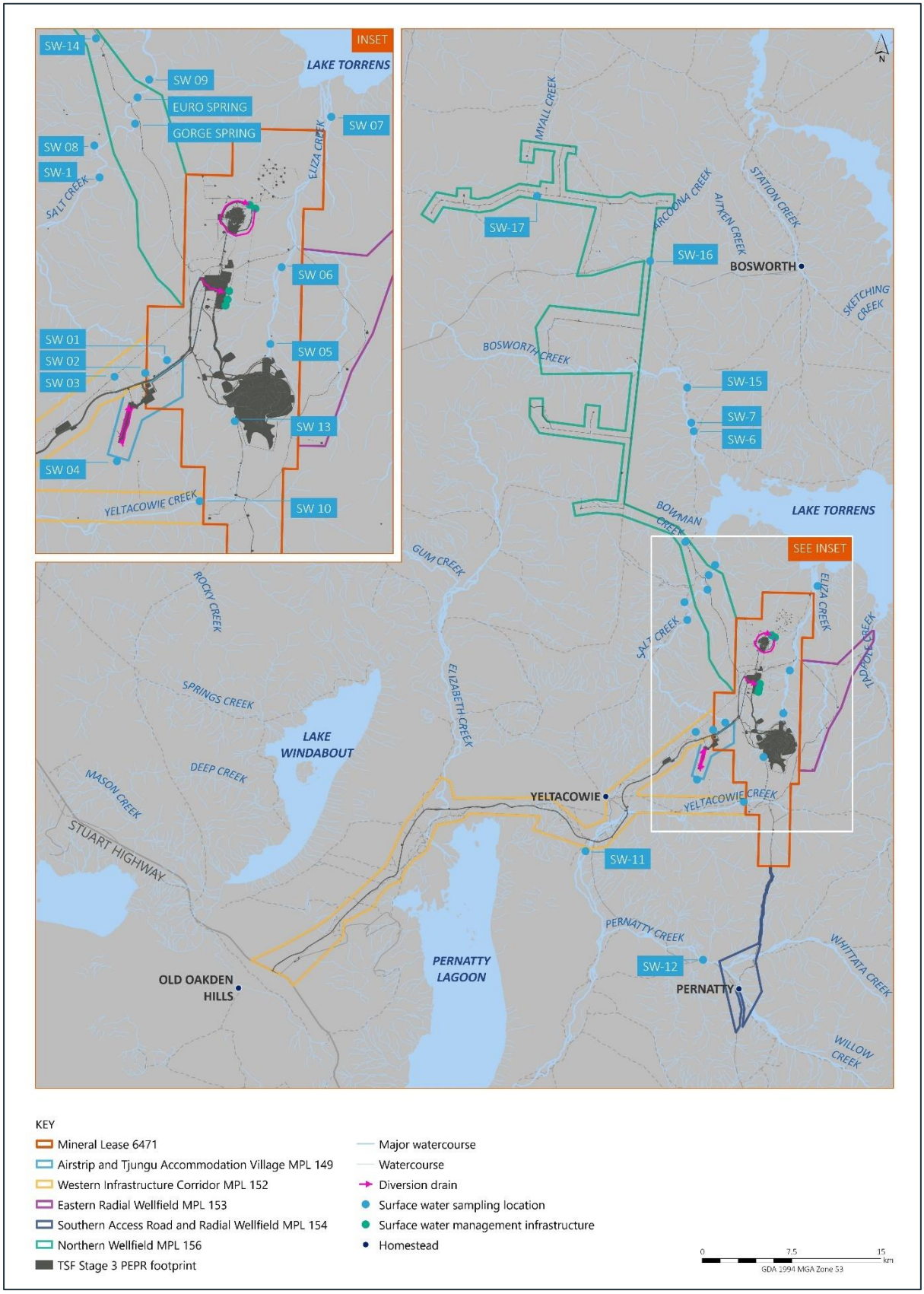


Figure 2: Carrapateena Surface Water monitoring locations (PEPR Figure 9.5)

2.2 Tailings storage facility

2.2.1 Shallow monitoring wells

The following OMCs relate to groundwater monitoring at shallow monitoring wells (TSFMB1s, TSFMB2s, TSFMB3s, TSFMB4s) downstream of the Tailings Storage Facility (TSF) to monitor the potential for shallow lateral seepage.

ID	Outcome Measurement Criteria	Result
Outcome Measurement Criteria – TSF1	Quarterly sampling of shallow monitoring wells downstream of the Tailings Storage Facility (TSFMB1s – TSFMB4s) and analysis of pH, Metals and EC demonstrates water quality does not exceed the ANZECC/ARMCANZ (2000) Freshwater Guidelines or baseline ranges (pH, EC and metals) whichever is greater.	TSFMB3s, EC, aluminium, barium, cobalt, copper, iron, strontium and uranium (Table 9) were above the ANZEC/ARMCANZ (2000) or baseline guidelines for shallow alluvial weather Proterozoic groundwater. TSFMB1s presented with first occurrence of obtainable groundwater in September 2025. TSFMB2s and TSFMB4s continue to present as dry and are unable to be sampled.
Outcome Measurement Criteria – TSF2	Quarterly monitoring of shallow monitoring wells downstream of the Tailings Storage Facility (TSFMB1s – TSFMB4s) demonstrates that the standing water levels are trending in accordance with modelled predictions and do not exceed the maximum predicted drawdown at each well.	Standing water level is not trending in accordance with modelled predictions at TSFMB3s and has exceeded maximum predicted increase in groundwater levels by ~7.5m. This is influenced by water levels and recharge by rainfall prior to TSF operation, and more recently heightened by lateral seepage. 2025 SWL increased by 1.87m to 107.573 mAHD. TSFMB1s presented with the first occurrence of measurable standing water level in September 2025 TSFMB2s and TSFMB4s continue to present as dry and are unable to be sampled.

ID	Outcome Measurement Criteria	Result
Outcome Measurement Criteria – TSF37	Quarterly sampling of shallow monitoring wells downstream of the Tailings Storage Facility (TSFMB1s – TSFMB4s) at the cessation of tailings discharge for a period of no less than one (1) year and analysis of pH, metals and EC demonstrates water quality does not exceed the ANZECC/ARMCANZ (2000) Freshwater Guidelines or baseline ranges (pH, EC and metals) whichever is greater.	Carrapateena is within an operational phase, this is a completion criterion and as such, is not currently addressed in this report.

Shallow monitoring wells downstream of the TSF were installed in April and May 2019 (TSFMB1s – TSFMB4s) (Figure 4). The wells screen the shallow alluvial sediments and quaternary aquifer at depths ranging from 14 to 46 metres below ground level (mBgl). At the time of installation, wells did not intercept the water table except for TSFMB3s.

Wells were also simulated in the groundwater model (OZ Minerals 2017a; MLP Appendix C3 Groundwater Modelling and Assessment of Effects) with modelled predicted head increases of between 1 to 11 m over 20 years. (CA-0000-ENV-REP-1044_Carrapateena PEPR 2025, Table 9.21 TSF monitoring well monitoring criteria). Standing water level at TSFMB3S is not trending in accordance with modelled predictions and has exceeded maximum predicted increase in groundwater levels by ~7.5m. SWL during 2025 increased by 1.87m to 107.573 mAHD, and this is influenced by TSF deposition and water levels increasing lateral seepage, hydrostatic loading and recharge by rainfall. TSFMB1s presented with the first occurrence of measurable standing water level of 103.008 mAHD in September 2025.

Quarterly sampling and laboratory analysis of the shallow monitoring wells as required by Outcome Measurement Criteria TSF1 occurred at TSFMB3s in all quarters throughout the monitoring period. TSFMB1s presented with the first occurrence of obtainable groundwater sample for quality analysis on 7 September 2025 and met the criteria for the last 2 quarters.

TSFMB3s analytical results indicate electrical conductivity, aluminium, cobalt, strontium, uranium and zinc were above the ANZEC/ARMCANZ (2000) or baseline guidelines for shallow alluvial weather Proterozoic groundwater (Table 9). Results for TSFMB1s exceeded electrical conductivity, barium, copper, iron, strontium, uranium and zinc. Both Wells had one exceedance of hydrocarbon in the C16-C34 fraction and will be monitored for anomalies in 2026.

Groundwater quality data demonstrates an increase in metals over baseline. This is due to lateral seepage and hydrostatic loading from deposition upstream of the TSF embankment and the unlined portion of the Decant Dam.

No baseline groundwater quality or standing water level (SWL) data was collected for dry wells TSFMB2s and TSFMB4s in 2025. Due to paucity of data, baseline comparisons in shallow TSF bores are limited. BHP continues to closely monitor TSFMB1s & TSFMB3s ensuring supernatant seepage is controlled from the TSF whilst better understanding the groundwater characteristics.

Measured groundwater levels of TSFMB1s & TSFMB3s are displayed in Figure 3, and groundwater quality is summarised in Tables 9 and 10.

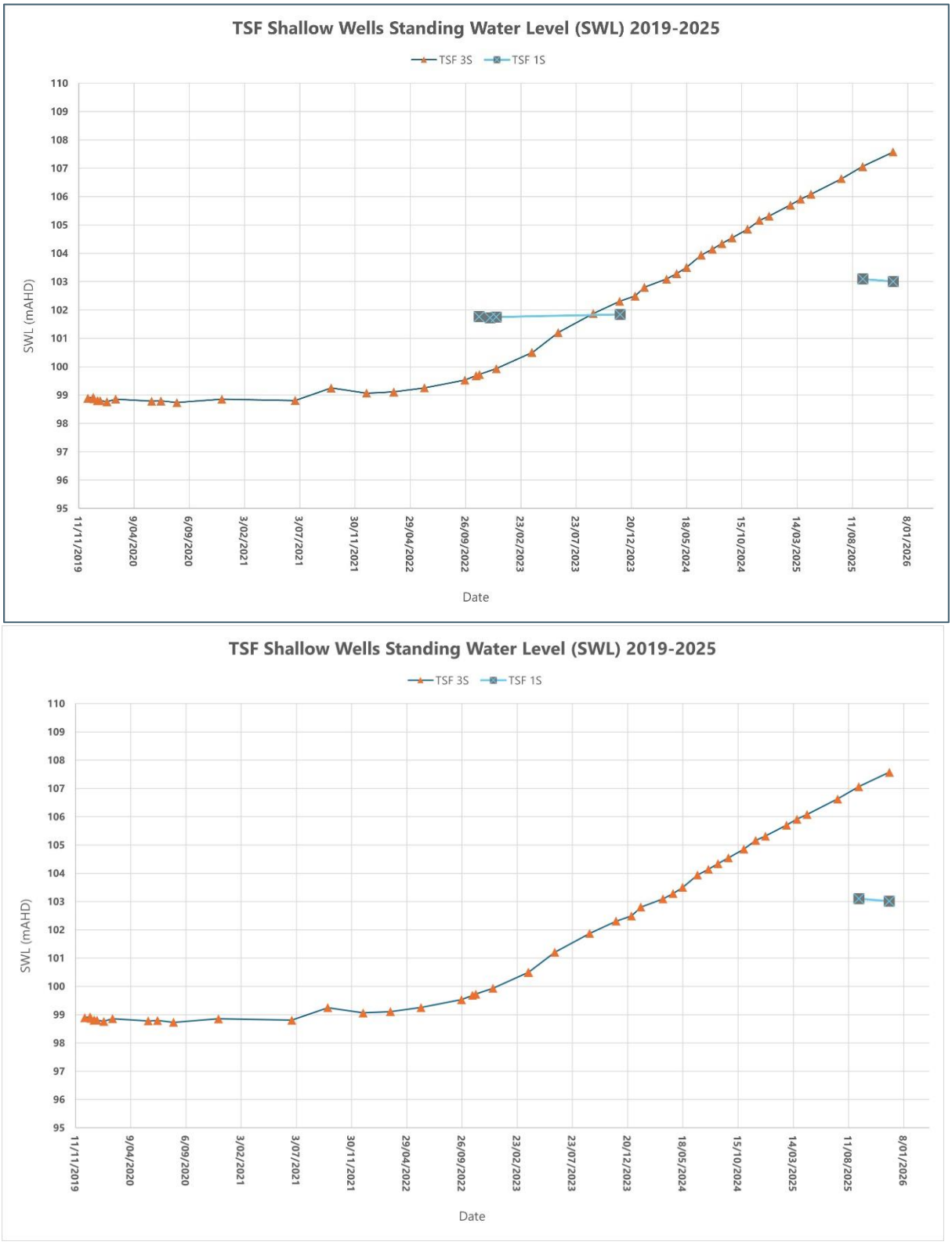


Figure 3: TSF Shallow Well Standing Water Level

Table 9: TSFMB1s shallow monitoring well groundwater quality data

Parameter	ANZECC / ARMCANZ (2000) Freshwater Guideline	Baseline data for shallow alluvial and weathered Proterozoic (HSU1)	TSFMB1s
No. of samples			2
pH	6.5 – 9	7.25 – 7.9	6.59 – 6.85
EC (µS/cm)	100 – 5,000	-	72,700 – 74,400
Suspended Solids	*no threshold*	-	588 – 1060
C10-C40 Fraction	0		<100 – 240*
Aluminium	-	0.02 – 3.33	0.07
Arsenic	0.024	-	<0.005
Barium	-	0.043 – 0.067	0.075 – 0.077
Cobalt	0.0028	0.001 – 0.003	<0.005
Copper	0.013	0.005 – 0.016	0.087
Iron	0.3	0.05 – 2.22	1.37
Lead	0.0034	0.001 – 0.004	<0.005
Manganese	1.9	0.073 – 0.091	0.041
Selenium	0.011	0.01 – 0.04	<0.005
Strontium	-	1.15 – 1.7	53 – 53.1
Uranium	0.0005	0.014 – 0.026	0.04 – 0.045
Zinc	0.008	0.046 – 0.69	0.037 – 0.061

*C16-C34 indicates (long chain, non-volatile hydrocarbon) potential oil and will be monitored into 2026.

Table 10: TSFMB3s shallow monitoring well groundwater quality data

Parameter	ANZECC / ARMCANZ (2000) Freshwater Guideline	Baseline data for shallow alluvial and weathered Proterozoic (HSU1)	TSFMB3s
No. of samples			7
pH	6.5 – 9	7.25 – 7.9	7.08 – 7.95
EC (µS/cm)	100 – 5,000	-	16,500 – 23,400
Suspended Solids	*no threshold*	-	<5
C10-C40 Fraction	0	-	<50 – 210*
Aluminium		0.02 – 3.33	<0.01
Arsenic	0.024	-	<0.001
Barium	-	0.043 – 0.067	0.014 – 0.019
Cobalt	0.0028	0.001 – 0.003	0.027 – 0.032

Parameter	ANZECC / ARMCANZ (2000) Freshwater Guideline	Baseline data for shallow alluvial and weathered Proterozoic (HSU1)	TSFMB3s
Copper	0.013	0.005 – 0.016	0.001 – 0.006
Iron	0.3	0.05 – 2.22	<0.05
Lead	0.0034	0.001 – 0.004	<0.001
Manganese	1.9	0.073 – 0.091	0.002 – 0.01
Selenium	0.011	0.01 – 0.04	0.01 – 0.02
Strontium	-	1.15 – 1.7	7.49 – 9.79
Uranium	0.0005	0.014 – 0.026	0.012 – 0.026
Zinc	0.008	0.046 – 0.69	0.033 – 0.346

*C16-C34 indicates (long chain, non-volatile hydrocarbon) potential oil and will be monitored into 2026.

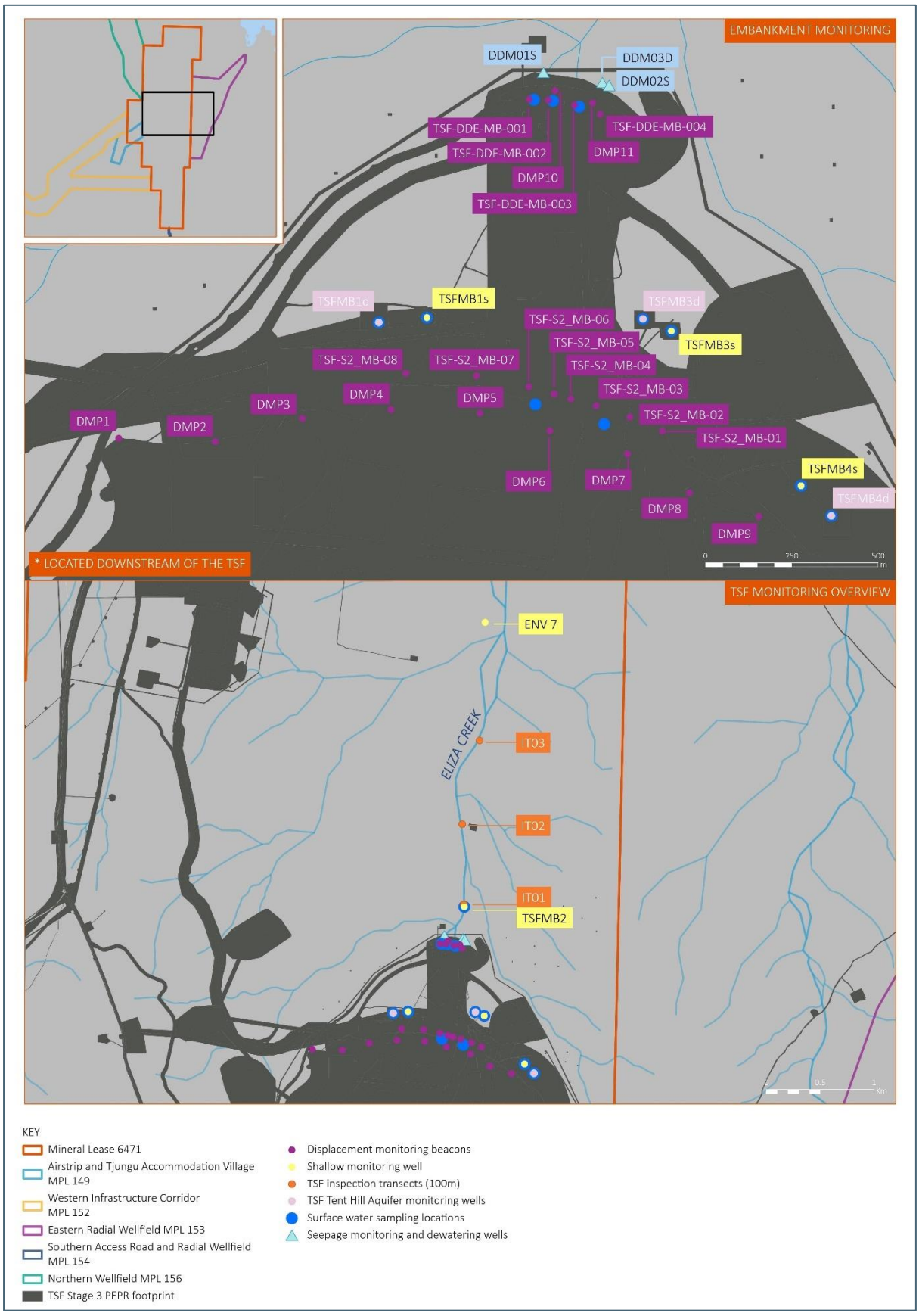


Figure 4: Tailings Storage Facility monitoring locations (PEPR Figure 9.6)

2.2.2 Surface water quality

The OMC below relates to surface water monitoring in Eliza Creek downstream of the TSF to monitor the potential for shallow lateral seepage.

ID	Outcome Measurement Criteria	Result
Outcome Measurement Criteria – TSF3	Opportunistic surface water sampling and laboratory analysis (rising stage samplers or grab samples) within Eliza Creek (SW05 – SW09) within seven days of a rainfall event required to create flows demonstrates water quality does not exceed the ANZECC/ARMCANZ (2000) Freshwater Guidelines or baseline ranges (pH, EC and metals) whichever is greater.	• No significant rainfall events greater than 20 mm, *resulting in no samples being available for analysis*

Outcome Measurement Criteria TSF3 states that opportunistic surface water sampling is required at Eliza Creek monitoring locations (SW05 – SW09) (Figure 2). As discussed in previous Groundwater and Surface Water Monitoring Reports, only sites SW05, SW06 and SW07 are reported under OMC TSF3 (Table 9) as SW08 and SW09 are within Salt Creek, not Eliza Creek.

Throughout the monitoring period surface water flow did not occur in South Eliza Creek, and as a result no samples were able to be collected from SW05, SW06 & SW07 (Table 11). It is noted there was a rainfall event in March 2025 however this was not significant enough to result in any pooling significant enough for sampling..

Quarterly drone surveillance inspections continued during 2025 within Eliza Creek (IT-01 to IT-03) to monitor vegetation impacts in the area.

Table 111: Surface water quality results from Eliza Creek monitoring locations

Variable	ANZECC / ARMCANZ (2000) Freshwater Guideline	Baseline Range	SW05	*SW06	SW07
No. of samples	-	-	0	0	0
pH (units)	6.5 – 9	-	-	-	-
EC (µS/cm)	100 – 5,000	397-491	-	-	-
Suspended solids	-	26 - 164	-	-	-
Hydrocarbons (>C10 -C40 fraction) (µg/L)	0	Not tested	-	-	-
Aluminium	-	0.72 – 1.67	-	-	-
Arsenic	0.024	0.002-0.004	-	-	-
Barium	-	0.095 – 0.11	-	-	-
Cobalt	0.0028	0.0005	-	-	-

Variable	ANZECC / ARMCANZ (2000) Freshwater Guideline	Baseline Range	SW05	*SW06	SW07
Copper	0.013	0.006-0.009	-	-	-
Iron	0.3	0.5 – 0.86	-	-	-
Lead	0.0034	0.0005-0.002	-	-	-
Manganese	1.9	0.018-0.072	-	-	-
Selenium	0.011	0.005	-	-	-
Strontium	-	0.12 - 0.157	-	-	-
Uranium	0.0005	0.12-0.157	-	-	-
Zinc	0.008	0.015 - 0.029	-	-	-

2.2.3 Sediment quality

The OMC below relates to sediment quality monitoring in Eliza Creek downstream of the TSF to monitor the potential for shallow lateral seepage.

ID	Outcome Measurement Criteria	Result
Outcome Measurement Criteria – TSF4	Annual sediment sampling and laboratory analysis for metals shall be undertaken within Eliza Creek (IT01 - IT03) and demonstrates sediments meet ANZECC/ARMCANZ (2000) Sediment Quality Guidelines or baseline ranges, whichever is greater.	All sites remain within the adopted Sediment Quality Guidelines, with results showing only slight elevations above the established baseline range.

Sediment sampling was undertaken at sites IT01, IT02 & IT03 within Eliza Creek in March 2025 (Figure 2) with one sample collected and analysed for each site. Sediment quality results for contaminants of interest are presented in Table 122. Metals concentrations for all sites are within the relevant ANZECC trigger values.

Table 12: Baseline sediment quality results for Eliza Creek

Total Metals (mg/kg)	Baseline range (mg/kg dry weight)[1]	ANZECC / ARMCANZ (2000) Sediment Quality Guidelines		CSIRO revision of ANZECC / ARMCANZ (2000) Guideline[4]		2025 monitoring results (mg/kg)		
		ISQG-Low (Trigger Value)[2]	ISQG-High[3]	Guideline Value	SQG-High	IT01	IT02	IT03
Cadmium	<0.1	1.5	10	1.5	10	<0.1	<0.1	<0.1
Chromium	8.6 – 10.7	80	370	80	370	11.5	16.2	13.4

Total Metals (mg/kg)	Baseline range (mg/kg dry weight)[1]	ANZECC / ARMCANZ (2000) Sediment Quality Guidelines		CSIRO revision of ANZECC / ARMCANZ (2000) Guideline[4]		2025 monitoring results (mg/kg)		
		ISQG-Low (Trigger Value)[2]	ISQG-High[3]	Guideline Value	SQG-High	IT01	IT02	IT03
Copper	5.8 – 7.6	65	270	65	570	11.5	14	13
Lead	4.6 - 8	50	220	50	220	4.3	6.5	6.5
Silver	<0.1 – 0.1	1	3.7	1.0	4.0	-	-	-
Zinc	14 – 20.2	200	410	200	410	20.4	29.2	25.8
Uranium	0.1 – 0.2	-	-	-	-	0.1	0.3	0.2

[1] Baseline ranges taken from 2019 results for IT01 – IT03
[2] ANZECC/ARMCANZ (2000); interim sediment quality guideline (ISQG) – lowest effect value
[3] ANZECC/ARMCANZ (2000); ISQG – median effect value
[4] Simpson SL et al (2013); revision of ANZECC/ARMCANZ Sediment Quality Guidelines

2.2.4 Acid and metalliferous drainage

The OMC below relates to surface water monitoring in Eliza Creek downstream of the TSF (SW06, SW07 and SW09) to monitor the potential for acid and metalliferous drainage.

ID	Outcome Measurement Criteria	Result
Outcome Measurement Criteria – AMD1	Opportunistic surface water sampling and laboratory analysis (rising stage samplers or grab samples) within Eliza Creek (SW05, SW06 and SW07) at least once a year within seven days of rainfall event required to create flows demonstrates water quality does not exceed the ANZECC/ARMCANZ (2000) Freshwater Guidelines or baseline ranges (pH, EC and metals), whichever is greater.	Throughout the monitoring period surface water flow did not occur in Eliza Creek therefore no samples were available for analysis.

3 Groundwater

3.1 Tailings storage facility

3.1.1 Groundwater quality

The OMC below relates to groundwater quality monitoring of Tent Hill Aquifer (THA) wells downstream of the TSF (TSFMB1d, TSFMB3d & TSFMB4d).

ID	Outcome Measurement Criteria	Result
Outcome Measurement Criteria – GW1	Quarterly sampling of Tent Hill Aquifer Wells downstream of the Tailings Storage Facility (TSFMB1d, TSFMB3d and TSFMB4d) demonstrates water quality are within the site groundwater baseline composition ranges.	• Electrical Conductivity for TSFMB1d remains above baseline with a maximum EC of 97,200 uS/cm recorded. • TSFMB3d & 4d EC consistent & stable with Baseline. • TSFMB1d multiple exceedances of Water Chemistry. • TSFMB3d & 4d negligible exceedances of Water Chemistry.

Groundwater monitoring wells TSFMB1d, TSFMB3d & TSFMB4d were installed in May 2019 for the purpose of monitoring the potential for vertical & lateral seepage of tailings solutes to the underlying aquifer. Baseline groundwater quality data was recorded following well installation in September 2019 and throughout 2020.

During the reporting period Electrical Conductivity within TSFMB1d reached EC 97,200 uS/cm. At ~triple concentration, likely from leakage from beneath the TSF embankment. TSFMB3d & 4d EC remain consistent & stable with Baseline.

TSFMB1d multiple exceedances of water chemistry including Al, Co, Cu, Fe, Pb, Mn, Sr and U.

TSFMB3d & 4d negligible exceedances of water chemistry including Al and Fe.

Water quality results for contaminants of interest from the baseline groundwater composition (PEPR Table 9.22) is presented in Table 13 for sampling completed during the reporting period.

Table 13: TSF monitoring wells groundwater quality data

Parameter* (mg/L)	Tent Hill Aquifer Baseline**	TSFMB1d, TSFMB3d, TSFMB4d Baseline***	TSFMB1d Monitoring Bore	TSFMB3d Monitoring Bore	TSFMB4d Monitoring Bore
No. Of Samples	-	-	8	7	7
pH	6.31 – 8.05	7.44 – 7.88	6.62 - 7.68	6.88 - 7.83	6.78 - 7.91
EC (uS/cm)	-	-	73,600 – 97,200	29,300 – 39,100	29,300 – 38,300
TDS (mg/L)	12,900 – 33,500	22,000 – 24,100	50,400 – 76,500	22,500 – 28,600	19,300 – 27,700
Aluminium	0.01 – 0.02	<0.01	<0.05 - 0.07	<0.05 - 0.16	<0.05 - 0.06
Arsenic	-	-	<0.005 - 0.129	0.02 - 0.064	0.01 - 0.063
Barium	0.025 – 0.161	0.027 – 0.030	0.06 - 0.077	0.03 - 0.035	0.023 - 0.028
Cobalt	0.001 – 0.0029	<0.001 – 0.001	0.017 - 0.023	<0.005	<0.005
Copper	0.001 – 0.013	<0.001	<0.005 - 0.022	<0.005 - 0.009	<0.005 - 0.009
Iron	0.05 – 5.58	<0.05	1.93 - 9.67	4.5 - 9.06	7.4 - 10.2
Lead	0.0005 – 0.004	<0.001	<0.005 - 0.009	<0.005	<0.005
Manganese	0.192 – 1.03	0.629 – 0.690	3.2 - 3.7	0.856 - 0.943	0.889 - 0.949
Selenium	0.01 – 0.02	<0.01	<0.021 - <0.10	<0.021 - <0.05	<0.021 - <0.05
Strontium	15.6 – 25.7	20.5 – 20.9	48.1 - 56.5	21.7 - 25.7	20.5 - 23.7
Uranium	0.005 – 0.016	<0.001 – 0.006	0.033 - 0.036	<0.005	<0.005
Zinc	0.005 – 0.636	<0.005	0.029 - 0.049	<0.026 - 0.04	<0.026

* Sub-set of parameters (predominantly metals) from PEPR Table 9.22.

** As presented in PEPR Table 9.22 – Baseline concentrations based on two sampling rounds from the THA beneath the Mineral Lease (19 wells)

*** Baseline concentrations based on one round of sampling from TSFMB1d, TSFMB3d, TSFMB4d (formerly referred to as THA1 to THA3)

3.1.2 Standing water levels

The OMC below relates to groundwater levels monitoring of THA wells downstream of the TSF Embankment (TSFMB 1d, TSFMB3d and TSFMB4d).

ID	Outcome Measurement Criteria	Result
Outcome Measurement Criteria – GW2	Quarterly monitoring of Tent Hill Aquifer monitoring wells downstream of the Tailings Storage Facility (TSFMB1d, TSFMB3d and TSFMB4d) demonstrates that the standing water levels are trending in accordance with modelled predictions and do not exceed maximum predicted drawdown at each well.	• All three wells have elevated standing water levels (SWL) than the previous reporting period suggesting hydraulic loading of the THA aquifer in the immediate vicinity of the TSF. • SWLs do not align with modelled predictions.

Figure 5 to Figure 7 presents the standing water level data in comparison to the predicted head for THA wells TSFMB1d, TSFMB3d and TSFMB4d.

The SWL recorded at all three bores is higher than the groundwater modelled prediction ,and groundwater pressure head continued to rise in elevation (mAHD) over the reporting period. These observations support findings of hydraulic loading on the THA aquifer in the immediate vicinity of the TSF:

- TSFMB1d gained 2.667 m to 88.16 mAHD (Figure 5).
- TSFMB3d increased 3.07 m to 83.665 mAHD (Figure 6).
- TSFMB4d increased 3.926 m to 89.073 mAHD (Figure 7).

The models used for groundwater have been updated with observed seepage rates. The outcomes of the updated modelling demonstrate that the relevant environmental outcomes can be achieved and provide updated predictions for Leading Indicators and OMC in terms of observed groundwater response. This will be presented in the future PEPR.

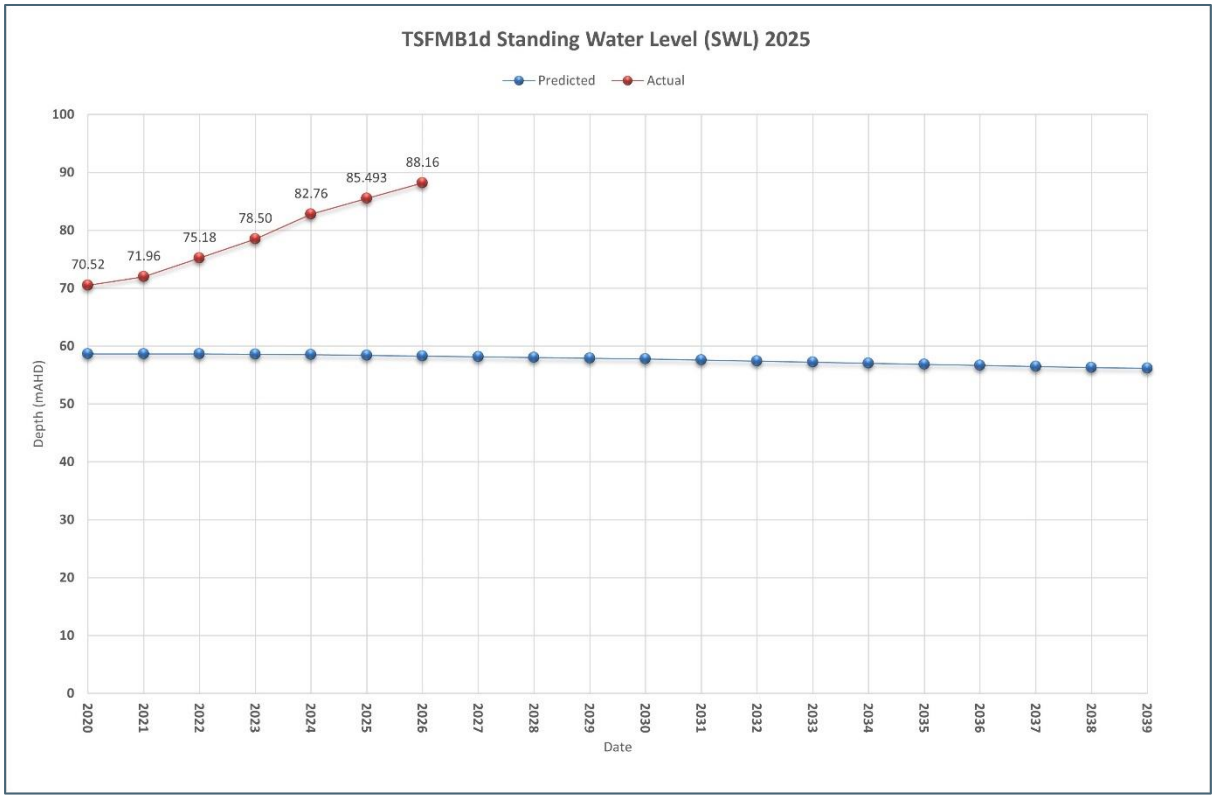


Figure 5: Predicted vs actual standing water levels for TSFMB1d

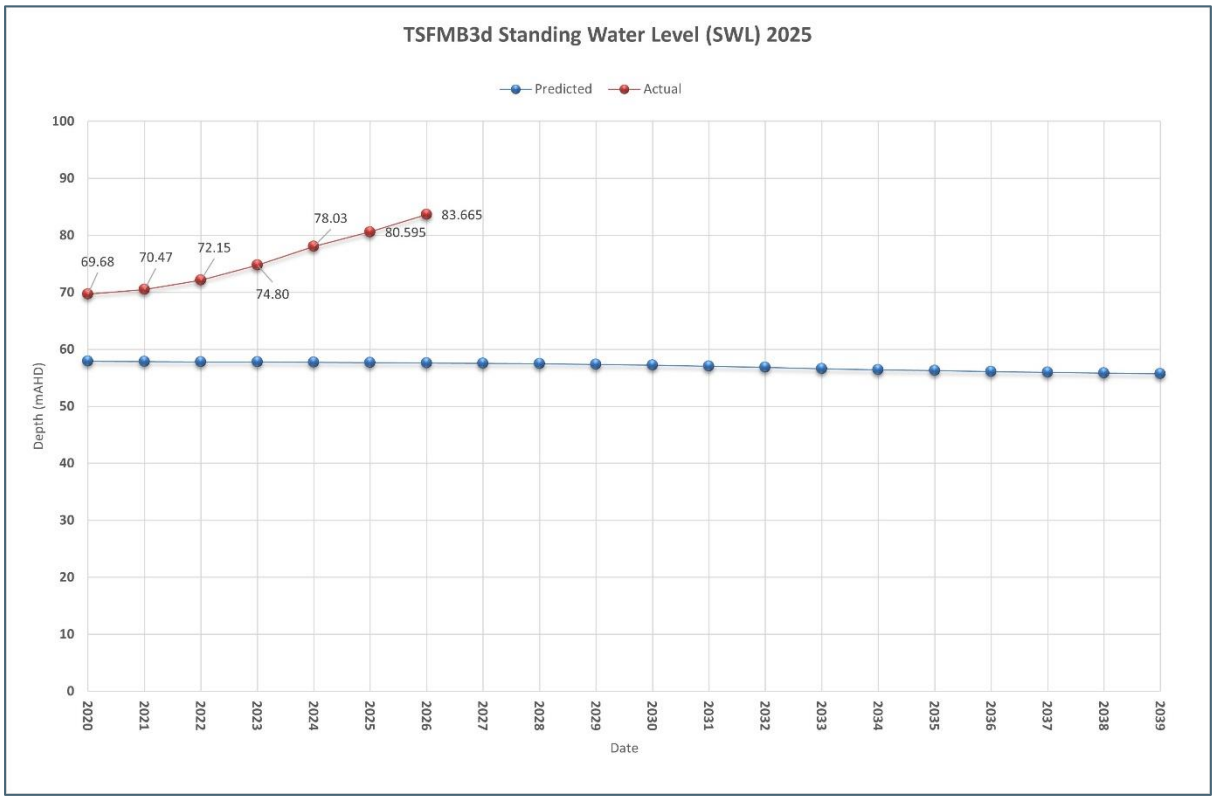


Figure 6: Predicted vs actual standing water levels for TSFMB3d

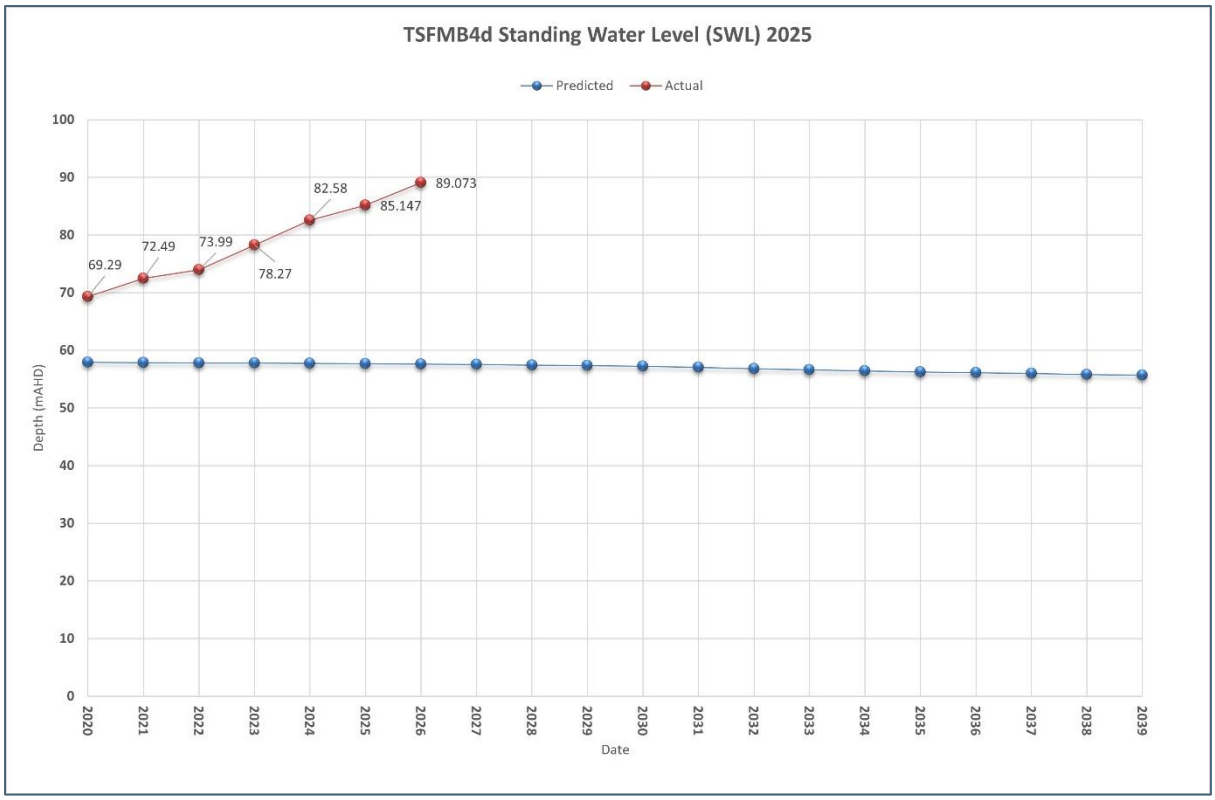


Figure 7: Predicted vs actual standing water levels for TSFMB4d

3.2 Drawdown

3.2.1 Compliance groundwater levels

The OMC below relates to regional groundwater level monitoring at compliance wells (Figure 14) to monitor groundwater drawdown.

ID	Outcome Measurement Criteria	Result
Outcome Measurement Criteria – GW3	Quarterly monitoring of groundwater compliance monitoring wells in the groundwater model (MS2, MS3, MD3, ENV S2 and ENV W3) demonstrates that the standing water levels are trending in accordance with modelled predictions and do not exceed the maximum predicted drawdown at each well. Quarterly monitoring of groundwater compliance monitoring wells not simulated in the groundwater model (ENV N4, ENV N8) demonstrate no evidence of a trend in standing water levels over three consecutive quarters.	• Stable groundwater levels observed in all Compliance Wells.

The seven groundwater compliance wells consist of five wells simulated in groundwater modelling (ENV S2, ENV W3, MS2, MS3, MD3) and two wells not simulated in modelling (ENV N4 and ENV N8).

Outcome Measurement Criteria GW3 was compliant in 2025. Compliance with this OMC is assessed through comparison of groundwater model predicted standing water levels against actual during the reporting period. The predicted SWL is based on the predicted head (mAHD) that was simulated in the original Groundwater modelling and assessment of effects report (CDM Smith, 2018) which is also presented in Table 9.20 within MPEPR2024/009 (BHP, 2024). The converted SWL is based on predicted head (mAHD) that was corrected to reflect actual site conditions and terrain at Carrapateena. This survey was undertaken after the original groundwater model was developed and the corrected values have not yet been updated in the current PEPR. Predicted standing water levels with accurate survey data will be incorporated in the latest groundwater model and updated in the future PEPR

Groundwater levels at ENV S2 and ENV W3 continue to demonstrate negligible drawdown (Figure 8 and Figure 9) and groundwater levels remain similar to that reported at well construction.

Groundwater levels at MS2 are now trending in accordance with drawdown as per the predicted hydrograph (Figure 10).

The groundwater level at MS3 is demonstrating drawdown less than predicted. Stable groundwater levels were recorded throughout 2025 (Figure 11). Groundwater level at MD3 is demonstrating a similar rate of drawdown against modelled predictions (Figure 12).

Predicted groundwater levels for ENV N4 and ENV N8 are un-simulated in the model (Figure 13). Neither well demonstrated evidence of a declining trend due to mining activities, and SWL remains stable.

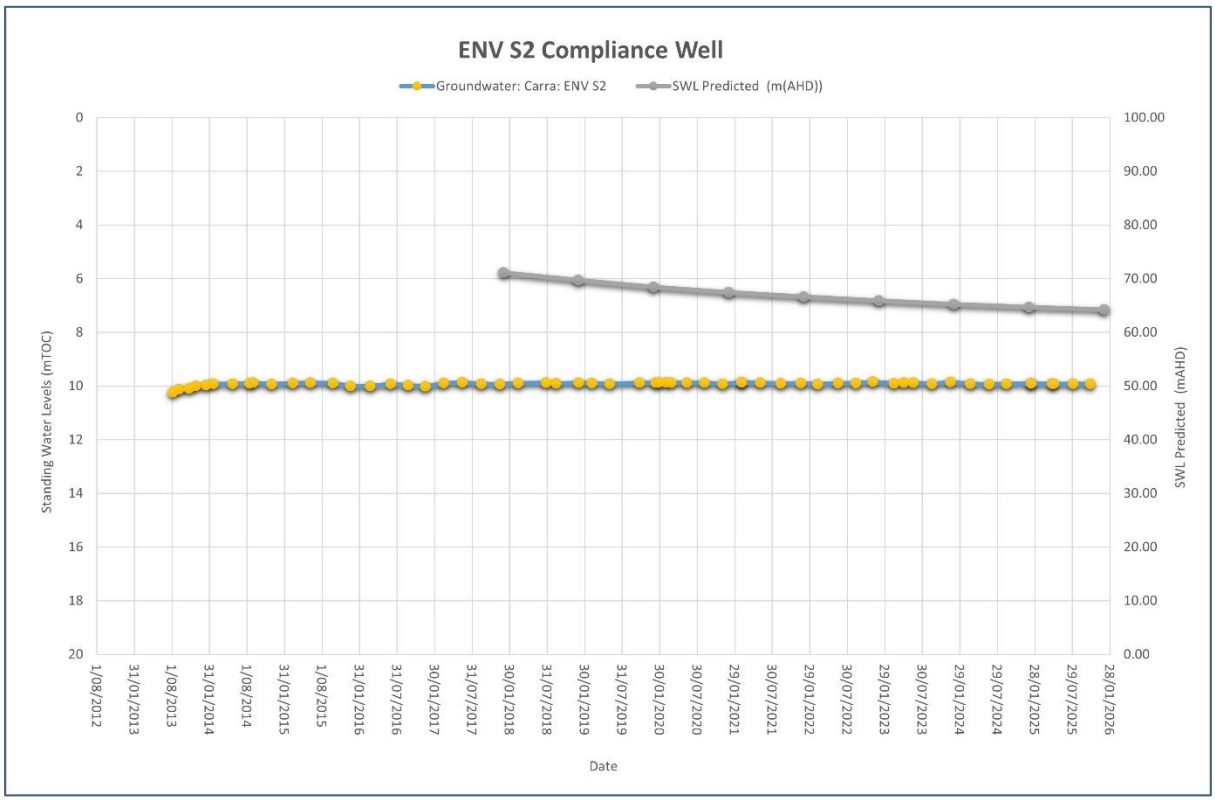


Figure 8: Standing water level for Compliance Well ENV S2

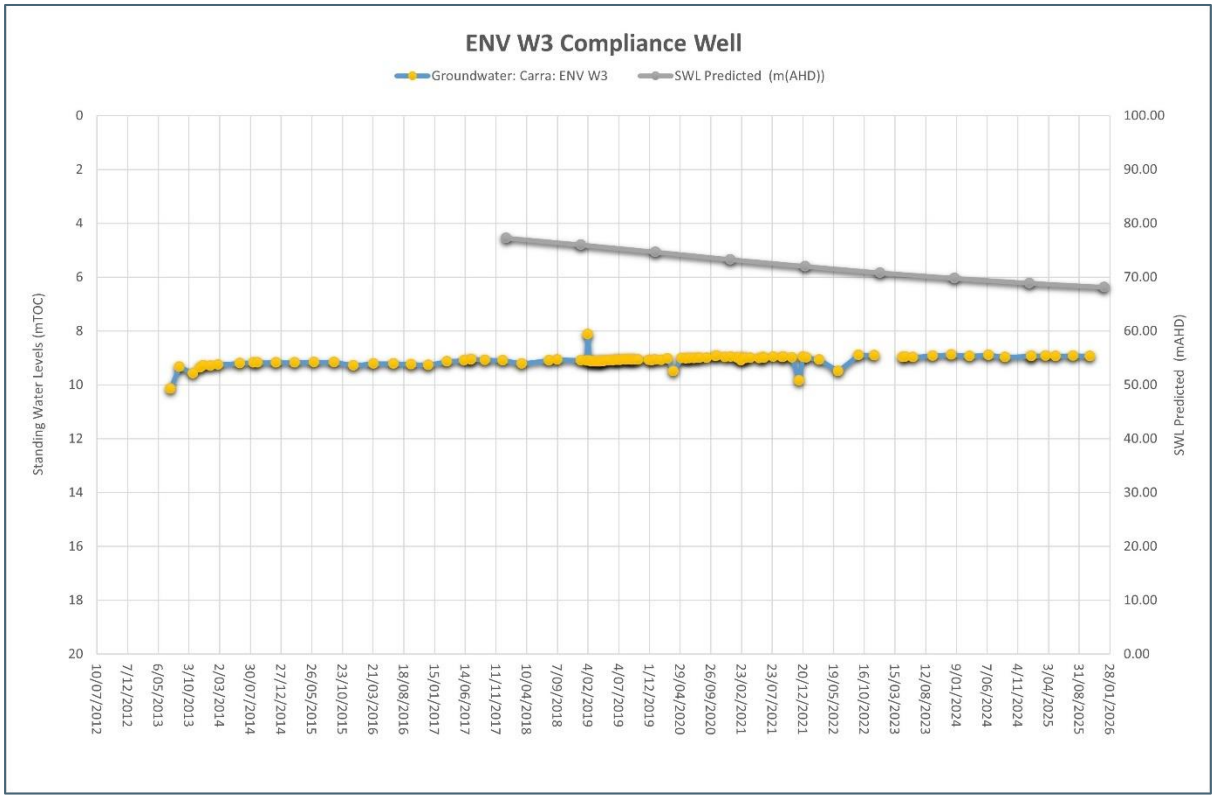


Figure 9: Standing water level for Compliance Well ENV W3

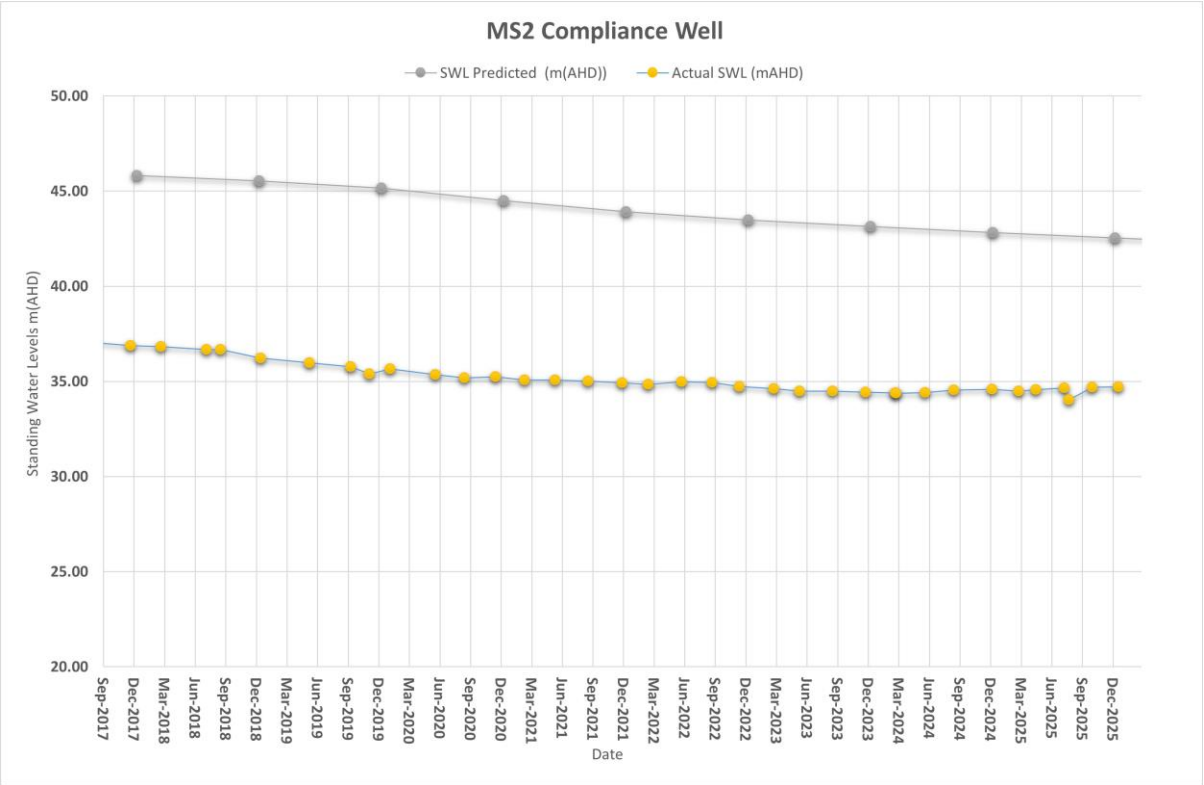


Figure 10: Standing water level for Compliance Well MS2

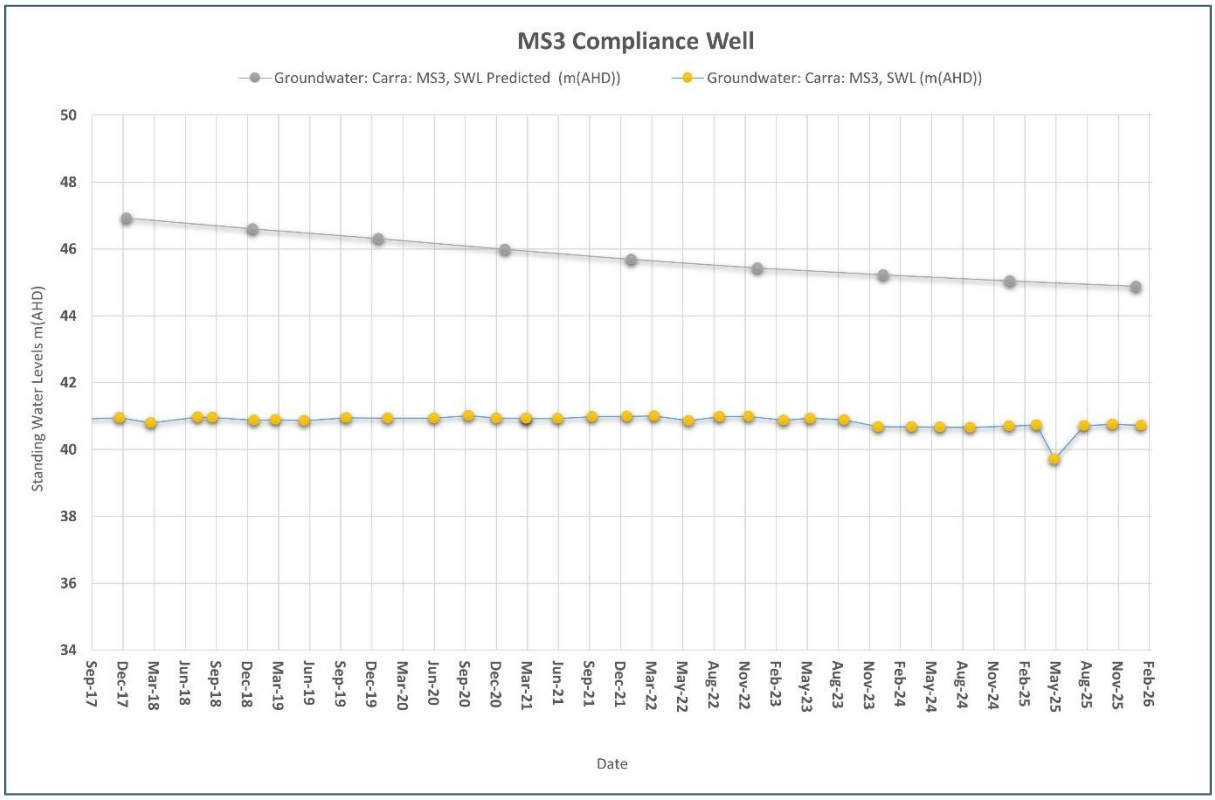


Figure 11: Standing water level for Compliance Well MS3

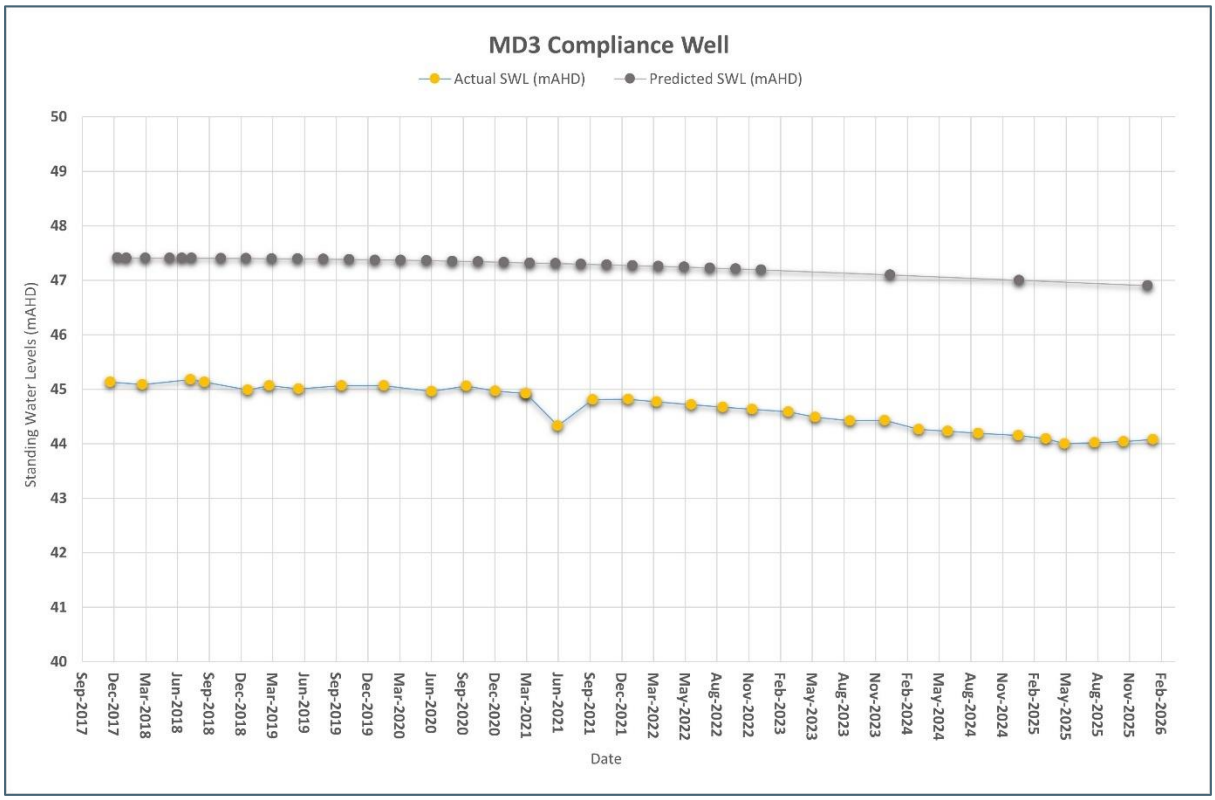


Figure 12: Standing water levels for Compliance Well MD3

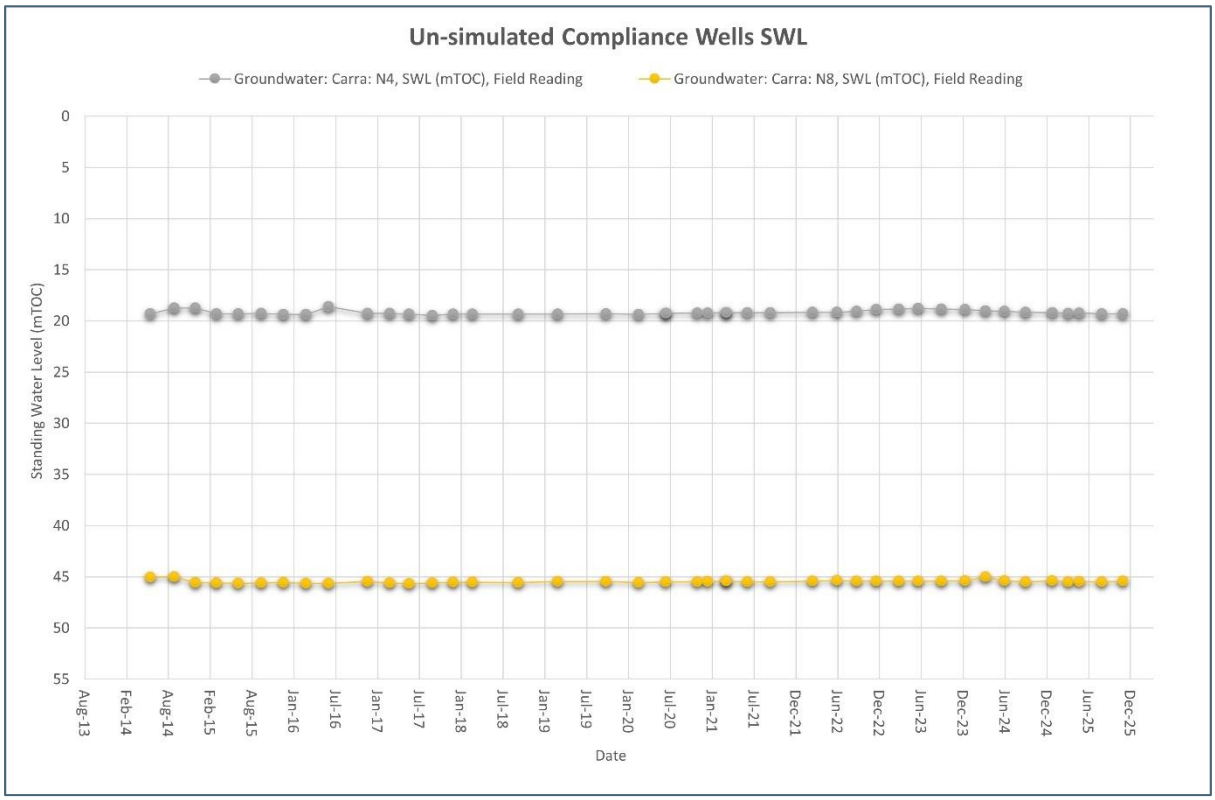


Figure 13: Standing water levels for Compliance Wells ENV N4 & ENV N8

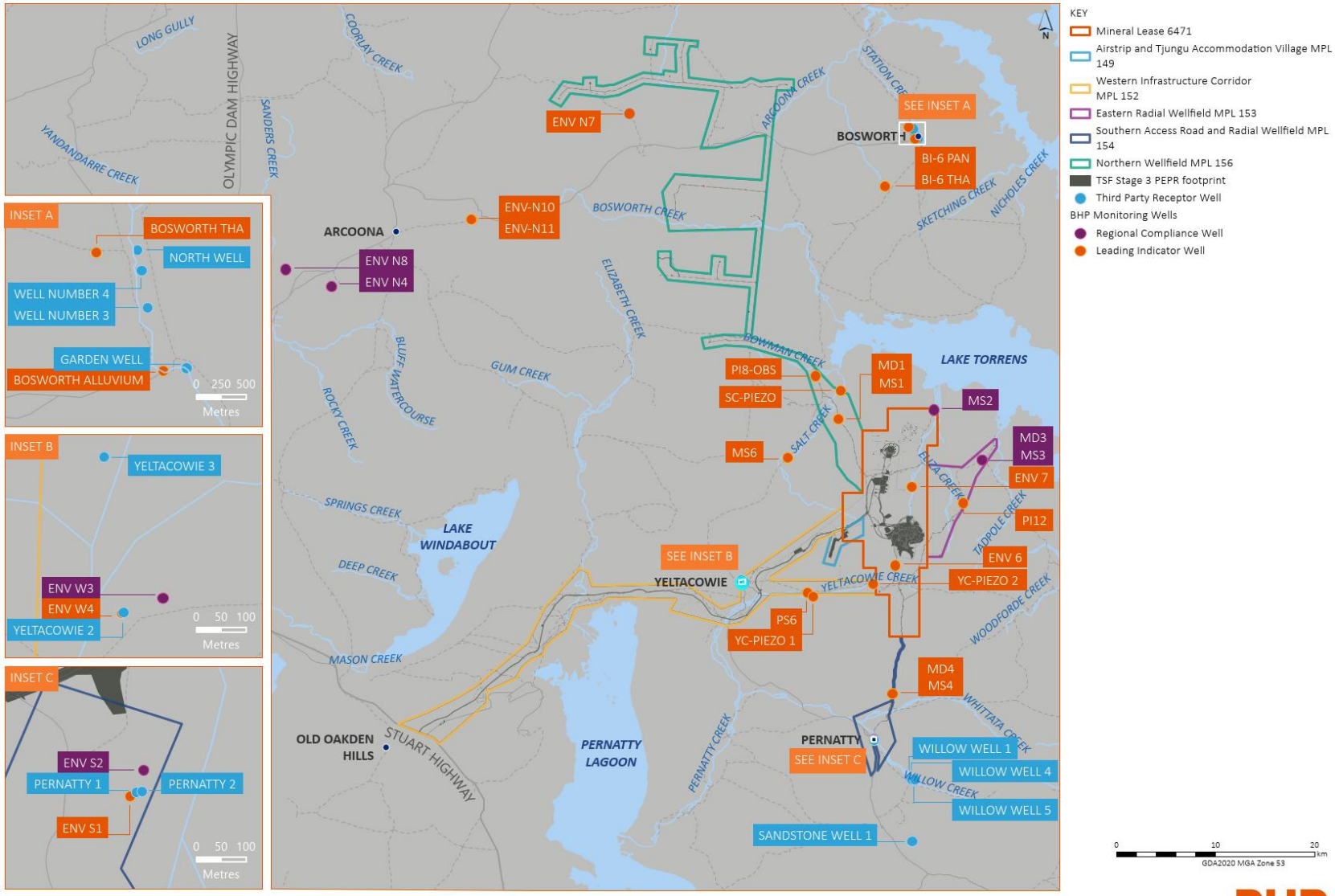


Figure 14: Groundwater compliance monitoring wells (MS2, MS3, MD3, ENV S2 and ENV W3) (PEPR Figure 9.8)

3.2.2 Leading Indicator groundwater levels

The Leading Indicator below relate to regional groundwater level monitoring at leading indicator wells to monitor groundwater drawdown.

ID	Outcome Measurement Criteria	Result
Leading Indicator – GW5	Quarterly monitoring of groundwater leading indicator monitoring wells simulated in the groundwater model demonstrates that standing water levels are trending in accordance with modelled predictions and do not exceed the maximum predicted drawdown at each well. Quarterly monitoring of groundwater leading indicator monitoring wells not simulated in the groundwater model shows no evidence of a trend in standing water levels over three consecutive quarters.	All leading indicator wells met the quarterly monitoring requirements of OMC GW5 during the monitoring period. In 2025, all wells were trending in accordance with modelled predictions and did not exceed maximum predicted drawdown.

Groundwater leading indicator wells comprise the following: ENV 6, ENV 7, ENV S1, ENV W4, MS4, MD4, PS6, MS6, YC Piezo 1, YC Piezo 2, SC Piezo, PI12, MS1, MD1, PI8-Obs, BI-6 THA, BI-6 PAN, ENV N-10, ENV N-11, Bosworth THA and Bosworth Alluvium. SC-Piezo, YC-Piezo 1 and YC-Piezo 2 could not be monitored due to the piezometers being dry, all other leading indicator wells were monitored quarterly throughout 2025 which fulfills the quarterly monitoring requirement of Leading Indictor GW5.

Results are displayed in Figure 15 to Figure 256 and include an actual SWL, predicted SWL and a converted SWL. The predicted SWL is based on the predicted head (mAHD) that was simulated in the original Groundwater modelling and assessment of effects report (CDM Smith, 2018) which is also presented in Table 9.20 within MPEPR2025/011 (BHP, 2025). The converted SWL is based on predicted head (mAHD) that was corrected to reflect actual site conditions and terrain at Carrapateena. This survey was undertaken after the original groundwater was developed and the corrected values have not yet been updated in the current PEPR. Predicted standing water levels with accurate survey data will be incorporated in the latest groundwater model and updated in a future PEPR.

A summary of the results from the monitoring period is included below:

- ENV 6 (Figure 15) monitors the Tent Hill Aquifer to the south of the mine. The well is indicating a gradual drawdown and aligns with predicted.
- ENV 7 (Figure 16), which intercepts the shallow alluvium aquifer, exhibits a continued & minor drawdown trend. This drawdown trend remains less than predicted.
- MS4 (Figure 17), intercepting the THA, continued to exhibit stable head and within the modelled prediction.
- The rate of change for drawdown observed at MD4 (Figure 18) continues with in trend with the predicted model.

- PS6 and PI8-Obs showed no major deviation from modelled predictions with water levels closely following those simulated (Figure 19 & Figure 24). SWL for PS6 was marginally below the predicted level in 2025.
- MS6 (Figure 20) aligns similarly to the corrected prediction.
- PI12 and MS1 wells indicate a drawdown rate exceeding the modelled predictions. Both wells have current SWL marginally below the predicted levels for 2025 (Figure 21 and Figure 22).
- MD1 (Figure 23) remains stable with a current SWL significantly higher when compared to the predicted level. Drawdown remains stable and continues a downward trend at a reduced rate compared to the modelled drawdown.
- Leading indicator wells BI-6 THA, ENV N-10 and Bosworth THA which un-simulated in the numerical groundwater model (Figure 25) showed no evidence of a declining trends in SWLs due to operations.
- ENV N-11 standing water level increased ~0.6 m in 2025 (Figure 25).
- ENV S1 at Pernatty Homestead remained steady during 2025 (Figure 25).
- ENV W4 at Yeltacowie Homestead is a Shallow Alluvial completed well and demonstrates unconfined response to rainfall and pastoral pumping activities. Depth to water is stable (Figure 256).

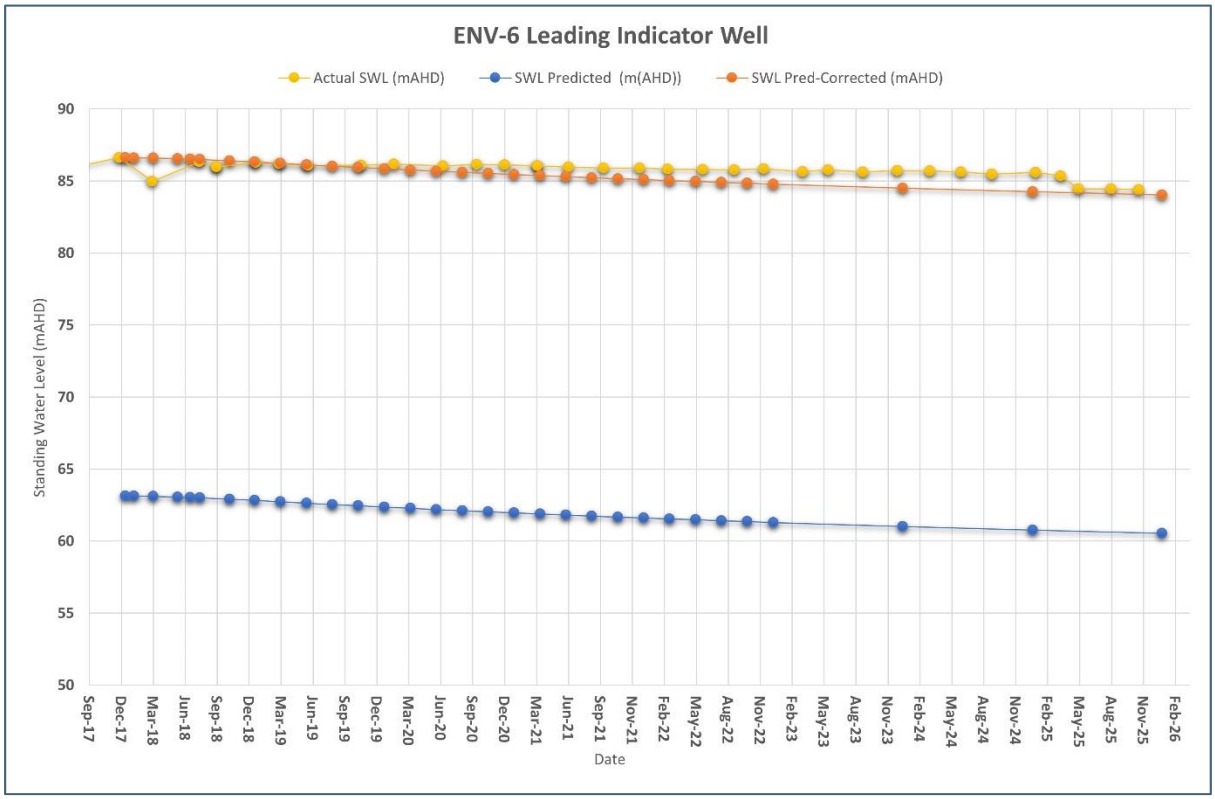


Figure 15: Standing water level for Leading Indicator Well ENV 6

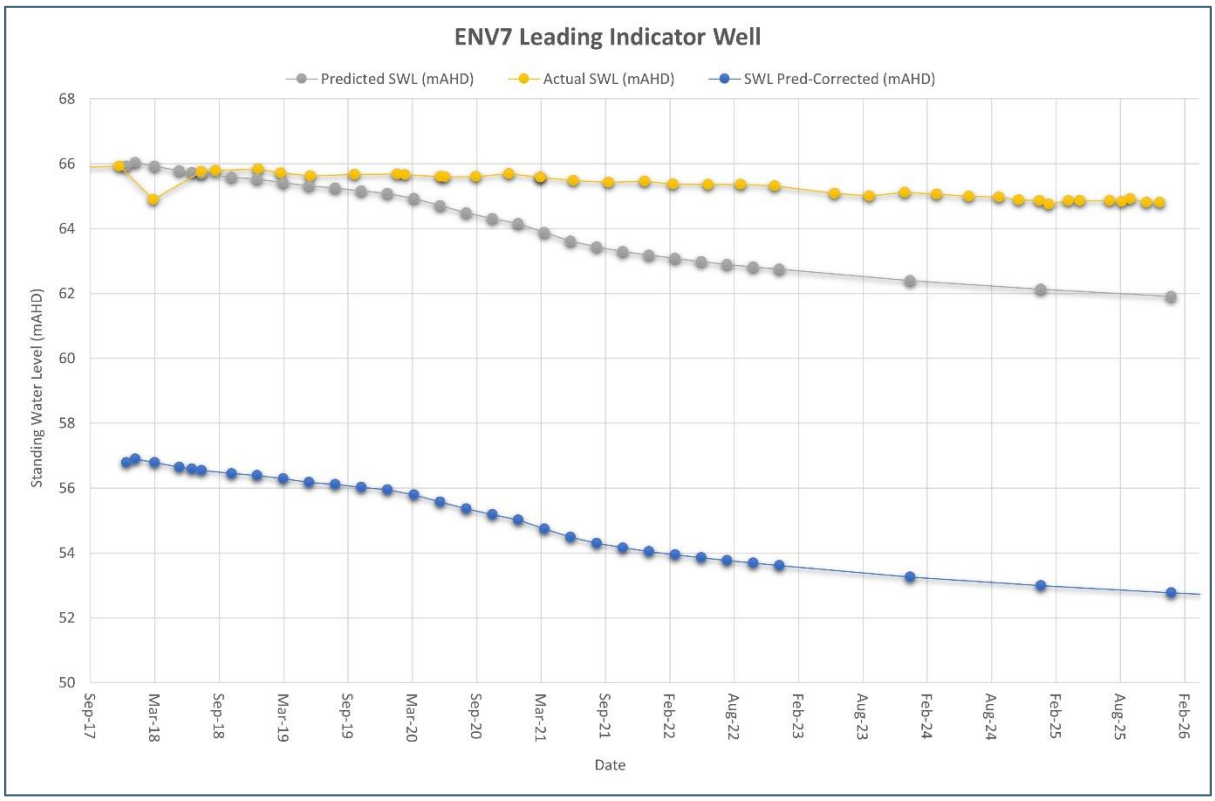


Figure 16: Standing water level for Leading Indicator Well ENV7

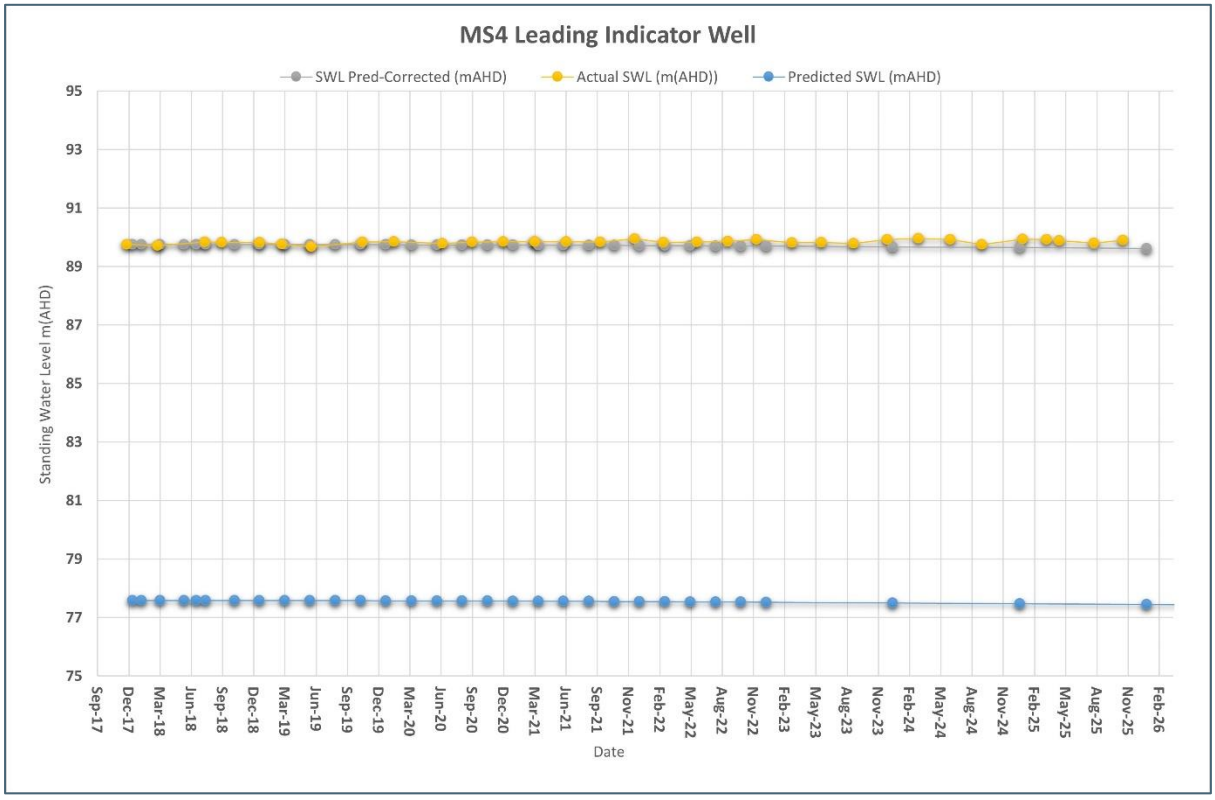


Figure 17: Standing water level for Leading Indicator Well MS4

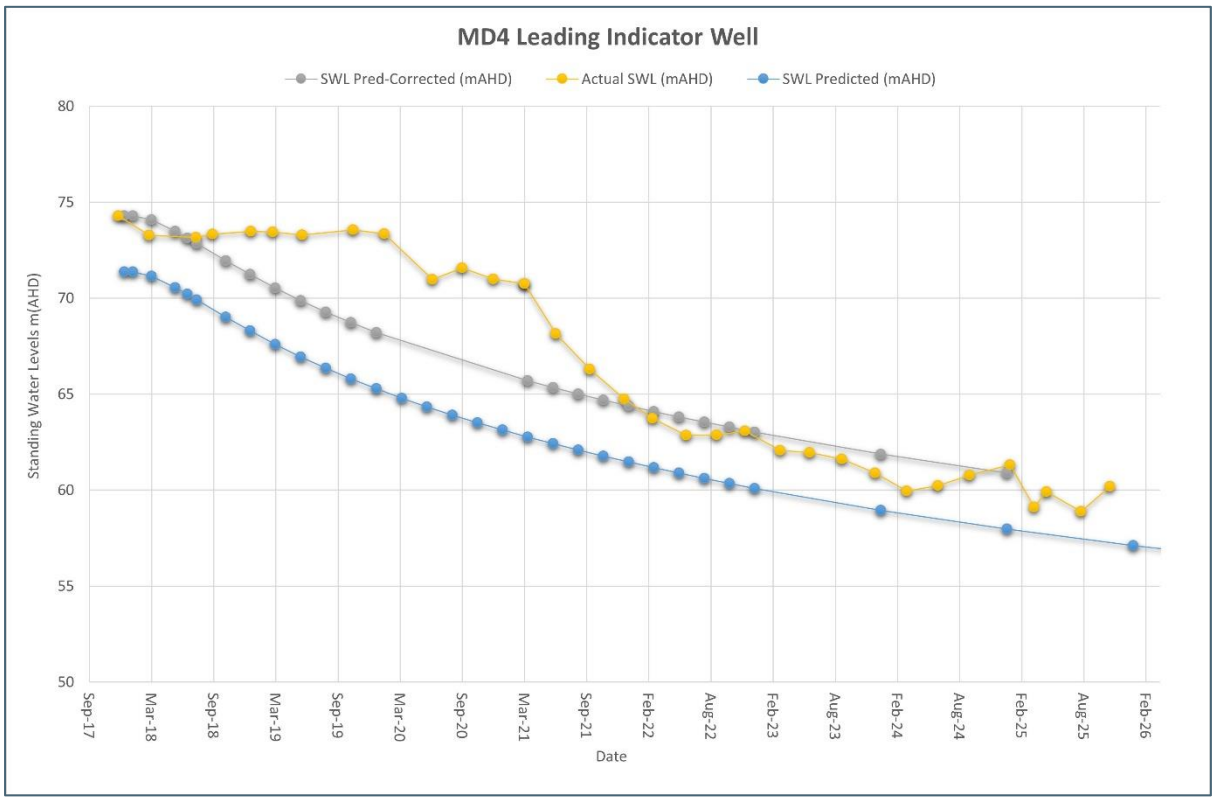


Figure 18: Standing water level for Leading Indicator Well MD4

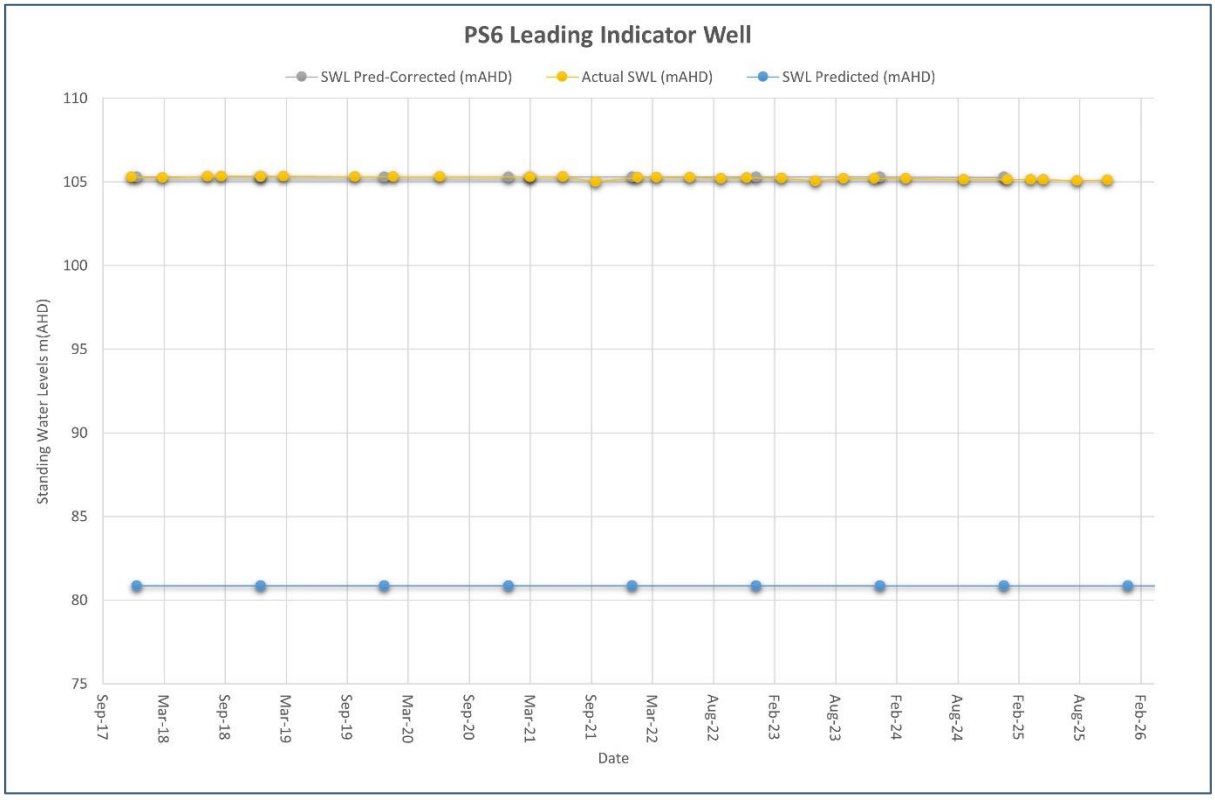


Figure 19: Standing water level for Leading Indicator Well PS6

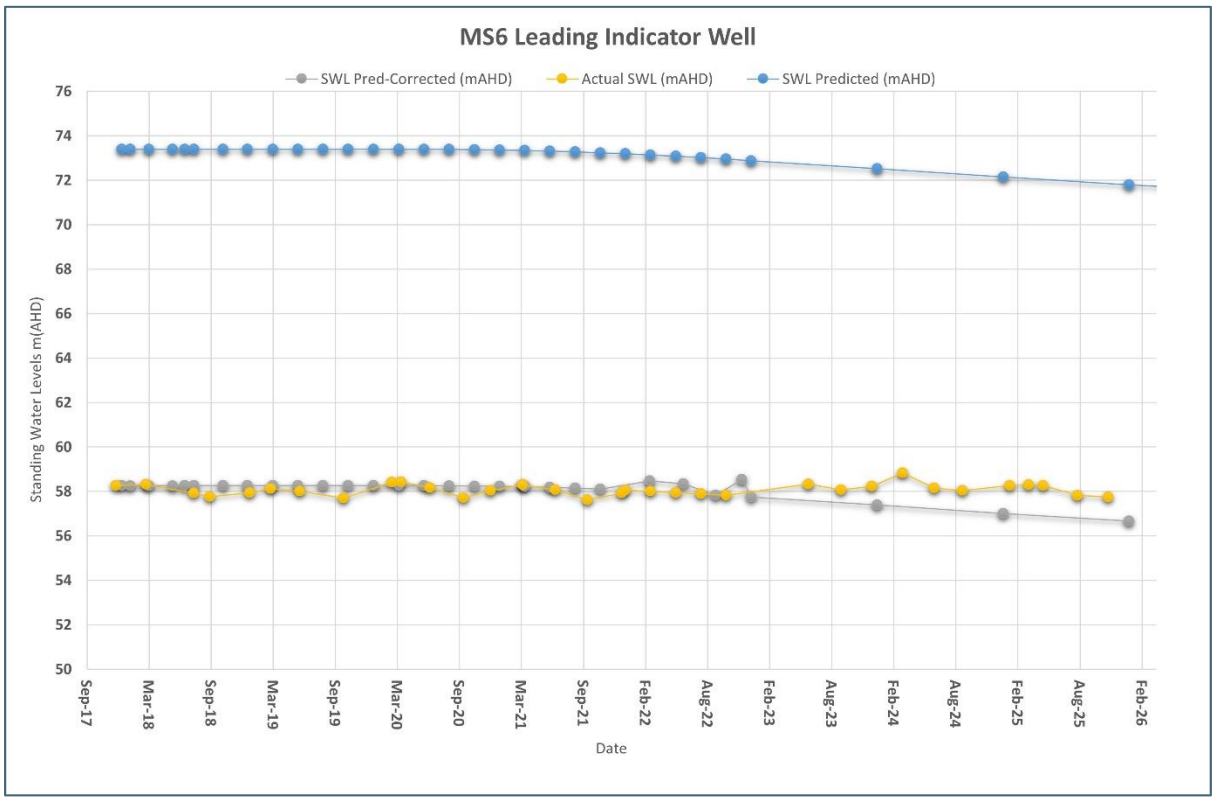


Figure 20: Standing water level for Leading Indicator Well MS6

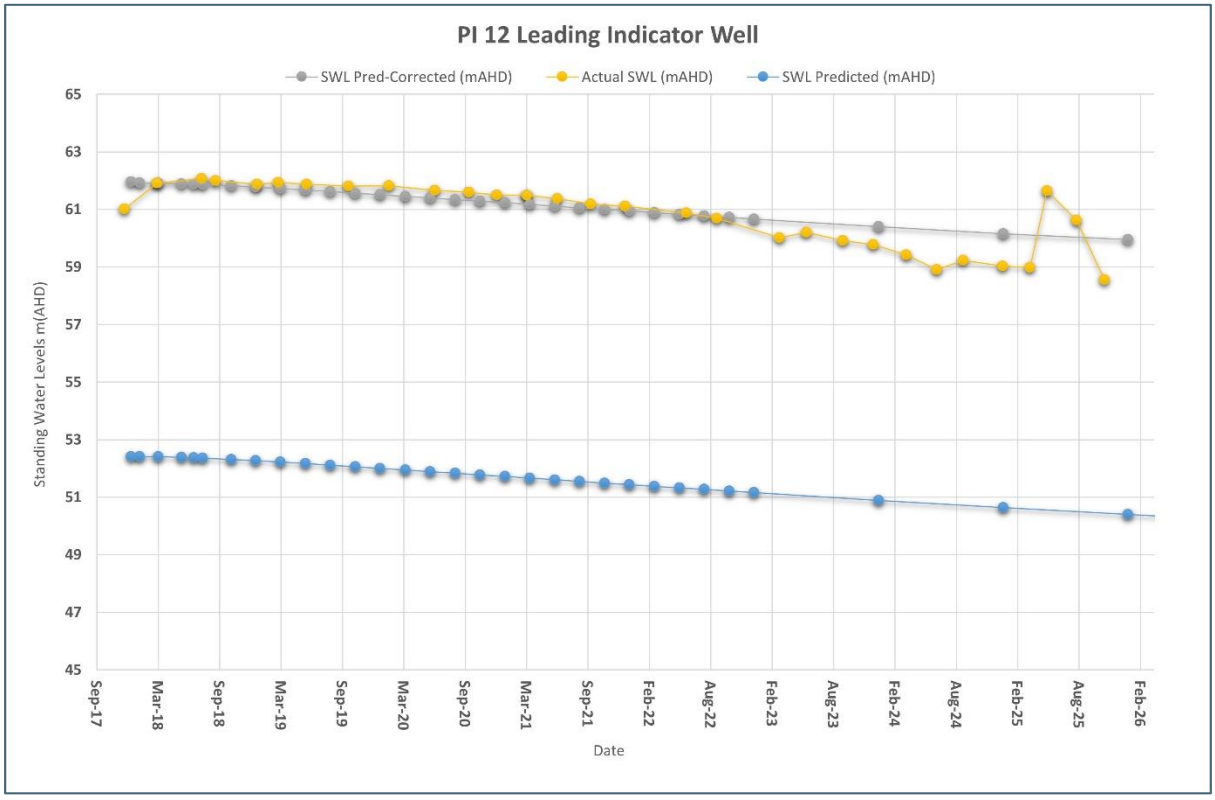


Figure 21: Standing water level for Leading Indicator Well PI12

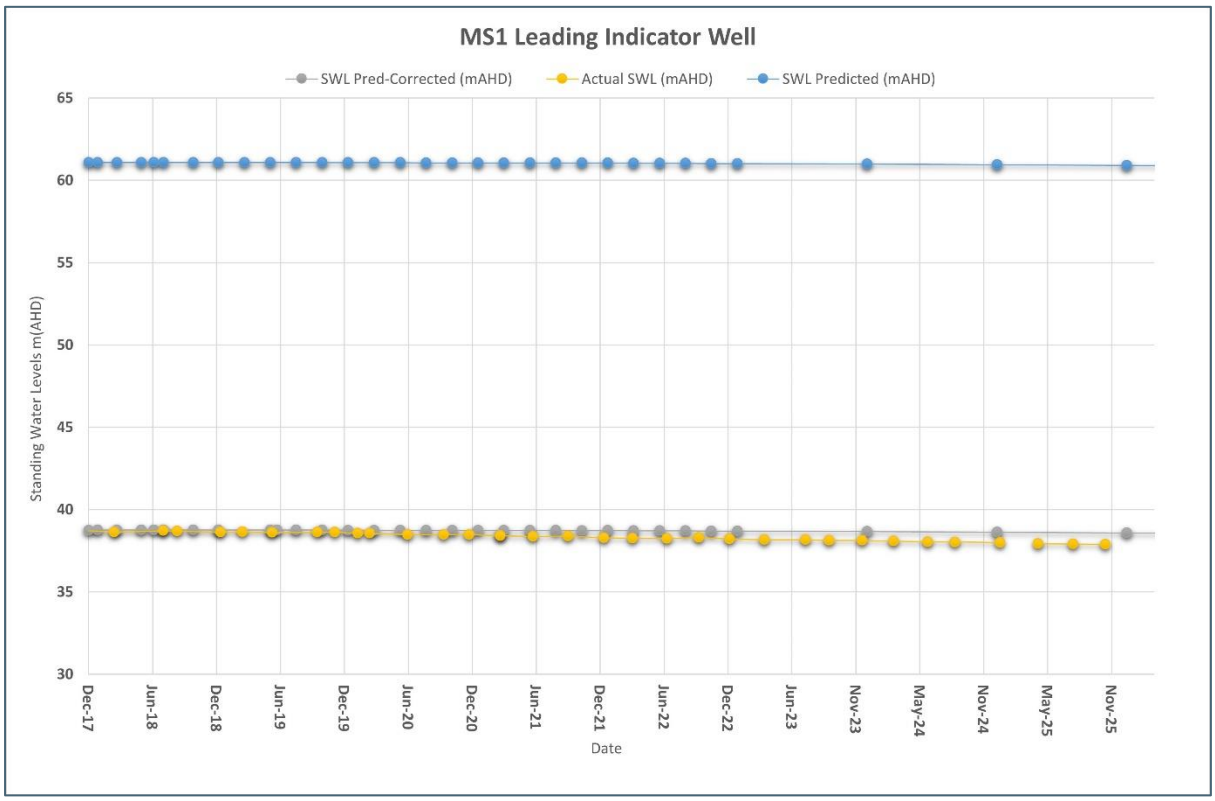


Figure 22: Standing water levels for Leading Indicator Well MS1

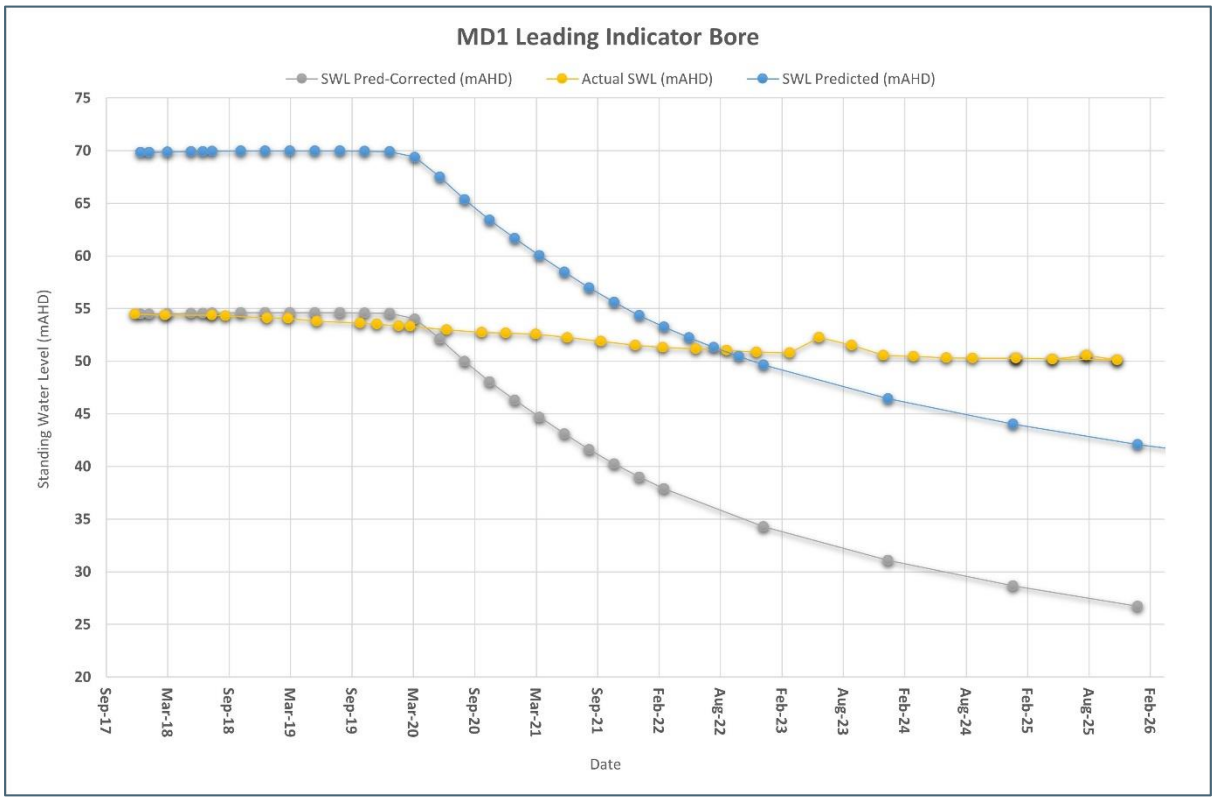


Figure 23: Standing water levels Leading Indicator Well MD1

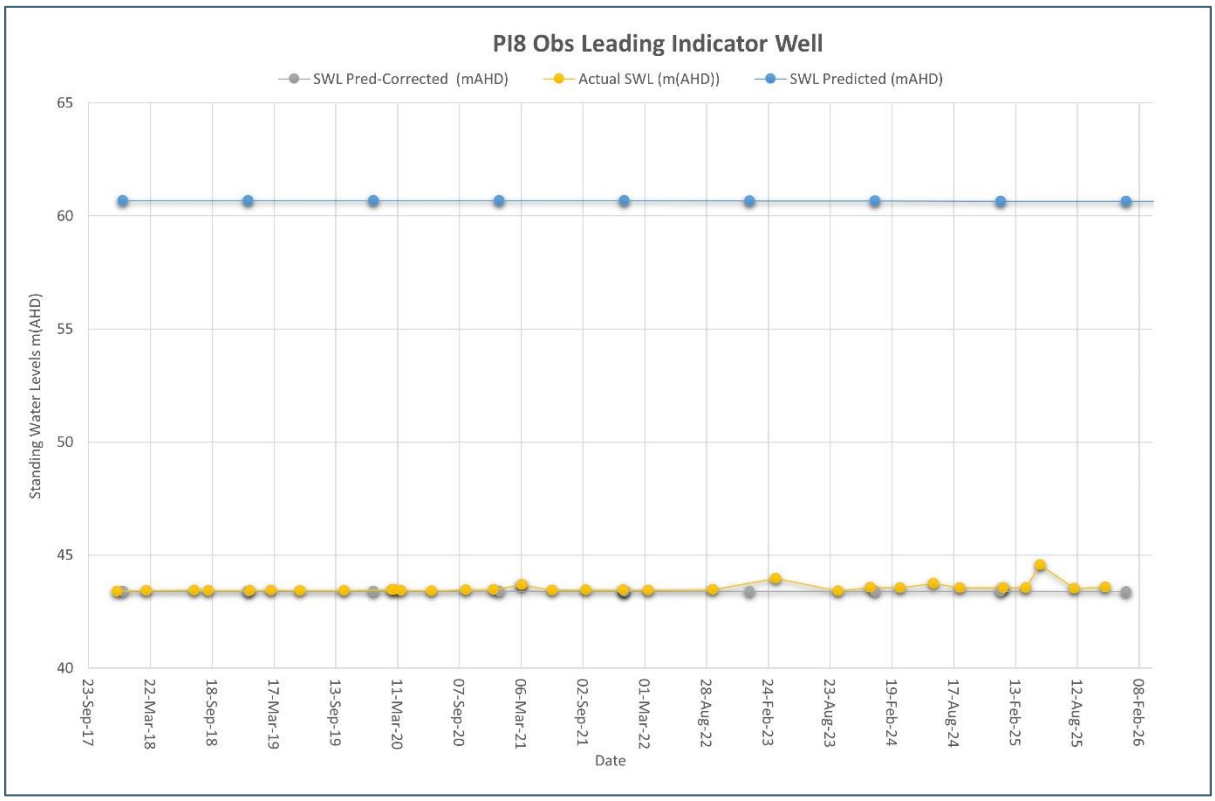


Figure 24: Standing water levels for Leading Indicator Well PI8-Obs

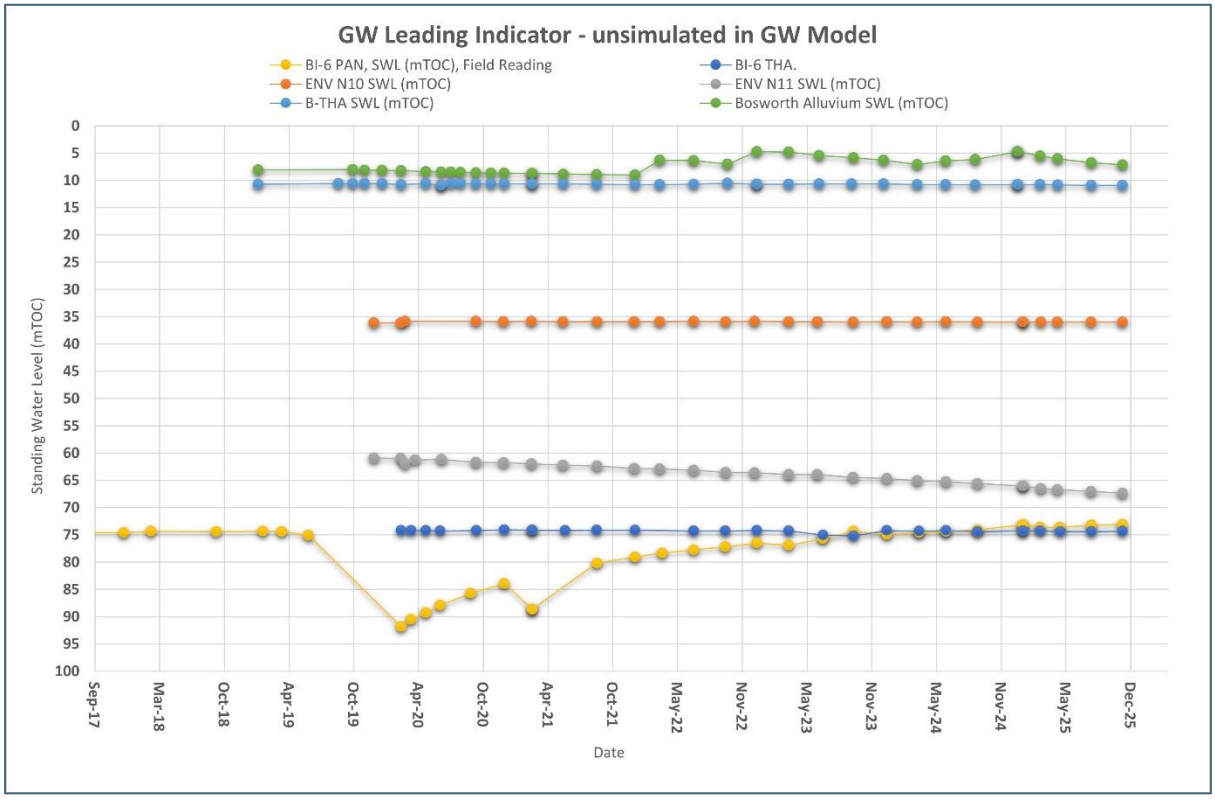


Figure 25: Standing water levels Leading Indicator Well – Unsimulated

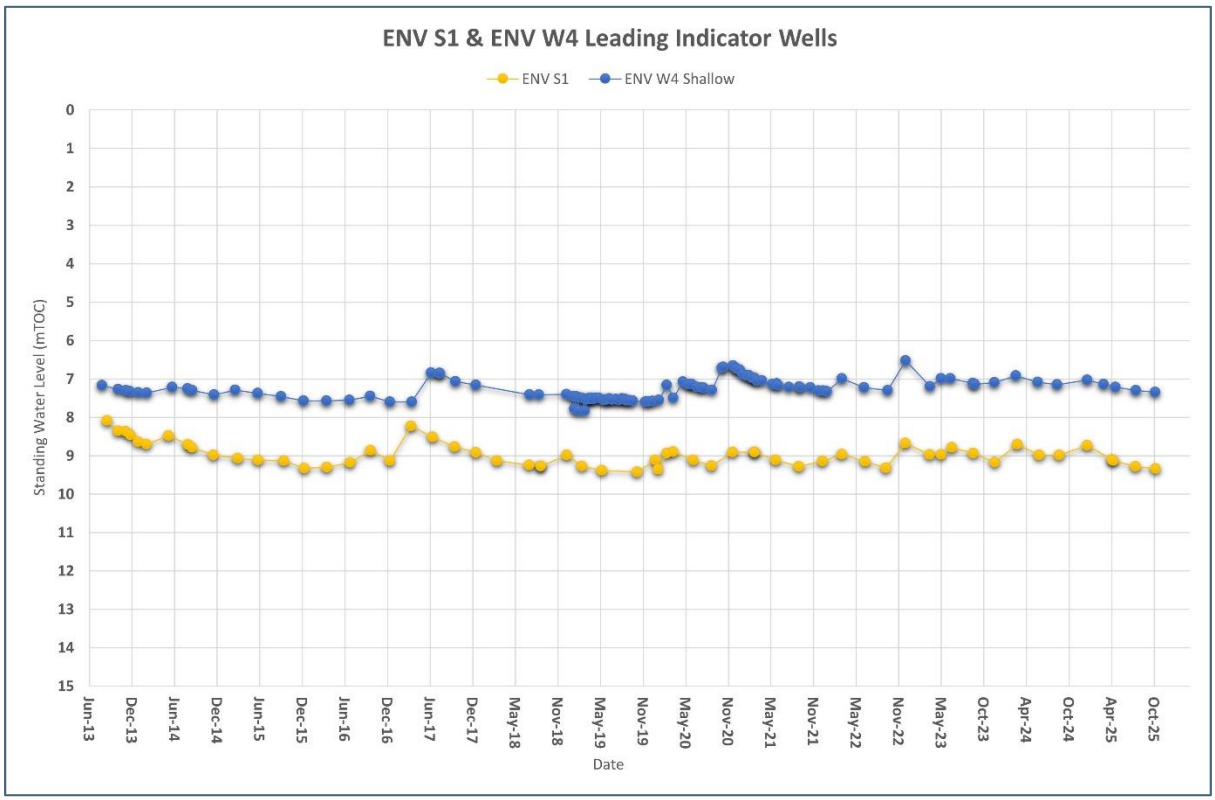


Figure 26: Standing water levels for Leading Indicator Wells ENV S1 & ENV W4

3.2.3 Abstraction volume

The Leading Indicator below relates to groundwater abstraction monitoring to monitor groundwater drawdown.

ID	Outcome Measurement Criteria	Result
Leading Indicator – GW4	Quarterly analysis of groundwater abstraction volumes from flow meter records at groundwater production wells demonstrate that trends do not exceed the predicted water demand (12.9 ML/d) and show that no more than average of 7 ML/d was abstracted from the Northern Wellfield	Abstraction volumes did not exceed predicted water demand or abstraction limits.

Production bores in the Radiation Wellfield (RP3, RP4, RP5, RP6 & RP7), Northern Wellfield (NT-2P, NT-4P THA, NT-4P PFA, NT-5P, NT-8P, NT-10P, NT-11, NT12, NT13, NT-17P, N01) and miscellaneous production bores (WAT-3 & WAT-17) were used for groundwater abstraction during the reporting period.

Groundwater extraction averaged 7.41 ML/day across all wells for the monitoring period, with 5.59 ML/day extracted from the Northern Wellfield (Table 14).

Table 14: Carrapateena groundwater abstraction volumes for 2025

Source	PEPR (ML/day)	2025 Groundwater Abstraction Volume (ML/day)
Radial Wellfield	**7.5**	**1.82**
Northern Wellfield	7	5.59
Miscellaneous Production Bores	-	-
TOTAL	12.9	7.41

*Excludes mine dewatering volumes and **WAR Bores

4 References

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BHP

Appendix D

2025 Carrapateena Flora and Fauna Survey

Carrapateena Operations

Flora and Fauna Survey, Spring 2025

BHP

LATHWIDA ENVIRONMENTAL



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The sole purpose of this report and the associated services performed by Lathwida is to document the 2025 Ecological Assessments for the survey area. This document and associated data will support the development of compliance monitoring reports and primary approval documentation required for the Carrapateena Mine site in South Australia. The report is based on the results of an annual flora and fauna survey for BHP. The scope of services, as described in this report, was developed with BHP.

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Executive summary

Carrapateena is a copper-gold mining operation located in South Australia approximately 160 km north of the regional centre of Port Augusta. BHP (previously OZ Minerals) have an approved Program for Environment Protection and Rehabilitation (PEPR) for the Carrapateena Mineral Lease (ML 6471), and associated Miscellaneous Purposes Licences (MPLs) MPL 149, MPL 152, MPL 153, MPL 154 and MPL 156, which satisfies section 70B of the *Mining Act 1971* (SA) (Mining Act). Under the Part 10A of the Mining Act, a compliant program must be in force before carrying out operations as defined in the PEPR. The PEPR outlines specific Outcome Measurement Criteria (OMC) which BHP are required to report against.

BHP engaged Lathwida Environmental (Lathwida) to conduct the annual flora and fauna survey at Carrapateena to determine whether approval conditions and outcomes have been met, as outlined in the PEPR for ML 6471 and associated MPLs. The relevant approval conditions require flora and fauna survey to monitor the following: common native flora and fauna diversity and abundance, plant health, evidence of new weed species that are declared under legislation, increases in abundance of existing (non-declared) weed species and evidence of pathogens or feral animals as a result of the mine operation or mine related activities. In addition, approval conditions require BHP to report records of fauna species with a National Conservation Rating, with those relevant to Carrapateena, as listed under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act), being Plains Mouse (*Pseudomys australis*), Night Parrot (*Pezoporus occidentalis*) and Thick-billed Grasswren (*Amytornis modestus indulkanna*).

This report provides the outcomes of the spring 2025 survey, which builds upon the previous ecological compliance monitoring surveys undertaken since the commencement of construction in autumn 2018. The majority of surveys were conducted in spring (from September 2018), however a couple of surveys were conducted in autumn to provide an additional opportunity to capture the EPBC listed Plains Mouse. In the year preceding the 2025 survey, Carrapateena rainfall was below average and fluctuated, with only 3 larger events (November 2024 (over 60 mm), March 2025 (30 mm) and July 2025 (over 20 mm)).

Flora survey methods undertaken here, and during compliance monitoring since the commencement of construction, are generally consistent with methods that have been used at Carrapateena for baseline studies undertaken prior to construction (2012 to 2017), with minor modifications to align data collection with the outcomes and mine approval conditions. Flora methods include Jessup transects, Rangeland Assessment Methodology (RAM), canopy cover assessments, weed transects and Landscape Function Analysis (LFA) transects. These methods provide a combination of data that informs current native and exotic (weed) plant diversity and abundance, whilst canopy cover data provides an indication of tree health (and stress) within Eliza Creek downstream of the tailings storage facility (TSF). Results are compared to baseline survey data where applicable data is available. LFA was conducted at 2 sites that have begun rehabilitation. Of the 2 other LFA sites that have previously been monitored, 1 site no longer required monitoring (Tjungu) and 1 had been re-ripped and seeded in 2025, but no germination had begun at the time of the survey. Hence, a new site will be established and monitoring will occur in 2026. The results of the spring 2025 LFA were compared with 2019 to 2024 results and baseline data from corresponding representative 'analogue' sites. In future additional LFA sites and new analogue sites could be established adjacent the LFA Sites or comparisons could use the nearest flora monitoring transects for efficiency, once infrastructure locations are final, and the rehabilitation is evident.

Fauna survey methods followed a modified version of the biological survey methods, with a focus on pitfall trapping to address the tenement condition relating to common fauna (e.g. small mammals and reptiles) diversity and abundance, as well as the EPBC listed as Vulnerable Plains Mouse. A single trap line was installed at 8 established fauna sites, and bird surveys were undertaken at 20 sites, aligning with vegetation survey sites. Two unbaited camera traps were also installed at each trap line site, and Song Meters were deployed at 10 sites to record bird calls and at 2 sites to record microbat calls. Opportunistic observation / capture of all vertebrate species across the site was also recorded to provide information about overall species diversity at Carrapateena, which is comparable with previous surveys.

Despite below average rainfall for the year prior to the survey, above average rainfall events (in November 2024, March and July 2025) and reduced grazing impacts, there was an abundance of short-lived flora species and presence of the 5 main long-lived flora species at Carrapateena continues to be sustained. This likely aligns with the moderate to high numbers of reptiles (which have less reliance on sustained rainfall), and moderate diversity of small mammals reported in 2025. A lack of sustained rainfall earlier in the preceding year, and resulting lack of suitable food resources (e.g. grass seeds), has likely influenced the overall fauna records at the site in 2025, which included low to moderate rodent diversity and captures and a continued lack of detection of EPBC listed Plains Mouse, consistent with other surveys in the broader region (e.g. Olympic Dam, Oak Dam and South Gap). Bird diversity was also moderate across the location. In contrast, reptile captures and diversity remained stable.

In 2025 compliance was met across all ecology related OMCs, further detail is provided below.

ES1 Flora results

In 2025, a total species diversity of 141 native species was recorded across all flora sites, and this was the equal highest recorded flora diversity during compliance monitoring, due to a very high diversity of short-lived species being recorded. These species germinate in response to rainfall events, e.g. average rainfall received in July 2025. Grazing impact continued to be low to moderate in 2025, following widespread destocking across the mineral lease, which also likely influenced widespread increased abundance of palatable species including juveniles (e.g. Bladder Saltbush, Bush Minuria and Plains Lantern Bush). The population abundance of the 5 most abundant and/or widespread long-lived perennials declined during 2018 to 2020, but have all increased since 2021 (Bladder Saltbush, Samphire, Sea-heath, Bush Minuria, Plains Lantern Bush). The fluctuations in long-lived perennial species are attributed to yearly and long-term rainfall totals rather than mining impacts (e.g. the 100% increases in Bladder Saltbush in 2025, largely due to juveniles). Similar to 2024, in 2025 the mean total species diversity for impact sites and for control sites was not significantly different, were within the baseline range, and comparable with mean total species diversities recorded in 2018 (early compliance). Based on the above, mining activities are not considered to be impacting either short-lived or long-lived species diversity at the mineral lease. Hence, results suggest there are no impacts on native flora species diversity and abundance from mining activities, satisfying Schedule 6 Conditions of the PEPR and OMCs SWRF1, AQ2.

Impacts in Eliza Creek have the potential to occur as a result of reduced surface water flows, reduced groundwater flows and / or groundwater contamination attributed to tailings seepage from the TSF, or flood water released through activation of the decant dam spillway in a 1 in 100-year 72 annual exceedance probability (AEP) rain event. Since 2018, there has been no distinct trend in species diversity for any of the Eliza Creek sites, with only minor fluctuations occurring yearly at each site. There are also no distinct differences in species diversity between sites. There is no clear pattern emerging in species diversity data relating to the time since the TSF establishment and the distance from the TSF. Five of the most abundant long-lived woody perennials recorded at the Eliza Creek Jessup transects were separately analysed. All 5 species have shown yearly fluctuations, but no downward population trends at any of the Eliza Creek sites since 2018, and the Eliza Creek Jessup transects have shown an increase in total perennial species abundance. Canopy cover assessments have also shown positive tree health for the sites downstream of the TSF. Western Myall trees have shown an increase in foliage and recruitment (notably at Site 17 closest to the TSF) and River Red Gums have regained canopy losses reported in previous years, but there was still no recruitment of Red Gums recorded along transects. Lack of recruitment from River Red Gums along the transects (located furthest from the TSF) are likely reflective of lower than average rainfall. The results of the formal monitoring sites results would suggest there are no impacts on Eliza Creek vegetation arising from the TSF and associated mining activities, satisfying Sixth Schedule Condition 2 of the PEPR and OMC SWRF1, TSF6.

Downstream of the TSF, but upstream of Site 17, a seepage incident at the Decant Dam has been closed out (offset has been accounted for). Whilst the Western Myall trees have not recovered, there are understory and midstorey shrubs showing recovery / regeneration. This is currently considered compliant.

Weed species were surveyed at existing flora sites; at designated weed transects, and at opportune locations throughout the lease area, including the camps and some of the dams. Most weeds recorded were annual herbs or grasses. Most annual weed records were from dams or drainage lines, areas naturally susceptible to weed invasion, and from the dune habitats, and their presence is unrelated to mining activities. There were no new weeds recorded in 2025 and no overall increase in abundance or extent of weeds declared under legislation, with the exception of a new small location of Declared species Bathurst Burr at weed transect CWM05. It is recommended that this BHP continue to work with the landholder to manage this small population when it is actively growing.

Ongoing control of Tobacco Bush (*Nicotiana glauca*), a non-declared weed, at Dawson Dam and South Eliza Dam is recommended. Fluctuations in density reflect seasonal rainfall patterns rather than mining impacts. No new species of declared weeds were recorded during spring 2025, indicating compliance with the Schedule 6 Condition 6, Schedule 2 Condition 28, and OMC WP1 and WP2.

No EPBC listed flora species were recorded during the 2025 survey. NPW Act listed flora species Rounded Sea-heath (*Frankenia subteres*) was again recorded near Flora Site 9. An area of approximately 0.8 ha was mapped including over 2,000 plants (adults and juveniles).

ES2 LFA results

The current status and trends at 2 of the 4 rehabilitation sites (Aerodrome laydown, Ventia laydown, Midway Quarry and Tjungu) were again measured by LFA, using the Established Method for both sites, and additionally using the Point Centre Quarter (PCQ) method for one of the sites. Ventia was decommissioned in 2025, but new sites will be established nearby in areas that were deep-ripped and hand seeded in 2025. Tjungu (a deep-ripped and hand seeded site) was closed out in 2024, having reached analogue status. For the 1 of the 2 sites assessed in 2025, the LFA has shown a positive trend in the number and area of plants per ha, albeit with a slight decline in plant cover recorded in 2025. Plant colonisation across sites is currently dominated by short-lived perennial species (particularly *Sclerolaena* spp.) although several longer-lived perennials were also recorded and some distant from the transects. Total species diversity continued to increase at this site. At the other LFA site assessed in 2025, plant colonisation has been very sparse and limited to a few individuals of 2 short-lived perennial species, with a decline in species (patches) recorded in 2025. It is recommended that the site be re-ripped to a greater depth and supplemented with hand direct-seeding. Whilst the short-lived species serve as an important colonising component in the stony tableland habitat, all plants improve soil stability and function. As patches establish and increase in size, the potential for resource capture and nutrient cycling improves leading to ongoing increased potential for recruitment of native species. Developed patches also provide cover and habitat opportunities for native fauna species and reduce soil loss and erosion.

Although LFA monitoring is in its early stages, there are evident differences between application of different rehabilitation techniques which may be affecting recruitment. These include deeper contour ripping and application of rocky surface strew at the Aerodrome, and Tjungu sites compared with shallower contour ripping at the Ventia and Midway Quarry site. The addition of hand seeding has also likely accelerated establishment of plants at the Tjungu site, although only a few species from the seed mix were recorded, regardless this site no longer requires formal monitoring. Ongoing LFA monitoring at the other sites will assist in informing trends and the benefits of additional intervention such as deeper or repeat ripping and seeding. Other additional intervention or restoration activities of the remaining sites could include applying native woody debris (e.g. old Myall fence posts, fallen branches), planting local groundcovers and low shrubs, and providing supplementary watering during critical periods of plant establishment.

Currently, LFA data is compared with data from a series of 'analogue sites' which were collected prior to construction at the site. Whilst this analogue data is considered broadly representative of the vegetation communities around the mine lease, and therefore a useful indicator of rehabilitation success, a more precise reference would be to establish LFA sites adjoining each rehabilitation site. For efficiency, the nearest flora monitoring 100 m Jessup transect could be used (i.e. 2 replicates of 50 m), e.g. Site 3 near Ventia, Site 16 near the Aerodrome, Site 5 near Midway Quarry, Site 16 closest to Aerodrome.

Overall, OMC LUP4 is considered to be in-progress / compliant.

ES3 Fauna results

The 2025 spring fauna survey identified a total of 87 vertebrate species from the 8 survey sites and opportunistically across the study area. Capture rates (relative to survey effort) for small mammals and reptiles were within baseline and previous compliance survey ranges. Small mammal detections were the highest recorded during the compliance monitoring period (includes camera detection). Reptile and bird species diversity across the whole of Carrapateena was also within the range of diversity that has been recorded during baseline surveys, meaning the data do not indicate that construction and early operational activities have resulted in a loss of abundance or diversity of fauna across the site more broadly. Bird diversity was within baseline and previous compliance survey range, but waterbird species presence had reduced from results of 2024 when there was temporary excess water at South Eliza Dam. Mammal total diversity was within baseline and compliance ranges, with captures lower for rodents and they were only detected at control sites. Whilst this trend is worth watching, rodents have been generally detected in smaller numbers in previous surveys and presence is most likely related to reduced rainfall over preceding years.

The common fauna species were captured in numbers within baseline ranges (e.g. Stripe-faced Dunnart, Fat-tailed Dunnart, Saltbush Ctenotus, Earless Dragons). Diversity of species and families was comparable to baseline data, and birds and reptiles showed evidence of breeding (e.g. plumage, multi-sex groupings and presence of juveniles), suggesting that mining related construction activities are not negatively impacting fauna at Carrapateena. Small mammal capture numbers were again skewed towards Stripe-faced Dunnarts, aligning with baseline and previous compliance survey outcomes, with the exception of 2022 when Fat-tailed Dunnarts were captured in higher numbers. Both species were detected at both control and impact sites in 2025. In addition, microbats were surveyed using Song Meter acoustic device at 2 opportunistic sites and 4 species were detected.

The approval conditions of the PEPR (Schedule 2 Condition 28) require that any records of 3 EPBC listed species (Night Parrot, Thick-billed Grasswren, and Plains Mouse) are documented and provided to the Biological Databases of South Australia (BDBSA), if they are recorded during ecological surveys at Carrapateena, or opportunistically during regular site activities. None of these EPBC listed species were detected during the 2025 survey. One EPBC listed as threatened species was detected opportunistically during the spring 2025 survey; Southern Whiteface (*Aphelocephala leucopsis leucopsis*) detected at weed monitoring site CWM05.

During the spring 2025 survey, there were 3 fauna species detected that had not been recorded within the lease prior to or since baseline monitoring, including the Broad-banded Swimmer (*Eremiascincus richardsonii*), Brown Goshawk (*Accipiter fasciatus fasciatus*) and Rufous Whistler (*Pachycephala rufiventris rufiventris*). The Broad-banded Swimmer (a reptile) has only been detected in low numbers during baseline (6 records in total); the two birds had only previously been detected once each opportunistically prior to baseline.

Less invasive fauna detection methods such as Song Meters and cameras have again proved useful to complement bird and fauna survey effort, particularly in the arid zone, where the local climate can affect species presence during a survey.

Overall, OMC WP1, WP2, EPBC1, EPBC2, EPBC3 are considered to be compliant.

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1 Introduction

1.1 Operation background

Carrapateena is a copper-gold mine owned and operated by BHP Group Limited (BHP) which is located in South Australia on the eastern margin of the Gawler Craton, approximately 160 km north of the regional centre of Port Augusta (Figure 1.1). Construction on Carrapateena was completed by OZ Minerals in late 2019 – early 2020, and the mine is now in a steady state of operation. The Carrapateena operation is an underground copper gold mine using a sub-level cave mining method. Onsite there is the Tjati and materials handling declines, process plant, ancillary infrastructure, Tailings Storage Facility (TSF), Tjungu village and Aerodrome. An exploration village that was temporary is also likely to be retained and updated given expansions that are in progress. OZ Minerals was purchased by BHP in 2023 and all former OZ Minerals assets are now part of BHP.

BHP have an approved Program for Environment Protection and Rehabilitation (PEPR) for the Carrapateena Mineral Lease (ML 6471), which satisfies section 70B of the Mining Act 1971 (SA) (Mining Act). Under Part 10A of the Mining Act, a compliance program must be in force before carrying out operations as defined in the PEPR. OZ Minerals was granted ML 6471 on 3 January 2018. The PEPR was updated in June 2025. In addition to the ML, the Carrapateena PEPR also includes the following Miscellaneous Purposes Licence (MPLs) for infrastructure associated with the mine:

- Airstrip, Workers' Accommodation Village, Access Road and Ancillary Infrastructure (MPL 149), granted 5 July 2017
- Western Infrastructure Corridor (MPL 152), granted 3 January 2018
- Eastern Radial Wellfield (MPL 153), granted 3 January 2018
- Southern Access Road and Radial Wellfield (MPL 154), granted 3 January 2018
- Northern Wellfield (MPL 156), granted 11 December 2018.

Jacobs were previously engaged to conduct construction and operational ecological monitoring surveys in autumn and spring of 2018, spring 2019 to 2022, and autumn 2023 in order to meet approval conditions outlined in the PEPR ML 6471. Lathwida Environmental (Lathwida) took over the ecological monitoring in 2024. This report represents the findings from the ninth compliance monitoring survey, undertaken in spring of 2025 by Lathwida. The approval conditions focus on:

- Surveying native plant species to ensure there is no decline in diversity and abundance as a result of mining activities,
- Monitoring of plant health to demonstrate that there are no detrimental impacts on plants as a result of mining activities (e.g. including impacts from raised dust levels, contaminants and/or declines in surface water flow),
- Monitoring to demonstrate that no new weed species declared under legislation have been introduced to Carrapateena, and no increase in abundance of existing (non-declared) weed species, pathogens or feral animals has occurred as a result of mining activities,

- Surveying common native fauna to ensure there is no loss in diversity or abundance, as a result of mining activities (e.g. from direct impacts, impacts to habitat, weeds and pests),
- Surveying native fauna species to ensure there is no decline in diversity and abundance of NPW Act or EPBC Act listed fauna as a result of mining activities, and
- Reporting of any records of EPBC Act listed fauna species, including migratory species, with specific objectives for several EPBC listed species (discussed below).



Figure 1.1: Project location
Carrapateena Flora and Fauna Survey, spring 2025

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1.1.1 Relevant conditions of approval

As stated in the initial compliance monitoring report, which occurred during construction (Carrapateena Ecology autumn 2018 survey, Jacobs 2018a), the approval conditions of the PEPR for ML 6471 and associated MPLs define a number of conditions relating to fauna and flora values that occur within the lease areas, which are summarised in Table 1.1 below. The PEPR, updated in June 2025, also outlines the monitoring program including Outcome Measurement Criteria (OMC), Leading Indicators and Strategies to demonstrate compliance with the defined and agreed Outcomes, which are summarised in Table 1.2.

Table 1.1: Mineral Lease 6471 and associated MPLs fauna and flora conditions relevant to annual monitoring (BHP 2025a)

Schedule and Conditions Reference no.	Condition Environmental Outcome / OMC ID
Schedule 2 Condition 28.2 to 28.4 (ML 6741, MPL 152 to 154)	To avoid impacts to (e.g. loss of abundance and diversity) Matters of National Environmental Significance, the Tenement Holder must: 28.2. Provide data from any future sightings and records of the Thick-billed Grasswren to the Biological Databases of South Australia (BDBSA) to enable effective monitoring and record keeping, as per the Recovery Plan Actions; 28.3. Provide data from any future sightings and records of the Night Parrot to the Night Parrot Recovery Team; and 28.4. Provide data from any future sightings and records of the Plains Mouse to the BDBSA to enable effective monitoring and record keeping, as per the Recovery Plan Actions. OMC ID EPBC1, EPBC2, EPBC3 (see Table 1.2)
Schedule 6 Condition 6 and 28.1 (ML 6471) Condition 3 (MPL 156) Condition 6 (MPL 152 to 154) Condition 10 (MPL149)	The Tenement holder must during construction and operation ensure no introduction of new species of Weeds declared or listed under relevant legislation, plant pathogens or pests (including feral animals), nor sustained increase in abundance of existing weed or pest species in the Land as a result of mining operations or mining related activities. 28.1. Develop, implement and maintain appropriate management actions to ensure the control of feral animal populations, including cats and foxes. OMC ID WP1, WP2 (see Table 1.2)
Schedule 6 Condition 17 (ML 6471)	The Tenement Holder must during construction, operation and post completion ensure no adverse impact to surface water quality and water dependent ecosystems (excluding surface water in the mine subsidence zone), on or off the Land, as a result of contamination and sedimentation caused by mining operations or mining-related activities. OMC SWRF1, TSF6 (see Table 1.2)
Schedule 6 Condition 7, 6, 4 (MPL 6471, MPL 149, 152 to 154, 156)	The Tenement Holder must during construction and operation ensure no impacts to agricultural productivity for third-party land users on or off the Land as a result of mining-related activities other than those agreed between the Tenement Holder and the affected user or determined by an appropriate court as evidenced in its order(s) (and the Tenement Holder must provide the Director of Mines (or other authorised officer) with a copy of the order(s), which shall be placed on the Mining Register). OMC LUP4
Schedule 6 Condition 14 (ML 6471)	The Tenement Holder must during construction, operation and post Completion ensure no adverse change to the air quality environment as a result of particulate emissions and/or dust generated by mining operations or mining related activities. OMC AQ2 (see Table 1.2)

Table 1.2: Outcomes, Outcome Measurement Criteria (OMC) / Leading Indicator and Achievement Values (BHP 2025a)

Outcome Measurement Criteria (OMC) Code	Relevant Environmental Outcomes	OMC / Leading Indicator	Achievement Values
SWRF1	The Tenement Holder must during construction, operation and post Completion ensure no adverse impact to surface water quality and water dependent ecosystems (excluding surface water in the mine subsidence zone), on or off the Land, as a result of contamination and sedimentation caused by mining operations or mining-related activities.	Annual ecological surveys undertaken by an independent and suitably qualified expert at Eliza Creek monitoring sites.	No adverse impact on the diversity and abundance of native vegetation and water dependant ecosystems attributed to reduced surface water flows caused by mining operations when compared to baseline conditions (Appendix C5 of PEPR - Ecological Baseline BHP 2025a) unless a significant environmental benefit has been approved in accordance with the relevant legislation Linked to Native Vegetation Outcome (Schedule 6 Condition 11).
TSF6			No adverse impact on the diversity and abundance of native vegetation and water dependant ecosystems attributed to tailings seepage when compared to baseline conditions (Appendix C5 of PEPR - Ecological Baseline BHP 2025a) unless a significant environmental benefit has been approved in accordance with the relevant legislation. Linked to Native Vegetation Outcome (Schedule 6 Condition 11).
WP1	The tenement holder must during construction and operation ensure no introduction of new species of weeds declared or listed under relevant legislation, plant pathogens or pests (including feral animals), nor sustained increase in abundance of existing weed or pest species in the Land as a result of mining activities mining operations or mining-related activities.	Annual flora and fauna surveys undertaken by suitably qualified ecologists at flora, fauna and weed monitoring locations.	No introduction of: • new species of weeds declared or listed under relevant legislation • plant pathogens, pests (including feral animals) when compared to previously recorded weed species and introduced fauna.
WP2			No increase in the abundance of existing weeds or pest species in the land compared to previous survey records.
AQ2	The Tenement Holder must during construction, operation and post Completion ensure no adverse change to the air quality environment as a result of particulate emissions and/or dust generated by mining operations or mining-related activities.	Annual ecological survey undertaken by a suitably qualified and experienced expert demonstrates no adverse impact on the diversity and abundance of native vegetation at monitoring sites (Figure 2.1).	No adverse impact on the diversity and abundance of native vegetation at monitoring sites directly attributed to dust deposition from mining operations or mining related activities when compared to baseline native vegetation conditions (Appendix C5 Ecological Baseline of BHP 2025a) when compared to baseline native vegetation conditions unless an SEB has been approved in accordance with relevant legislation.

Outcome Measurement Criteria (OMC) Code	Relevant Environmental Outcomes	OMC / Leading Indicator	Achievement Values
EPBC1	Provide data from any future sightings and records of the Thick-billed Grasswren to the Biological Databases of South Australia (BDBSA) to enable effective monitoring and record keeping, as per the Recovery Plan Actions.	Annual monitoring for flora and fauna and opportunistic sighting provide option for records of Thick-billed Grasswren, if detected provide records to the BDBSA (Figure 2.1, Figure 2.2, Figure 2.3).	Records of the Thick-billed Grasswren provided to the BDBSA if observed. Linked to MNES Condition (Schedule 2 Condition 28.2).
EPBC2	Provide data from any future sightings and records of the Plains Mouse to the BDBSA to enable effective monitoring and record keeping, as per the Recovery Plan Actions	Annual monitoring for flora and fauna and opportunistic sighting provide option for records of Plains Mouse, if detected provide records to the BDBSA (Figure 2.1, Figure 2.2, Figure 2.3).	Records of the Plains Mouse, provided to the BDBSA if observed. Linked to MNES Condition (Schedule 2 Condition 28.4).
EPBC3	Provide data from any future sightings and records of the Night Parrot to the Night Parrot Recovery Team	Annual monitoring for flora and fauna and opportunistic sighting provide option for records of Night Parrot, if detected provide records to the BDBSA (Figure 2.1, Figure 2.2, Figure 2.3).	Records of the Night Parrot provided to the Night Parrot Recovery Team if observed. Linked to MNES Condition (Schedule 2 Condition 28.3)
LUP4	The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use.	Rehabilitation trials shall be undertaken at infrastructure locations no longer required (at least 1 area per closure domain) Figure 2.6 and ongoing (annual) assessment at LFA monitoring sites demonstrating development of trends and annual improvement of rehabilitation through LFA methodology. Should the data indicate rehabilitation not trending towards sustainability root-cause investigations will be undertaken and rectification methods be identified and implemented.	Rehabilitation has achieved, or is likely to achieve, a landscape function equivalent to that of adjacent analogue LFA sites

Note WP3 includes monthly weed inspections, this is not part of the scope of this report.

1.2 History of monitoring at Carrapateena

The history of baseline ecological monitoring at Carrapateena is summarised in Jacobs (2018a), which also represents the first of the compliance monitoring reports following commencement of construction. Briefly, baseline flora and fauna surveys were undertaken by EBS Ecology within and surrounding the Carrapateena Mineral Lease (ML 6471), biannually between autumn 2012 and spring 2016 / 2017 (references provided in EBS Ecology 2017c and Jacobs 2018a). The surveys covered a range of seasonal and yearly climatic conditions and therefore collectively provide a robust baseline data set describing the fauna and flora values present at the site, against which impacts arising from the construction and operation of Carrapateena can be compared. The autumn and spring 2018, spring 2019 to 2022 and autumn 2023 surveys represent the commencement of, and ongoing construction and operational compliance monitoring associated with the approved PEPR (Jacobs 2018a, 2019a, 2019b, 2020a, 2021b, 2022, 2023b). It is noted that whilst baseline surveys were conducted in 2017, some raw data (primarily floristic data) was not available for comparison against the compliance monitoring data. Further, baseline surveys conducted in 2012 did not include Jessup flora at sites 15 and 16.

1.3 Climate at Carrapateena

The closest Bureau of Meteorology (BoM) weather station with comprehensive temperature and rainfall records for the Carrapateena Mine area is the Woomera Aerodrome station (BoM station 16001; BoM 2025a), located approximately 70 km west of the operational area. This station has long-term climate data dating from 1949 to the present, offering valuable insight into regional climate patterns. The Carrapateena mineral lease occurs within an arid zone characterised by a hot, dry climate. The long-term mean annual rainfall for the Woomera weather station is 184 mm (BoM 2025a). While long-term mean monthly rainfall shows little seasonal variation, mean monthly maximum temperatures range from the low to mid-30s during summer to below 20°C in winter (Figure 1.2).

During the 12 months preceding the spring 2025 survey, the Woomera region experienced approximately 40 mm below the long-term mean annual rainfall, even though November and July recorded approximately 40 mm and 10 mm more rain than the long-term monthly means, respectively (Figure 1.3, Figure 1.4, and Figure 1.5). The yearly rainfall total deficit was largely due to 7 months receiving at least 10 mm less rainfall than the long-term monthly averages (Figure 1.3). Between 1 January and 30 June 2025, Woomera recorded 25 mm, well below the long-term mean of 94 mm. The remaining months were generally within 5 mm of the long-term means. The total rainfall for the 3 winter months immediately preceding the September survey, however, equalled the long-term mean of 43 mm. Additional discussion on rainfall patterns specific to Carrapateena is provided in Section 3.1.

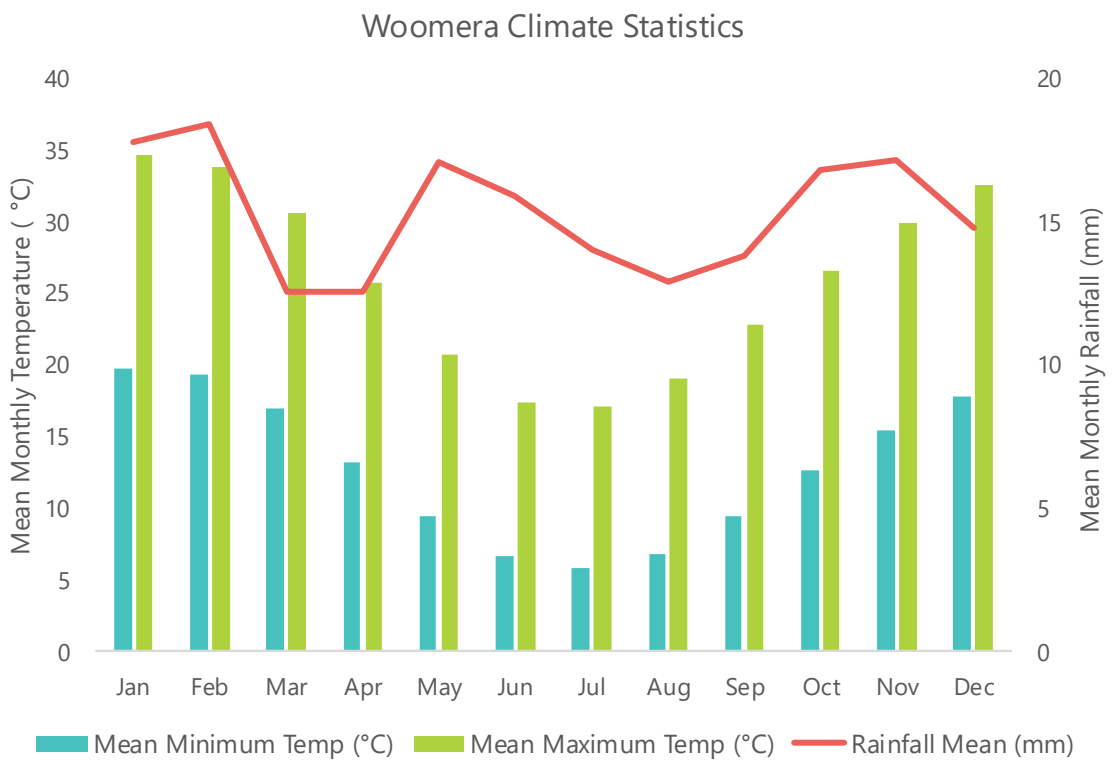


Figure 1.2: Long-term climate averages (1949-2025) for the regional weather station nearest to Carrapateena; Woomera Aerodrome

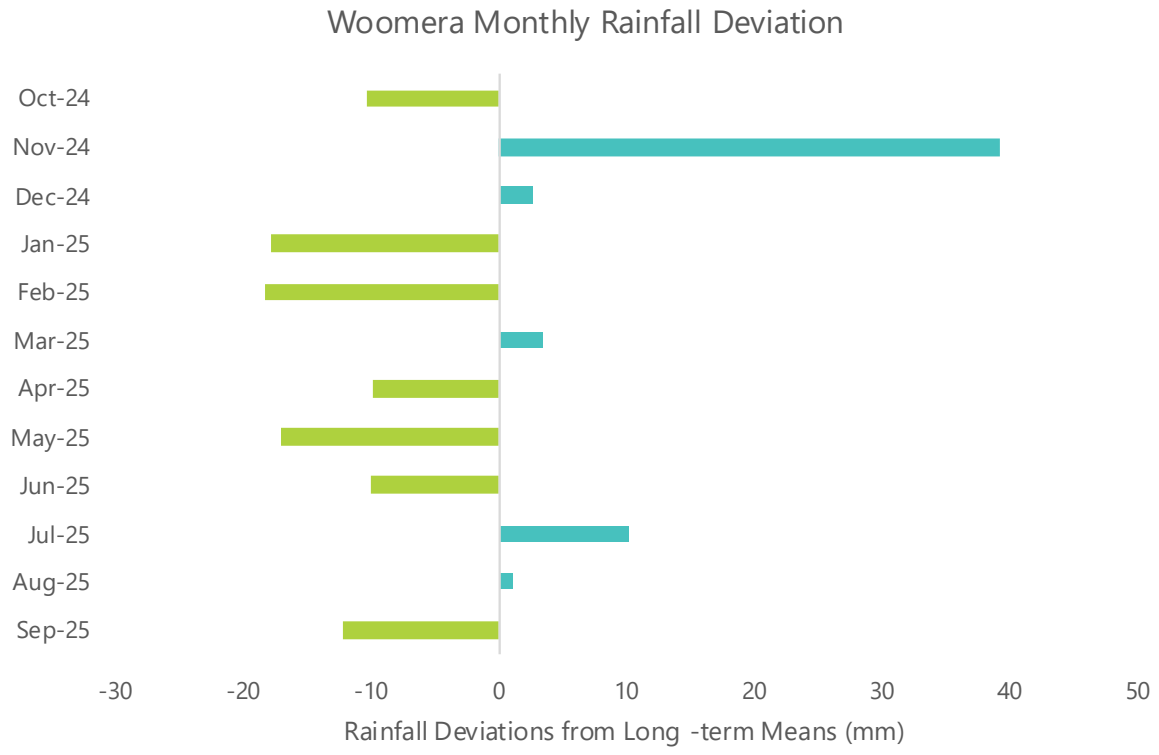


Figure 1.3: Rainfall deviations between year preceding survey and long-term averages (1949-2025) for Woomera Aerodrome

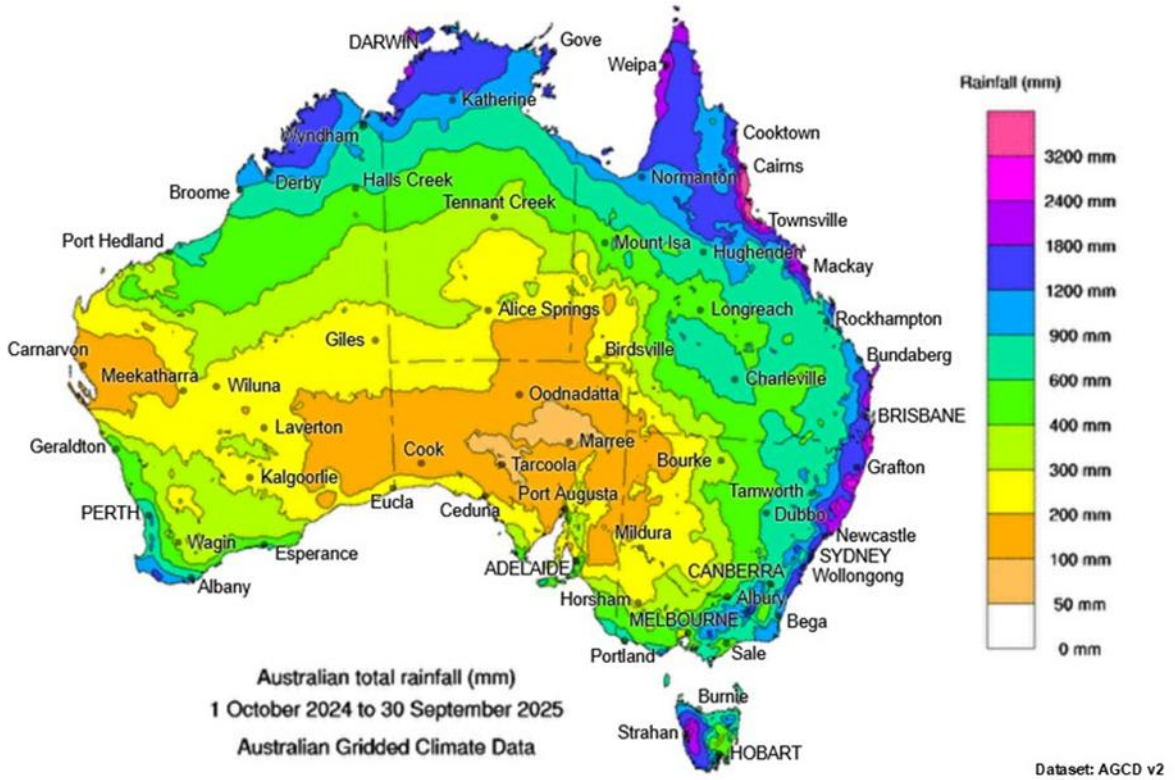


Figure 1.4: Total rainfall across Australia, 12 months preceding the spring 2025 survey (BoM 2025b)

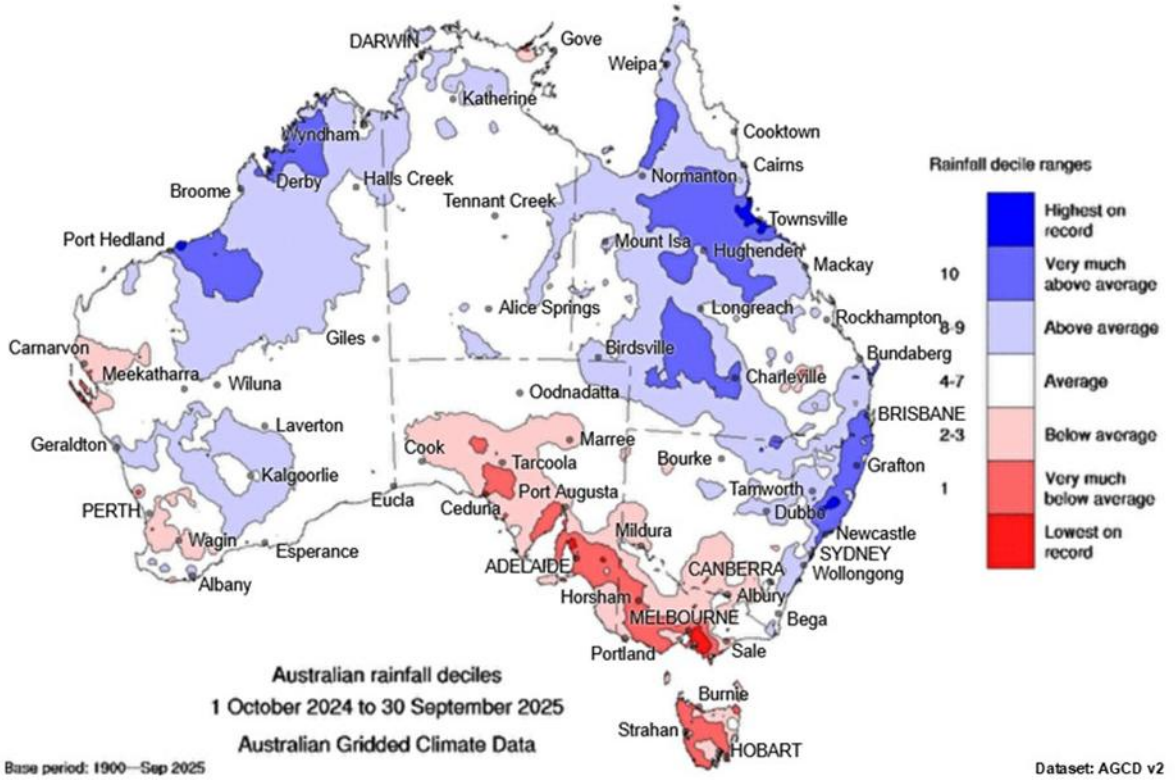


Figure 1.5: Rainfall deciles across Australia, 12 months preceding the spring 2025 survey (BoM 2025b)

2 Methods

2.1 Survey details

Lathwida undertook the spring flora and fauna surveys at Carrapateena between 18 and 26 September 2025. The survey team included the following suitably qualified personnel:

- Principal Ecologist Dr Zeta Bull undertook trap installation, morning and afternoon trap checks, bird survey, mammal and reptile identification lead, flora survey assistant, trap removal.
- Senior Associate Ecologist Greg Smith undertook trap installation, morning and afternoon trap checks, mammal and reptile identification, bird survey, flora survey, trap removal and Song Meter deployment and analysis. Greg specifically surveyed 'men only' cultural sites;
- Senior Associate Ecologist Dr Sonia Croft undertook trap installation, morning and afternoon trap checks, flora surveys, bird survey, trap removal;
- Undergraduate Ecologist Andy Delvaux provided survey assistance and undertook trap installation, assisted with morning and afternoon trap checks, assisted with flora survey, mammal and reptile identification, bird survey and trap removal. Andy assisted with survey of the 'men only' cultural sites.

BHP Environmental personnel Trent Anderson, Tina Law and Luke Boehm assisted with various logistics associated with the survey.

2.2 Permitting

Undertaking ecological research and handling/trapping of animals in South Australia can only legally be undertaken with relevant permits and licences in place. Relevant permits and licences were obtained prior to field survey commencement. All works were undertaken in accordance with permit and licence conditions; details as below.

- Permit to Undertake Scientific Research:
  - Permit # A27482-1, valid from 11/10/2024 to 10/10/2025
- Wildlife Ethics Committee Permit:
  - Application number Bull_26/2023M2 statewide fauna with semi-pitfalls, approval period 31/08/2023 to 01/09/2026
- Permit to Undertake Scientific Research for State-wide Vegetation Surveys:
  - Permit # U27347-2, valid 17/10/2024 to 16/10/2025
- Licence for 'teaching, research or experimentation involving animals':
  - Licence # 414, expires 12/8/2027

- Licence to 'possess and administer Prescription Drug[1]:
  - Licence # 2023-87672, expires 12/09/2026.

2.3 Spring 2025 Sites

The objective of the survey monitoring program is to demonstrate whether the site is compliant with the conditions of the Mineral Lease and the approved Outcomes during the mine construction, operations and rehabilitation. Table 2.1 below includes a summary of previous monitoring sites against the compliance survey sites and an explanation for any changes. Table 2.2 provides a summary of specific spring 2025 survey site details. Refer spring 2019 report (Jacobs 2020a) for further details. The locations of the spring 2025 survey sites are provided on Figure 2.1 for flora and canopy cover, Figure 2.2 for fauna sites, Figure 2.3 for weed transects, and Figure 2.6 for LFA, as part of the operational monitoring.

[1] A condition of Scientific Research Permits is that 'best practice' for biological survey work is undertaken, including vouchering of specimens of interest for the South Australian Museum (SAM). This condition is included on permits as a means of maximising value obtained from survey work across the State, to enable taxonomic specialists the chance to verify field identification, and to encourage survey records to be included in the Biological Database of South Australia for broader knowledge. As such, the project team liaised with the SAM prior to undertaking the survey to ascertain whether the Museum had particular interest in the region being surveyed. In this case, the curator of mammals and curator of reptiles requested voucher specimens and liver tissue samples be collected for target species. Pentobarbitone sodium is used to euthanize specimens, however, was not required on this survey as no animals were euthanized.

Table 2.1: Sites surveyed in spring 2025, compared with baseline survey sites

Baseline Survey Sites (2012-2017)	Compliance sites	Construction / Operational (Compliance) Monitoring Survey Sites (spring 2025)
Flora		
Jessup transects (at 16 sites) (Flora Site 1 to 16)	18 Jessup transects	Jessup transects (as per baseline Flora Site 1 to 16), plus additional Jessup sites at Eliza Creek Flora Sites 17 to 20. *In spring 2019, Sites 8 and 14 were permanently removed from the program given proximity to stock impact areas, interfering with assessment of mining impacts. Refer Jacobs Spring 2019 for additional detail (Jacobs 2020a). **Jessup sites not undertaken at Site 21, 22 sand dune habitat as per Section 2.4
Flora sites (at 16 sites) (Flora Site 1 to 16)	20 RAM sites	Flora Site 1 to 16 (excludes 8 and 14), Eliza Creek sites (Sites 17 to 20) and dune habitat sites (Sites 21 to 22). Record of all plant species and cover/abundance within a 1-ha area using Rangeland Assessment Method (RAM) (NVC 2024).
Flora cover sites (at 33 sites) (CFL01 to CFL33)	NA	Baseline surveys only, not continued. Survey sites covered 10 m x 5 m area, deemed too small to capture meaningful change in this habitat type.
Canopy cover (at 11 transects). 7 Eliza Creek transects, 4 Yeltacowie Creek transects (CCC01 to CCC11)	8 sites (Eliza Creek)	Baseline Yeltacowie Creek and Eliza Creek canopy cover sites (CCC01 to CCC11, EBS 2017c) were not assessed as per 2018-2023. Eliza Creek canopy cover transects (17A/B, 18A/B, 19A/B and 20A/B) surveyed in spring (2018 to 2022, 2024, 2025) and in autumn (2018, 2019, 2023).
Weed Monitoring (at 4 transects) (CWM01 to CWM04)	10 weed transects	Baseline weed transects (CWM01 to CWM04), CWM05 to CWM07 (established in 2018 to 2022); Northern Wellfield (MPL 156) transects (NWM01 to NWM03). Opportunistic observations of declared weed species or species listed under legislation are also recorded.
Fauna		
Reptiles and mammals (at 8 sites) Fauna Sites 1 – 6, 15, 16)	8 fauna sites	Semi-permanent pitfall trap line sites as per baseline surveys (Fauna Site 1 to 6, Fauna Site 15 to 16). As per 2018 to 2024, only 1 pitfall line was opened (6 pits per line). No Elliott traps were deployed as per baseline (2015-2017), and compliance / operation (2018 to 2024). This methodology will be continually reviewed based on an analysis of compliance monitoring trapping data for small rodents (e.g. Plains Mouse). Camera traps have also been used (1-2 per line) since 2021.
Bats	NA	Common microbat audible to humans (Dennis Mathews, pers. com.). No bats likely to be present at the site have a conservation rating. In 2024 and 2025 Song Meters were deployed to detect birds and microbats; at Sites 10 and 7 in 2025.
Bird Sites (at 16 sites, Fauna Site 1 – 16), opportunistic surveys at water points	20-22 sites, opportunistic at water points / irrigation areas	Bird surveys at 20 sites. Opportunistic surveys at water points (e.g. farm dams), camps to capture diversity across the site as per baseline surveys. Survey of water points also enables opportunistic observations of seasonal of migratory shorebirds. Song Meters were deployed to detect bird species by call at all fauna sites, Flora Site 10 (Eliza Creek), and Flora site 7 (Bosworth Creek). Water was present at site dams, but the creeks were dry.
Landscape Functional Analysis (LFA)		
Landscape Functional Analysis (CEF01 to CEF07)	4 sites, each with 2 transects	Four Landscape Functional Analysis sites (LFAAL1, LFAVOL2, LFAQUA3, LFATJU4), each with 2 transects A and B (e.g. LFAAL1A, LFAAL1B). In September 2025, 2 sites were not assessed (LFAVOL2 has been re-ripped and reseeded, awaiting germination; LFATJU4 was considered to be complete as per Lathwida 2025a). Two sites will be monitored in 2026 (LFAVOL2 and / or new sites along the WAR where seeding and ripping has occurred).

Refer to Jacobs Spring 2019 report for additional detail (Jacobs 2020a).

Table 2.2: Summary of survey sites, codes and coordinates

Survey Techniques at Site	Site Code	Start / End	Easting	Northing
Weed Transect	CWM01	Start	737108	6517520
		End	736871	6516550
	CWM02	Start	737842	6530179
		End	738177	6529435
	CWM03	Start	733610	6535627
		End	732611	6535266
	CWM04	Start	735912	6540184
		End	736548	6540963
	CWM05	Start	700638	6518508
		End	701466	6519078
	CWM06	Start	717686	6529628
		End	718673	6529505
	CWM07	Start	743694	6539567
		End	743410	6540518
	NWM01	Start	726014	6554920
		End	726937	6554923
	NWM02	Start	726955	6569623
		End	725963	6569751
	NWM03	Start	720606	6580675
		End	720551	6581674
RAM, Jessup, Fauna Trapping, Birds	Flora / Fauna 1 (CAR001)	Start	731707	6550590
	Flora / Fauna 2 (CAR002)	Start	734223	6545185
	Flora / Fauna 3 (CAR003)	Start	736001	6540156
	Flora / Fauna 4 (CAR004)	Start	736251	6534615
	Flora / Fauna 5 (CAR005)	Start	729131	6532955
	Flora / Fauna 6 (CAR006)	Start	739690	6531181
	Flora / Fauna 15 (CAR015)	Start	737123	6538106
	Flora / Fauna 16 (CAR016)	Start	732472	6535805
RAM, Jessup, Birds	Flora / Fauna 7 (CAR007)	Start	732755	6548730
	Flora / Fauna 9 (CAR009)	Start	746788	6544253
	Flora / Fauna 10 (CAR010)	Start	740538	6541973
	Flora / Fauna 11 (CAR011)	Start	734655	6536360
	Flora / Fauna 12 (CAR012)	Start	740402	6532837
	Flora / Fauna 13 (CAR013)	Start	745093	6528963
RAM, Jessup, Birds, Canopy Cover	Flora / Fauna 17, CC17A (CAR017)	Start	739269	6536920
	Flora / Fauna 18, CC18A (CAR018)	Start	739350	6537556
	Flora / Fauna 19, CC19A (CAR019)	Start	739621	6539504
	Flora / Fauna 20, CC20A (CAR020)	Start	739950	6541083
Canopy Cover only	CC17B	Start	739265	6536929
	CC18B	Start	739345	6537556
	CC19B	Start	739676	6539434
	CC20B	Start	739959	6541060
RAM, Birds	Flora / Fauna 21 (CAR021)	Start[1]	722657	6531233
	Flora / Fauna 22 (CAR022)	Start[1]	718006	6529448
Landscape Function Analysis	LFA Site 1 Aerodrome Laydown (Aerodrome) (LFAAL1A-B)	Start	733020	6534295
		End	733063	6534316
		Start	733052	6534277
		End	733068	6534319
	LFA Site 2 Ventia (Office) Laydown (Ventia) (LFAVOL2A-B) Not monitored in 2025, rehabilitation renewed, no germination at time of survey	Start	736103	6540338
		End	736103	6540391
	LFA Site 3 Midway Quarry Laydown (Midway Quarry) (LFAQUA3A-B)	Start	729264	6533139
		End	729291	6533097
		Start	729307	6533163
		End	729335	6533123
	LFA Site 4 Tjungu to WAR (LFATJU4A-B) Not monitored in 2025 – rehabilitation complete	Start	734595	6536191
		End	734631	6536219
		Start	734631	6536219
		End	734673	6536252

[1]Refer Jacobs (2019a) for further detail;

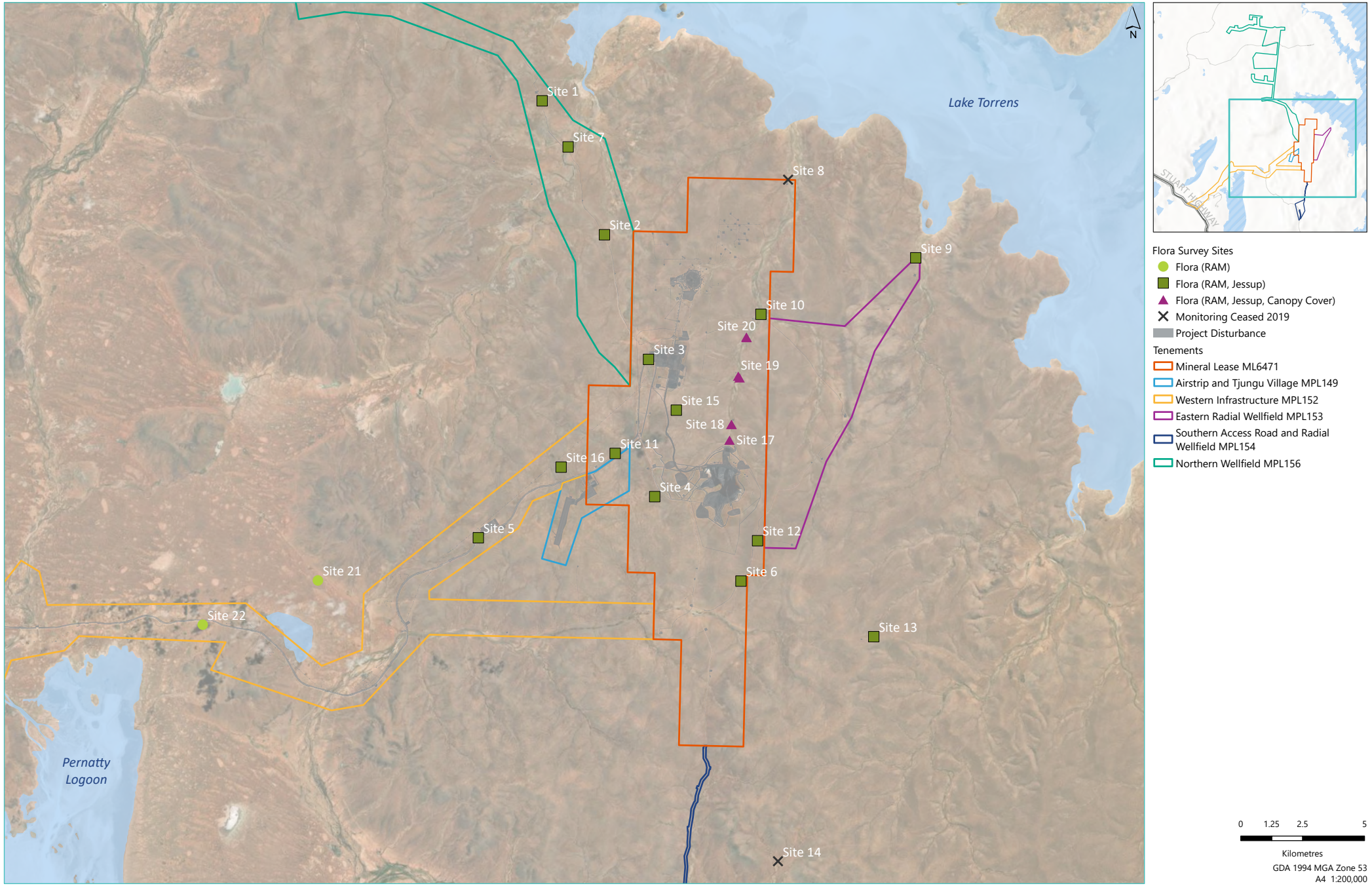


Figure 2.1: Location of Flora Sites
Carrapateena Flora and Fauna Survey, spring 2025

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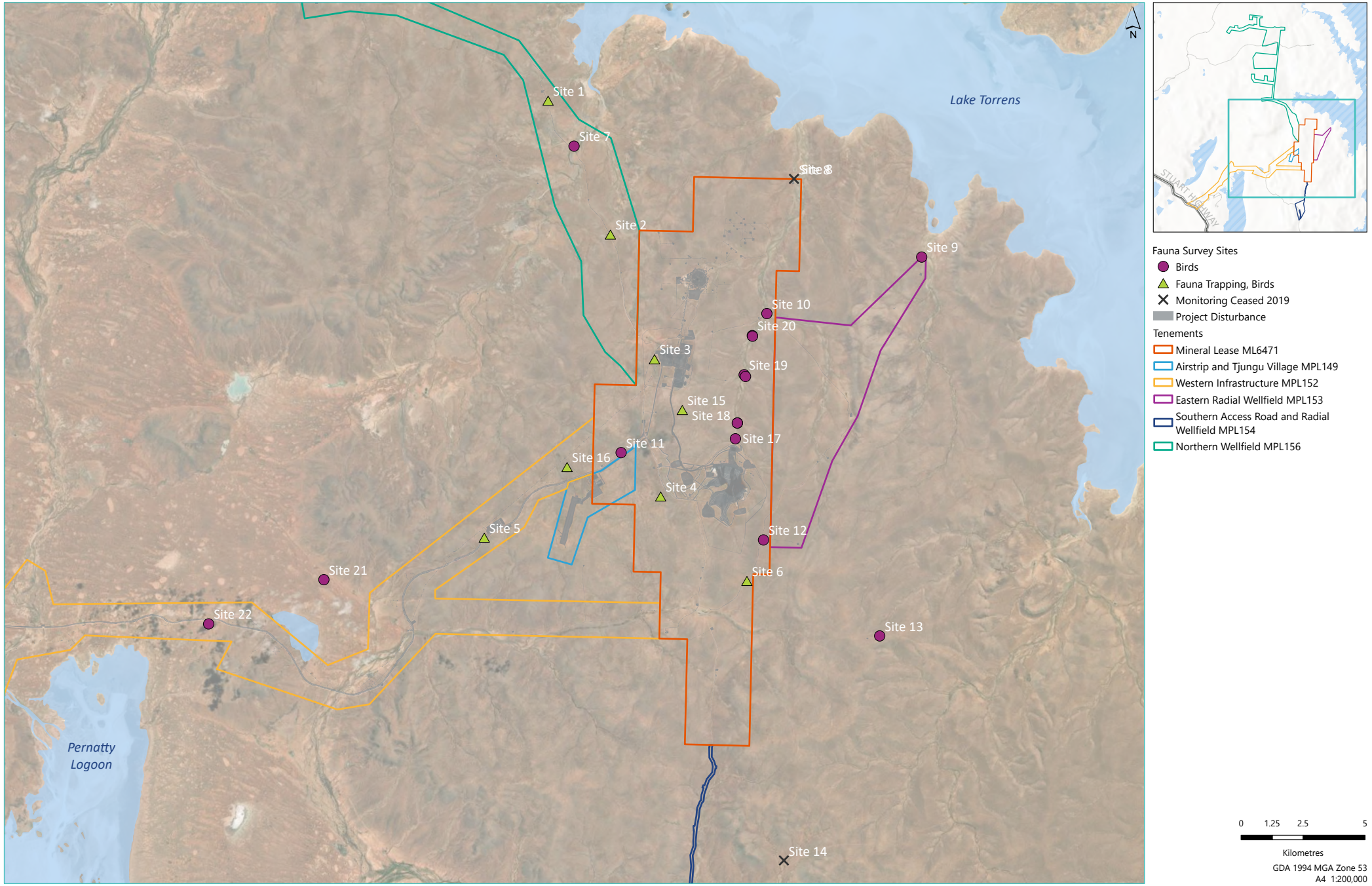


Figure 2.2: Location of Fauna Sites
Carrapateena Flora and Fauna Survey, spring 2025

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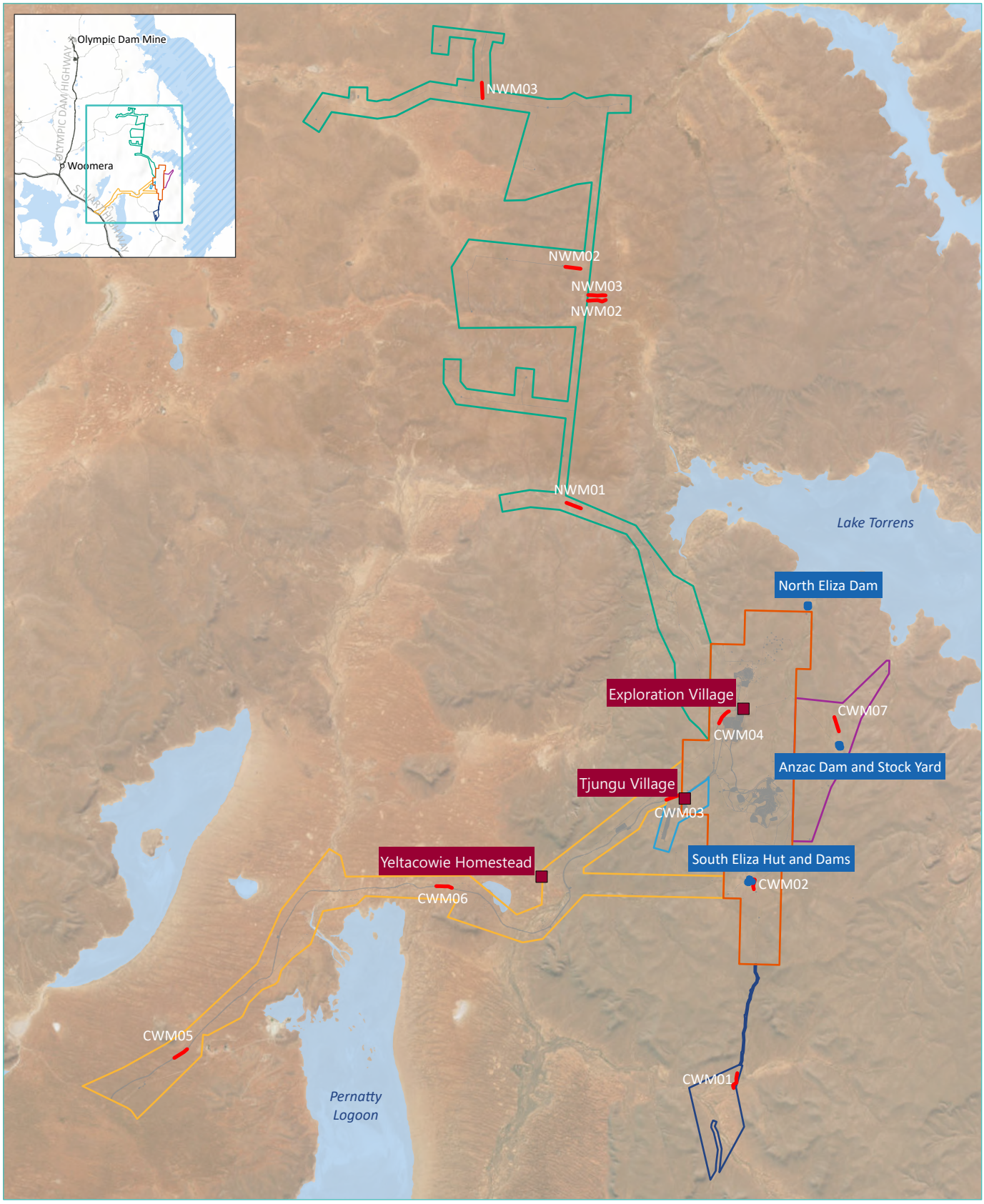


Figure 2.3: Location of Weed transects
Carrapateena Flora and Fauna Survey, spring 2025

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2.3.1 Nomenclature

Survey site naming conventions remain as per previous spring surveys (Jacobs 2019a, 2020a, 2021b, 2022a, 2023b; Lathwida 2025a). It is noted that throughout this report, a simplified version of site names is often used e.g. Site 1, whereas CAR001 is the code used for data permit (refer Section 2.3.2) and the Carrapateena database.

2.3.2 Designation of control sites and impact sites

Survey sites are assigned to be either a control site (no detectable impact from mining considered likely) or an impact site (impacts on flora and/or fauna from mining activities considered possible). All sites on Eliza Creek, downstream of the tailings dam, were considered to be possible impact sites, due to potential changes in groundwater and / or surface water impacting vegetation. As such, the analysis of potential impacts in Eliza Creek involves a comparison of results over time, and with distance from the Tailings Storage Facility (TSF) embankment.

For other sites, impacts on flora and / or fauna were considered to be most likely due to increased dust, noise and / or increased vehicle presence, and for sites near the airstrip, also aerial collision of birds with aircraft. For non-Eliza Creek sites, there were considered to be potential impacts from mining activities if the site was < 2 km from infrastructure. Distances > 2 km were considered unlikely to be impacted by possible raised dust (e.g. based on air quality modelling), noise and / or increased vehicle presence, and as such, sites located > 2 km from infrastructure (including major roads) were designated as control sites for future comparison.

The initial designation in 2018 assumed the Western Access Road (WAR) would be a major thoroughfare complete at the time of the 2022 and 2023 surveys. The Midway Quarry, which is being progressively rehabilitated, is located adjacent Site 5 alongside the WAR and Site 22 (a sand dune site) is also adjacent the WAR. Site 6 located 1.5 km off the Southern Access Road (SAR), no longer used for heavy vehicle use, but 2.4 km from the south-eastern edge of the TSF was revised to a control site in 2024 due to the SAR no longer being widely used and being hydrogeologically distant and over 2 km from the TSF. Compliance monitoring to date has shown that sites > 1.5 km from major roads have not been impacted by mining activities and no change in flora of fauna is expected due to the lower vehicle activity on the SAR. Similarly, Site 4 is < 300 m from the SAR and former gatehouse, but is 1.5 km upstream of the TSF (however a temporary construction office was located at the site of the former gatehouse during the spring 2025 survey). Again, compliance monitoring to date has demonstrated no impact from mining activities on flora and fauna at this site and whilst no changes are anticipated in future, due to reduced vehicle use of the SAR. Hence, this site has also been revised to a control site, but the treatment status will be monitored as site operations change.

A site summary, including distance from infrastructure and designation as control or impact, is provided in Table 2.3 below. Control sites included Sites 1, 2, 7, 9, 13 and 21, from 2012 to 2023, but also Site 4 and 6 from 2024, given the reduction in potential impact as a result of the reduced use of the SAR. Impact sites for the 2025 survey included Sites 3, 5, 10, 11, 12, 15, 16, 17,18, 19, 20 and 22. Site locations relevant to infrastructure, including roads are provided in Figure 2.4 and Figure 2.5 below. It is noted that degree of potential impact varies and all sites are close to roads or tracks, but some have lower levels of traffic

(e.g. Site 12). Regardless data is assessed for trends and if trends emerge further analysis is undertaken where necessary.

Rehabilitation sites (LFA sites) were assessed in 2025 at the Aerodrome Laydown (LFA Site 1 / Aerodrome), and Midway Quarry Laydown (LFA Site 3 / Midway Quarry), with 2 transects at each site (refer Table 2.3, Figure 2.6 and Section 2.5 for further information).

Weeds have been recorded at standard flora sites, designated weed transects, targeted sites (dams and villages), and opportunistically. Details of weed transect relative locations and habitat are provided in Table 2.4.

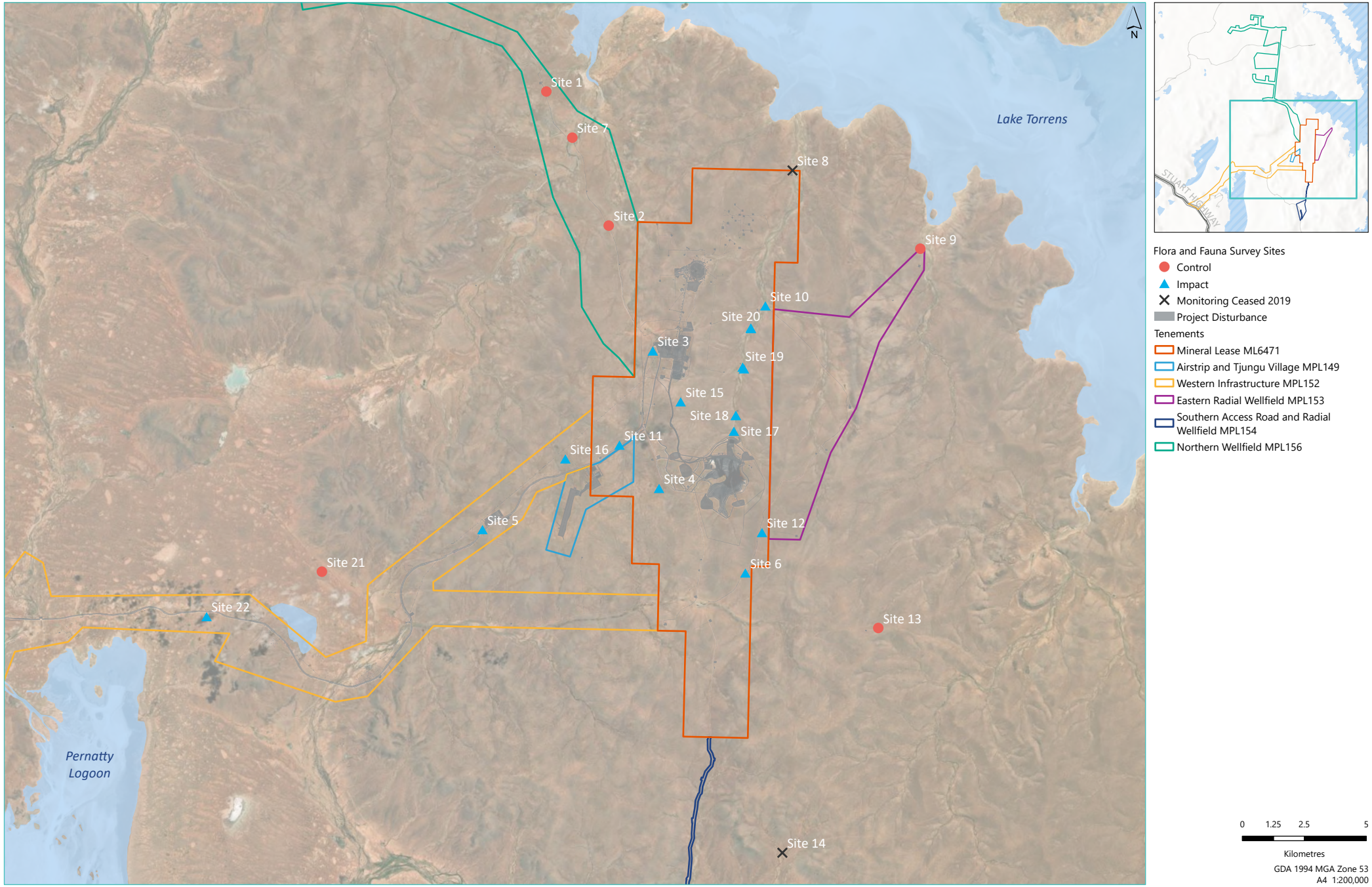


Figure 2.4: Carrapateena Control and Impact Sites (baseline to 2023 original treatment)
Carrapateena Flora and Fauna Survey, spring 2025

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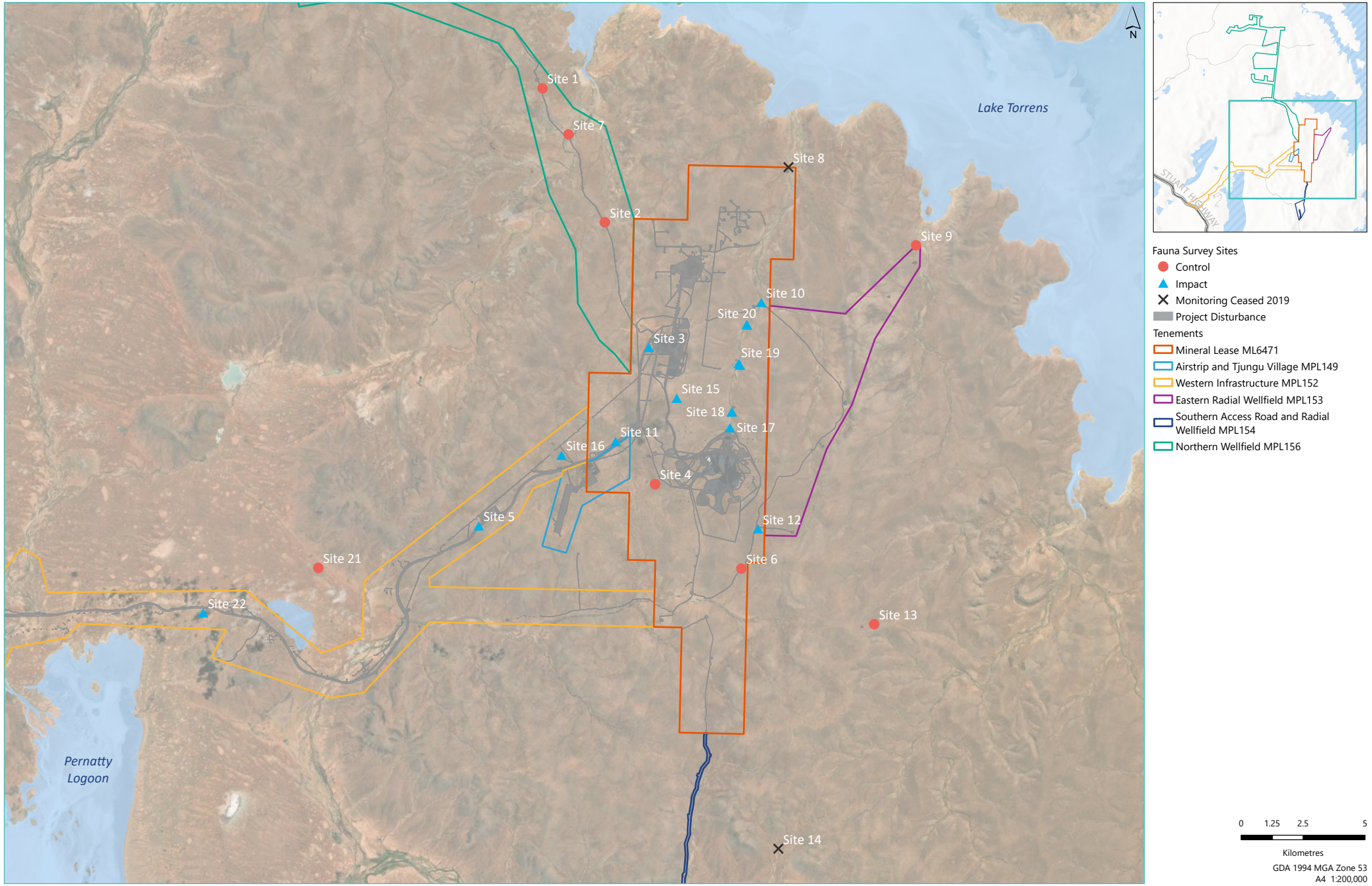


Figure 2.5: Carrapateena Control and Impact Sites (2024 onward with revised treatment)
Carrapateena Flora and Fauna Survey, spring 2025

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Table 2.3: Summary of survey sites, and designation as control or impact

Site	Vegetation Association	Landform	Distance from Infrastructure	Site Type
Flora / Fauna Site 1	Bladder Saltbush (*Atriplex vesicaria*) Low Open Shrubland	Stony tableland with shallow drains	7 km from drill pad, and outside lease area, adjacent northern wellfield road (Khamzin)	Control
Flora / Fauna Site 2	Bladder Saltbush Low Very Open Shrubland	Stony tableland	Approximately 2 km west of drill Pad, adjacent Northern Wellfield Road (Khamzin). Depending on future traffic volume these sites may need to be considered as impact in the future.	Control
Flora / Fauna Site 3	Bladder Saltbush / Samphire (*Tecticornia medullosa*) Low Open Shrubland		Less than 100 m from access road, less than 200 m from Processing Plant, carparks and administration buildings	Impact
Flora / Fauna Site 4	Bladder Saltbush +/– Samphire Low Open Shrubland		Approximately 1.5 km west of TSF, < 300 m from SAR (no longer used for heavy vehicles, reduced light vehicle traffic). Site is hydrogeologically disconnected (i.e. upstream) from the TSF. In 2024, Site 4 was revised from Impact site to a Control site.	Control
Flora / Fauna Site 5			Site is ~ 40 m from WAR, <500 m from Midway Quarry, ~3.5 km from airstrip	Impact
Flora / Fauna Site 6	Bladder Saltbush Low Open Shrubland		~2 km north-east of South Eliza Dam / SAR (no longer used for heavy vehicles, reduced light vehicle traffic) ~ 2.4 km upstream from south-eastern edge of TSF, hydrogeologically disconnected. In 2024 Site 6 was revised from Impact site to a Control site.	Control
Flora / Bird Site 7			100 m west of Hilson Creek on Khamzin Rd and 3 km south of Lake Torrens. 5 km north-west of drill pad	Control
Flora / Bird Site 9	Western Myall (*Acacia papyrocarpa**) Tall Open Shrubland on minor drainage line over Bladder Saltbush Low Open Shrubland	Minor drainage line / adjoining stony plain. Approximately 1.5 km from Lake Torrens.	12 km north-east of Tailings Dam. 600 m from Radial Pipeline.	Control
Flora / Bird Site 10	Northern River Red Gum (*Eucalyptus camaldulensis* ssp. *arida*) Low Open Woodland	Eliza Creek, junction with major tributary. 8 km south of Lake Torrens.	~ 5.5 km downstream of Tailings Dam	Impact
Flora /, Bird Site 11	Bladder Saltbush Low Open Shrubland fringed by Western Myall	Stony tableland and minor drainage line	~ 1.5 km from SAR junction. 200 m west of laydown area, and 40 m from WAR. 2 km north-east of Tjungu Accommodation Village.	Impact
Flora /, Bird Site 12	Bladder Saltbush) Low Open Shrubland	Stony tableland	~ 1 km south-east (upstream) of the TSF mid-eastern boundary	Impact
Flora / Bird Site 13	Bladder Saltbush +/- Samphire Low Open Shrubland		~ 7 km south-east (upstream) of the TSF and 6 km from Radial Pipeline.	Control
Flora / Fauna Site 15	Bladder Saltbush Low Open Shrubland		~ 300 m from haul road, < 900 m from processing plant	Impact
Flora /, Fauna Site 16			Approximately 1 km north-west of Tjungu Accommodation Village and airstrip and 500 m north of WAR / gatehouse.	Impact
Flora / Bird Site 17	Western Myall Low Open Woodland)	Major drainage line / Eliza Creek	~230 m north of the TSF Decant Dam Embankment	Impact
Flora / Bird Site 18			~870 m north of the TSF Decant Dam Embankment	Impact
Flora / Bird Site 19	Northern River Red Gum* Low Open Woodland		~3 km north of northern bank of Tailings Dam on Eliza Creek, 730 m from Injection Well.	Impact
Flora / Bird Site 20			~5 km north of northern bank of Tailings Dam on Eliza Creek and 470 m from Injection Pipeline.	Impact
Flora / Bird Site 21	Umbrella Bush (*Acacia ligulata*) Tall Shrubland	Sand dune	>2 km from WAR	Control[1]
Flora / Bird Site 22	Umbrella Bush shrubland over Sandhill Cane-grass (*Zygochloa paradoxa*) Hummock Grassland		150 m from WAR	Impact
LFA Aerodrome	Formerly Bladder Saltbush Low Open shrubland	Stony plain	10 m from airport road, 100 m from airport	Rehab monitoring
LFA Ventia	Formerly Bladder Saltbush / Samphire Low Open Shrubland	Stony tableland	5 m from WAR, 100 m from processing plant	
LFA Midway Quarry			WAR (40 m in), west of Midway Quarry	
LFA Tjungu to WAR	Formerly Bladder Saltbush (Low Open Shrubland		WAR, approximately 1.5 km from SAR junction.	

*Refer Appendix B for explanation of taxonomy; [1]Refer Jacobs (2019a) for additional detail about change of site location

Table 2.4: Weed Transects location and habitat

Transect	Road	Habitat
CWM01	Southern Access Road (SAR)	Gibber stony tableland is dominant, but the transect also includes creeks and culverts
CWM02		
CWM03	Western Access Road (WAR)	Gibber stony tableland
CWM04	Access Road west of administration and processing area	Gibber stony tableland, includes “Ventia” LFA site
CWM05	Western end of WAR	Mulga (*Acacia aneura*) woodland on sandy loam
CWM06	WAR	Gibber stony tableland, dunes and minor creek
CWM07	Minor road, north-east of Anzac Dam	Gibber stony tableland
NWM01	Northern Wellfields Road	
NWM02		
NWM03		Drainage Line

2.4 Techniques to address OMC

Table 2.5 summarises the survey techniques used in spring 2025 to assess each OMC. More detailed descriptions of each method (Jessup, RAM, Photopoints, Canopy Cover, Weeds) are provided in the 2018 -2022 reports (Jacobs 2018a, 2019a, 2019b, 2020a, 2021b, 2022a, 2023b).

At each Flora site where a RAM (NVC 2024) was undertaken, it was within a 1-ha area. For the stony tableland sites (1 – 7, 9, 11–13, 15 and 16) this was a survey of 100 m x 100 m plot, 50 m either side of the line joining the start and end of the Jessup transect. For the Eliza Creek sites (Flora Site 10, Flora Sites 17 – 20) the 1-ha survey was confined to vegetation considered to be under the influence of the creek landform and water regime. The RAM survey area at Sites 21 and 22 is an area centred on the site coordinate, with a 55 m radius (namely a circular area of approximately 1 ha).

As per 2019 – 2024 surveys, Jessup surveys were not undertaken at Site 21 and 22 (sand dunes), given the sand dune sites were not marked in the field (due to potential heritage values).

As per 2021 to 2024 reporting, Canopy Cover results include data from spring 2018 onwards. For Canopy Cover sites, densitometer results are provided for individual transects at each site, as well as mean data results for the 2 transects at a site. Canopy Cover intactness is calculated as the extent of the individual tree's live canopy at the time of the survey compared to the potential extent of the canopy for a fully healthy tree.

Weed transect refinements were required at some locations during spring 2024 and 2025, due to realignments and substantial widening of the WAR since the initial weed transects were established. The distances (250 m, 500 m, 750 m and 1000 m) represent the distance in a straight line from the start of the transect and not necessarily the distance along the road (some transects have bends/curves). For the SAR and WAR roads, 2 photographs are taken on both sides of the road, with photo bearings being parallel with the road in each direction (i.e. 4 photos at each survey location). The area surveyed is a semicircle on either side of the road with a radius of 50 m beginning from the carriageway (the surveyed area includes the road shoulder/verge). For weed transects on the Northern Wellfield Road and narrow tracks (CWM04 and CWMO7), the area surveyed is a circle with a 50 m radius from centre of road.

Table 2.5: Survey techniques used in spring 2025 to address Outcome Measurement Criteria

OMC Code	Outcome Measurement Criteria (OMC)	Technique / data collection strategy to determine if obligations are being met
SWRF1	Annual ecological surveys undertaken by an independent and suitably qualified expert demonstrates no adverse impact on the diversity and abundance of native vegetation and water dependent ecosystems at Eliza Creek monitoring sites (Figure 9.2, Figure 9.3 of the PEPR) attributed to reduced surface water flows caused by mining operations when compared to baseline conditions (Appendix C5 of PEPR BHP 2025a).	RAM survey at 5 Eliza Creek site (Sites 17, 18, 19, 20, 10) at increasing distance (downstream, 0.23 km to 5.5 km.) from the northern bank the TSF dam. Results assist with distinguishing grazing impacts from other causes of plant impact, provides inventory of species present and detection of any loss of diversity. Abundance data allows detection of changes in native and introduced species, with repeat monitoring. Jessup (DENR 2011) and Canopy Cover transects at the same location as RAM sites (1 Jessup transects at each of 5 sites). Provides information on population structure of long-lived perennials, including recruitment. Eight Canopy Cover sites (2 parallel transects at each of the 5 sites) to assess possible impacts on tree health due to potential higher watertable, reduced surface water flows and / or tailings seepage. Comparing the total number of GRS (2018) densitometer foliage records along a transect over time provides an indication of changes in total canopy volume. Canopy data recorded from 100 points at each location. One transect representing instream habitat and one representing bank habitat. In summary, Jessup, RAM and Canopy Cover Assessment provides detailed information on plant species diversity, abundance and health at each site: vegetation structural layers, population data for woody perennials (number of adults and number of juveniles), and grazing impacts on woody perennials, plus notes on existing disturbance agents at each site.
TSF6	Annual surveys undertaken by an independent and suitably qualified expert demonstrates no adverse impact on the diversity and abundance of native vegetation and water dependent ecosystems at Eliza Creek monitoring sites (Figure 9.2, Figure 9.3 of the PEPR) attributed to tailings seepage when compared to baseline conditions (Appendix C5 of PEPR, BHP 2025a) unless an SEB has been approved in accordance with the NVMP.	
WP1	Annual flora and fauna surveys undertaken by suitably qualified ecologists at flora, fauna and weed monitoring locations (Figure 9.2, Figure 9.3 and 9.4 of the PEPR) demonstrates no introduction of new species of weeds declared or listed under relevant legislation, plant pathogens or pests (including feral animals) as a result of mining related activities when compared to previously recorded weed species and introduced fauna. Similarly, annual flora and fauna survey results demonstrates no increase in the abundance of existing weeds or pest species in the land compared to previous survey records as a result of mining related activities.	Survey of 10 weed Transects (CMW01-CMW07, NWM01, NWM02 and NWM03). For each weed transect, the abundance and cover of all weeds recorded at 5 locations (250 m intervals, 50 m radius) along a 1000 m transect). Opportunistic records of all weed species whilst traversing around the whole mine site in general. Weed location, habitat, and weed population size and extent recorded. In addition, active searches of areas with a high potential for weed establishment also undertaken (e.g. dams, spill areas, and villages).
WP2		
AQ2	Annual ecological surveys undertaken by a suitably qualified and experienced expert demonstrates no adverse impact on the diversity and abundance of native vegetation at monitoring sites (Figure 9.3 Flora of the PEPR) directly attributed to dust deposition from mining operations or mining related activities when compared to baseline native vegetation conditions (Appendix C5 Ecological Baseline of the PEPR, BHP 2025a).	Jessup Transects and RAM survey at 14 of the 16 baseline Flora Sites with the addition of collecting species cover and abundance information using both the Crown Separation Ratio scale. Survey of additional sites along the WAR within dune habitat that was not covered by the existing baseline data (Sites 21 and 22, RAM only).
EPBC1	Future records of Thick-billed Grasswren are to be provided to the Biological Databases of South Australia (BDBSA) to enable effective monitoring and record keeping if observed during annual flora and fauna surveys at monitoring sites (Figure 9.2, Figure 9.3 and 9.4 of the PEPR, BHP 2025a)	Bird surveys conducted at 14 of the 16 baseline bird monitoring sites, as well as at the 4 Eliza Creek flora sites and the 2 WAR dune sites. Opportunistic records of Thick-billed Grasswren to be recorded. Song Meters are also deployed at 10 of these sites. All records of Thick-billed Grasswren will be forwarded to Department for Environment and Water (DEW) as part of the Permit reporting requirements, which will then be uploaded into the BDBSA.
EPBC2	Future records of Plains Mouse are to be provided to the BDBSA to enable effective monitoring and record keeping if observed during annual flora and fauna surveys at monitoring sites (Figure 9.2, Figure 9.3 and 9.4 of the PEPR, BHP 2025a)	Fauna trapping surveys conducted at each of the 8 baseline fauna sites as per autumn 2017. Pitfall traps and un-baited cameras used to detect any Plains Mouse captures in spring 2025, aligning with the later years of the baseline surveys.
EPBC3	Future records of Night Parrot are provided to the Night Parrot Recovery Team to enable effective monitoring and record keeping if observed during annual flora and fauna surveys at monitoring sites (Figure 9.2, Figure 9.3 and 9.4 of the PEPR, BHP 2025a)	Bird surveys are undertaken as part of annual survey. Song Meters are also deployed, as per Thick-billed Grasswren (species not detected to date during compliance monitoring).
LUP4	Rehabilitation trials shall be undertaken at infrastructure locations no longer required and ongoing assessment at LFA monitoring at sites (Figure 9.3; CEF1-7 of the PEPR) are assessed annually demonstrating development of trends and annual improvement of rehabilitation through LFA methodology. Should the data indicate rehabilitation not trending towards sustainability root-cause investigations will be undertaken and rectification methods be identified and implemented	Following site rehabilitation, LFA is being undertaken within rehabilitation zones, and comparable data from these sites is being compared with baseline data, and future more relevant control sites will be established. Four LFA sites established (1 complete, 2 ongoing, 1 de-commissioned, but to be re-establised).

Refer Appendix C (this report) for additional detail about species classification and long-lived and short-lived, flora taxonomy and identification.

2.5 Landscape function

2.5.1 LFA sites

To meet the requirements of Outcome Measurement Criteria (OMC) LUP4 in the PEPR. Landscape Function Analysis (LFA) monitoring was conducted at two sites in September 2025. The objective of LFA surveys (2019 to present) was to measure the success of returning the sites to sustainable pre-impact levels of landscape function. LFA measures various processes that contribute to the formation of self-sustaining ecosystems and can be used to monitor revegetation post-impact (Tongway & Hindley 2005). The data collected during the September 2025 survey represents the sixth year of data collection for the Airport Laydown site (LFAAL) established in 2019 and fourth year for the Midway Quarry site established in 2022. A site known as Ventia was decommissioned in 2025. The Ventia site was established in 2019 adjacent to the Carrapateena Mine Processing Plant, but as at 2024 the transects intersected only one short-lived plant, and much of the site was being used as a temporary laydown area for adjoining road construction. Due to the shallow initial ripping, the almost total absence of vegetation naturally re-establishing, and its use as a laydown area, the site was decommissioned in 2024. New ripping has occurred in 2025 near the Ventia site and once evidence of regeneration is detected LFA sites will be re-established. A further re-establishment site known as Tjungu was established in 2022. By 2024, a combination of hand seeding and natural re-establishment had exceeded the reference site plant density and cover. In 2025, re-establishment of vegetation at this site method was complete based on LFA data, and no further monitoring was necessary.

For the initial surveys of all sites, the LFA Bank and Trough assessment method was undertaken for the new sites as they comprised only non-vegetated rip lines (refer Jacobs 2023h). By the second or third survey, the ripped troughs had levelled out, and sufficient vegetation had established to convert to the Established method, whereby patches comprised plants and inter-patches comprised soil/rocks. The rehabilitation of the 4 areas has been monitored using 2 complementary methods: the LFA, following the established method, supplemented by the Point-centred Quarter (PCQ) method during the early phase of colonisation and succession (Tongway and Hindley 2005). Jacobs (2023h) provides a summary of the methodologies applied and reasoning for the change.

Table 2.6 provides a summary of where the different approaches have been applied to date. For LFA transect coordinates and location refer Table 2.2 above and Figure 2.6.

Section 2.5.2 and Section 2.5.3 below provides a summary of the methodologies applied and reasoning for the change. Table 2.6 provides a summary of where the different approaches have been applied to date.

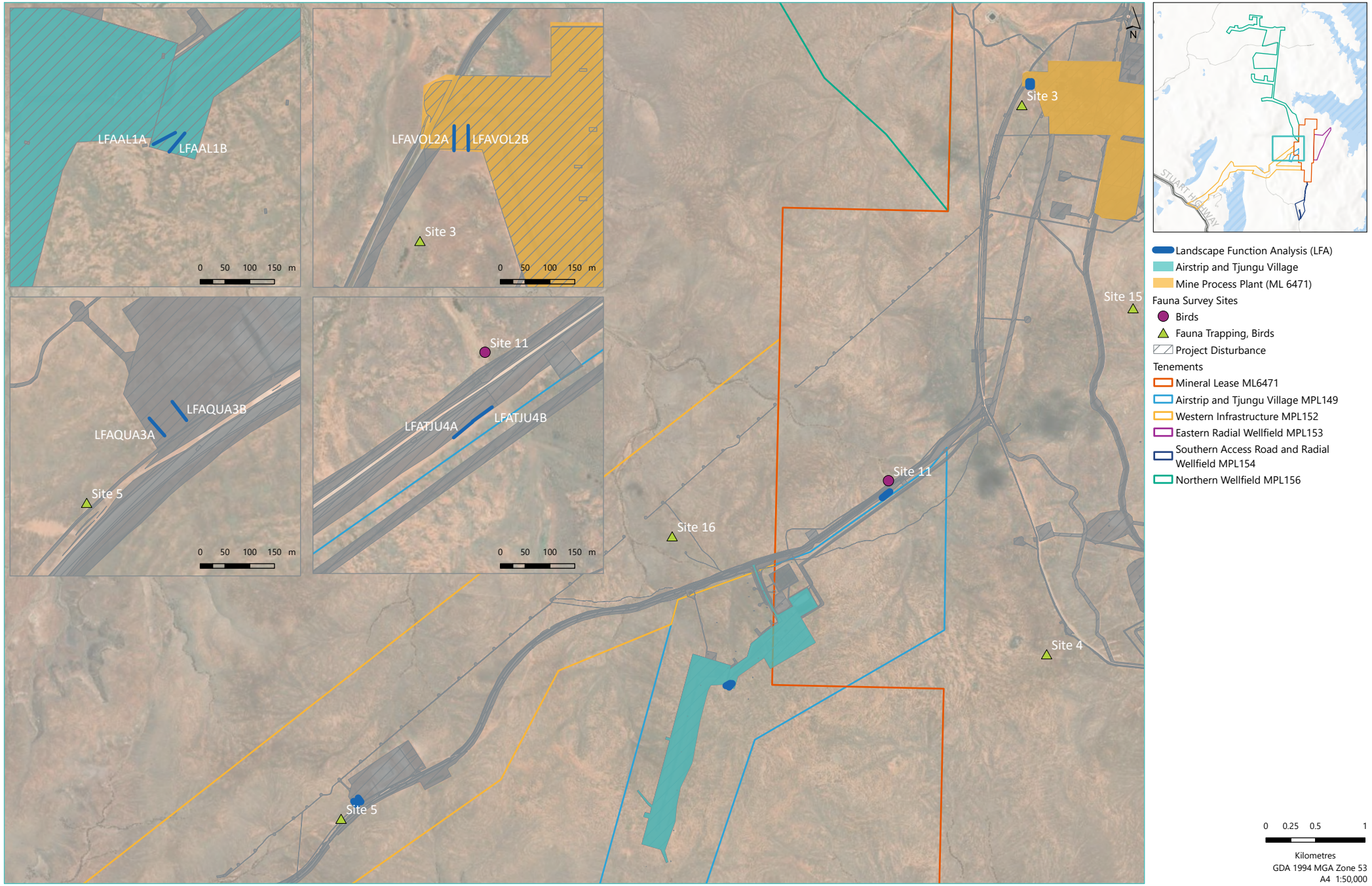


Figure 2.6: LFA Sites, Aerodrome Laydown (LFAAL), Ventia Laydown (LFAVOL), Midway Quarry (LFAQUA), Tjungu (LFATJU)
Carrapateena Flora and Fauna Survey, spring 2025

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2.5.2 The LFA established method

The methodology used during compliance monitoring for the LFA 'Established Method' is as described in Department for Manufacturing, Innovation, Trade, Resources and Energy (DMITRE) (2013). At each site, 2 fixed transects have been established, 50 m in length (Table 2.2). Directly beneath the transect line, the zones that occur are classified as a patch (represented by a plant/s with overlapping canopies or other resource-accumulator such as litter or logs), or interpatch (e.g. rocky surface, or bare ground). All short-lived and long-lived perennial species have been included as patches. Short-lived perennials, particularly *Sclerolaena* species, comprise a large proportion of the groundcover in the LFA site natural habitat.

2.5.3 Supplementary vegetation sampling using the Point-centred Quarter (PCQ) Method

Rehabilitation in semi-arid Australia is expected to be slow. In the early phase, plants may colonise in low abundance, or a clumped pattern, making it difficult to representatively sample using a fixed transect (Tongway and Hindley 2004). To supplement the LFA Established Method, the PCQ Method has been used in the early stages of vegetation re-establishment. The fixed transects were divided at regular intervals: 10 m, 20 m, 30 m, 40 m and 50 m. At each point, the nearest either short-lived or long-lived perennial plant up to 10 m away was located within each of 4 quadrants. No data was recorded for a quadrant where there were no perennial plants within 10 m of the sample point that had not already been sampled for a prior quadrant (Tongway and Hindley 2005). For each transect the mean distance between plants, and plant density (number of plants per unit area) were derived from the PCQ data. As more plants become established, the mean distance between plants deceases, while plant density increases. A summary of the different methods of data collection that have been applied for LFA at the Carrapateena site is presented below in Table 2.6.

Table 2.6: Summary of methods used to date for Landscape Function Analysis at Carrapateena

Survey	Sites	LFA Bank & Trough Method	LFA Established Method	LFA Soil Surface Assessment (SSA)	Point-centred Quarter (PCQ) method
2013 /2014 Baseline (EBS)	6 analogue sites	Nil	All 6 sites	X	Nil
September 2019 (Jacobs) (newly ripped soil)	2 sites with 2 transects each	1A, 1B, 2A, 2B		1A, 1B, 2A, 2B	Nil
September 2020 survey (Jacobs)		2A	1A, 1B, 2B	1A, 1B, 2A, 2B	1A, 1B, 2A, 2B
September 2021 (Jacobs)		Nil	1A, 1B, 2A, 2B	1A, 1B, 2A, 2B	1A, 1B, 2A, 2B
September 2022 (Jacobs)	4 sites with 2 transects each	3A, 3B, 4A, 4B	1A, 1B, 2A, 2B	1A, 1B, 2A, 2B	1A, 1B, 2A, 2B
May 2023 (Jacobs)		Nil	1A, 1B, 2A, 2B 3A, 3B, 4A, 4B	1A, 1B, 2A, 2B 3A, 3B, 4A, 4B	1A, 1B, 2A, 2B 3A, 3B, 4A, 4B
October 2024 (Lathwida)	3 sites with 2 transects each, 1 site with one transect	Nil	1A, 1B, 2B, 3A, 3B, 4A, 4B	1A, 1B, 2B, 3A, 3B, 4A, 4B	1A, 1B, 2B, 3A, 3B, 4A, 4B
September 2025 (Lathwida)	2 sites with 2 transects each[1]	Nil	1A, 1B, 3A, 3B	1A, 1B, 3A, 3B	3A, 3B

[1] Site LFAVOL decommissioned due to lack of vegetation reestablishing and use as a temporary laydown area for adjoining road construction; to be reinstated; Site LFATJU successfully restored by 2024 and not monitored in 2025.

2.6 Fauna survey method

2.6.1 Fauna trapping

As per 2018-2024 monitoring, fauna trapping was undertaken at 8 sites in spring 2025, with groups of 4 sites monitored over 2 consecutive trapping periods. Each site was monitored for 4 days and 4 nights between 18 and 26 September 2024. Two sites were opened on 18 September, and 2 sites were opened on the 19 September which were closed on 22 and 23 September respectively, and a second round of sites was opened on 22 September and closed on 26 September. All equipment and flagging tape was removed from each site at the end of each survey, except for semi-permanent pits which remained in-situ with lids re-established and screwed in with 'hex' (tech) screws to prevent animals entering the pits post monitoring. Trench lines for drift fencing between pit traps were backfilled.

The configuration at each of the 8 established fauna trapping sites (i.e. Sites 1-6, 15, 16) was as follows:

- A single pitfall line was opened from 1 of 4 semi-permanent baseline lines (Site 5 only has 3 semi-permanent pit lines remaining, 1 was removed in 2019).
    - Six pitfall traps were opened within each line, the minimum required by the SA Vertebrate Survey Guidelines (Owens 2000).
    - The pitfall traps were 240 mm diameter (standard PVC 225 / 250 mm pipe - internal diameter 240 mm) and 600 mm deep with a metal base to allow water drainage; used to target small to medium sized mammals and reptiles.
- A drift fence line (~80 m x 0.3 m) was temporarily installed into the ground approximately at 5-10 cm depth. The fence running across the semi-permanent pitfall traps, 10 m apart (fence extending approximately 5 m either side of the first and last pitfall trap).
- Two funnel trap pairs were placed evenly along each line.
- Two camera traps were deployed (facing each trap line at open locations, with minimal vegetation to avoid accidental triggers, or facing into a gilgai if present).
- No Elliott traps, cage traps, HARP traps or ANABAT recorders were used (Song Meters were deployed at alternative locations to target microbats).
- One Song Meter was deployed at a suitable location away from the trapping line.
- Refer spring 2019 report (Jacobs 2020a) for additional details.

2.6.2 Bird/bat detection

As per previous monitoring (2018 to 2024), bird surveys were undertaken in spring 2025 at least once at each of the 20 survey sites (Flora sites 1 to 7, 9 to 13, 15 to 16, plus sites 17, 18, 19, 20, 21 and 22) for 30 minutes in the early morning or late afternoon, when conditions were suitable. Bird data was also collected during multiple visits to the fauna trapping sites and opportunistically when driving between sites, during flora surveys, at dams and camps.

In addition, Song Meters were deployed in spring 2025 at all 8 fauna trapping sites, and 2 flora creek sites (Site 7 and Site 10), in order to detect additional species that were not detected during the day or nocturnal / crepuscular species. Song meters were deployed for a minimum of 24 hours at each site. Desktop analysis was undertaken post field to determine whether any additional species were present. Such analysis involves ecologists reviewing images and calls of bird calls and bat calls and verifying species against recognised images.

The Song Meters used were either Wildlife Acoustics® Song Meter Micro 2 Acoustic Recorders (birds only), Song Meter 4 Acoustic Recorders (birds only, larger range than Micro 2s), or Song Meter Mini Bat Acoustic Recorders (both bird and bat).

Song Meters were deployed within areas of habitat considered suitable for detection of birds approximately 100-200 m from fauna trapping lines (if present), or near habitat likely to provide specific habitat features. The units were configured to record in the acoustic mode; for 1 hour either side of both sunset and sunrise. In this configuration, for every 24 hours of deployment, each unit captured 14 hours of acoustic recordings (birds) and 4 hours of ultrasonic records (bats).

Each Song Meter was affixed to a stake or other stable object using cable ties. All cable ties were clipped short to avoid the potential for whistling interference in high winds. The location of each deployment was also marked using a GPS unit (IPAD).

2.6.2.1 Acoustic analysis

All bird recordings were processed using Wildlife Acoustics® Kaleidoscope Pro audio analysis software to detect vocalisations for visual and acoustic assessment. Analyses for these deployments followed the procedure of analysing recordings for the presence of any fauna species by detection using a combination of listening through in real time and high-speed visual spectrogram scanning. All audible taxa were noted in the order in which they appear in recordings. A total of 273.5 hours of recording were collected from 10 sites between 18-26 September 2025.

Bat data that was analysed included at total of 193 WAV sound format bat detector sound files from 2 recording sites over 7 recording nights (19 – 23 September 2025); Site 7 (near Bosworth Creek), and Site 10 (Eliza Creek). A multi-step acoustic analysis procedure was applied to the recordings. The sound files were scanned using SCAN'R, bat calls were then analysed against representative calls from southern Australia (Specialised Zoological 2025, provided in Appendix F).

Species identifications were made based on measurements of characteristic frequency and observation of pulse shape, and with reference to information in Armstrong et al. (2021b, cited in Specialised Zoological 2025). Nomenclature follows Jackson and Groves (2015, cited in Specialised Zoological 2025).

Distribution information for all bat species considered here was checked against the BatMap resource hosted by the Australasian Bat Society, Inc (https://www.ausbats.org.au/batmap.html) (Milne et al. 2023, cited in Specialised Zoological 2025).

2.6.3 Active reptile, track and scat search

Given the warmer conditions of the spring 2025 survey and the moderate number of reptile captures at fauna trapping sites, no active-reptiling was undertaken at trapping sites, but opportunistic searches were undertaken at flora sites when conditions were suitable. Additional reptile species were also detected as part of opportunistic observations throughout the survey, and via camera trapping.

2.6.4 Spotlighting

No spotlighting was undertaken in 2025 (usually only undertaken at Site 10 in Eliza Creek if conditions are suitable and time allows). Noting the Camera Traps (2 per site), and Song Meters were also collecting nocturnal images / acoustic data for 4 trap nights at each of the 8 fauna trapping sites (Sites 1-8, 15, 16) and Song Meters were also deployed at Site 7 and Site 10 to record birds and bats at dusk, dawn and throughout the night.

2.6.5 Opportunistic observations

Opportunistic observations make up an important component of a fauna survey and constitute any observations made while travelling around the Operations area, targeted searches at likely locations for fauna (e.g. dams), or between the survey sites. Any animals identified opportunistically, either via direct observation or by evidence, were recorded. These species were added to site species lists if identified at a survey site, or to a general survey species list if from the broader Operations area (if not attributed to a particular habitat type).

Location details for the key opportunistic observation locations are provided in Table 2.7 and on Figure 2.3.

Table 2.7: Key opportunistic survey site locations at Carrapateena

Location	Easting	Northing
Exploration Village (EV)	737500	6541120
Anzac Dam (AD)	743880	6539300
Tjungu Village (TV)	733700	6535306
South Eliza Dam (SED)	737960	6529976
Yeltacowie Homestead (YH)	724430	6530245

*MGA zone 53. GDA1994

2.6.6 Identification

Given surveys at Carrapateena have occurred since 2012, some species have undergone taxonomic revision and there have been changes to scientific and or common names. Where possible the naming conventions follows the current nomenclature of the Biological Databases of Australia flora and fauna taxonomy (DEW 2025). The following reference material and taxonomic keys were also used for species identification and classification:

Reptiles and amphibians

- A Complete Guide to Reptiles of Australia 2nd edition (Wilson and Swan 2023)
- Reptiles and Amphibians of Australia (Cogger 2014)
- Key to the Geckos of South Australia (Hutchinson and Williams 2024a)
- Key to the Skinks of South Australia (Hutchinson and Williams 2024b)
- Key to the Snakes of South Australia (Hutchinson and Williams 2024c)
- Key to the Dragons of South Australia (Hutchinson and Williams 2024d)
- Key to the Goannas of South Australia (Hutchinson and Williams 2024e)
- Checklist of the Reptile and Frogs of South Australia (Hutchinson and Williams 2024f).

Birds

- The Field Guide to the Birds of Australia, 9th edition (Pizzey et al. 2012)
- Field Guide to the Birds of Australia, 8th edition (Simpson and Day 2010)
- eGuide to Birds of Australia, application (Morcombe 2011-2019, Version 1.5 to 1.6.2)
- The Australian Bird Guide. (Menkhorst et al. 2023)
- Annotated List of the Birds of South Australia (Horton et al. 2020)
- The compact Australian Bird Guide (Davies et al. 2022).

Mammals

- A Field Guide to the Mammals of Australia (Menkhorst and Knight 2011)
- Mammals of Australia (Strahan 1995)
- Tracks, Scats and Other Traces (Triggs 2004)
- Key to Dasyuridae of SA (Kemper and Stokes 2021)
- Key to Muridae of South Australia (Kemper and Stokes 2023)
- Australian Bats (Churchill 2008).

Plants

- PlantNET - NSW FloraOnline (2025)
- Plants of Western New South Wales (Cunningham et al. 1992)
- Field guide to the plants of outback South Australia (Kutsche et al. 2023)
- South Australian Seed Conservation Centre (2025)
- The Australasian Virtual Herbarium (AVH) (2025)
- Atlas of Living Australia (ALA) (2025)
- Flora SA (Kellermann 2025).

2.6.7 Vouchering

No vouchering of fauna species was required, as all species captured had been sufficiently vouchered previously.

Flora collection occurred to facilitate in-field and post-field identification, as enabled under the conditions of relevant permits (Section 2.2).

2.6.8 Fauna survey limitations

The limitations associated with this fauna survey, consistent with most fauna surveys, are as follows:

- The results of the fauna surveys are only a 'snapshot' in time and cannot describe seasonal variation or migrations on their own.
- Scats could not always be correctly attributed to species, however where they could be confidently identified, they provide an accurate indication of the presence and habitat preferences of certain species (Triggs 2004).
- Detection of nocturnal species by spotlighting/nocturnal audio recordings does not detect all of the animals present and can be affected by environmental factors (Wayne et al. 2005).
- Read & Moseby (2001) concluded that environmental factors affected the capture rates of small reptiles. Unfortunately, planning logistics for fauna surveys around specific environmental conditions is very difficult. Planning to survey when weather conditions are generally favourable (as was done here) allows the best chance of favourable conditions during a survey and species identification. It is noted that daily conditions were considered favourable for reptiles during this survey.
- Read et al. (2015) suggest that trapping is most effective on dark nights during the first 2 nights, with higher capture rates observed when the moon illumination is less than 40%. As above, given the lead time to plan surveys, it is difficult to plan around this. However, during the survey a new moon (the darkest phase) occurred on 22 September, hence the majority of survey nights were considered suitable in relation to moon phase.

- Conditions for birds were suitable for early spring, however there were some very windy and above average (for September) warm days (e.g. 4 days of 25-31 degrees). Bird detection was also complemented at each individual site with Song Meter deployment, and opportunistic observations from across the broader Operation area (e.g. dams, tracks, camps, creeks). However, many Song Meter files were wind affected, each site was analysed for one 24-hour period and at least 2 mornings. Consequently, overall bird diversity is reduced compared to 2024. There also seemed to be more Sheep on the recordings at some sites (i.e. Site 6).
- Similar to recent surveys, for camera traps, facing the camera towards open areas, without vegetation, or roads in the field of view are noted to produce less false triggers.

3 Results

3.1 Climate during and preceding survey

3.1.1 Rainfall preceding survey

The region receives an average of about 180 mm of rain annually (BOM 2025a). Long-term mean monthly rainfall is relatively consistent throughout the year, with only a slight reduction typically occurring in late autumn and late winter. At the Woomera weather station, annual rainfall totals for 2022, 2023, and 2024 were 381.4 mm, 173.2 mm, and 174.6 mm respectively; with 2022 representing a notably wetter-than-average year.

In the 12 months prior to and inclusive of the spring survey (October 2024 to September 2025), the Carrapateena weather station recorded 169 mm of rainfall, approximately 8% below the regional annual average, primarily due to lower-than-average totals from January through June. This deficit occurred despite November 2024 and March/July 2025 combined, accounting for more than half of the year's rainfall. However, the total rainfall at the Carrapateena weather station for the 3 winter months immediately preceding the September survey, was 46 mm, very close to the regional average of 43 mm. With the exception of March, monthly totals at Carrapateena and Woomera differed by less than 10 mm during this period (Figure 3.1).

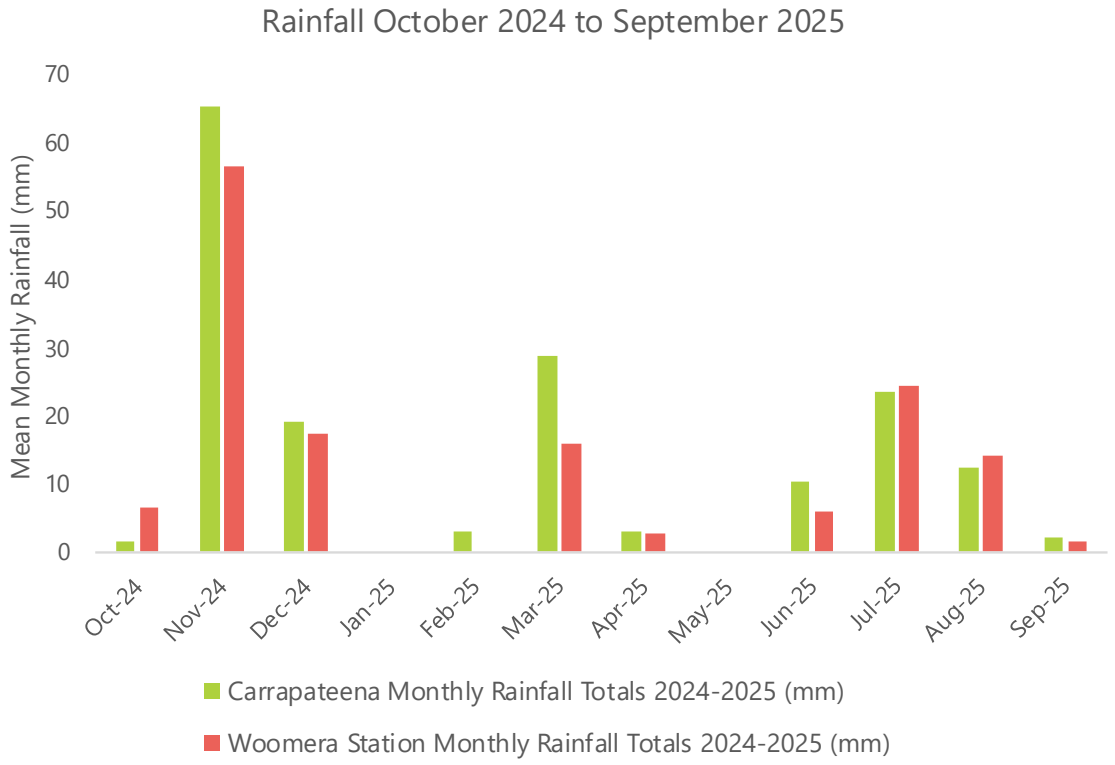


Figure 3.1: Rainfall 12 months preceding the Carrapateena spring 2025 survey (Unit – Vaisala WXT520) and at Woomera Aerodrome

3.1.2 Weather during survey

Weather conditions recorded during the survey are summarised in Table 3.1, presenting data from the on-site weather station near the Tailings Storage Facility (TSF) (a Vaisala WXT520). Temperatures were mild to warm throughout the period, with daily maximums between 19.5°C and 31.6°C, averaging 24.4°C; slightly above the regional long-term September average of 22.9°C (Woomera Aerodrome, BoM 2025a).

Minimum overnight temperatures were also mild, ranging from 8.9°C to 16.1°C and averaging 11.7°C, which is slightly warmer than the long-term September mean minimum of 9.5°C (Woomera Aerodrome, BOM 2025a).

Winds during the spring survey were generally light to moderate, with daily average speeds between 10.5 and 24.6 km/h (Table 3.1). Although no thunderstorms occurred, peak wind gusts reached 46.8 km/h on 19 September. Overall, these weather conditions were considered satisfactory for conducting bird surveys and operating Song Meters, aside from brief periods of stronger winds. The conditions were also favourable for conducting mammal and reptile trapping, daily temperatures not being either extremely hot or cold.

Table 3.1: Field survey weather (Carrapateena all weather data spring 2025)

Observation	18-Sep	19-Sep	20-Sep	21-Sep	22-Sep	23-Sep	24-Sep	25-Sep	26-Sep
Min temp (°C)	12.4	14.3	10.9	8.9	10.1	9.4	9.3	12.6	16.1
Max temp (°C)	27.8	25.5	19.5	21.1	20.4	22.0	23.7	27.4	31.6
Mean wind (km/h)	16.2	24.6	18.0	16.5	23.9	18.6	12.4	10.5	16.6
Max wind (km/h)	39.2	46.8	38.2	42.5	42.8	35.6	32.0	35.3	43.9
Rainfall total (mm)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

3.2 Flora

3.2.1 Plant diversity

A general floristic description of each site is provided in the Carrapateena Ecology Survey – Autumn 2018 report (Jacobs 2018a). Representative photographs of each site during the spring 2025 survey are provided in Appendix A.

3.2.1.1 Total species diversity: compliance monitoring period

In spring 2025, a cumulative total of 134 native flora taxa (57 long-lived and 77 short-lived) were recorded at the 1-hectare RAM sites across the Carrapateena Operation area (Flora Sites 1 – 7, 9 – 13, 15 – 22). This was slightly above the mean diversity of 130 species recorded during the compliance monitoring period that began in autumn 2018 (Table 3.2). During compliance monitoring, the total plant species diversity

recorded at the flora sites has ranged from 111 species in spring 2018 to 141 species in both 2023 and 2024.

Since 2018, the variation in total species diversity has been largely due to variations in short-lived species diversity. Short-lived species diversity per compliance survey has ranged from 52 – 83 species; long-lived perennial species diversity has ranged from 57 – 62 species (Figure 3.2). Pre-construction comparisons of total species diversity across the Carrapateena Operation area are not possible, as Sites 17 – 22 were established in 2018. Appendix B1 contains a list of all species recorded in spring 2025, their frequency and their long-lived status Appendix B2 contains a list of all species recorded at each site in 2025, their abundance and grazing impact.

Table 3.2: Total species diversity recorded at RAM sites during compliance monitoring period (construction and operation)

Life Span	2018 Autumn	2018 Spring	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	2024 Spring	2025 Spring	2018 – 2025 range	2018 – 2025 Mean, St. Dev
Long-lived[2]	58	59	61	59	62	60	58	60	57	57 – 62	59 (±1.8)
Short-lived	58	52	75	80	57	74	831	81	77	52 – 83	71 (±11.8)
Totals	116	111	136	139	119	134	141	141	134	111 – 141	130 (±11.5)

[1] amended from 2023 report to remove duplicate records; [2] Long-lived woody perennials and long-lived grasses; rounded to nearest whole number; St. Dev = Standard Deviation



Plate 3.1: Purslane (*Calandrinia* sp.), an annual recorded at the dune sites

3.2.1.2 Total species diversity at control/impact sites: baseline and compliance monitoring period comparison

Flora sites 1-7, 9-13 and 15-16 were surveyed in all years both during pre-construction (baseline) and during the construction/operational phase (compliance monitoring period). Hence these sites are suitable to compare species diversity during these phases. Total plant species diversity at all individual sites in 2025 was within the baseline range for each site (Table 3.3). During both the baseline and compliance monitoring period, total plant diversity has varied widely across all sites.

In 2024, Sites 4 and Site 6 were transferred from impact to control sites due to the SAR no longer being in general use for mining activities, and there being no hydrogeological connection to the TSF. The baseline mean for control sites and for impact sites (and min/max) values therefore change at 2024 as a result of these changes. In 2025, the mean total species diversity for control and impact sites was 25.9 and 29.1, respectively and not significantly different (Welch's t-test (uneven variance) test, two-tailed $p = 0.264$, $t = -1.17$). The 2025 mean flora diversity for impact and control sites was within the baseline ranges and very close to the baseline means (Figure 3.2, Figure 3.3). The following sections indicate that the range in total native plant diversity is largely due to variations in short-lived plant diversity.

Table 3.3: Total native plant species diversity, baseline versus compliance monitoring period

Site Type	Baseline (2012-2016) and Compliance Total Diversity to (2018-2023)										Updated Treatment Baseline and Compliance Total Diversity (2004-2025)					
	RAM Site[1]	Baseline Min	Baseline Max	2018 Autumn	2018 Spring	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	Site Type	RAM Site1	Baseline Min	Baseline Max	2024 Spring	2025 Spring
Control	1	18	40	24	17	23	18	25	27	31	Control	1	18	40	24	21
	2	9	35	14	15	21	21	14	19	21		2	9	35	28	21
	7	20	46	20	46	30	24	30	17	32		4	15	38	25	29
	9	21	42	21	42	21	18	30	34	31		6	15	38	21	28
	13	10	34	10	36	18	16	31	23	16		7	20	46	35	25
	Means	**15.6**	**39.4**	**20.6**	**19.2**	**26.8**	**22.0**	**24.0**	**26.4**	**28.8**		9	21	42	41	34
Impact	3	16	41	23	22	29	21	17	25	34		13	10	34	24	23
	4	15	38	14	25	19	17	23	25	26		**Means**	**15.4**	**39**	**28.3**	**25.9**
	5	13	41	21	14	25	19	17	23	25	Impact	3	16	41	37	30
	6	15	38	15	28	23	16	18	21	24		5	13	41	26	29
	10	26	56	26	56	22	15	28	23	16		10	26	56	24	37
	11	18	49	18	49	32	25	37	28	26		11	18	49	24	37
	12	9	32	9	32	17	14	29	22	16		12	9	32	36	21
	15	10	36	10	36	17	16	27	15	17		15	10	36	33	22
	16	10	36	26	56	22	15	28	23	16		16	10	36	20	29
	Means	**14.7**	**40.8**	**22.2**	**19.7**	**30.1**	**23.7**	**20.9**	**24.6**	**29.8**		**Means**	**14.6**	**41.6**	**28.6**	**29.3**

[1] Rangeland sites, as per previous reporting. Note: Comparable data for 2017 not available.

[2] In 2024, Sites 4 and Site 6 were transferred from impact to control sites due to the Southern Access Road no longer being in general use for mining activities, and there being no hydrogeological connection to the Tailings Storage Facility. The baseline mean (and min/max) values therefore change at 2024 as a result of these changes.

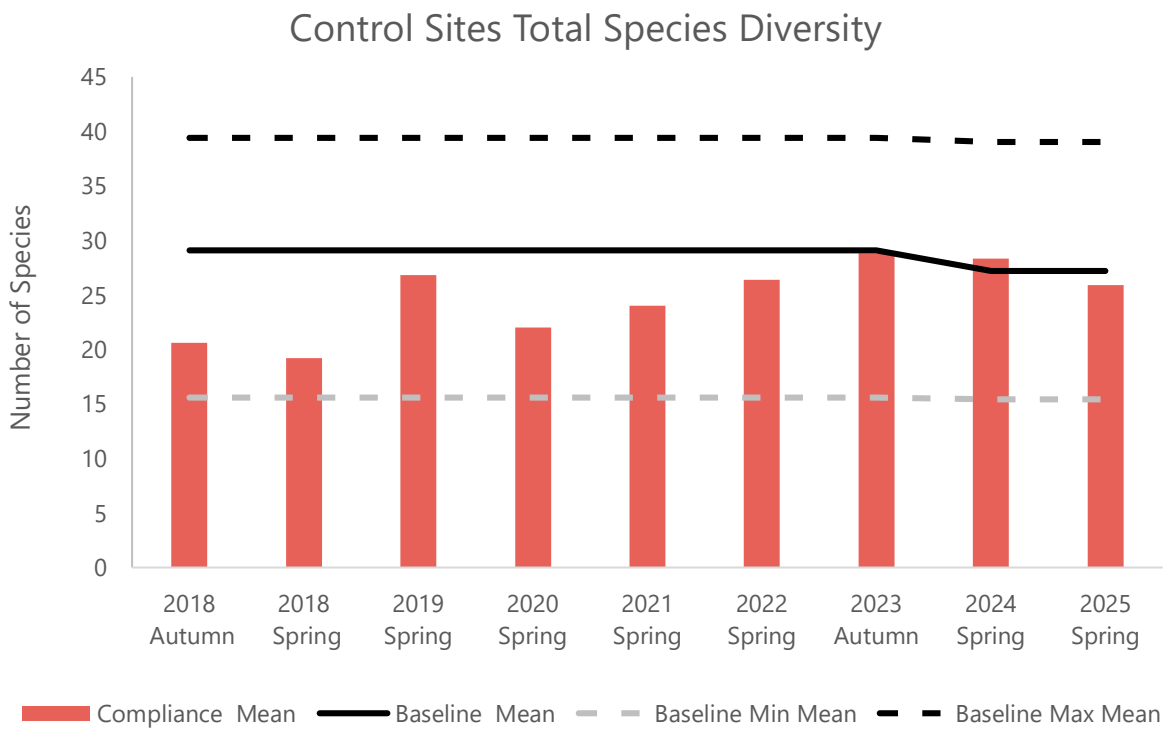


Figure 3.2: Mean total flora species diversity (long-lived and short-lived species) at control sites during compliance monitoring (compared to baseline mean, min, max)

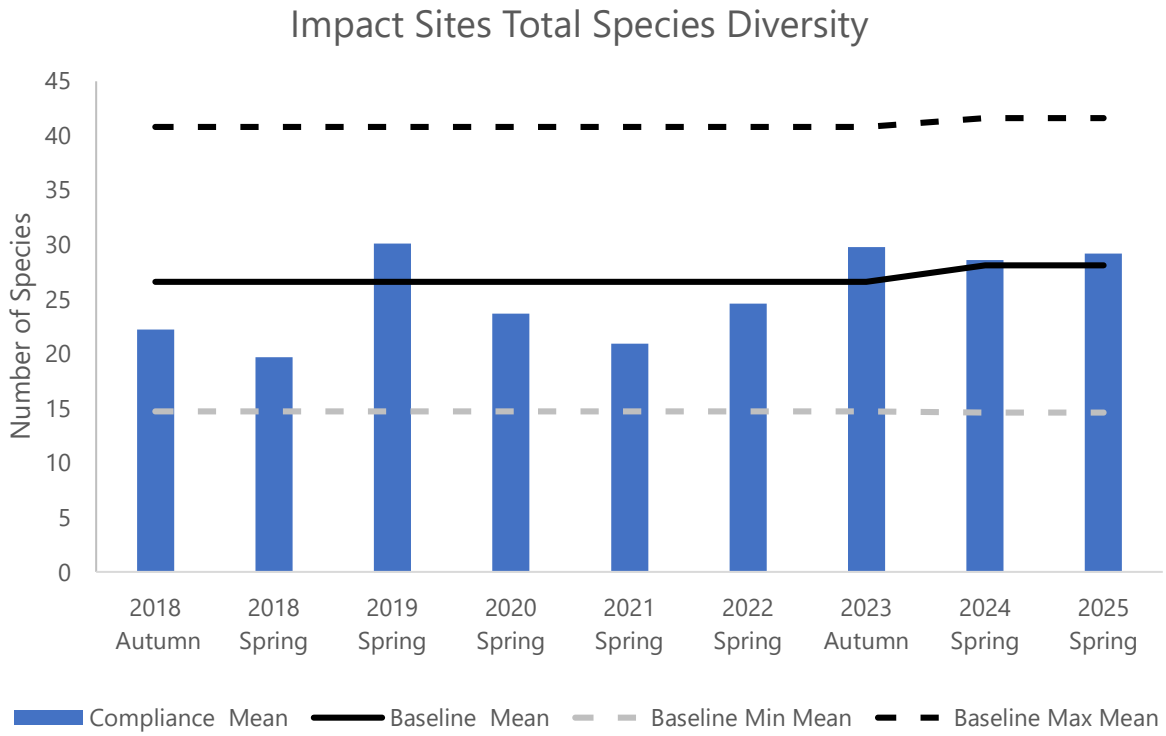


Figure 3.3: Mean total flora species diversity (long-lived and short-lived species) at impact sites during compliance monitoring (compared to baseline mean, min, max)

3.2.1.3 Long-lived species diversity: baseline and compliance monitoring period comparison

Table 3.4, Figure 3.4 and Figure 3.5 show the range in long-lived native species diversity at sites surveyed in during baseline (autumn 2012 to 2016) and compliance monitoring (autumn 2018 to spring 2025). For all compliance monitoring surveys, long-lived species diversity has been within the baseline range, both for individual sites (Table 3.4), and for mean values for control sites (Figure 3.4) and impact sites (Figure 3.5). Control and impact sites have recorded similar directional changes in long-lived species diversity during compliance monitoring. Namely, both control and impact sites recorded increases in mean long-lived species diversity in 2018, 2019, 2021, 2022 and 2024, and decreases in mean long-lived species diversity in 2020, 2023 and 2025. In 2025, total long-lived species diversity was 57 species, one fewer than the previous lowest compliance tally of 58 (recorded in both 2018 and 2023). In 2024, 1 individual plant of Australian Boxthorn (Lycium australe) was recorded at dune site 21, but the species was not recorded in 2025. Similarly in 2024, 1 individual plant of Tar Bush (Eremophila glabra) was recorded in the creek line at site 9, but was not recorded in 2025. The dune RAM site is undulating and not defined on the ground, meaning that species represented by only 1 individual can be overlooked. Similarly, the creek habitat survey area is difficult to define accurately in the field. These examples illustrate possible reasons for small variations in perennial diversity at RAM sites.

At individual impact and control sites, long-lived species diversity has fluctuated between survey periods during both baseline and compliance monitoring, but shows no obvious trends. Since 2012, long-lived diversity has ranged between 4 – 10 species at individual sites, less than the range in short-term species diversity (see below).

Table 3.4: Long-lived perennial native species diversity, baseline versus compliance monitoring period

Type	Baseline (2012-2016) and Compliance Long-lived Diversity to (2018-2023)											Updated Treatment Baseline and Compliance 2024				
	RAM Site[1]	Baseline Min	Baseline Max	2018 Autumn	2018 Spring	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	Type	RAM Site	Baseline Min	Baseline Max	2024 Spring	2025 Spring
Control	1	10	14	12	10	13	7	15	12	11	Control	1	10	14	11	8
	2	4	8	4	7	9	6	3	7	7		2	4	8	7	6
	7	11	19	16	17	20	10	16	19	11		4	5	10	9	7
	9	13	21	15	14	19	16	18	16	19		6	4	8	9	8
	13	4	8	4	6	6	6	6	8	8		7	11	19	18	12
	Means	**8.4**	**14**	**10.2**	**10.8**	**13.4**	**9**	**11.6**	**12.4**	**11.2**		9	13	21	19	19
Impact	3	5	10	9	10	10	7	8	9	10		13	4	8	10	7
	4	5	10	7	7	8	7	7	8	7		**Means**	**7.3**	**12.6**	**11.9**	**9.6**
	5	8	14	10	10	11	8	9	11	10	Impact	3	5	10	11	9
	6	4	8	7	6	7	7	6	6	6		5	8	14	9	11
	10	17	29	22	26	26	21	27	25	24		10	17	29	23	20
	11	11	16	18	16	17	14	15	17	19		11	11	16	18	15
	12	3	7	4	8	8	6	4	10	9		12	3	7	7	6
	15	6	10	6	7	8	10	7	7	6		15	6	10	8	7
	16	6	10	6	7	7	5	5	7	9		16	6	10	9	9
	Means	**7.2**	**12.7**	**9.9**	**10.8**	**11.3**	**9.4**	**9.8**	**11.1**	**11.1**		**Means**	**8**	**13.7**	**12.1**	**11.0**

*In 2024, Sites 4 and 6 were transferred from impact to control sites due to the Southern Access Road no longer being in general use for mining activities, and there being no hydrogeological connection to the Tailings Storage Facility. The baseline mean (and min/max) values therefore change at 2024 as a result of these changes.

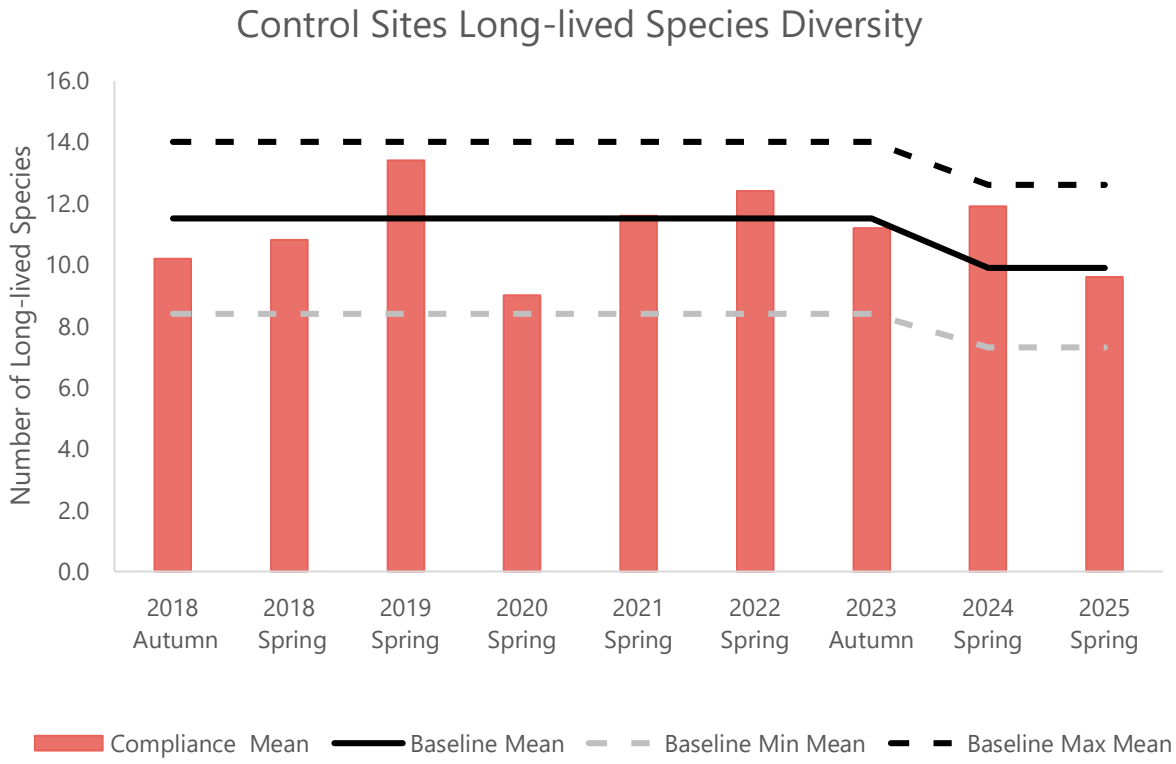


Figure 3.4: Mean diversity of long-lived flora species at control sites during compliance monitoring (compared with baseline mean, min, max)

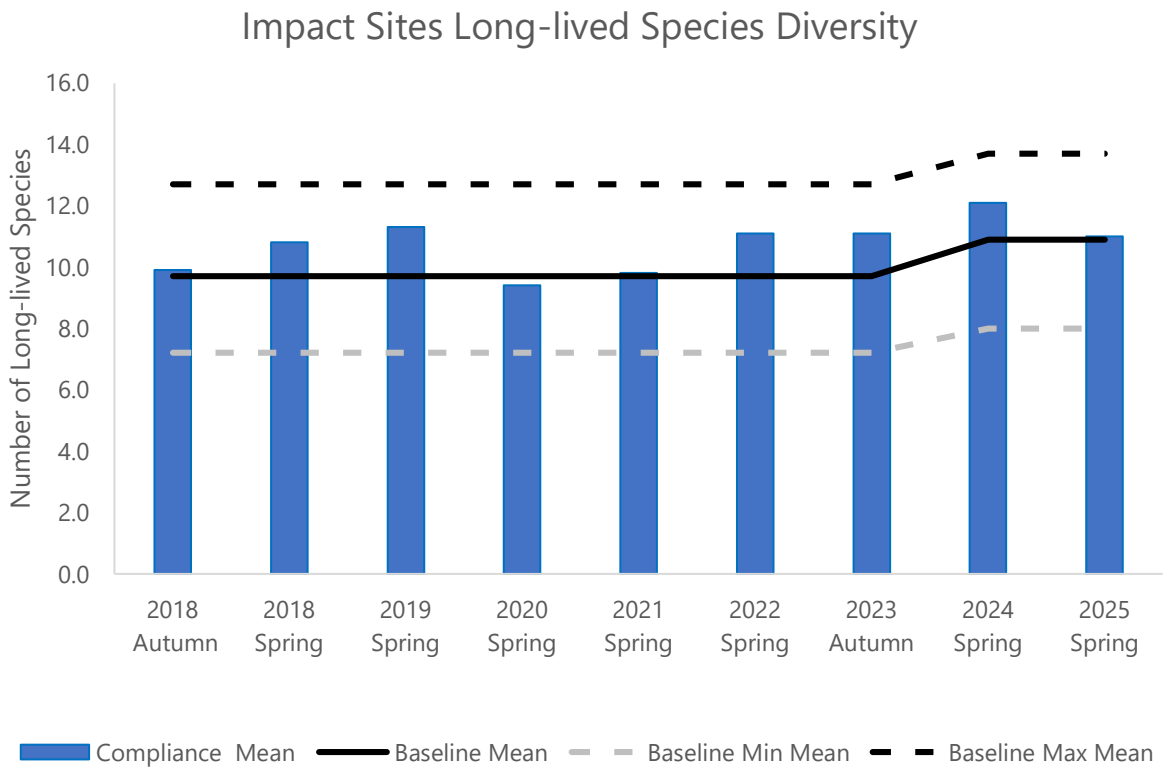


Figure 3.5: Mean diversity of long-lived flora species at impact sites during compliance monitoring (compared with baseline mean, min, max)

3.2.1.4 Short-lived species diversity: baseline and compliance monitoring period comparison

During compliance monitoring, the mean short-lived species diversity for both control and impact sites has fluctuated yearly, largely in response to fluctuations in rainfall patterns. Since 2012, short-lived plant diversity has ranged between 13 – 28 species at individual sites (Table 3.5), almost 3 times the magnitude of variation in perennial species diversity.

In 2025, the mean short-lived species diversities for control sites (16.3 species) and for impact sites (19.4 species) were the third highest and the highest totals, respectively recorded during compliance monitoring, and almost the same as the mean for baseline monitoring (Figure 3.6 and Figure 3.7). The short-lived diversity tallies for all individual sites were also within the baseline ranges (Table 3.5).

Table 3.5: Total diversity of short-lived native species, baseline versus compliance monitoring period

Type	Baseline (2012-2016) and Compliance Short-lived Diversity to (2018-2023)											Updated Treatment Baseline and Compliance 2024				
	RAM Site[1]	Baseline Min	Baseline Max	2018 Autumn	2018 Spring	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	Type	RAM Site	Baseline Min	Baseline Max	2024 Spring	2025 Spring
Control	1	6	28	12	7	10	11	10	15	20	Control	1	6	28	13	13
	2	4	31	10	8	12	15	11	12	14		2	4	31	21	15
	7	8	28	14	7	10	7	16	14	14		4	8	29	17	22
	9	2	25	6	4	11	18	13	18	21		6	11	24	15	20
	13	5	27	10	14	24	14	12	11	19		7	8	28	17	13
	Means	**5.0**	**27.8**	**10.4**	**8.0**	**13.4**	**13.0**	**12.4**	**14.0**	**17.6**		9	2	25	22	15
Impact	3	10	35	14	12	19	14	9	16	24		13	5	27	14	16
	4	8	29	14	7	17	12	10	15	18		**Means**	**6.3**	**27.4**	**17.0**	**16.3**
	5	4	32	12	10	14	12	9	10	16	Impact	3	10	35	26	21
	6	11	24	15	9	21	16	10	12	15		5	4	32	15	18
	10	8	28	6	9	14	21	18	18	26		10	8	28	13	16
	11	7	33	14	9	20	14	11	14	18		11	7	33	15	22
	12	6	25	13	6	21	16	12	13	21		12	6	25	13	15
	15	4	29	12	9	23	13	9	12	15		15	4	29	17	15
	16	4	30	11	9	20	10	12	9	15		16	4	30	15	29
	Means	**6.9**	**29.4**	**12.3**	**8.9**	**18.8**	**14.2**	**11.1**	**13.2**	**18.7**		**Means**	**6.1**	**30.3**	**16.3**	**19.4**

*In 2024, Sites 4 and Site 6 were transferred from impact to control sites due to the Southern Access Road no longer being in general use for mining activities, and there being no hydrogeological connection to the Tailings Storage Facility. The baseline mean (and min/max) values therefore change at 2024 as a result of these changes.

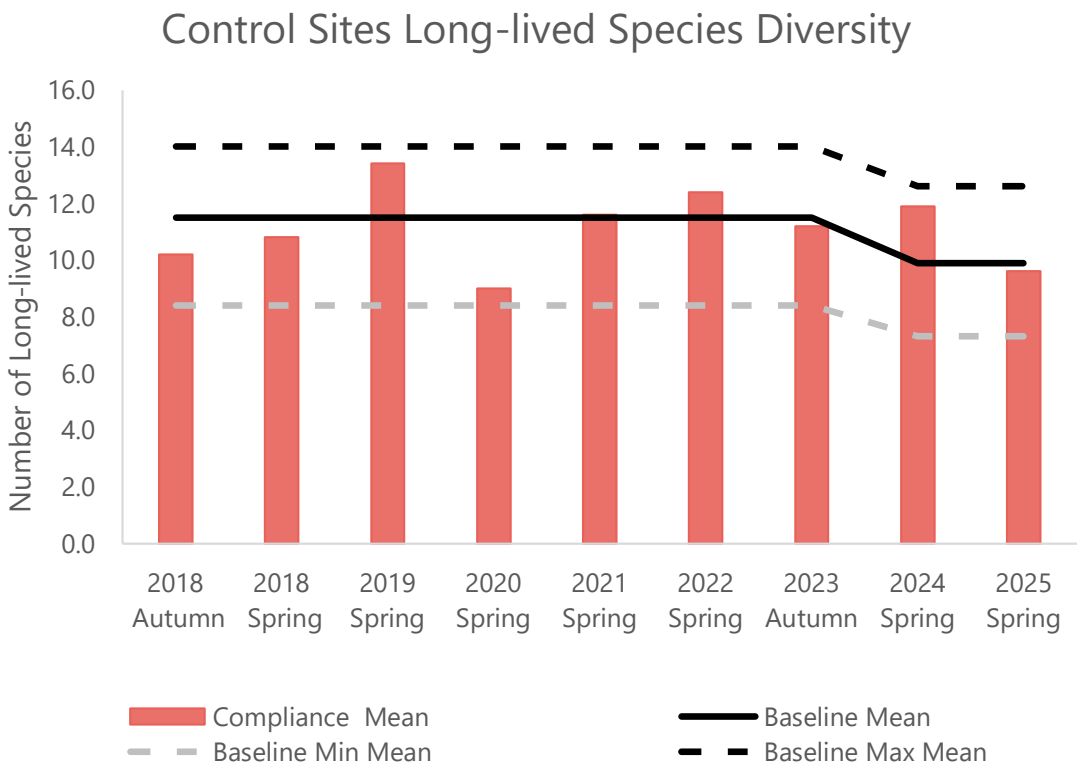


Figure 3.6: Mean diversity of short-lived flora species at control sites during compliance monitoring (compared with baseline mean, min, max)

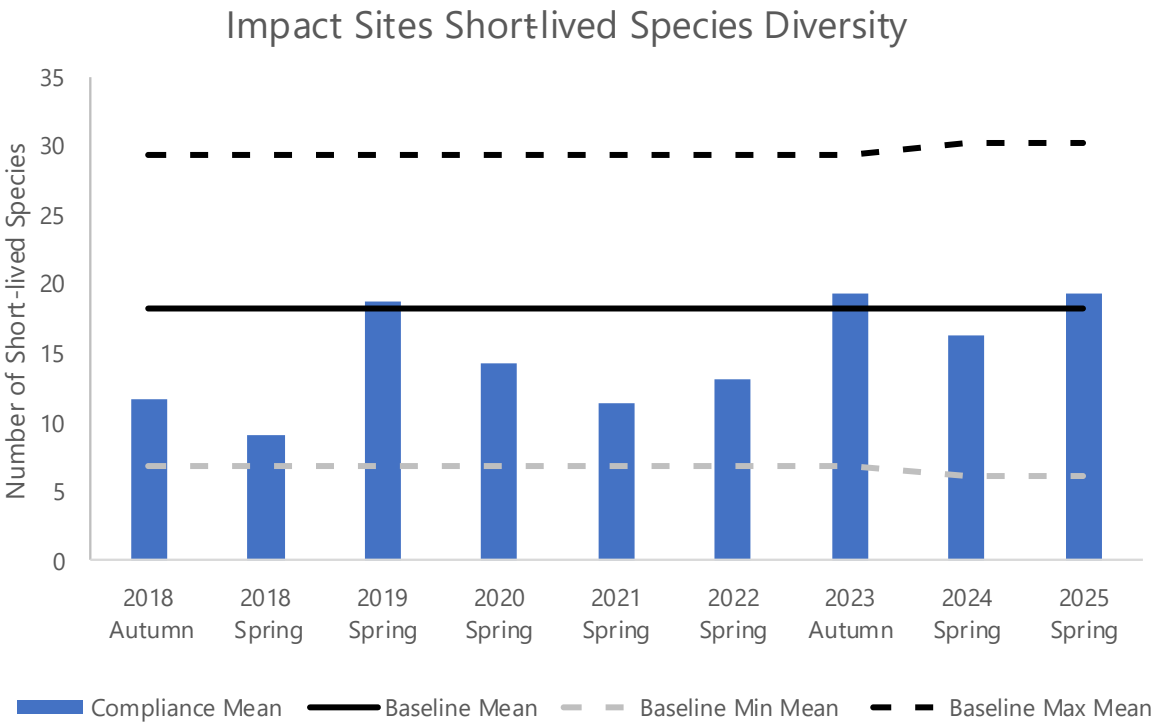


Figure 3.7: Mean diversity of short-lived flora species at impact sites during compliance monitoring (compared with baseline mean, min, max)

3.2.1.5 Comparison of long-lived species diversity by habitat type and site

Four distinct habitats were recognised at the Flora Rangeland sites: Eliza Creek (major drainage line) sites, sand dune sites, gibber sites with no drainage line, and gibber sites with a drainage line. Trends in perennial species diversity were compared between sites of similar habitat. This was done to:

1. Determine the magnitude of inherent variation between sites of similar habitats, regardless of potential impact from mining, and
2. Detect potential changes in plant diversity associated with a particular habitat, regardless of distance from mining infrastructure; namely to detect possible stressors (mining related or otherwise), impacting species diversity in specific habitats.

Potential increasing or decreasing trends for individual sites were also assessed. This was done to detect possible trends at a site level, that were otherwise being masked at a control group or impact group level.

Long-lived species diversity at Eliza Creek

The Eliza Creek Sites 17, 18, 19 and 20 were established in autumn 2018, to monitor the potential impacts of the tailings dam embankment on downstream vegetation. In addition, flora Site 10, established in 2012, is located on Eliza Creek, approximately 5 km downstream from the TSF and therefore also represents a potential impact site. The TSF construction began in 2018 and operations commenced during February 2020. As such, the 2018 and 2019 survey data represent the best 'baseline' data available for Eliza Creek survey sites 17-20, noting that natural spatial and temporal variations in species diversity are present and due to inter alia: slight habitat differences (width and depth of channel); seasonal and yearly rainfall variations; and slight variations in area surveyed at each site for each survey.

Between 2020 and 2024, mean long-lived species diversity for each site during operational monitoring was either greater than, or within 5% of construction (2018 and 2019) means (Table 3.6). However, in 2025, the long-lived species diversity for sites 10, 18 and 20 was below the construction (baseline) mean, but long-lived diversity at Sites 17 and 19 was the same or greater than construction means (Figure 3.8). Since 2020, long-lived species diversity has shown both increases and declines at sites 10, 17, 18 and 20, with only site 19 recording similar diversities each survey (Figure 3.9). However, for all sites the 2025 long-lived species diversities were similar to 2020 diversities.

In summary there is no clear pattern emerging in long-lived species diversity data relating to the time since TSF establishment and the distance from the TSF (Sites 17 being the closest (270 m) and Site 10 being the furthest away).

Table 3.6: Long-lived native plant species diversity at Eliza Creek during compliance monitoring (all sites considered potential impact sites)

RAM Site[1]	Construction Long-lived Species Diversity			Operation Long-lived Species Diversity						
	Min	Max	2018-2019 Mean	2020	2021	2022	2023	2024	2025	2020-2025 Mean
17	19	24	21	18	20	27	24	22	21	22
18	22	25	23	21	20	23	21	24	18	22
19	16	19	18	23	24	25	24	23	23	24
20	21	26	24	20	21	23	25	25	18	23
10	22	26	25	21	27	25	24	23	20	24

[1] Flora sites (1 hectare Rangeland) displayed by increasing distance from TSF, where flora Site 17 = CAR017, 18 = CAR018 and so on.

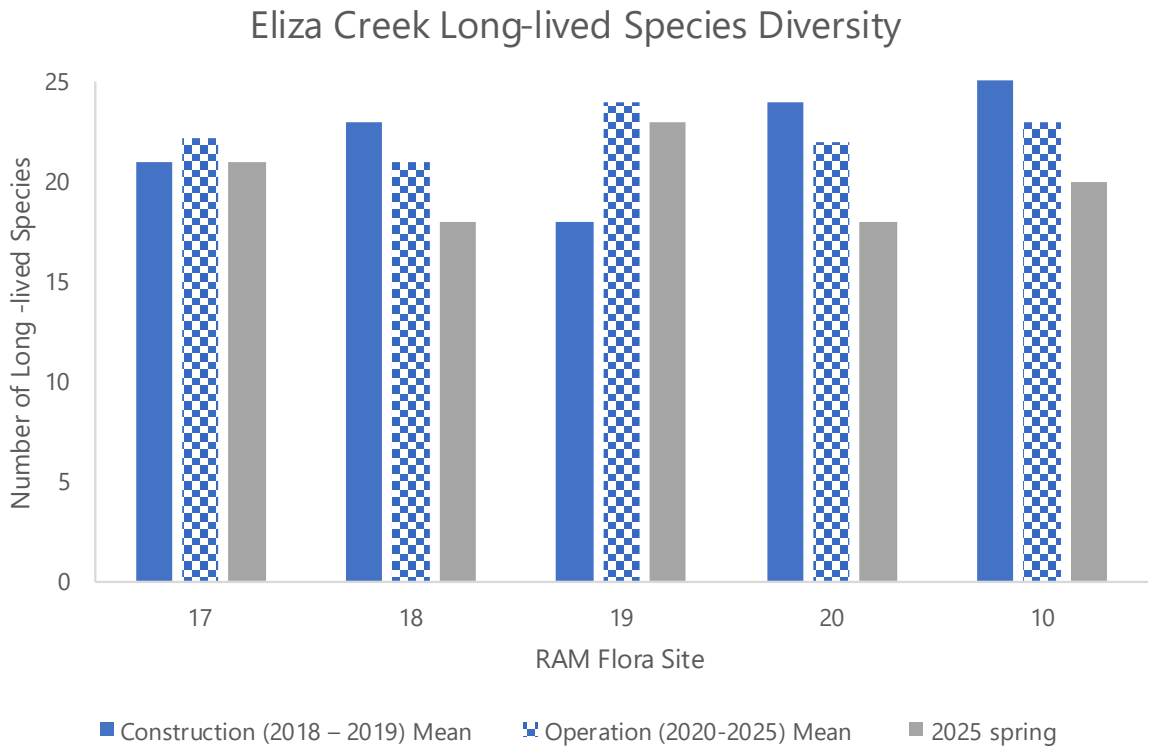


Figure 3.8: Native long-lived species diversity at Eliza Creek Rangeland Flora Sites

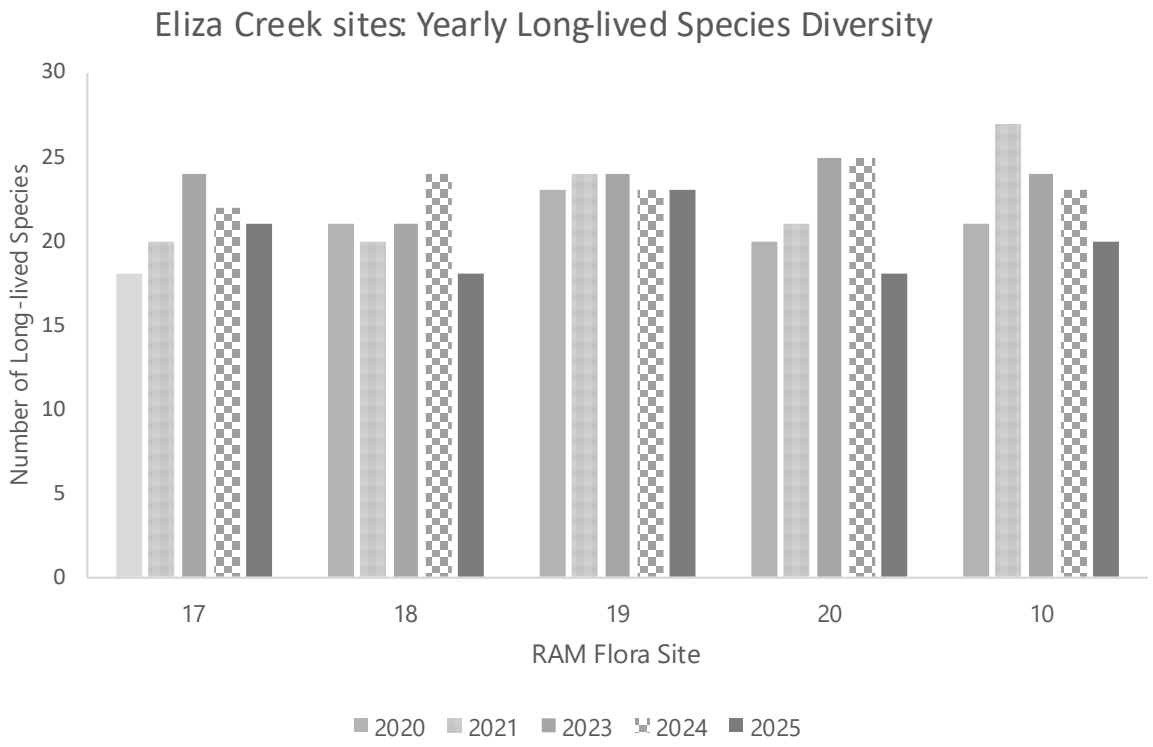


Figure 3.9: Yearly Long-lived species diversity at Eliza Creek during TSF operation (2020 to 2025)

Long-lived species diversity at sand dune habitats

Flora Sites 21 and 22 were established in May 2018 on sand dunes, a previously un-monitored habitat within the Carrapateena Operation area, with control Site 21 relocated in spring 2018 given proximity to proposed infrastructure. For both sites, perennial species diversity has fluctuated yearly (Table 3.7) without any clear trend emerging in either long-term increases or declines.

The sand dune sites are not defined on the ground. A central point is designated by an easting and northing coordinate and the site is surveyed by walking within an area defined by a 55 m radius from the central coordinate (an area equivalent to a 1 ha RAM site). Several species are present as isolated individuals only. Due to the undulating nature of the dunes and the absence of on-ground survey markers, it is possible that some perennial species of low abundance, are present but not detected during some surveys.

Table 3.7: Long-lived perennial plant species diversity at sand dune habitats during compliance monitoring

RAM Site	Site Type	Compliance Monitoring Long-lived Species Diversity							
		2018 Spring	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	2024 Spring	2025 Spring
21	Control	10	8	7	9	8	12	11	9
22	Impact	7	8	10	5	5	7	9	9

Long-lived species diversity at gibber habitats with no drainage line

Gibber habitat sites that contain no drainage line include Control Sites 2, 4, 6 and 13, and Impact Sites 3, 5, 12, 15 and 16. In 2025, the mean long-lived species diversity during compliance monitoring (2018 to 2025) varied from 6.2 species at Site 2 to 9.6 species at Site 5. Mean diversity at all sites during compliance monitoring has remained within the baseline range, and remained similar to baseline diversity (Figure 3.10). Long-lived species diversity has fluctuated yearly but there has been no obvious trend in diversity at any individual site regardless of whether designated a control or potential impact site (i.e. based on distance from mining infrastructure (Figure 3.11). Of the gibber sites with no drainage line, Site 3 and Site 5 recorded the highest perennial species diversity in 2025, both designated as impact sites and noting that Site 3 is closest to major mining infrastructure.

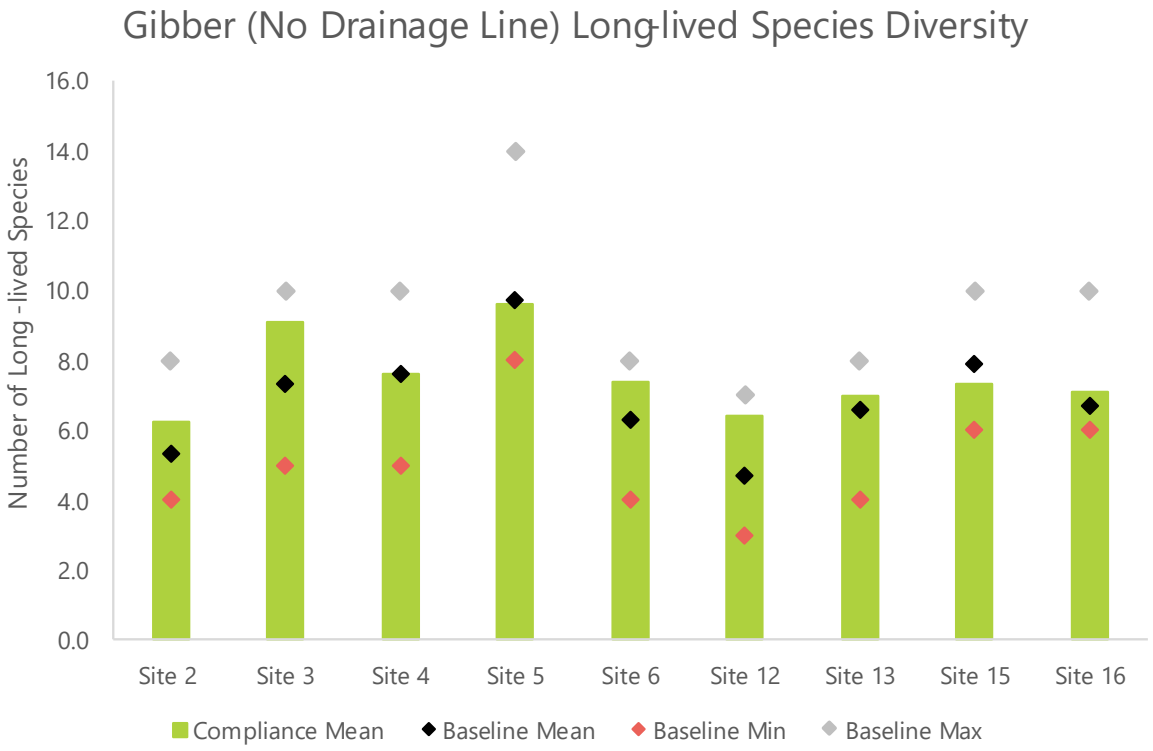


Figure 3.10: Mean diversity of long-lived species at gibber sites (no drainage line), 2025

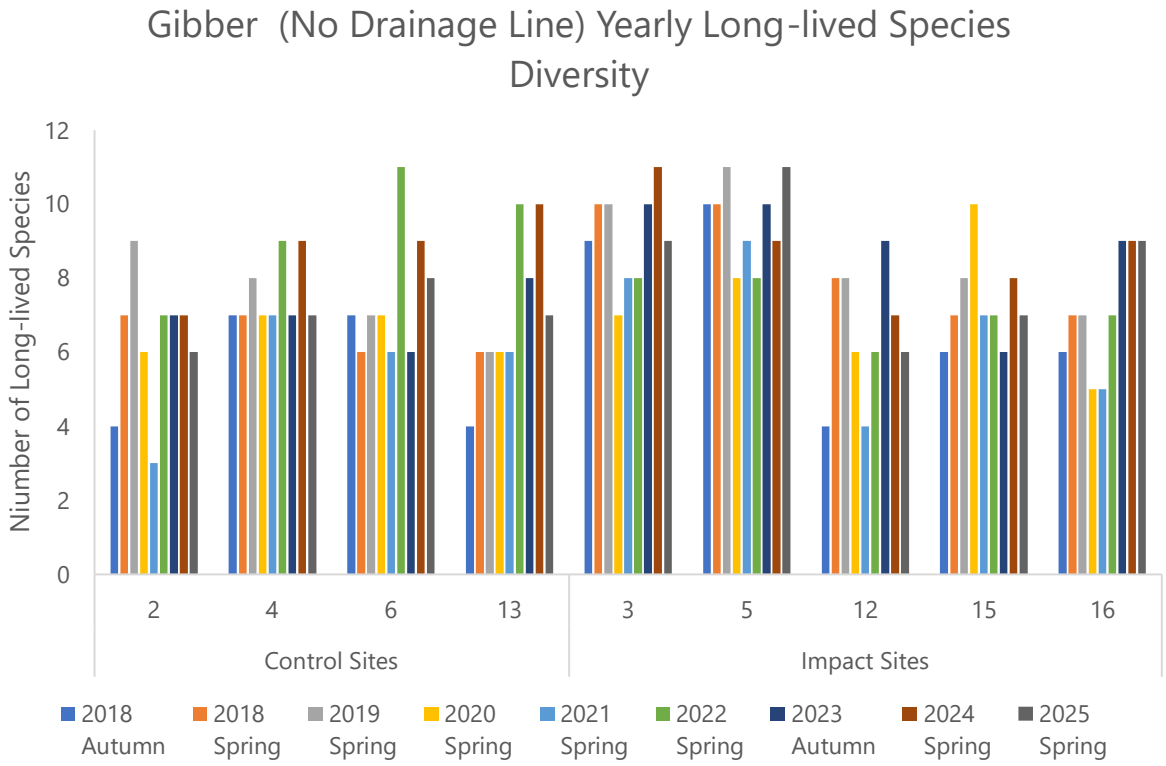


Figure 3.11: Yearly totals of long-lived species diversity at gibber sites (no drainage line)

Long-lived species diversity at gibber habitats that include a minor drainage Line

Gibber sites that included a drainage line were Control Sites 1, 7 and 9, and Impact Site 11. Mean diversity at all sites during compliance monitoring has remained within the baseline range (Figure 3.12). During both baseline and operational monitoring, diversity has fluctuated quite widely at Control Sites 1 and 7, and to a lesser extent at control Site 9 and impact site 11, but overall there are no clear trends evident (Figure 3.13).

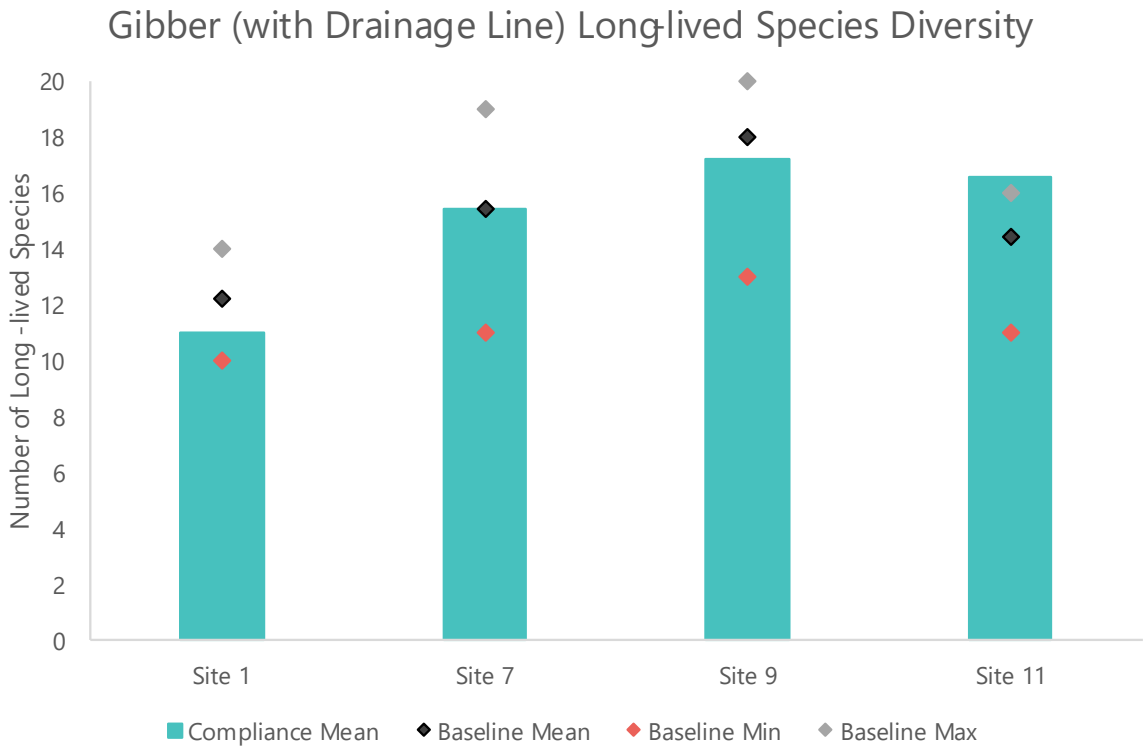


Figure 3.12: Mean long-lived species diversity at gibber sites with a minor drainage line

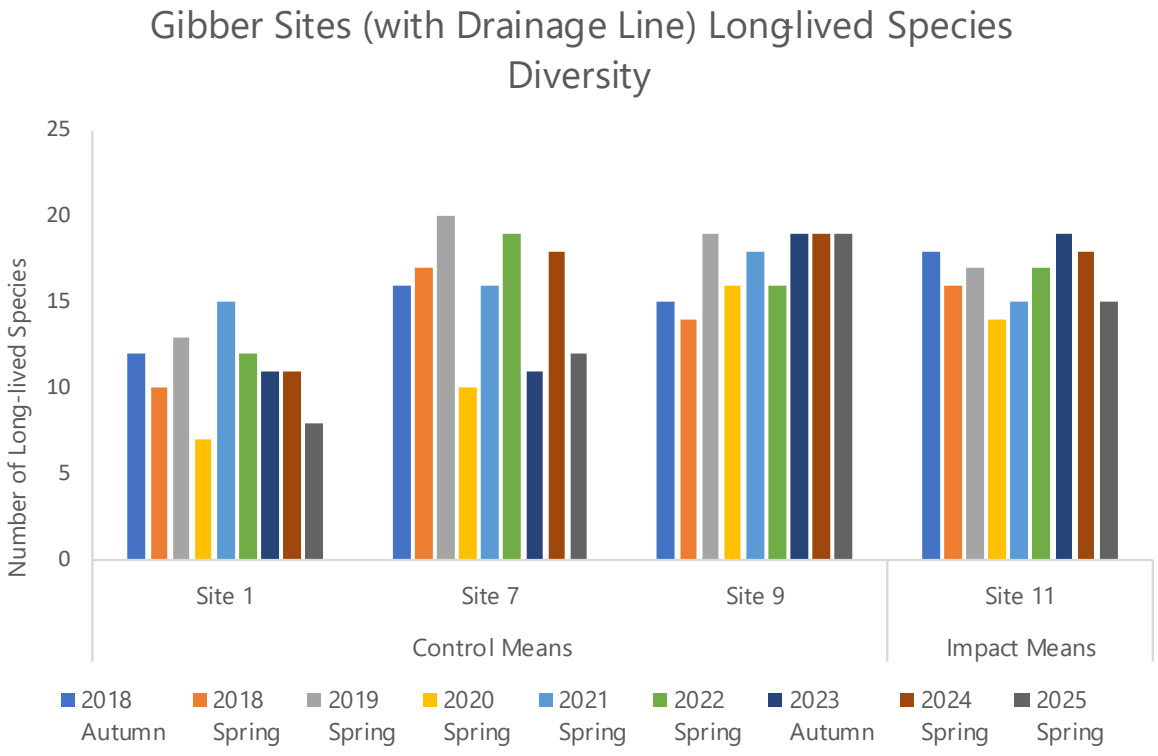


Figure 3.13: Yearly totals of long-lived species at gibber sites with a minor drainage line

3.2.2 Jessup transects – population structure of long-lived woody perennials

During compliance monitoring, Jessup transects were conducted at all 13 gibber habitat flora sites (Sites 1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 13, 15 and 16) and at the 5 Eliza Creek flora sites (Sites 10, 17, 18, 19, 20). Baseline Jessup site data is available for comparison for the 13 gibber sites for surveys conducted in 2013, 2014 and 2015 (Sites 15 and 16 were not surveyed in 2012 and there was no data available for 2016 or 2017).

3.2.2.1 Gibber habitat Jessup transects

Jessup data (Appendix D) shows the total number of adults and juveniles of long-lived woody perennials for the flora sites, recorded in spring 2024. Jessup transects conducted in gibber habitat during both the baseline and compliance periods were Sites 1 to 7, 9 to 13, 15 and 16. For these transects, population trends of the 5 most abundant long-lived woody species are presented, including a comparison of control and impact sites, and comparison of baseline and compliance monitoring populations. Note, baseline mean populations are for 2013 – 2015, given some sites were not surveyed in 2012 and no data was available for 2016 or 2017. The 5 species assessed were:

- Bladder Saltbush (*Atriplex vesicaria*): dominates the Jessup transects. In 2025, 4,971 individuals were recorded, approximately 10 times more adult plants than the next most abundant species (*Tecticornia medullosa*). In the semi-saline gibber habitat, this species is only slightly palatable to stock.
- Samphire species (*Tecticornia* species): were widespread and common at most gibber sites (373 plants recorded in 2025) with *Tecticornia pergranulata* and *T. indica* confined to gibber sites that also contained a drainage line.
- Plains Lantern Bush (*Abutilon halophilum*): A total of 379 plants were recorded from 11 gibber sites in 2025. In the semi-saline gibber habitat, this species is only slightly palatable to stock.
- Sea-heath (*Frankenia serpyllifolia*): widespread in the gibber habitat, and in 2025 was the fourth most abundant species recorded in Jessup gibber sites (164 individuals). The relative unpalatability of the species eliminates grazing impact as a cause of potential decline. Hence likely causes of potential changes in abundance can be narrowed down to climate and/or mining impact.
- Bush Minuria (*Minuria cunninghamii*). This species is highly palatable and in 2025 was the fifth most abundant species recorded for the Jessup transects (89 individuals).

Further interrogation of the presence of these 5 species at control and impact sites, is provided below.

Bladder Saltbush

Bladder Saltbush is a drought-tolerant, long-lived woody perennial, and the dominant plant species at the gibber habitat Jessup transects (Sites 1 to 7, 9 to 13, 15 and 16). In South Australia, due to its longevity and drought tolerance, the species is used extensively as an indicator of land condition in chenopod shrublands (Baulderstone and Baird 2012). In the gibber habitat Bladder Saltbush is only moderately palatable, due to the semi-saline soils.

During compliance monitoring (2018 to 2025), population trends at impact and control sites have been similar. At impact sites, the mean population of Bladder Saltbush has either been relatively stable or increased (Figure 3.14). At control sites, the mean population of Bladder Saltbush declined noticeably in 2020, before increasing by approximately 40% in 2024 and 100% in 2025 (Table 3.8). The increase at both impact and control sites since 2023 was largely due to an increase in juveniles. However, since 2023, the total number of adult plants has also increased by 35% at control sites and by 11% at impact sites. There has also been an increase in adults at all individual sites, except site 16. (Table 3.8 and Table 3.9). The decline in adults at Site 16, however, was accompanied by 202 juveniles being recorded (compared with 15 juveniles in 2024). Future monitoring is required to determine the impact of any trends in the adult population of Saltbush at site 16.

In 2025, the mean number of Bladder Saltbush plants increased after 2024, rising to be above the baseline mean. Since compliance monitoring began in autumn 2018, the mean number of Bladder Saltbush plants at control sites has been above the baseline mean in 2018 and 2019, but below the baseline mean between 2020 and 2024. However, in 2025, following successive rises in abundance since 2023, the control population mean of Bladder Saltbush was almost 75% greater than the baseline mean (Figure 3.15). This was due largely to an increase in juveniles (Table 3.8). At impact sites the mean number of Bladder Saltbush plants has fluctuated less than at control sites and has remained within the baseline range for all but the 2020 survey (Figure 3.16). Between 2019 – 2024, the mean number of plants at impact sites has largely been just below the baseline but was above the baseline mean in 2025.

The Bladder Saltbush population at impact sites has been more stable than at control sites during compliance, and remained within the baseline range for longer periods, hence mining activities are not considered to have had an impact.

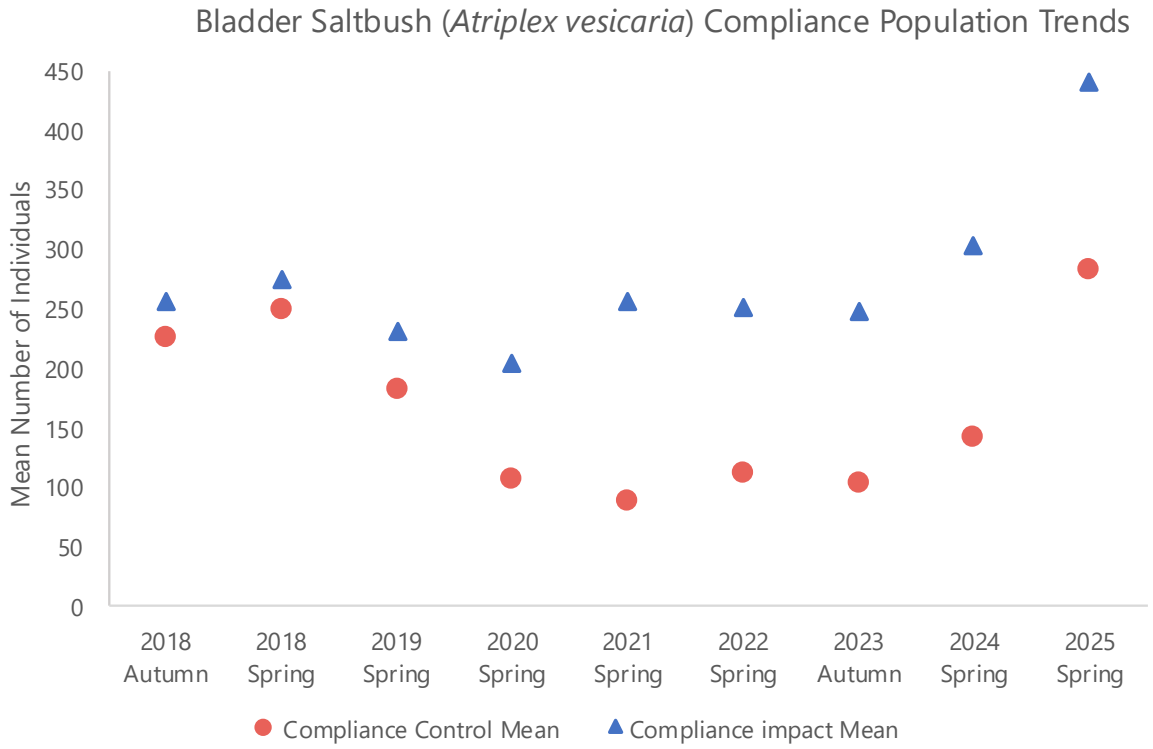


Figure 3.14: Compliance monitoring population trends in Bladder Saltbush at control and impact sites

Table 3.8: Adult and juvenile Bladder Saltbush at control sites, 2023 – 2025

Site	Adults			Adult increase[1] 2023 - 2025	Juveniles		Juvenile increase[1] 2024 - 2025
	2023	2024	2025		2024	2025	
1	57	86	81	**24**	3	61	**58**
2	95	112	116	**21**	9	60	**51**
3	141	143	160	**21**	19	69	**50**
4	105	173	210	**105**	30	279	**249**
5	403	314	514	**111**	77	236	**163**
6	149	152	194	**45**	5	102	**97**
7	40	51	65	**25**	10	22	**12**
9	93	104	118	**25**	39	207	**168**
11	440	498	528	**88**	80	194	**114**
12	205	228	231	**26**	15	156	**141**
13	188	180	219	**31**	42	252	**210**
15	94	93	117	**23**	9	42	**33**
16	290	324	202	**-88**	15	202	**187**

[1] Increase in the number of individual plants within the Jessup transect

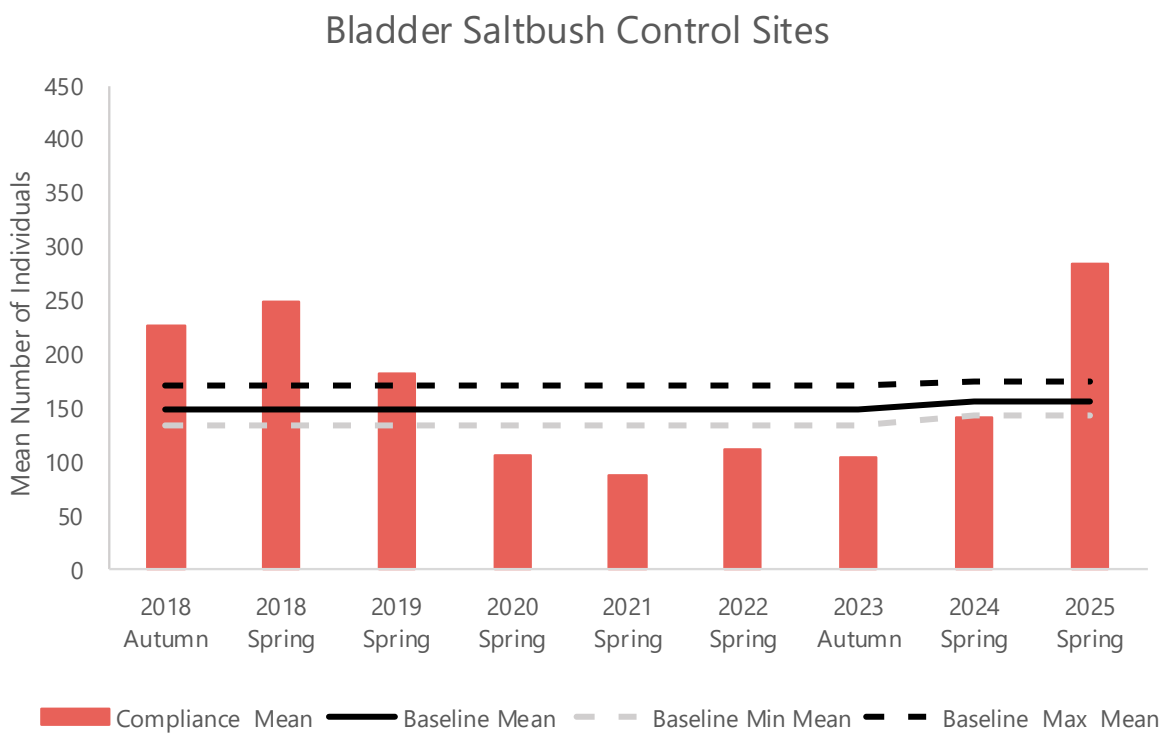


Figure 3.15: Mean abundance of Bladder Saltbush (adults and juveniles combined) at Jessup control sites, baseline versus compliance monitoring

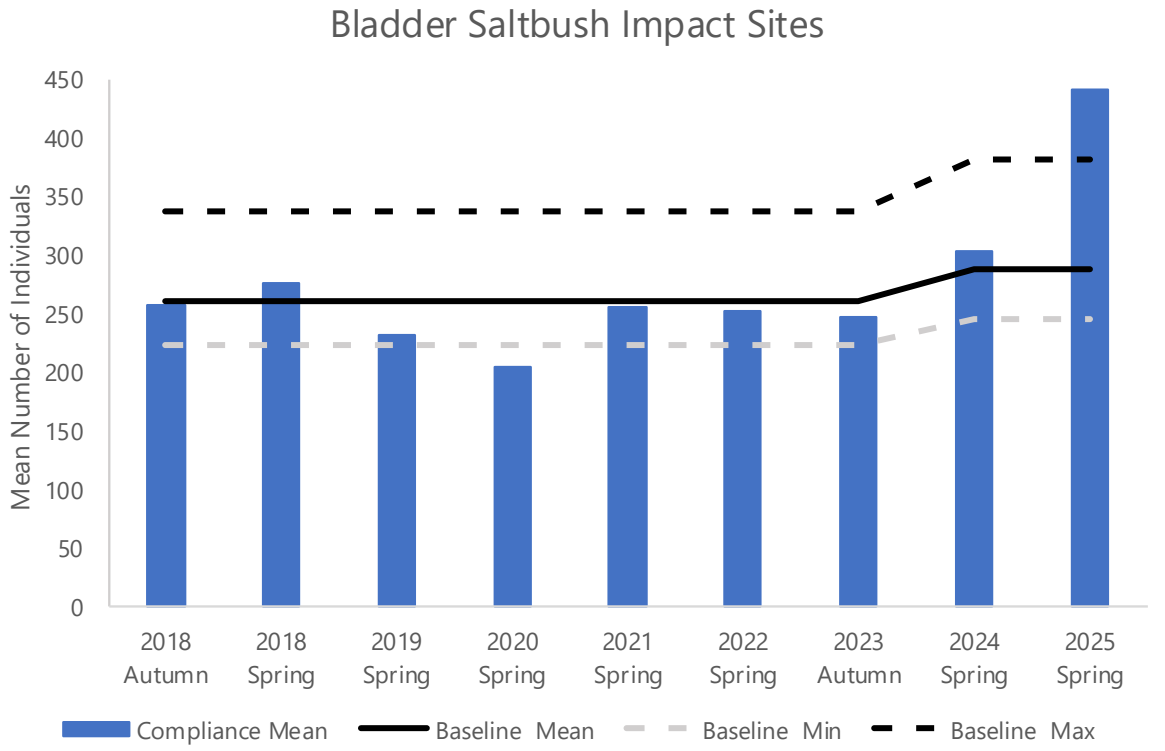


Figure 3.16: Mean abundance of Bladder Saltbush (adults and juveniles combined) at Jessup impact sites, baseline vs compliance monitoring

Samphire

All Samphire species were analysed collectively. The most widespread Samphire species at the Jessup sites is *Tecticornia medullosa*, with *T. pergranulata* and *T. tenuis* being associated with floodout areas of drainage lines. Samphire species were present at all 13 gibber Jessup sites.

The mean abundance at impact sites has been relatively stable between 2018 and 2024, but increased in 2025. The increase in 2025 was due largely to a 50% increase in Tecticornia medullosa at site 5, with the abundance at other impact sites little changed from 2024. At control sites, the mean abundance of Samphire during compliance surveys has been more variable, but with no distinct trends emerging between 2018 and 2025 (Figure 3.17).

Since 2018, the mean number of Samphire individuals at control sites has been within, or exceeded, the baseline range except in 2021 (Figure 3.18). The mean number of Samphire at impact sites was slightly below the baseline range in 2020, 2021 and 2022. However, in 2023 and 2024, the mean number of individuals at impact sites returned to within the baseline range, and in 2025 increased again to be at the baseline mean abundance (Figure 3.19). Samphire populations at impact sites have either been stable or increased during compliance, and were within the baseline range as of 2025, hence there is no evidence that Samphire populations are impacted by mining activities at Carrapateena.

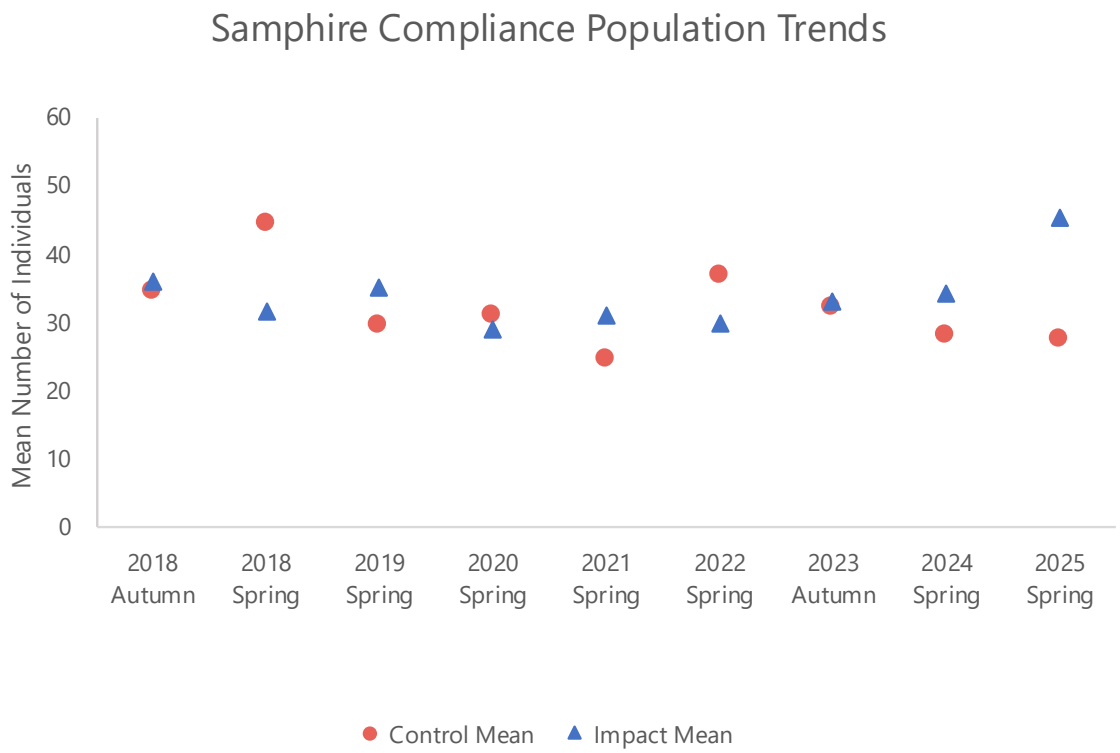


Figure 3.17: Samphire population trends during compliance period at control and impact sites

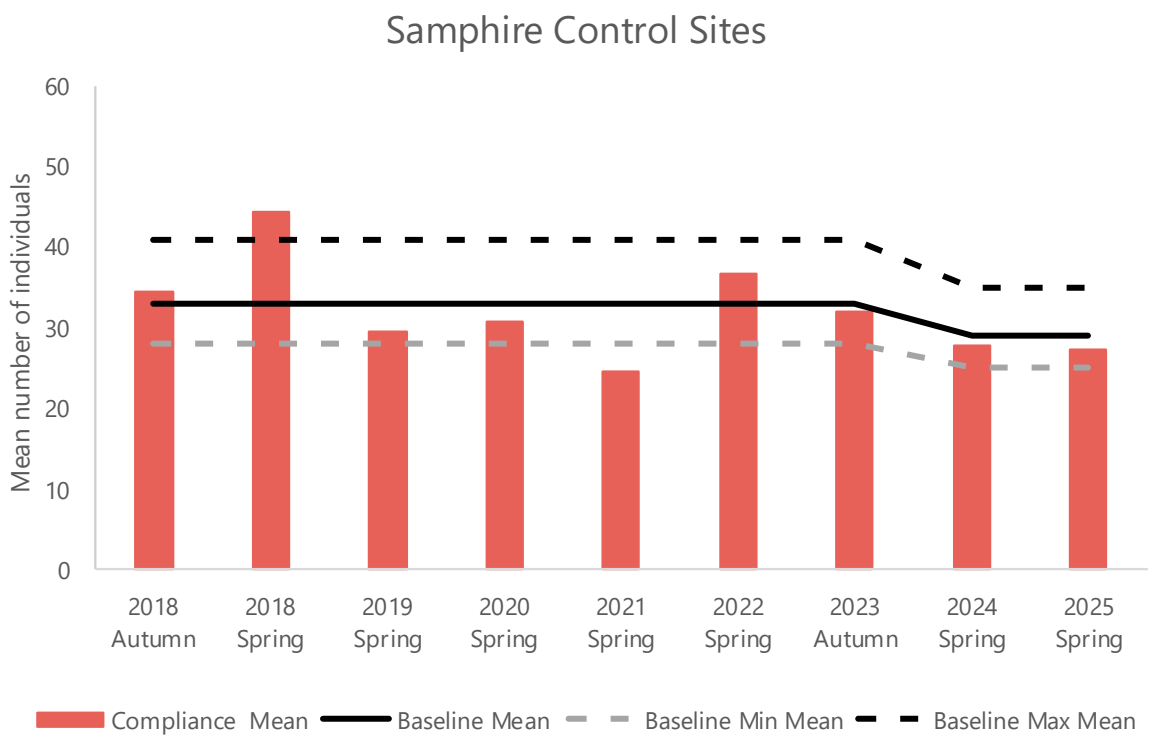


Figure 3.18: Mean abundance of Samphire at Jessup control sites, baseline vs compliance monitoring

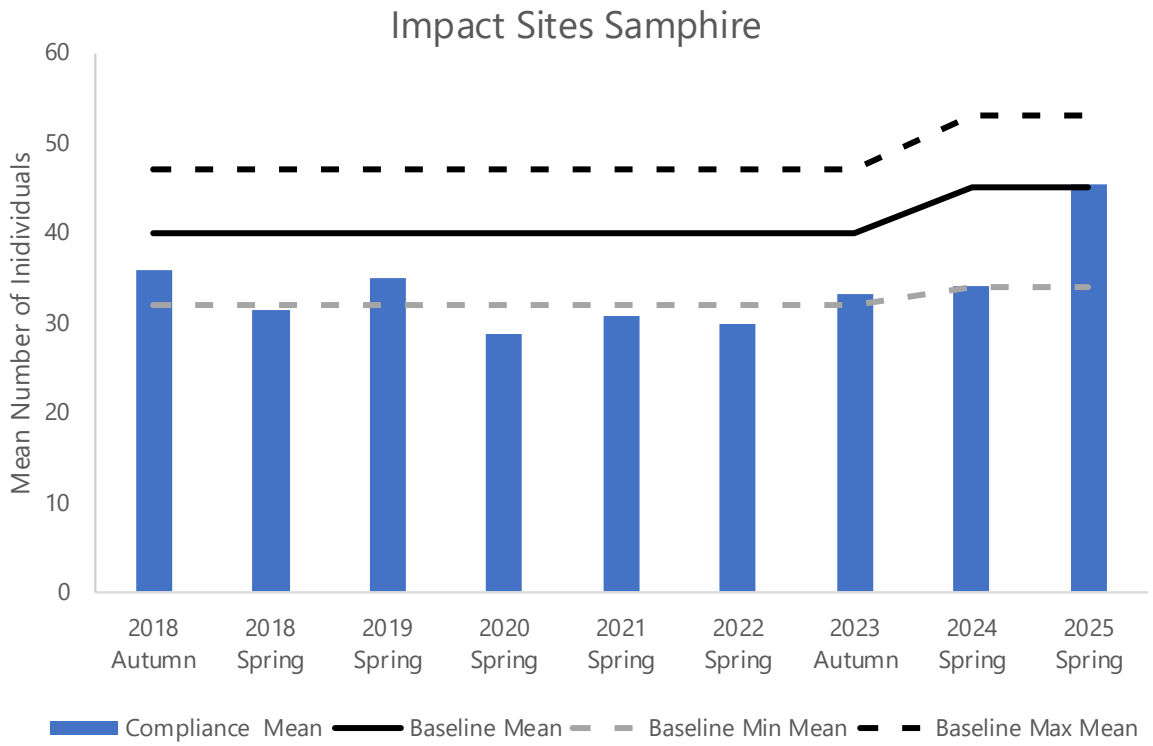


Figure 3.19: Mean abundance of Samphire at Jessup impact sites, baseline vs compliance monitoring

Thyme Sea-heath

At impact sites, the mean population of Thyme Sea-heath was stable between 2018 – 2023 before increasing in 2024 and 2025 (Figure 3.20). The increase in mean population in 2024 and 2025 reflects the re-assignment of sites 4 and 6 in 2024, from impact sites to control sites (due to infrastructure changes). At control sites, the population mean has fluctuated during compliance but with no distinct trend evident (Figure 3.20). At the individual site level, the population of Thyme Sea-heath has also remained relatively stable and or/shown no clear trends (Table 3.9). Thyme Sea-heath was most abundant at Impact Sites 3 and 5, which despite their proximity to infrastructure (Site 3 adjoining the processing plant, and Site 5 being near the WAR / Midway Quarry), the populations have shown no clear trends.

At control sites, the mean number of Thyme Sea-heath has been within, or exceeded, the baseline range for all survey periods except spring 2021 (Figure 3.21). At impact sites, the mean number of Thyme Sea-heath has remained within the baseline range during all compliance phase surveys (Figure 3.22). Hence, mining activities have not had an impact on Thyme Sea-heath populations.

Table 3.9: Abundance of Thyme Sea-heath at all sites, 2018 to 2025

Site[1]	2018 Autumn	2018 Spring	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	2024 Spring	2025 Spring
1	1	1	2	0	0	4	1	0	0
2	0	5	1	1	0	0	0	1	1
3	45	33	36	13	27	18	28	28	30
4	1	1	3	0	0	0	0	3	5
5	116	111	67	59	67	106	74	65	82
6	2	0	2	3	1	1	5	5	5
7	21	17	14	10	6	8	7	9	2
9	2	16	13	9	9	10	13	12	16
11	0	1	3	4	3	3	3	2	3
12	0	0	1	2	1	2	2	1	4
13	29	58	30	11	4	24	30	14	14
15	4	7	8	5	5	5	6	8	6

[1]Note Site 10 and 16 are absent, given there are no Thyme Sea-heath in the Jessup transect

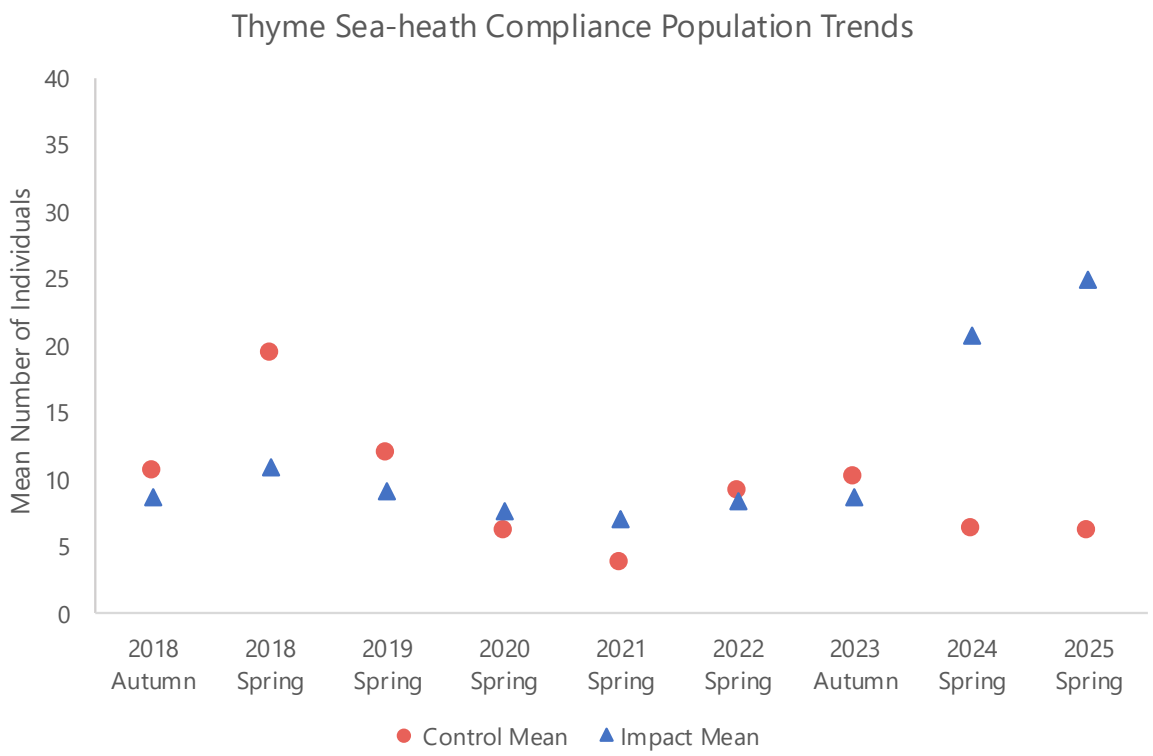


Figure 3.20: Population trends in Thyme Sea-heath during compliance period, control and impact sites

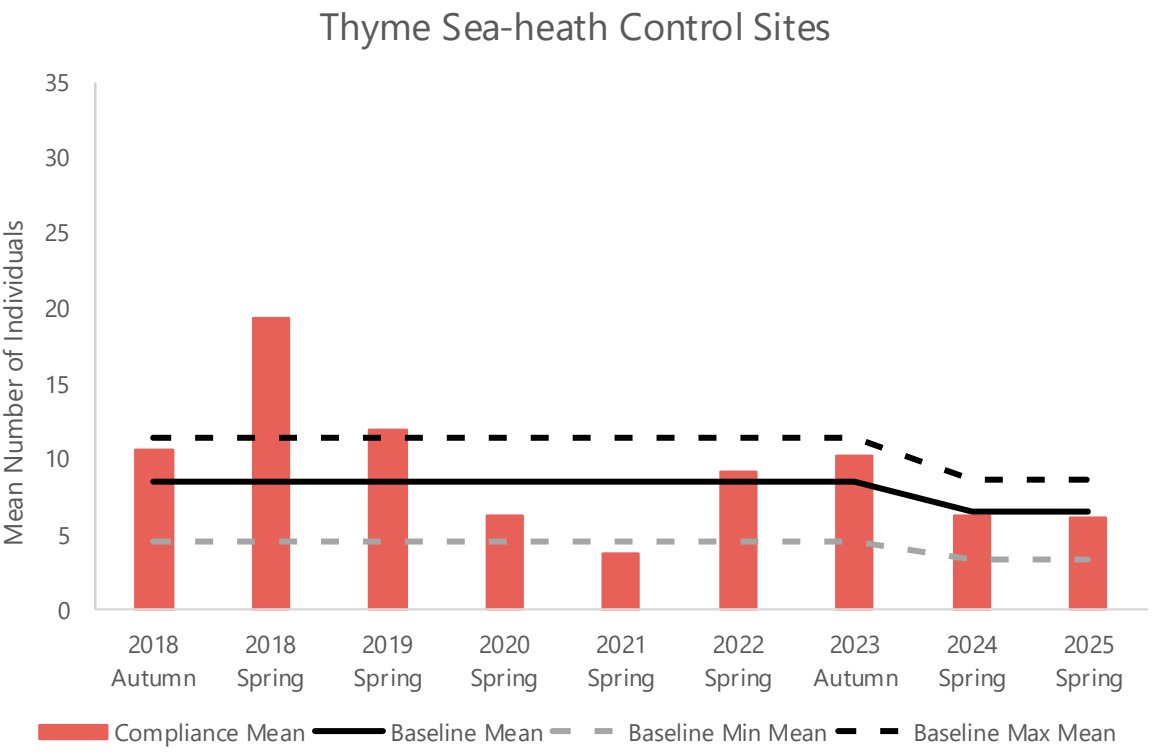


Figure 3.21: Mean abundance of Thyme Sea-heath at Jessup control sites, baseline vs compliance monitoring

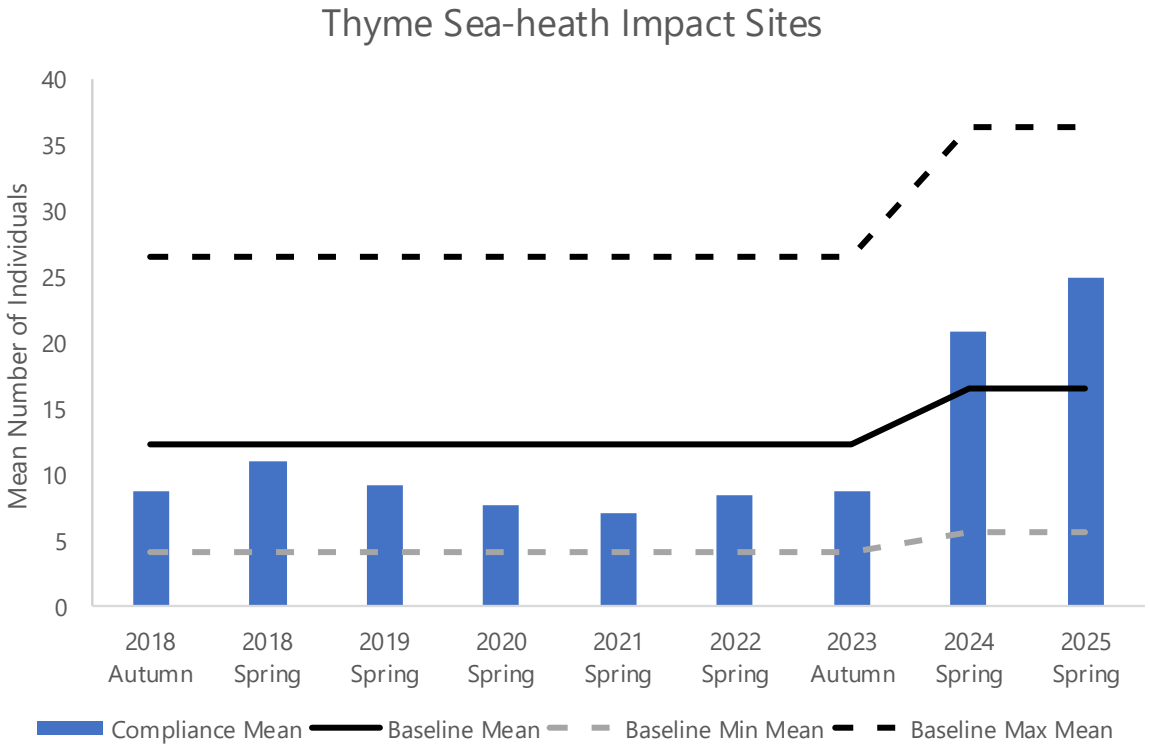


Figure 3.22: Mean abundance of Thyme Sea-heath at Jessup impact sites, baseline vs compliance monitoring

Bush Minuria

Bush Minuria is a relatively widespread and long-lived shrub at the gibber sites. Unlike Thyme Sea-heath, however, it is relatively palatable. Previous compliance reporting has shown that the abundance of Bush Minuria at Jessup sites has varied widely both between surveys and also within survey sites. This was attributed to both variation in yearly rainfall totals (defoliating during prolonged drought), and to grazing impact. During the exceptionally low rainfall years of 2018 and 2019 and continuing into 2020 – 2022, the mean abundance of Bush Minuria at both control and impact sites was below the baseline means. However, since 2022, the mean abundance at control sites has been above the baseline mean abundance, and since 2023 the mean abundance at impact sites has approached or exceeded the baseline mean (Table 3.10). In 2024 and 2025, regeneration was recorded at 3 of the 7 impact sites and at 1 of the 4 control sites (Table 3.10 and Table 3.11). Trends in abundance at impact and control sites have been similar, hence discounting mining impacts as a cause of variable abundance.

Table 3.10: Mean abundance of Bush Minuria, compliance and baseline

Treatment	2018	2018	2019	2020	2021	2022	2023	Pre-2024[1]	2024	2025	2024-2025[1]
	Autumn	Spring	Spring	Spring	Spring	Spring	Autumn	Baseline	Spring	Spring	Baseline
Control Means	3.7	3.3	3.3	2.3	0.7	6.5	15.0	4.3	12.5	11.8	5
Impact Mean	2.6	1.6	0.2	0.4	0.2	0.4	6.6	6.7	6.8	3.6	4

[1] Pre-2024 Sites 4 and 6 were Control Sites, but changed to Impact sites in 2024, given change in use of Southern Access Road

Table 3.11: Adult and juvenile abundance of Bush Minuria per site

Treatment	Site	2024		2025	
		Adults	Juveniles	Adults	Juveniles
Control	1	3		1	
	4	1		4	
	6	24		27	6
	7	1			
	13	3		1	
Control Totals		**31**	**0**	**33**	**6**
Impact	3	12	1	6	1
	5	5		5	1
	11	43		32	
	12	8		1	
	15		4		
	16	2	2		4
Impact Totals		**71**	**7**	**44**	**6**
Adults plus juveniles		**78**		**50**	

Plains Lantern Bush

In 2025, Plains Lantern Bush was the second most abundant long-lived shrub at gibber Jessup transects, following Bladder Saltbush. The mean abundance of Plains Lantern Bush has fluctuated between surveys (Table 3.12). However, at impact sites the mean abundance has been above the baseline mean for all compliance surveys except 2020 and 2021. Mean abundance at control sites has been above the baseline mean for all compliance surveys except 2020, 2021 and 2022, returning to be well above the baseline since 2023. The declines below the baseline mean at both impact and control sites are likely related to lag effects of the exceptionally low rainfall years of 2018 and 2019. Given it is unpalatable, grazing is not likely to be a major factor in declines. In 2024 and 2025, regeneration was also widespread in both control and impact sites (Table 3.13). Trends in abundance at impact and control sites have been similar, hence discounting mining impacts as a cause of variable abundance.

Table 3.12: Mean abundance of Plains Lantern Bush, compliance and baseline

Treatment	2018	2018	2019	2020	2021	2022	2023	Pre-2024[1]	2024	2025	2024-2025[1]
	Autumn	Spring	Spring	Spring	Spring	Spring	Autumn	Baseline	Spring	Spring	Baseline
Control Means	11.7	15	8.7	1.3	0	5	13	5.0	10.3	12.5	6.4
Impact Mean	37.2	44.5	43	34.8	30.5	42.2	53.3	41.4	58.8	57.5	34.7

[1] Pre-2024 Sites 4 and 6 were Control Sites, but changed to Impact sites in 2024, given change in use of SAR

Table 3.13: Abundance of Plains Lantern Bush adults and juveniles, 2024 and 2025

Treatment	Site	2024		2025	
		Adults	Juveniles	Adults	Juveniles
Control	1	19	2	17	5
	2	13	4	9	3
	Control Totals	**32**	**6**	**26**	**8**
Impact	3	4		4	
	5	73	23	76	57
	11	176	23	115	12
	15	1		1	
	16	26	25	37	43
	Impact Totals	**312**	**77**	**259**	**120**
	Adults + Juveniles	**389**		**379**	

3.2.2.2 Jessup transects Eliza Creek Sites

To assess potential impacts on vegetation downstream of the Tailings Storage Facility (TSF), 4 sites were established in autumn 2018 progressively downstream from the TSF embankment within Eliza Creek. In addition, Site 10 was established in 2012 during baseline surveys, and is located downstream from site 20 (furthest from the TSF). At each site, the survey methods included a Jessup transect, which is a count of all adult and juvenile woody long-lived perennial species. Since 2018, all sites have recorded a net increase in the total number of long-lived woody perennials (Figure 3.23). Sites 17 has recorded a net increase in plant abundance of 17%.

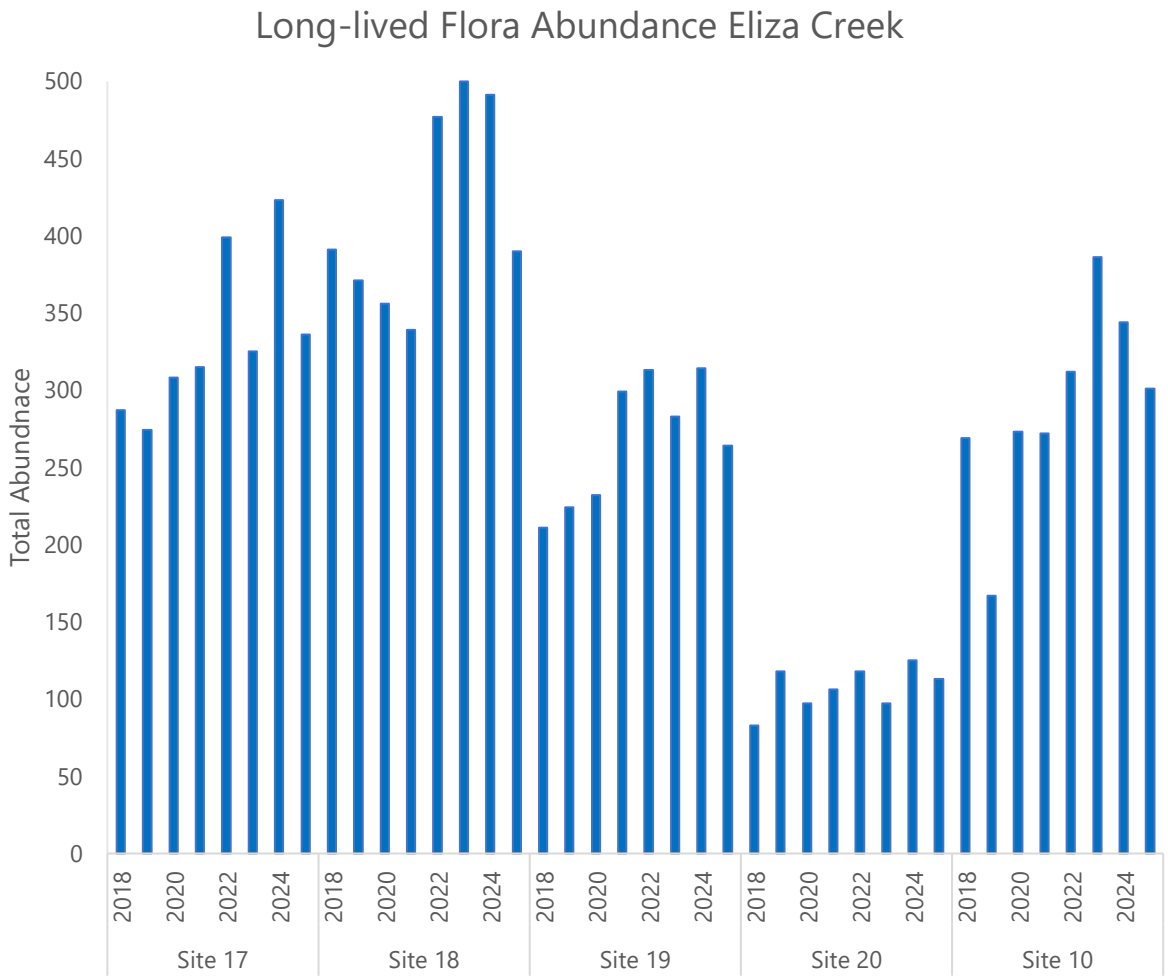


Figure 3.23: Combined abundance of all species recorded at Eliza Creek Jessup transects (adults and juveniles)

3.2.2.3 Abundance of select long-lived perennials at Eliza Creek

To further analyse population trends in long-lived species at the Eliza Creek transects, the population of trees and shrubs present at 3 or more sites, including Sites 17 and 18, were analysed and shown in Figure 3.24 to Figure 3.29. Appendix D2 presents the data in tabular form, in addition to data for the more abundant species present at Sites 19, 20 and/or 10 (further downstream). Site 10 is 270 m downstream from the TSF, site 18 is 930 m and site 19 is 3 km from the TSF. Sites 20 and 10 are approximately 4.7 km

and over 5 km respectively from the TSF. Hence potential impacts due to the TSF are expected to first become apparent at site 17, followed by sites 18, 19, 20 and 10 in that order.

Western Myall

At site 17, closest to the TSF, Western Myall numbers have shown a slight downward trend, but only because the 2023 tally was low (Figure 3.24). In 2024 and 2025 however, 27 individuals were recorded, similar to the 2018 tally. Western Myall abundance has fluctuated widely at Site 18, largely due to fluctuations in seedling abundance (with some seedlings germinating, but not surviving beyond a year). Regeneration of Western Myall has been extensive: in 2025, 23 juveniles were recorded at site 18 and 9 juveniles recorded at Site 17. At site 19, the population of Western Myall along the Jessup transect has been very stable. There has been no notable decline in abundance of Western Myall which could be attributed to the TSF operation.

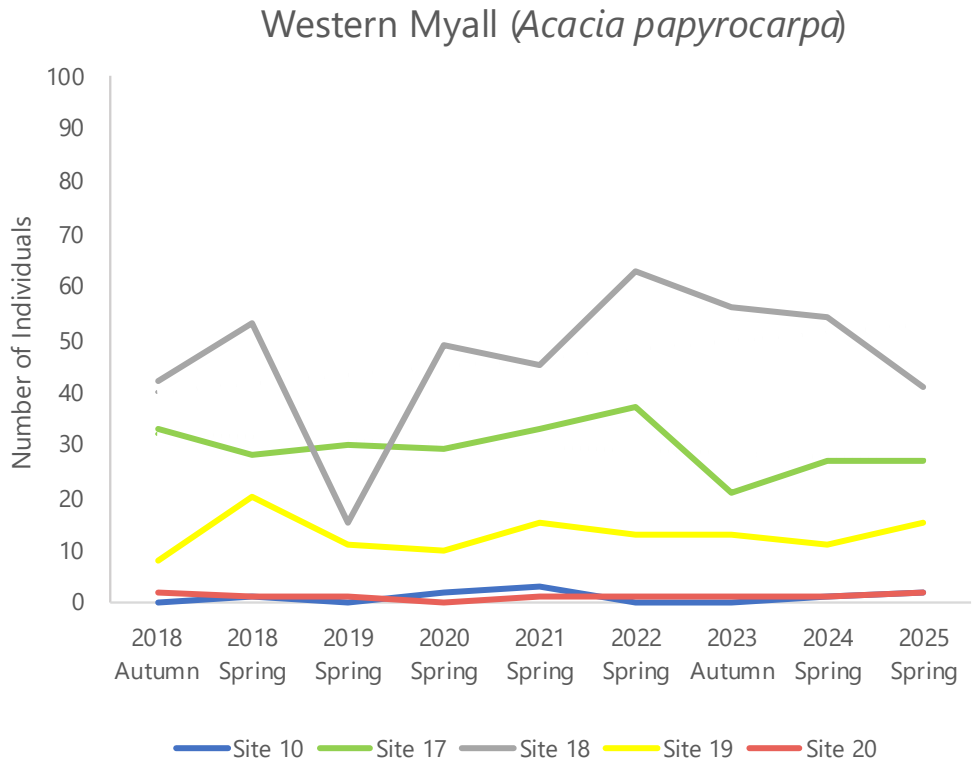


Figure 3.24: Abundance of Western Myall (adult and juveniles) recorded along Eliza Creek Jessup transects

Lobed-leaf Hop-bush

Lobed-leaf Hop-bush abundance has remained stable at Sites 10, 17, 18 and 20. At Site 19, population levels at the Jessup transect reached a peak in 2021, but have declined since 2021 with the 2025 tally being the lowest since compliance (Figure 3.35). The reason for the decline at Site 19 is not known. However, given the population at Sites 17 and 18 have been stable, it is unlikely that the cause for a decline at Site 19 are due to mining (Sites 17, 18 being within 930 m of the TSF and Site 19 being 3 km from the TSF). Hence, there is no notable decline in abundance of Lobed-leaf Hop-bush which could be attributed to the TSF operation.

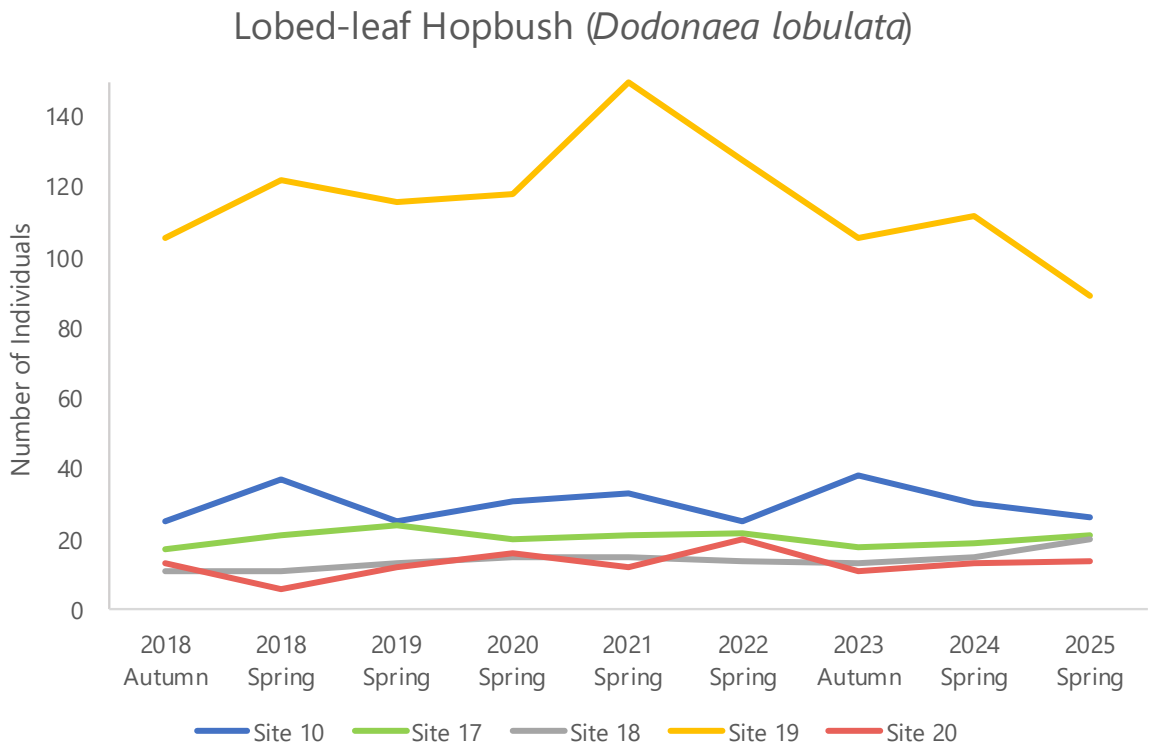


Figure 3.25: Abundance of Lobed-leaf Hop-bush (adult and juveniles) recorded along Eliza Creek Jessup transects

Spongy-fruit Bluebush

Spongy-fruit Bluebush is highly palatable but the populations at both Sites 17 and 18 have increased since 2018 (Figure 3.26). There is no notable decline in abundance of Spongy-fruit Bluebush which could be attributed to the TSF operation.

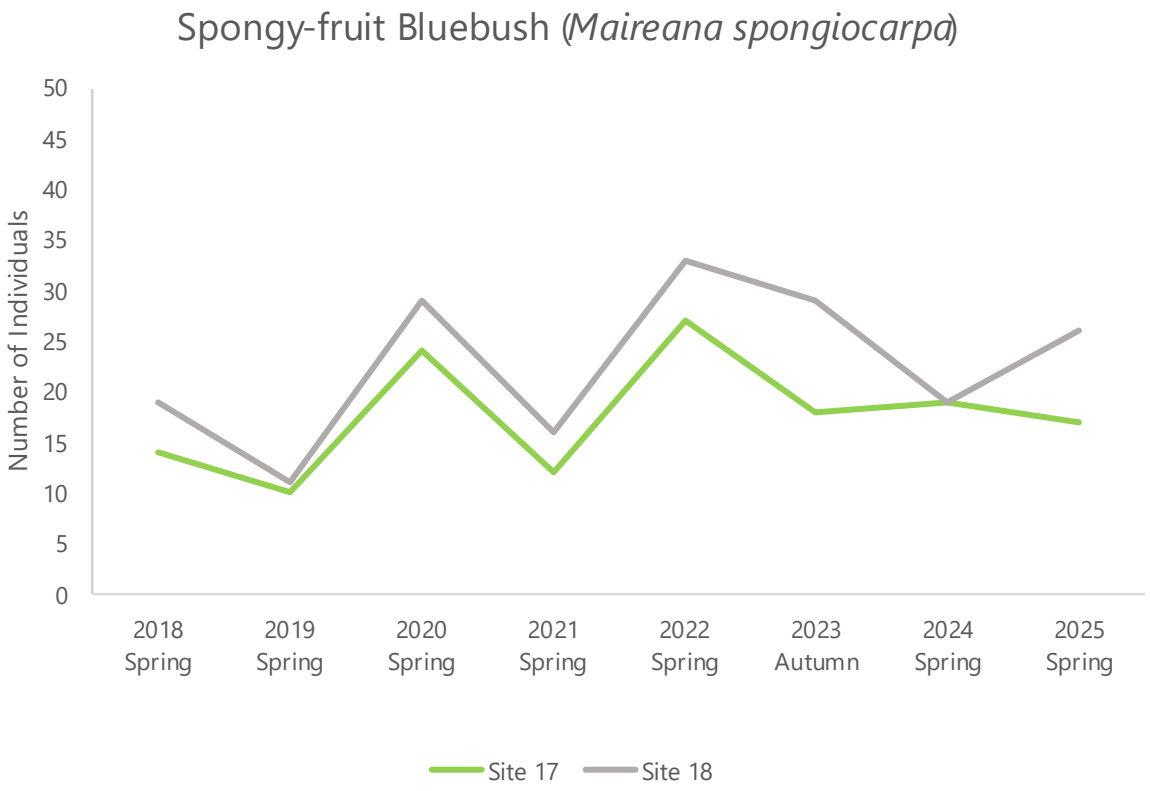


Figure 3.26: Abundance of Spongy-fruit Bluebush (adult and juveniles) recorded along Eliza Creek Jessup transects

Silver Mulla Mulla

In 2025, Silver Mulla Mulla decreased in abundance at sites 10, 17, 18, with smaller variations recorded at sites 19 and 20 (Figure 3.27). However, the populations at site 17 remains higher than totals recorded from 2018 to 2021. The site 18 population declined almost 65% in 2025, but was still higher than the 2021 population. The site 10 population has also fluctuated widely since 2018, but remains higher than tallies recorded 2018 to 2021. Hence the abundance of this species seems to be naturally more variable than other species that are woodier and longer-lived than Silver Mulla Mulla. Although the population has varied widely at sites 17, 18 and 10, there remains no obvious trends in abundance. Hence mining impacts are not apparent.

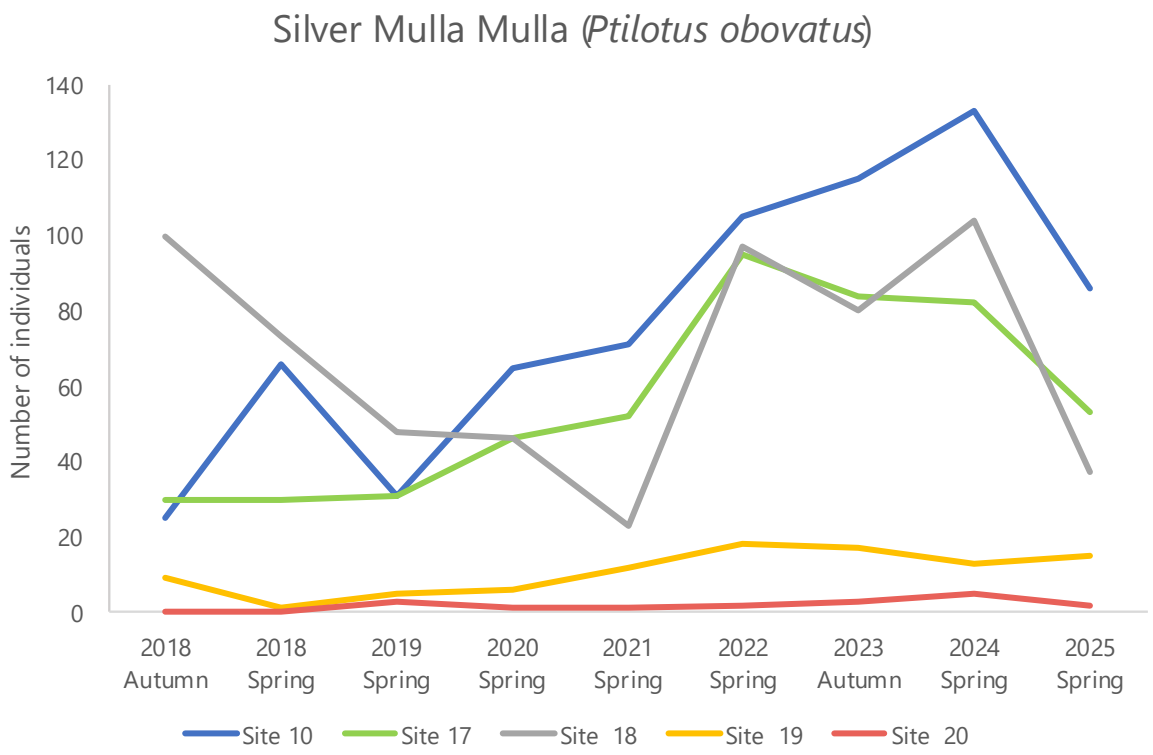


Figure 3.27: Abundance of Silver Mulla Mulla (adult and juveniles) recorded along Eliza Creek Jessup transects

Spiny Fanflower

The Spiny Fanflower population has recorded an upward trend at Sites 10 and 19, while no distinct trends are evident at Sites 17, 18 and 20 (Figure 3.28). Hence, there is no notable decline in abundance of Spiny Fanflower which could be attributed to the TSF operation.

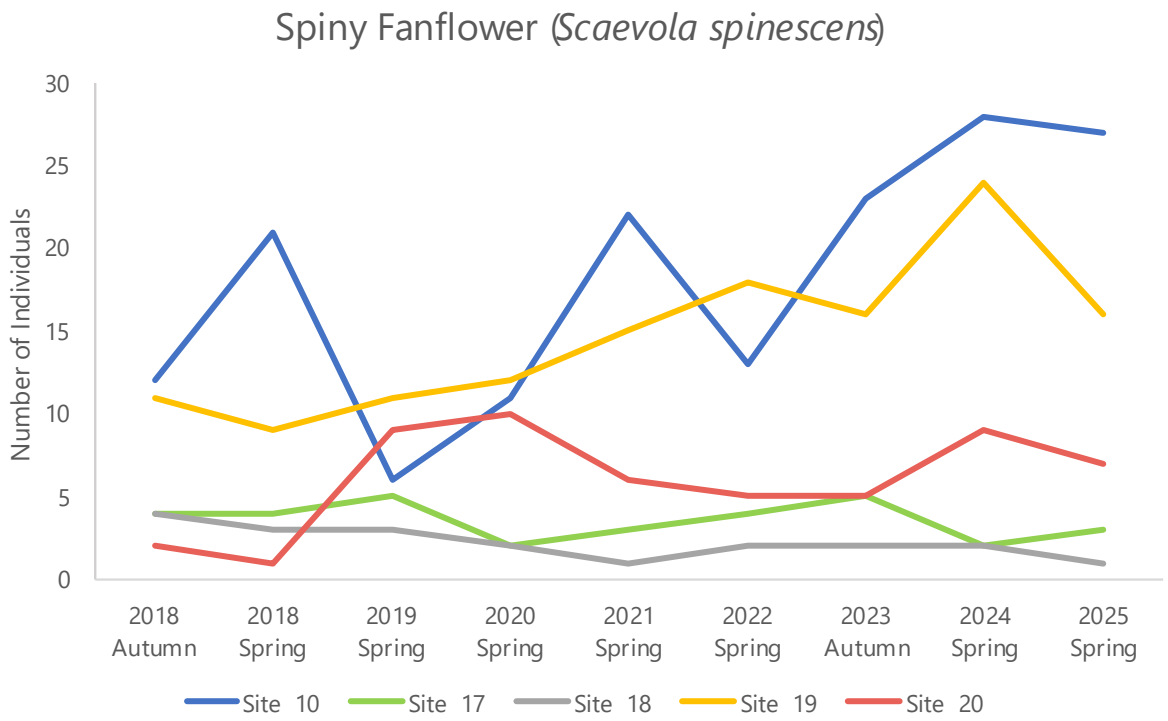


Figure 3.28: Abundance of Spiny Fanflower (adult and juveniles) recorded at Eliza Creek Jessup transects

Senna sp.

The Senna Jessup population at each site is ≤ 7 individuals, but, there have been no obvious increasing or decreasing trends at any site (Figure 3.29). There is no noticeable decline in Senna, which could be attributed to the TSF.

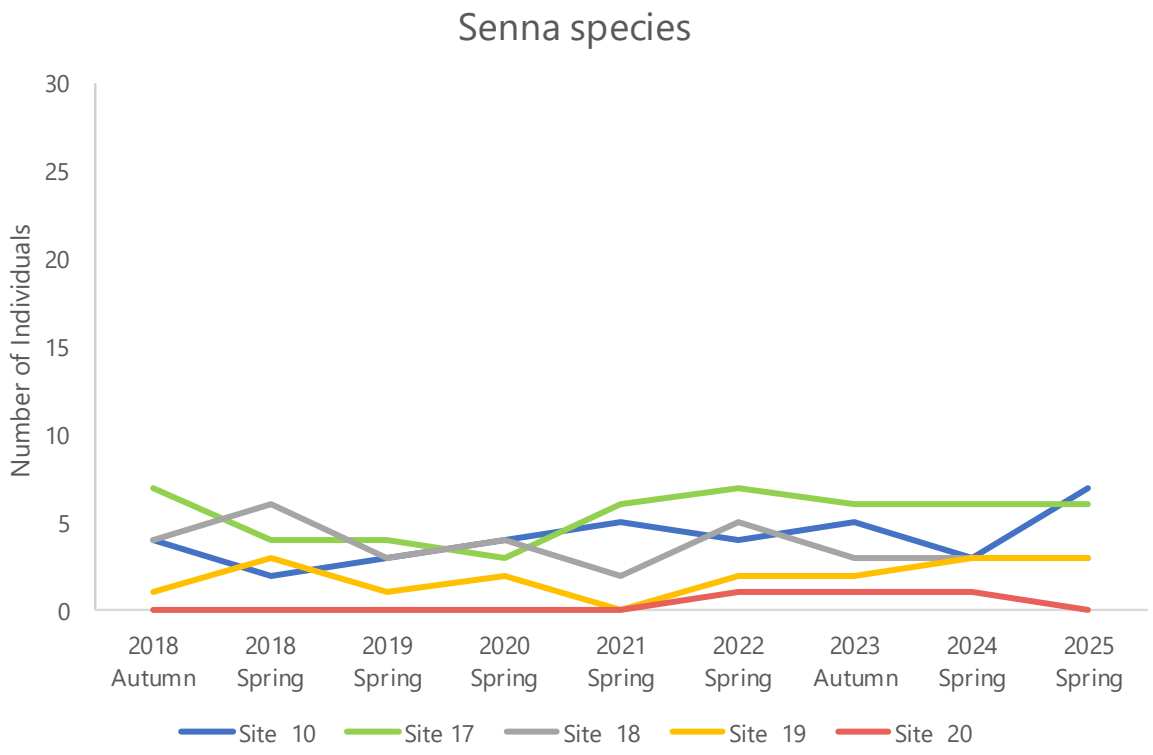


Figure 3.29: Abundance of Senna species (adult and juveniles) recorded along Eliza Creek Jessup transects

3.2.3 Canopy cover tree health, Eliza Creek

Tree canopy cover was also assessed at transects in Eliza Creek to assess potential impacts on tree health due to seepage from the TSF or reduced water flows down the catchment as a result of the TSF. Site 17 and Site 18 are Western Myall sites and Site 19 and Site 20 are River Red Gum dominant (refer Table 3.14 for approximate distance from TSF). No canopy cover sites were installed in Eliza Creek Site 10 because it was part of the original RAM / Jessup program and is furthest downstream, therefore least likely to demonstrate impacts from the TSF.

3.2.3.1 Canopy cover change

Table 3.14 summarises changes in canopy cover along each transect, since 2018, using 2 techniques: the densitometer, and visual estimates of individual canopy extent.

There has been a net increase in the number of Western Myall trees intercepted along the transects; a net increase in the number of Myall foliage intercepts, but net declines in visual estimates of Western Myall canopy extent (the latter only recorded in 2025). For Red Gums, there has been no change in the number of trees intercepted along the transects, no distinct trends in the number of foliage intercepts at each site, but net declines in Red Gum canopy extent as estimated visually without the aid of a densitometer.

Table 3.14: Summary of canopy changes between 2018 to 2025

Transect, landscape position, trees in 2025[1,3]	New Trees and Tree Death	Number of Foliage Intercepts	Net % Change in # of Foliage Intercepts	Tree Mean Canopy Extent[2]	Net % Change in Mean Canopy Extent
17A, channel (270 m from TSF), WM: 12 live	New trees: 5 Deaths: 0	2018: 25 2025: 35	+40%	2019: 86% 2025: 79%	-8%
17B, bank (270 m from TSF), WM: 8 live	New trees: 1 Deaths: 0	2018: 17 2025: 21	+17%	2019: 90% 2025: 69%	-23%
18A, bank (930 m from TSF), WM: 23 live, 1 dead	New trees: 9 Deaths: 1	2018: 13 2025: 39	+200%	2019: 81% 2025: 73%	-10%
18B, channel (930 m from TSF), WM: 5 live, 2 dead	New trees: 2 Deaths: 2	2018: 7 2025: 8	+14%	2019: 42% 2025: 39%	-5%
19A, channel (3 km from TSF), RG: 6 live, 1 dead WM: 8 live, 1 dead	RG New trees: 0 Deaths: 0 WM New trees: 6 Deaths: 0	RG 2018: 26 2024: 30	+15%	RG 2019: 70% 2025: 52%	-26%
19B, channel edge (3 km from TSF), RG:	RG New trees: 1 Deaths: 1	RG 2018: 16 2025: 10	-38%	RG 2019: 54% 2025: 30%	-44%

Transect, landscape position, trees in 2025[1,3]	New Trees and Tree Death	Number of Foliage Intercepts	Net % Change in # of Foliage Intercepts	Tree Mean Canopy Extent[2]	Net % Change in Mean Canopy Extent
6 live, 2 dead WM: 6 live	WM New trees: 4 Deaths: 0				
20A, channel edge (4.65 km from TSF), RG: 9 live WM: 1 live	RG New trees: 0 Deaths: 0 WM New trees: 0 Deaths: 0	RG 2018: 21 2025: 28	+33%	RG 2019: 49% 2025: 39%	-20%
20B, channel (4.65 km from TSF), RG: 4 live WM: nil	RG New trees: 0 Deaths: 0	RG 2018: 24 2024: 17	-29%	RG 2019: 63% 2024: 56%	-11%

[1]WM = Western Myall (*Acacia papyrocarpa/Acacia sp. Blyth Range*), RG = Northern River Red Gum (*Eucalyptus camaldulensis subsp. arida*); [2]Canopy Extent first recorded in 2019. [3]Note error in 2024 reporting 18B should have been 1 dead WM.

3.2.3.2 Live foliage estimates (densitometer data)

Comparing the total number of densitometer foliage records along a transect over time provides an indication of changes in total canopy cover along the transect. Potential changes in total canopy cover may be a combination of canopy expansion of individual trees (natural growth, improved canopy health), dieback; and/or recruitment of new trees.

Western Myall[2]

At the Western Myall dominant transects (Site 17 and Site 18), the total number of Western Myall foliage records has trending strongly upwards since 2018 (Figure 3.30). The increase in foliage records at each site is largely due to additional trees being recorded along each transect (discussed further below). At Site 19, where both Red Gums and Western Myall occur, there has also been an upward trend in the total number of Western Myall foliage records since 2018, although totals stabilising since 2022. At Site 20, there has been only 1 Western Myall tree intercepted at all recording periods, and the foliage records have been relatively constant. Figure 3.30 shows the sum of Western Myall foliage records for both transects combined at each site. Figure 3.31 and Figure 3.32 show foliage records for individual transects at Site 17 and Site 18, respectively.

[2] Note that the Western Myall trees in the Carrapateena operational area may be *Acacia papyrocarpa* and/or the very similar *Acacia* sp. Blyth (formerly *Acacia affinity papyrocarpa*). Distinction requires fruiting pods which were absent during surveys

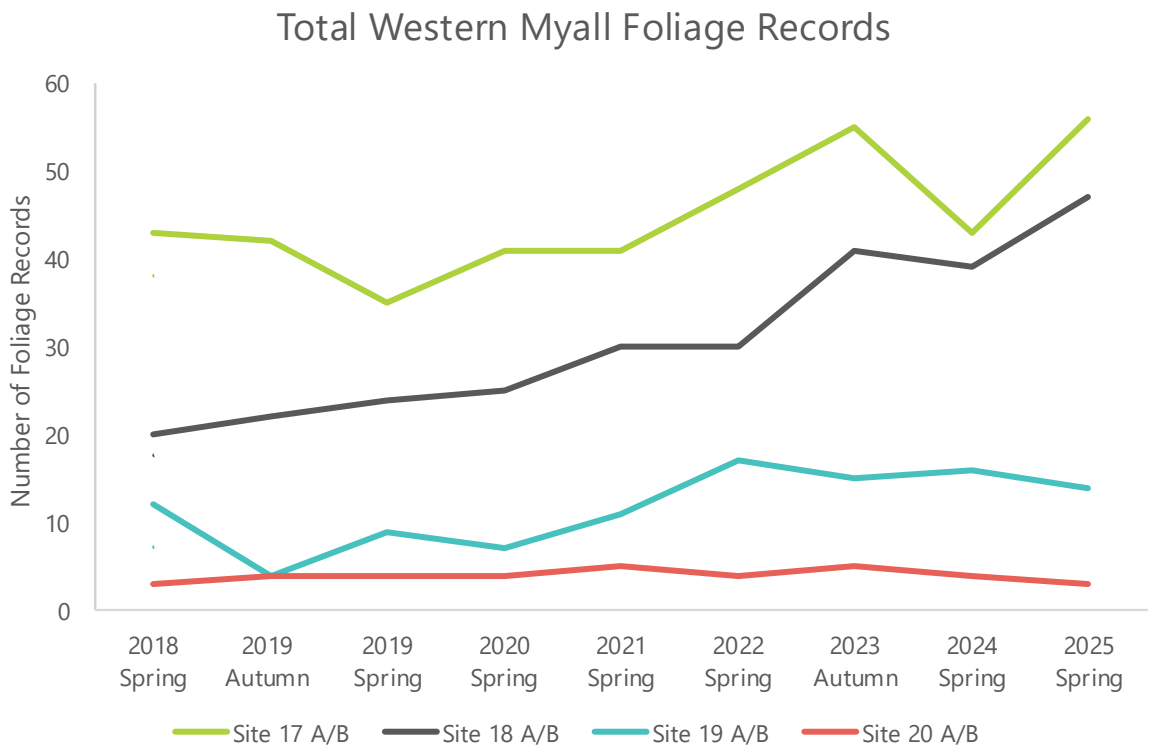


Figure 3.30: Total number of Western Myall foliage records at each site (2018-2025)

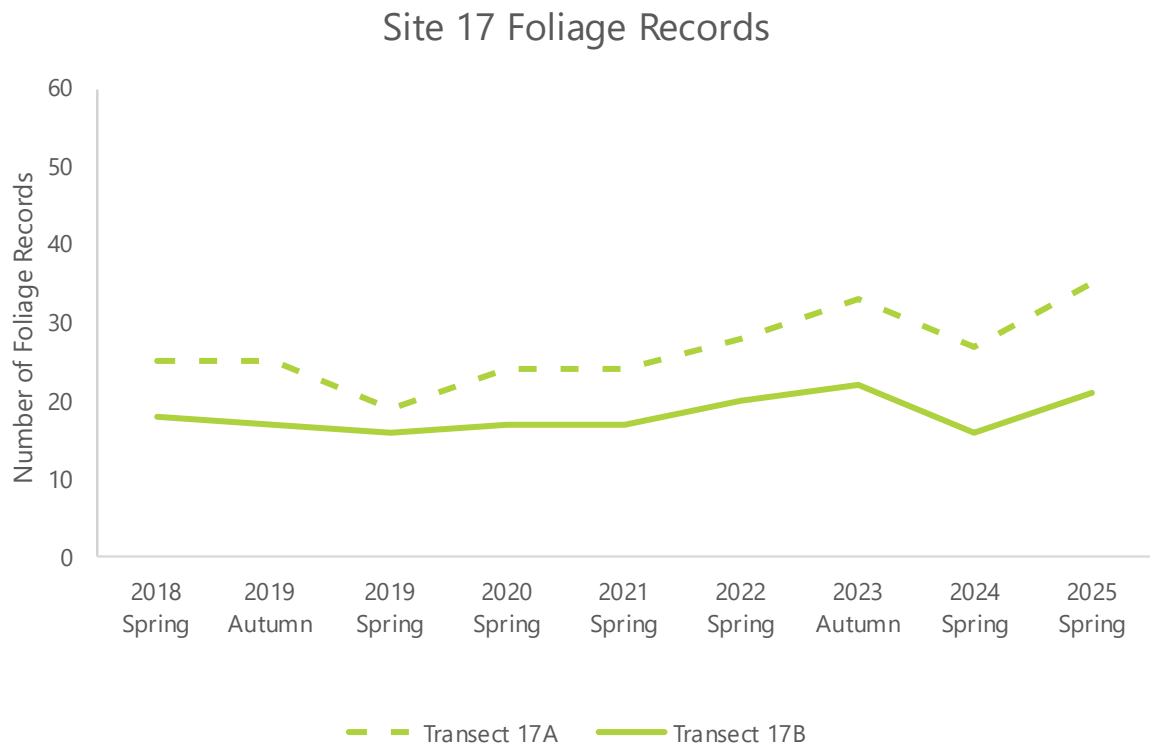


Figure 3.31: Number of Western Myall foliage records along Site 17 transects (2018 to 2025)

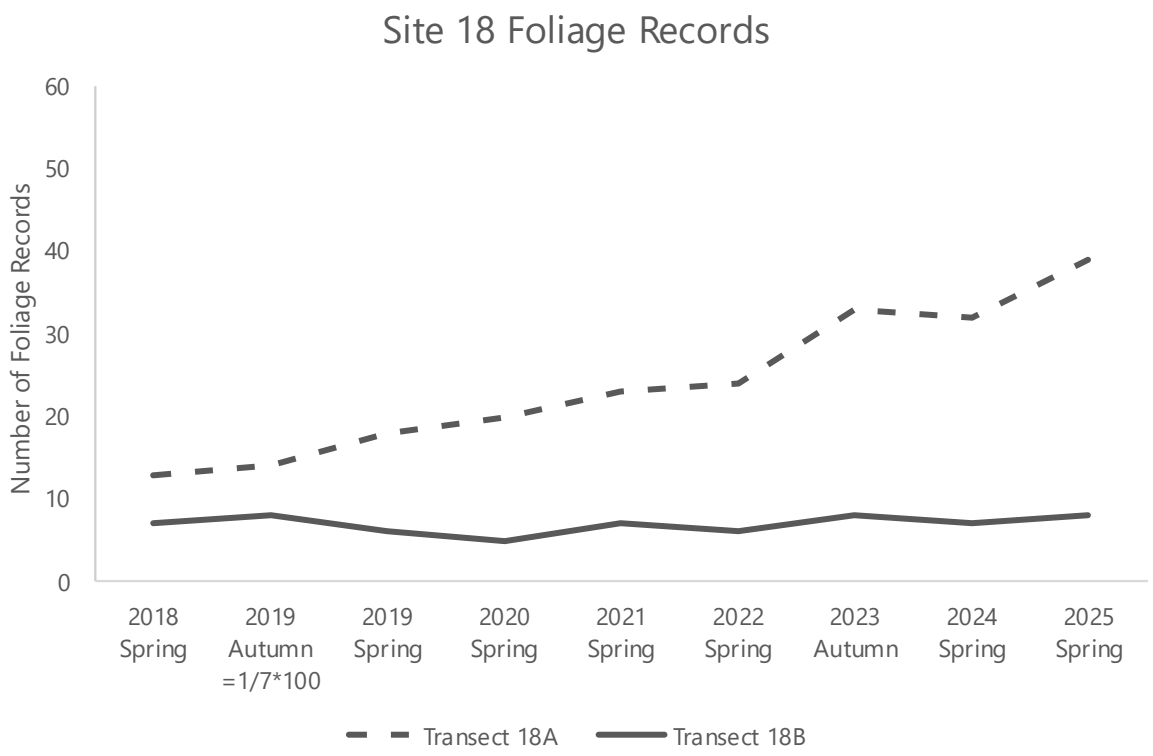


Figure 3.32: Number of Western Myall foliage records along Site 18 transects (2018 to 2025)

River Red Gum

The number of River Red Gum (*Eucalyptus camaldulensis ssp. arida*) foliage records for Sites 19 and 20 has fluctuated, often quite markedly, between survey periods. However, there has been no distinct trend apparent at Site 19, and a slight upward trend in total River Red Gum foliage records at Site 20. At both Site 19 and 20, the number of River Red Gum foliage records for both transects combined was similar in 2018 and 2025 (Figure 3.33). Figure 3.34 and Figure 3.35 show River Red Gum foliage records for individual transects at Sites 19 and 20, respectively. There have been slight upward trends in foliage records for both transect 19A and 20A, but no apparent trend at transect 20A. There has been a very slight decline in total foliage records at transect 20B, corresponding to a decline in canopy extent, as estimated visually (no densitometer). However, there are only 4 River Red Gum trees along this transect and results for the whole site should be considered.

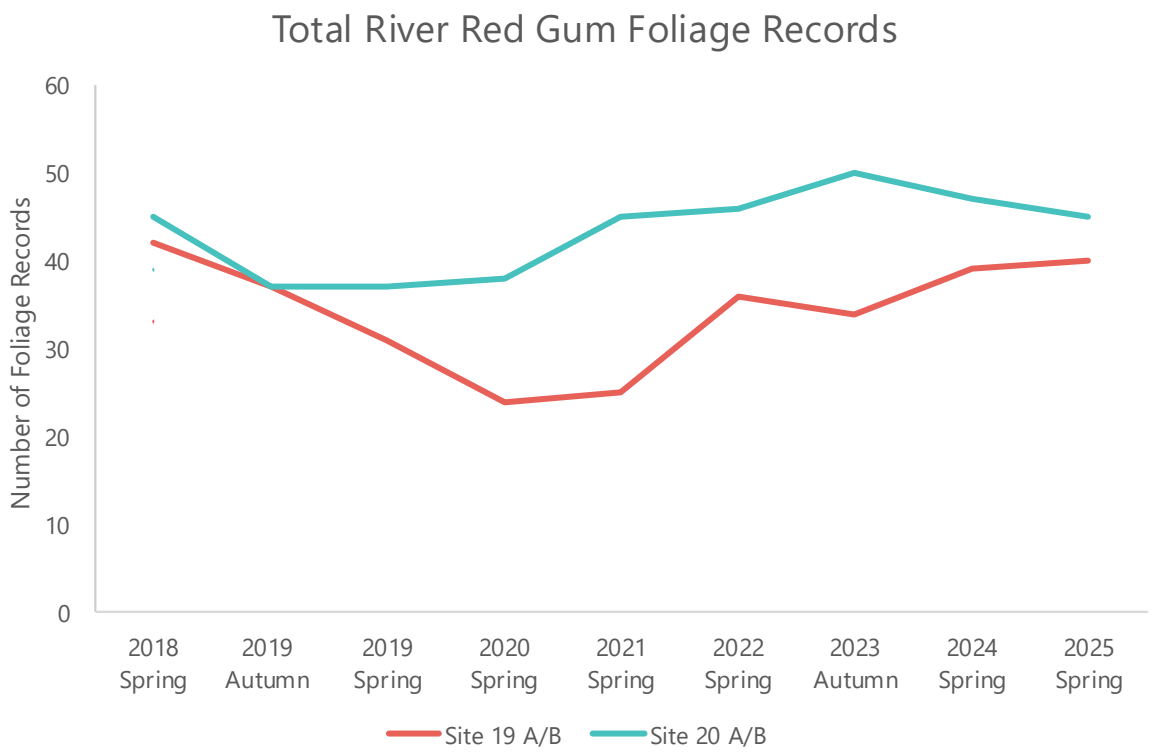


Figure 3.33: Total number of River Red Gum foliage records for each site (2018 to 2025)

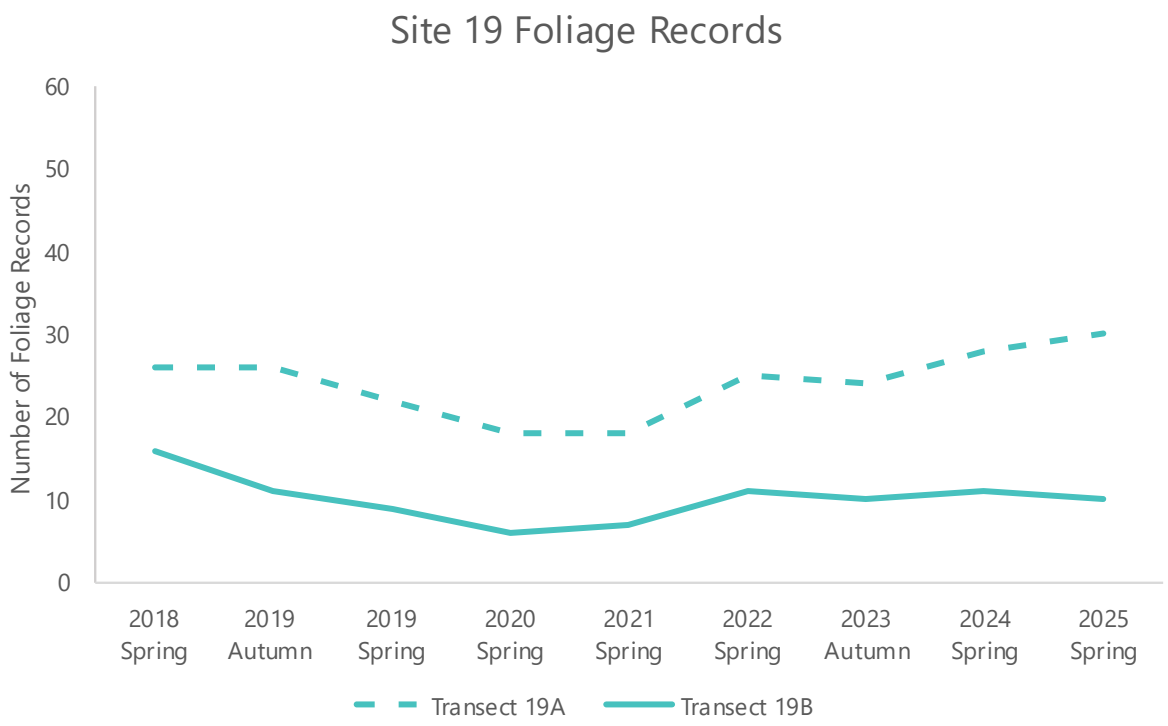


Figure 3.34: Number of River Red Gum foliage records along Site 19 transects (2018 to 2025)

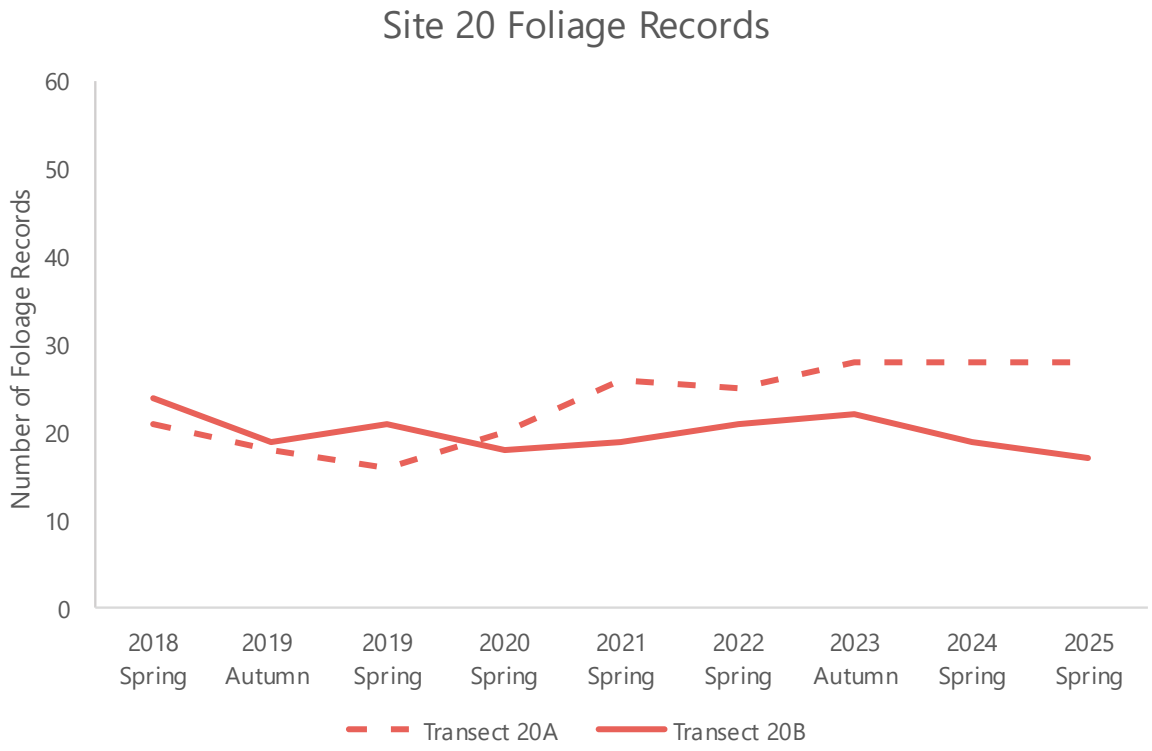


Figure 3.35: Number of River Red Gum foliage hits along Site 20 transects (2018 to 2025)

3.2.3.3 Tree death and new trees

Surveyed trees are individually numbered along each transect, which facilitates records of individual tree death, canopy loss resulting in trees no longer being recorded along the alignment, and tree canopies that are intercepted along the alignment for the first time. New trees are recorded as a result of expansion of mature tree canopies onto the transect alignment and/or younger trees that newly meet the survey criteria for densitometer recordings (i.e. minimum plant height of 1 m and intercepting the transect).

Western Myall

The number of existing, new and dead Western Myall trees recorded at each site (transects combined) is shown in Figure 3.36 (where Site 17 is the closest to the TSF, Site 20 is not shown, given only 1 Western Myall present at all survey periods). In 2025, 3 new Western Myall trees were recorded, all on Transect 18A. One tree died on Transect 18B (Figure 3.36). Since 2018, there have been 3 Western Myall tree deaths and 26 new Western Myall trees recorded along the combined transects. The 3 deaths occurred at Site 18. Two of these trees were estimated to have retained less than 10% of their canopy foliage prior to the operation of the TSF. The most recent tree to die had an estimated canopy loss of >90% since 2021 (Appendix E). There have been no Western Myall deaths at Sites 17, 19 or 20. The majority of new trees intercepted along transects have been juveniles that have increased in size, meeting the survey criteria (as mentioned above).

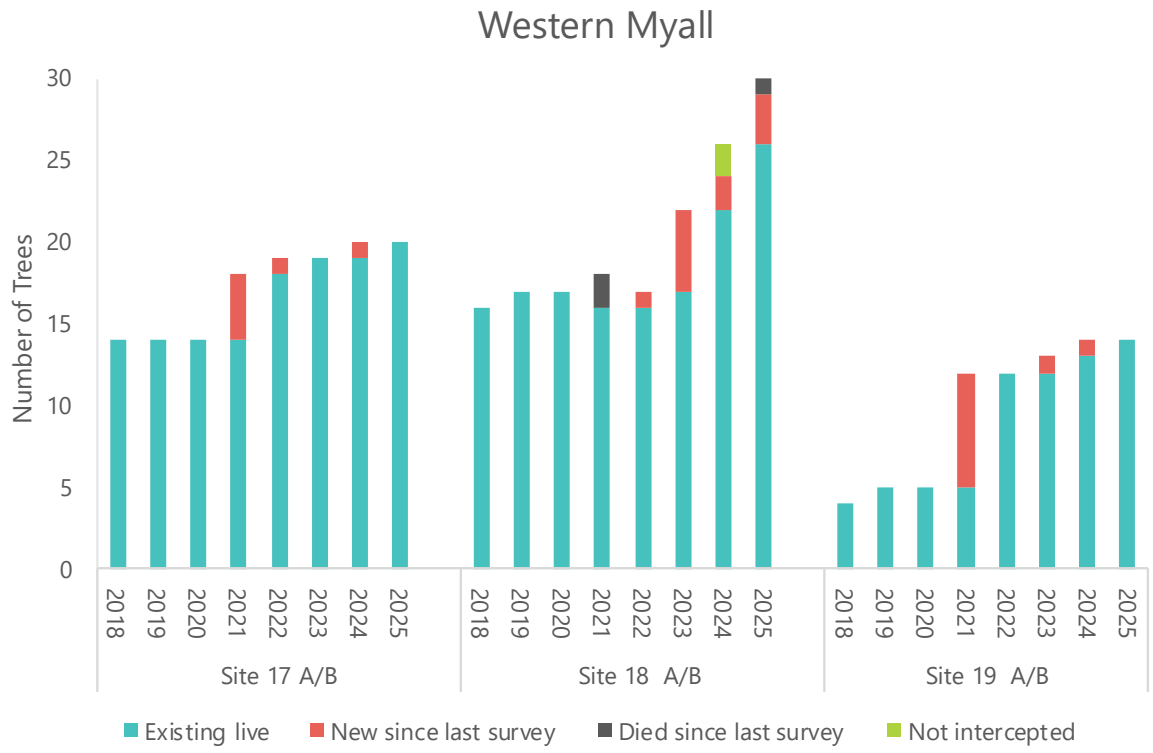


Figure 3.36: Change in Western Myall abundance (new = meets criteria, not intercepted = tree present but not intersecting transect)

River Red Gum

Since 2018, there has been 1 new Red Gum intercepted (Site 19, in 2024) and 1 Red Gum has died (Site 19 in 2021). The dead tree had a visually estimated canopy extent of approximately 50% in 2019 and 3% in 2020. Transect 19 is 3 km downstream of the TSF. Figure 3.37 shows the number of live Red Gum trees, deaths and new trees for each survey period since 2018.

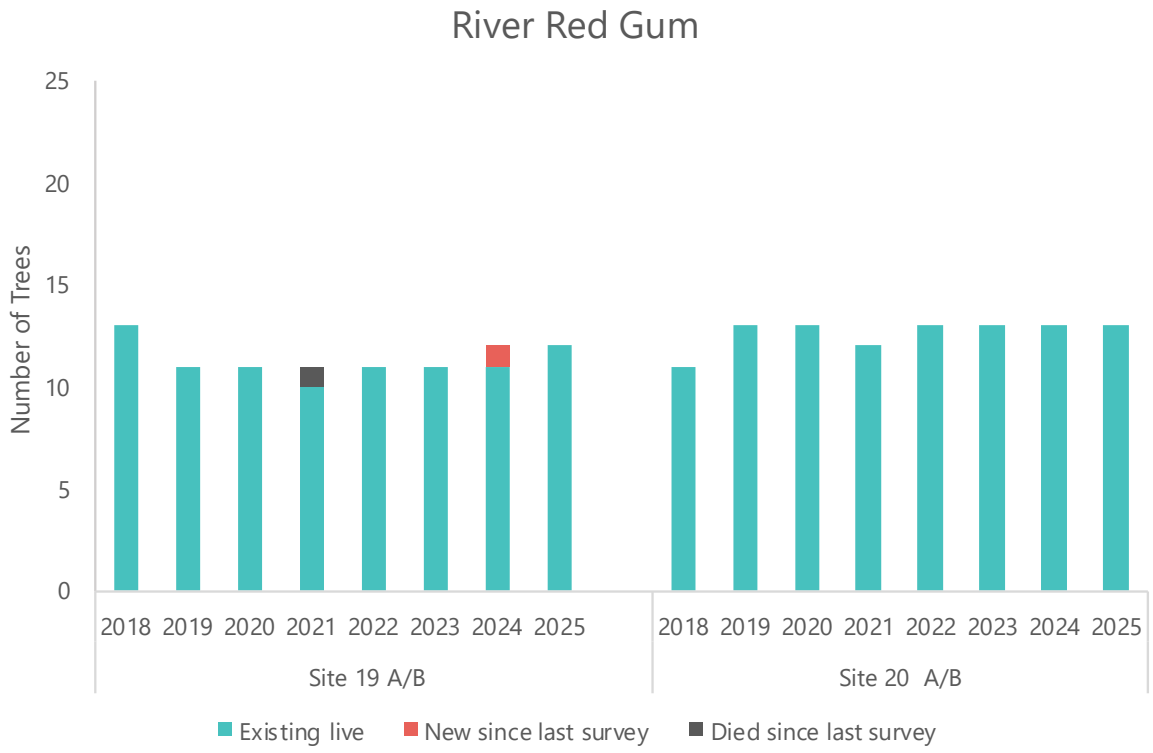


Figure 3.37: Change in River Red Gum abundance (new = met criteria)

3.2.3.4 Visual estimates of canopy intactness

Visual estimates of canopy intactness for individual trees commenced in 2019 as an additional alternate means of estimating overall tree health.

Western Myall

Visual estimates of canopy intactness for Western Myall trees are shown in Table 3.15 and Figure 3.38. Up until 2024, visual estimates indicated relatively similar levels of canopy intactness for each transect. However, for the 2025 survey, a mean decline in Western Myall canopy intactness of between 6 – 21% was recorded for Transects 17A/B, 18A and 19A/B. Mean canopy intactness at Transect 17B declined from means of 90 – 97% (between 2019 and 2024) to just 69% in 2025. The discrepancy between visual estimates and densitometer records is elaborated further in the Discussion (Section 4.1.5 and Section 4.3.4).

Table 3.15: Visual estimates of canopy intactness for Western Myall trees

Transect (# of live trees in 2025)[2]	Mean % Canopy Intact[1] Western Myall Trees						
	2019 Spring	2020 Spring[3]	2021 Spring	2022 Spring	2023 Autumn	2024 Spring	2025 Spring
17A (12)	86	87	94	90	92	86	79
17B (8)	90	92	93	91	97	90	69
18A (23)	81	-	72	80	89	80	73
18B (5)	42	-	18	28	35	33	39
19A (8)	100	100	96	99	100	97	79
19B (6)	69	68	75	77	86	79	72
20A (1)	100	90	77	100	100	70	70

[1]Visual estimate of canopy extent compared with expected canopy extent for tree in optimum health. [2]No Western Myall on transect 20B. [3]Canopy intactness was not recorded in 2020 for Transects 18A and 18B.

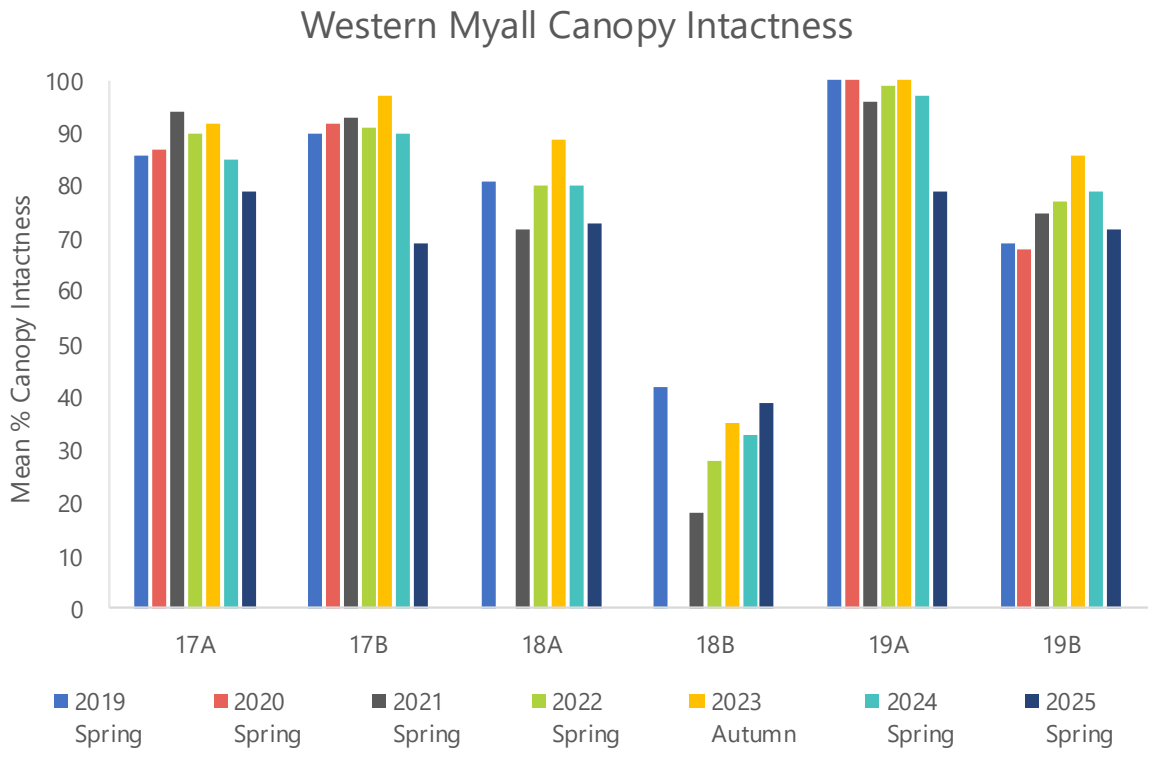


Figure 3.38: Visual estimates of mean canopy intactness for Western Myall trees (2019-2025)

River Red Gum

Visual estimates of Red Gum canopy intactness declined for all transects in 2025, following even larger declines in 2024 (Table 3.16 and Figure 3.39). These declines followed a general pattern of canopy decline 2019 to 2021, followed by large increase in canopy extent in 2022 and 2023. The variation in visual estimates of canopy intactness for River Red Gums has been greater than the variation recorded via densitometer foliage records.

Table 3.16: Visual estimates of canopy intactness for River Red Gum trees

Transect (# of live trees in 2025)	Mean % Canopy Intact[1] River Red Gum Trees						
	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	2024 Spring	2025 Spring
19A (6)	70	63	60	72	87	61	52
19B (6)	54	47	43	42	67	47	26
20A (9)	49	40	47	80	91	61	39
20B (4)	63	46	46	75	85	78	56

[1]Visual estimate of canopy extent compared with expected canopy extent for tree in optimum health

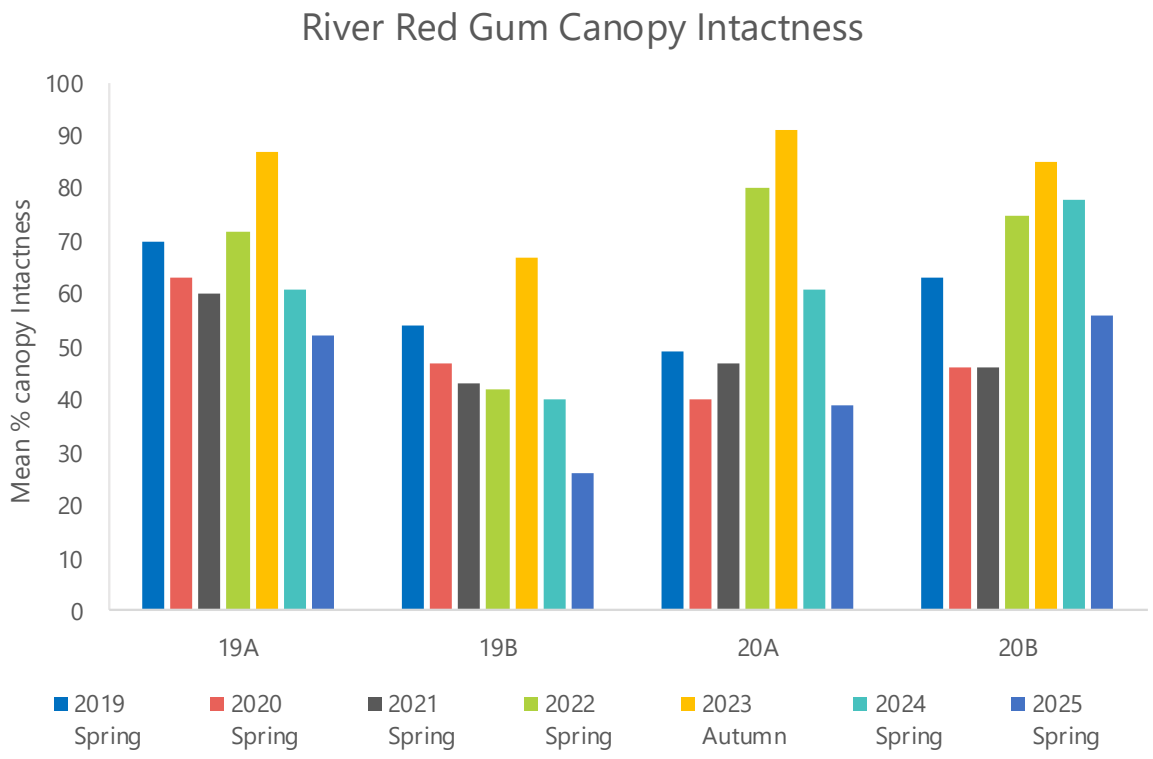


Figure 3.39: Visual estimates of canopy intactness for River Red Gum trees (2019-2025)

3.2.4 Weed diversity and abundance

Weeds were surveyed at standard flora sites, designated weed transects, targeted sites (including dams, villages and Yeltacowie homestead), and opportunistically. All weed species recorded during baseline surveys (2012 to 2016) and compliance monitoring (2018 to 2025) are summarised in Table 3.17 and Appendix G. Although Dawson Dam, South Eliza Dam, North Eliza Dam and Anzac Dam are outside of existing mineral leases, weed species at these locations were documented in detail during annual surveys 2018 – 2024 to identify potential sources of new weed infestations into the mineral leases and/or document potential spread of weeds from the mineral leases into dams. These surveys provided a comprehensive list of weeds occurring at the 4 dams. Given no new weed species, nor obvious changes in abundance, were recorded in 2024 at the dam locations, only a subset of dams were surveyed in 2025. The need for future weed surveys at dams outside of the mineral lease will be influenced largely by whether new weed species are recorded within the mineral lease, and the source thereof being determined.

3.2.4.1 New weed species

No new weed species were recorded during the 2025 spring survey (Table 3.17), namely all weed species recorded in 2025 had been previously recorded during baseline and/or monitoring surveys.

Table 3.17: Weed species recorded during baseline surveys (2012-2016); compliance monitoring (2018 – 2024) and the current compliance survey (2025)

Scientific Name	Common Name	Recorded During Baseline Surveys (EBS 2012-2016)[2]	Recorded 2018-2024[2]	Recorded Spring 2025[1,2]	Weed Status[3]
Brassica tournefortii	Mustard	Y	N	N	
Carrichtera annua	Wards Weed	N	Y	N	
Carthamus lanatus	Saffron Thistle	Y	Y	N	
Centaurea calcitrapa	Star Thistle	Y	N	N	
Centaurea melitensis	Malta Thistle	Y	Y	N	
Centaurium erythraea / tenuiflorum	Centaury	Y	Y	Y	
Chenopodium album/murale	Goosefoot	NS	Y	Y	
Citrullus species, including C. colocynthis	Bitter Melon	N	Y	N	
Cucumis myriocarpus	Paddy Melon	N	Y	N	
Erodium sp. including Erodium cicutarium	Cut-leaf Heron's-bill	N	Y	Y	
Heliotropium curassavicum	Smooth Heliotrope	N	Y	N	
Heliotropium supinum	Spreading Heliotrope	N	Y	Y	
Lepidium africanum	Peppercress	Y	N	N	

Scientific Name	Common Name	Recorded During Baseline Surveys (EBS 2012-2016)[2]	Recorded 2018-2024[2]	Recorded Spring 2025[1,2]	Weed Status[3]
Lysimachia arvensis	Scarlet Pimpernel	N	Y	Y	
Malva parviflora	Mallow	N	Y	Y	
Medicago sp. (including *M. minima*)	Medic	N	Y	Y	
Mesembryanthemum crystallinum	Iceplant	N	Y	N	
Mesembryanthemum nodiflorum	Slender Iceplant	Y	N	N	
Nicotiana glauca	Tree Tobacco	Y	Y	N	
Opuntia sp.	Prickly Pear	NS	Y	Y	WoNS
Rostraria pumila	Tiny Bristle Grass	Y	Y	N	
Rumex vesicarius	Rosy Dock	Y	Y	N	
Schismus barbatus	Arabian Grass	Y	N	N	
Sisymbrium erysimoides	Smooth Mustard	Y	Y	Y	
Solanum nigrum	Black Nightshade	Y	Y	Y	
Sonchus oleraceus	Sow Thistle	Y	Y	Y	
Tamarix aphylla	Athel Pine	NS	Y	Y	WoNS, D
Tribulus terrestris	Caltrop	Y	Y	N	
Urtica urens	Stinging Nettle	NS	Y	N	
Xanthium spinosum	Bathurst Burr	N	Y	Y	D

[1] Excludes dams and Whittata Creek (non-mineral lease areas); [2](Y = Yes Recorded N = Not Recorded; NS = Not surveyed); [3] Weed status where WoNS = Weed of National Significance, D = Declared under the Landscape South Australia Act 2019, blank = common.

3.2.4.2 Increase in abundance

Appendix G1 details all weed species recorded during baseline surveys and compliance, along with the location recorded and their abundance. Excluding the dam locations (non-mineral lease sites), 3 weed species recorded an increased abundance in 2025, compared with previous compliance surveys (2018 – 2024); Sow Thistle (*Sonchus oleraceus*), Cut-leaf Heron's-bill (*Erodium cicutarium*) and Bathurst Burr (*Xanthium occidentale*).

Sow Thistle

In 2025, Sow Thistle was recorded at 18 locations, more than previous years. For example, Sow Thistle was recorded at 5 locations in 2024. Of the 18 locations where Sow Thistle was recorded in 2025, Sow Thistle had previously been recorded at 10 of these locations. However, prior to 2025, Sow Thistle had been recorded from a cumulative total of 12 locations (including weed transects, Rangeland sites and other regularly targeted sites).

Bathurst Burr

Previous compliance surveys have recorded Bathurst Burr only at dams (namely on non-mineral lease land), and on drainage lines intercepting weed transects CWM01 (Whittata Creek) and CWM02 (Yeltacowie Creek/South Eliza Dam) both along the Southern Access Road. CWM01 and CWM02 Bathurst Burr populations have not increased during compliance monitoring, including when surveyed in 2025.

However, in 2025, Bathurst Burr was recorded along weed transect CWM05 for the first time. This transect occurs along the Western Access Road, approximately 5 km from the Stuart Highway. A total of 10 plants were recorded at the western end of the weed transect. The plants were recorded within an area of cracking clay soil (9 m wide x 50 m long), south of the made road, between the road shoulder and the dune. Nine plants were in a cluster of 6 m^2 and a further isolated plant occurred at the eastern end of the cracking clay soil. The plants were 0.3 to 0.5 m tall and appeared dead. No fruit were observed. It is possible that seeds were spread to this location from vehicle tyres and/or animals.

Cut-leaf Heron's-bill

One plant was recorded at each of Rangeland Sites 4, 5 and 9, previously unrecorded from these sites and an increase from previous surveys.

All other weed species were recorded at the same or non-discernible changes in abundance compared with previous compliance surveys.

3.2.4.3 Species recorded at previously unreported locations

Two weed species were recorded in 2025 at previously unreported locations.

Spreading Heliotrope

Spreading Heliotrope (*Heliotropium supinum*) was recorded as an isolated clump along weed transect CWM02. Spreading Heliotrope has not been recorded along this transect during baseline or compliance monitoring. Along weed transect CWM02, the species was recorded near the road culvert next to South Eliza Dam outlet. Spreading Heliotrope occurs on wet clay soils and its presence is connected to the wet soils rather than mining activities. Conversely, in 2025, Spreading Heliotrope was not recorded along weed transect CWM01, where it has been previously reported during both baseline and compliance monitoring. The net population of Spreading Heliotrope, therefore has not increased between 2024 and 2025.

Scarlet Pimpernel

Scarlet Pimpernel (*Lysimachia arvensis*) was recorded at Eliza Creek Flora Site 18 for the first time (1 seedling). Conversely, in 2025 it was not recorded along weed transects CWM01 and CWM06, where it has been previously recorded during compliance monitoring. The net population of Scarlet Pimpernel, therefore, has not increased between 2024 and 2025.

Table 3.17, Appendix G1 and Appendix G2 contain further details on weed records during baseline and compliance monitoring.

3.2.4.4 Weeds recorded at RAM sites (Control and Impact)

During the 2025 survey, 4 species of weeds were recorded at Rangeland flora sites:

- Smooth Mustard (*Sisymbrium erysimoides*) was recorded at Eliza Creek site 18 (1 plant), and at both dune sites (21 and 22). Smooth Mustard was widespread and locally common at Site 21 (control) and widespread and abundant at Site 22 (impact being 150 m from the WAR). Smooth Mustard has been recorded every year at sites 21 and 22 during compliance monitoring. At each site, it has been recorded at similar levels of abundance, namely a relatively high cover at Site 22 and a moderate cover at Site 21. The construction of the WAR does not appear to have increased Smooth Mustard density at Site 22.
- Sow Thistle was again widespread at both control and impact sites, but always sparsely occurring. Of the 18 locations where it was recorded in 2025, 12 were Rangeland sites (4 control gibber habitats, 3 impact gibber habitats, 3 Eliza Creek (impact), and both dune sites).
- Cut-leaf Heron's Bill, 1 plant recorded at Impact Site 4 and 1 plant recorded at Control Site 5.
- Scarlet Pimpernel, 1 seedling recorded at Eliza Creek Site 18.

It is noted that Maltese Thistle (*Centaurea melitensis*), previously recorded as small isolated clusters at Eliza Creek Site 20, was not recorded at Rangeland flora sites in 2025.

3.2.4.5 Northern Wellfields lease area

The Northern Wellfield Lease area includes weed monitoring transects (NWM01, NWM02, NWM03) and Rangeland Flora Sites 1, 2 and 7. No weeds were recorded at these sites during annual surveys from 2020 to 2024, nor during baseline surveys at the Rangeland flora sites. However, in 2025 a few Sow Thistle plants were recorded at weed transect NWM01, at the bottom of a drainage line.

3.2.4.6 Weeds of National Significance

Prickly Pear *(Opuntia species)*

The isolated population of Prickly Pear near the Yeltacowie homestead has been actively managed since 2021 (and including 2025) by poisoning with cochineal (Plate 3.2). The cluster of Opuntia was first detected during operational monitoring in 2018, occurring within an area of approximately 10 m^2, (Easting 724000 Northing 6530688, Zone 53), just off lease (east of Site 21). At the time of the 2025 survey, the Opuntia cluster appeared to be reduced in area by approximately 90% since 2018. An additional two small patches have also been treated for the last couple of years, both patches are outside the operations area (near SED and Emmie's Buff near the WAR).



Plate 3.2: Cochineal treatment on Prickly Pear

Athel Pine *(Tamarix aphylla)*

Athel Pine has been recorded as clustered trees around Yeltacowie Homestead and the nearby dam. These trees are being actively controlled with numerous dead trees and/or cut trees evident. In 2025, the population comprised up to 10 previously cut trees that are now suckering and/or supporting regrowth shoots, and two large old trees, up to 10 m tall.

3.2.4.7 Declared Weeds

In addition to being WoNS, Prickly Pear and Athel Pine are also Declared species under the *Landscape South Australian Act 2019*. Athel Pine is declared for control within 100 m of a watercourse.

Bathurst Burr

As noted above, in addition to previously recorded populations (e.g. Dawson Dam, South Eliza Dam, CWM01 and Whittata Creek, CWM02), in 2025 Bathurst Burr was also recorded along weed transect CWM05 (10 plants) (Plate 3.3). The CWM01 and CWM02 populations adjoin the SAR. In 2025, 7 plants were detected along CWM01 in association with Whittata Creek (reduced from 30 seedlings in 2024), and 3 plants were detected along CWM02 near Yeltacowie Creek/South Eliza Dam (reduced from 12 plants in 2024). Fruit were present on the plants and on the ground at both locations.

Outside of the mineral lease at South Eliza Dam, the population of Bathurst Burr observed during the 2025 survey comprised only isolated small clusters. The population of Bathurst Burr at Dawson Dam was not surveyed in 2025. It is noted that Dawson Dam is excluded from ML6471, hence managed by the landholder and management and control of Bathurst Burr is ongoing.



Plate 3.3: Bathurst Burr detected at CWM05

3.2.4.8 Other weeds of high environmental threat

Wards Weed (Carrichtera annua)

Within the Carrapateena operational area, Wards Weed has been previously recorded at 2 locations; in 2021, an isolated patch was recorded along weed transect CWM01 (along the SAR) and in 2024, a few plants along weed transect CWM05. Wards Weed was searched for in 2025 but not recorded.

Tobacco Bush (Nicotiana glauca)

An extensive population of Tobacco Bush persists at South Eliza Dam (in the drainage channels behind the dam). Due to is high rate of fruit and seed set, high viability of seeds and successful survival of seedlings, it forms dense stands (CABI 2022). Hence the species has the potential to increase still further in this location.

3.2.5 Landscape Function Analysis

The following provides a summary of changes in key parameters: Landscape Organisation Index (LOI) (reflecting plant cover), plant species diversity and soil attributes, for the Landscape Function Analysis (LFA) transects. Each LFA site comprised 2 transects, each 50 m long. Photos taken at the start and end of each transect are contained in Appendix A.

3.2.5.1 Site 1: Aerodrome (LFAAL1)

Aerodrome Transects 1A and 1B: LFA established method

Each transect (1A and 1B) comprised two zones, namely one patch type 'vegetation' and one interpatch type 'rocky/ soil'.

In 2025, short-lived perennials (primarily *Sclerolaena* (Bindyi) species) were still the dominant plant cover, but an increasing number of long-lived species were also re-establishing. Both transects supported areas of dense vegetation Plate 3.4), but also large areas where vegetation was absent. Approximately one third of each transect comprised a continuous length that was devoid of vegetation: along Transect 1A no vegetation was intercepted between 0 – 14 m, and Transect 1B lacked vegetation from 37 – 50 m (Plate 3.5 and Plate 3.6). During the 2025 survey, however, it was noted that vegetation had colonised to within 5 m of the transect adjoining these zones.

From 2020 to 2024, both transects recorded increases in the LOI. The LOI being the proportion of the total transect that is intercepted by vegetation patches. However, in 2025, both transects recorded a decline in the total amount of vegetation intercepted - 24% of the transects in 2024 versus 11% in 2025 (Figure 3.40). The total patch area also declined from a mean of 23.2 m^2 in 2025 to 5.6 m^2 in 2025 (due to a decline in length and width of patches). Species recorded along the Aerodrome LFA linear transects are shown in Table 3.18.

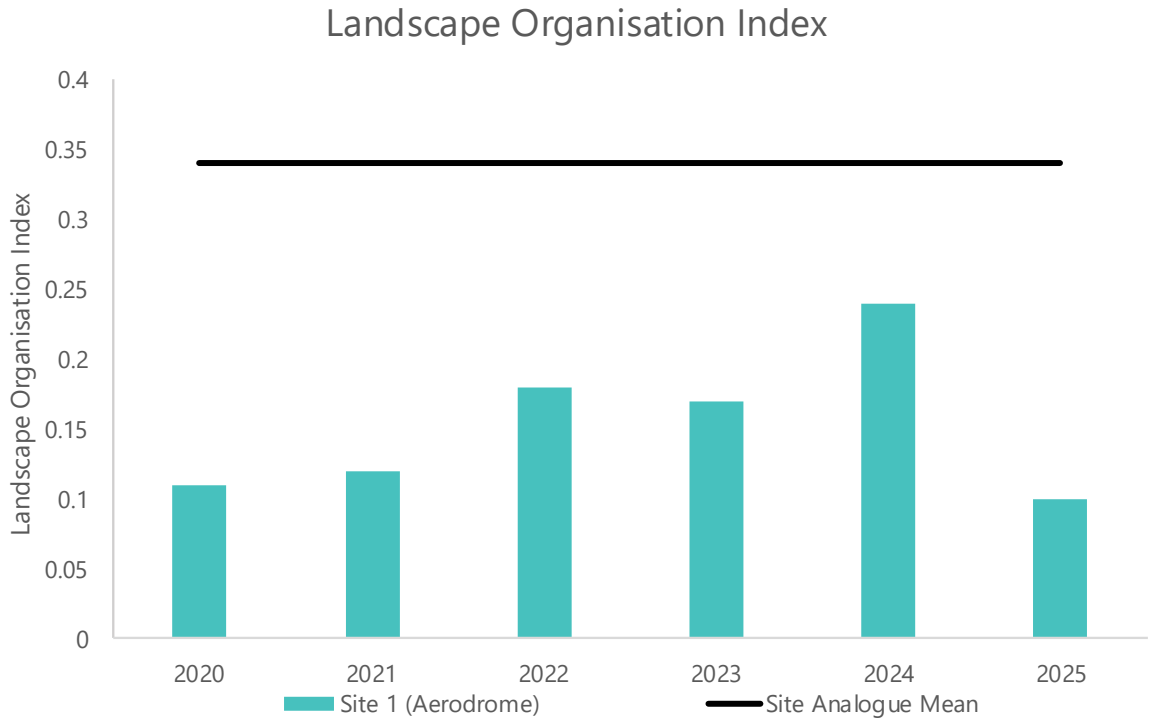


Figure 3.40: Landscape Organisation Index (LOI) at LFA Airport Laydown (mean of transects A and B)



Plate 3.4: Dense patch of re-established vegetation adjoining Transect 1A, including long-lived perennial Bladder Saltbush (dominant shrub of adjoining reference community)

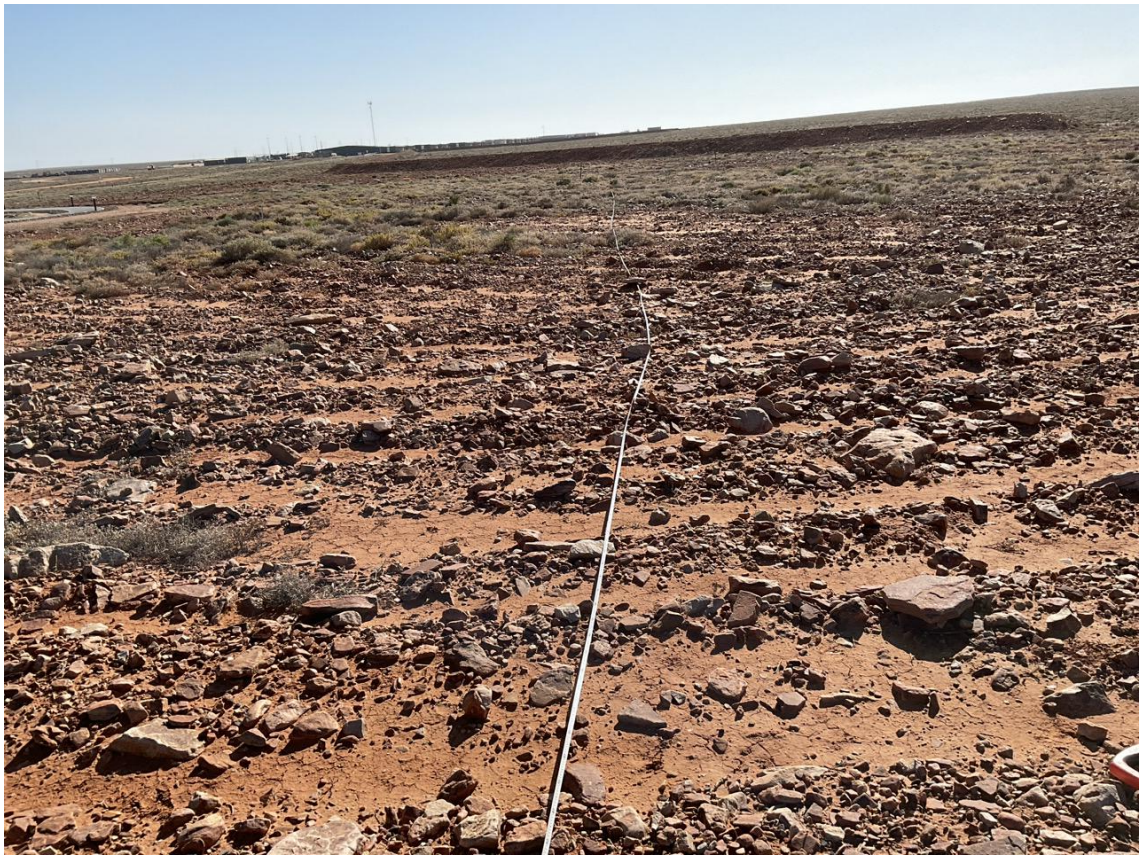




Plate 3.5: Aerodrome Transect 1A showing little change between 2024 (above) and 2025 (below); re-establishment of vegetation largely concentrated in the second half of the transect

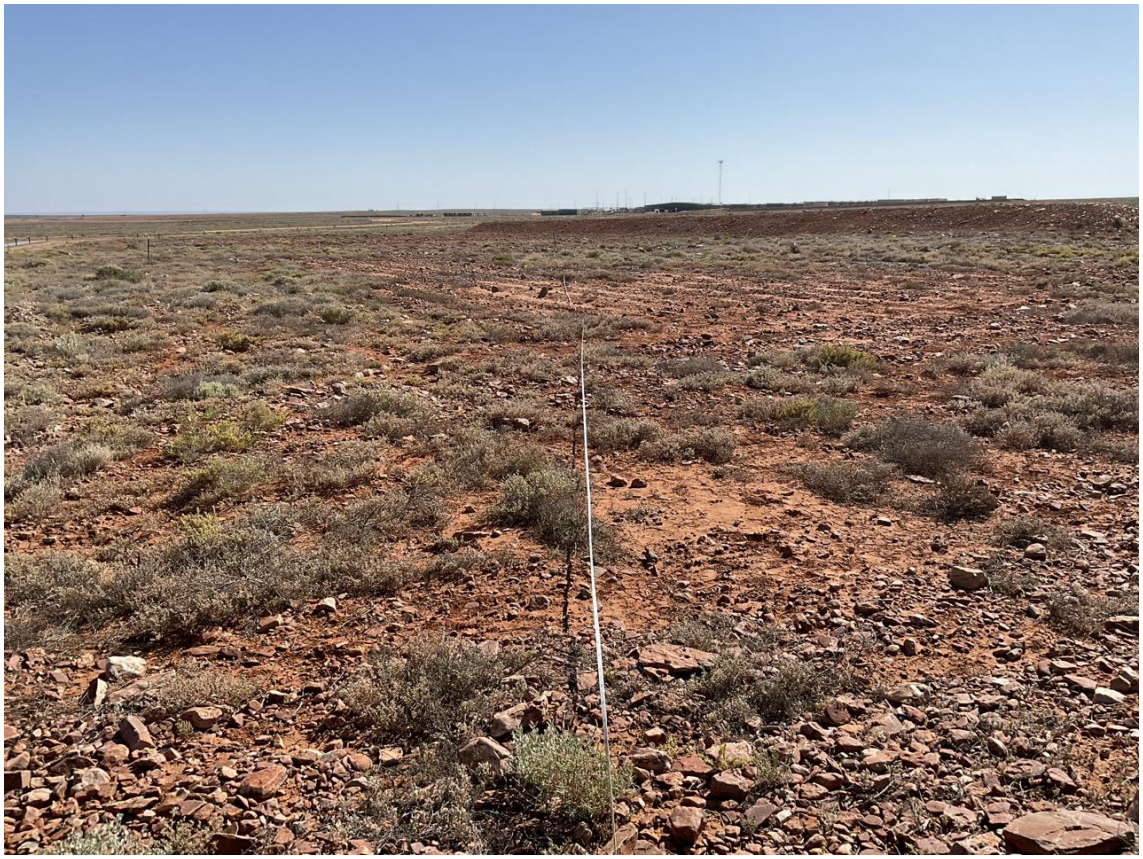




Plate 3.6: Aerodrome Transect 1B showing little change from 2024 (above) to 2025 below); moderately dense vegetation covers much of the first half of the transect

Aerodrome Transects 1A and 1B: PCQ method

Due to the high number of vegetation patches recorded along the transect, and notable changes being detected by the LFA method, the PCQ was no longer considered a necessary supplementary method to show yearly changes.

Table 3.18: Species recorded along and within 5 m of the Aerodrome LFA transects 2024 and 2025

Species	Common Name	Number of patches species was recorded in along LFA transects				Recorded within 5 m of transects (2025)
		2024 1A	2025 1A	2024 1B	2025 1B	
Short-lived Perennials						
Atriplex holocarpa	Pop saltbush	1	5	1	2	
Cullen cinereum	Annual Scurf-pea			1	0	1 (1A)
Dissocarpus biflorus	Twin-horned Copper-burr	0	1	6	0	1 (1B)
Dissocarpus paradoxus	Ball bindyi	1	0	1	1	
Enneapogon avenaceus	Bottlewahsers			1	0	
Panicum decompositum	Native Millet			1	0	2 (1A), 2 (1B)
Sclerolaena brachyptera	Short-wing Bindyi	0	1	2	0	
Sclerolaena divaricata	Tangled Bindyi	2	2	3	0	
Sclerolaena ventricosa	Salt Bindyi	19	10	16	6	
Sclerolanea intricata	Tangled Bindyi			0	1	
Sida fibulifera	Pin Sida	0	1			
Long-lived Perennials						
Abutilon halophilum	Plains Lantern Bush	1	2			2 (1A)
Astrebla pectinata	Mitchell Grass					2 (1A), 2 (1B)
Atriplex vesicaria	Bladder Saltbush	3	3	3	4	5 (1A), 10 (1B)
Minuria cunninghamii	Bush Minuria					1 (1A)
Tecticornia medullosa	Samphire	3	3	2	2	3 (1A), 10 (1B)

3.2.5.2 Site 3: Midway Quarry (LFAQUA3)

Midway Quarry Transects 3A and 3B: LFA established method

Transects 3A and 3B are parallel to each other, and on relatively flat ground. In 2022, the sites were prepared for re-establishment by ripping to a moderate depth (< 40 cm). By 2023, however, the troughs had eroded and were no longer deep enough to be considered effective "patches" (nutrient collectors). Hence since 2023, both transects have been assessed using the established LFA method. Each transect comprised two zones; 1 patch type 'vegetation' and 1 interpatch 'rocky/ soil'.

To date, re-establishment of vegetation has been very sparse, and confined to 2 short-lived species, Salt Bindyi (*Sclerolaena ventricosa*) and Pop Saltbush (*Atriplex holocarpa*) (Plate 3.7, Plate 3.8). The LOI increased slightly in 2024, but declined in 2025, and remained much below the analogue mean (Figure 3.41). In 2025, the mean LOI for both transects was 0.02 (namely 2% of the transects intercepted by vegetation) compared with the LOI analogue mean of 0.34 (34% of the transect).

Transect 3A intercepted just 1 patch of vegetation in 2025 (namely, 1 patch of Pop Saltbush), a decline from 3 patches in 2024. Transect 3B intercepted 7 patches in 2025 (all Pop Saltbush), compared with 8 patches in 2024 (all Pop Saltbush).

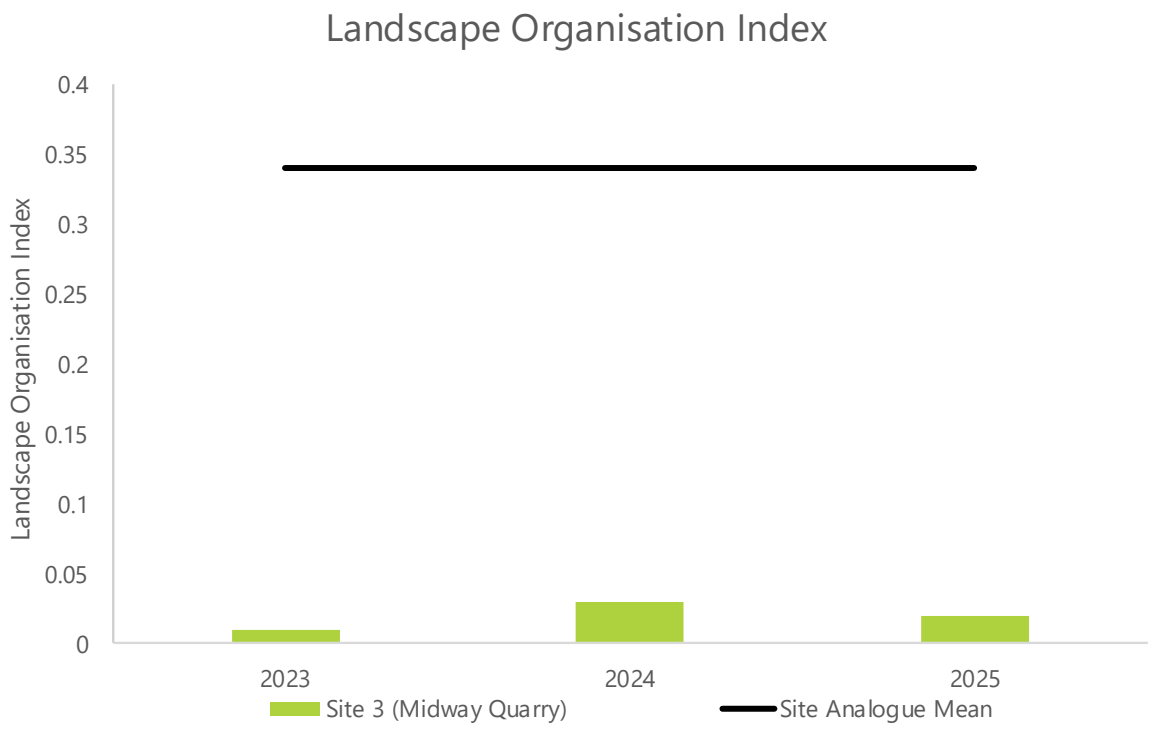


Figure 3.41: Landscape Organisation Index (LOI) at Midway Quarry (mean of transects A and B)



Plate 3.7: Midway Quarry Transect 3A from start facing end, re-establishment of vegetation has been very sparse, and confined to short-lived perennials, with minimal change between 2024 (above) and 2025 (below)





Plate 3.8: Midway quarry Transect 3B, contours have levelled out (< 10 cm deep) and plant regeneration is sparse; minor change between 2024 (above) and 2025 (below)

Table 3.19: Species recorded along LFA transects 2024

Species	Common Name	Number of patches that individual species were recorded in along transects			
		2024 3A	2025 3A	2024 3B	2025 3B
Short-lived Perennials					
Atriplex holocarpa	Pop saltbush	1	5	1	2
Sclerolaena ventricosa	Salt Bindyi	19	10	16	6
Additional species recorded within 5 m of transects in 2025 (all are short-lived species)					
Osteocarpum sp.	Bonefruit				
Sclerolaena divaricata	Tangled Bindyi		1		
Senecio glossanthus	Annual Groundsel		1		1
Sida fibulifera	Pin Sida		1		1

Midway Quarry Transects 3A and 3B: PCQ method

The PCQ method was first conducted in May 2023, when plants became apparent at the site. The PCQ method was also conducted in 2024 and 2025. Plant density (as measured by the mean distance between plants and also by the mean number of plants per m^2) has remained very low since 2023. Plant density increased between 2023 and 2024 but declined again in 2025 (Figure 3.42 and Figure 3.43). In 2025, the mean number of plants per square meter along Transect 3A was approximately 1 plant per 20 m^2, and approximately 1 plant per 3 m^2 along Transect 3B.

Only 3 species were recorded by the PCQ method in 2025; Pop Saltbush (73% of records), Salt Bindyi (24% of records) and Tangled Bindyi (3% of records).

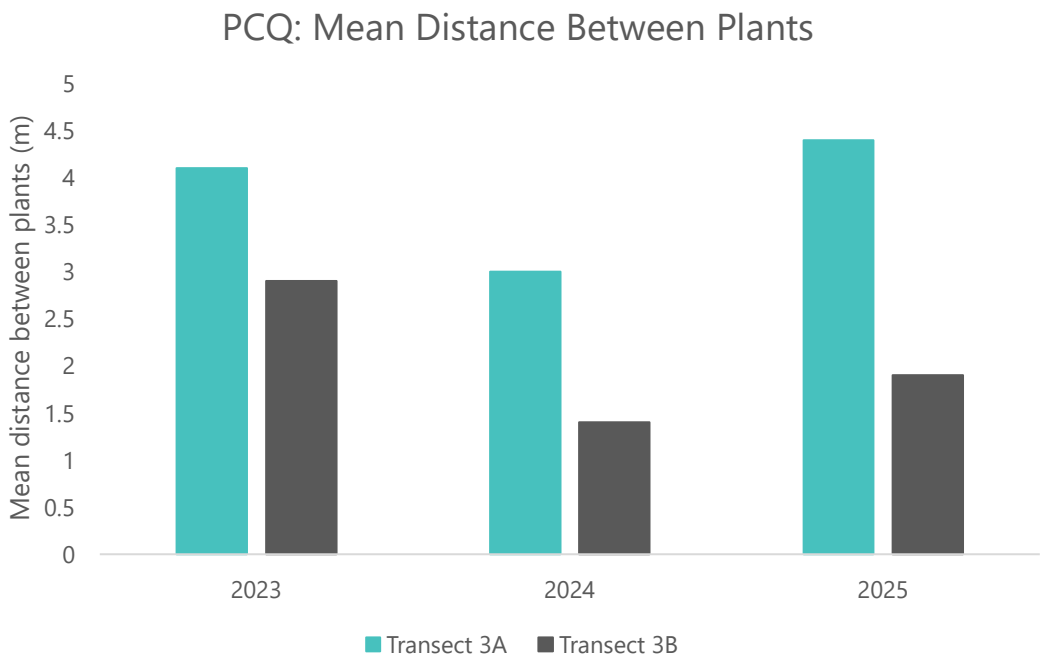


Figure 3.42: Midway Quarry mean distance between plants (PCQ)

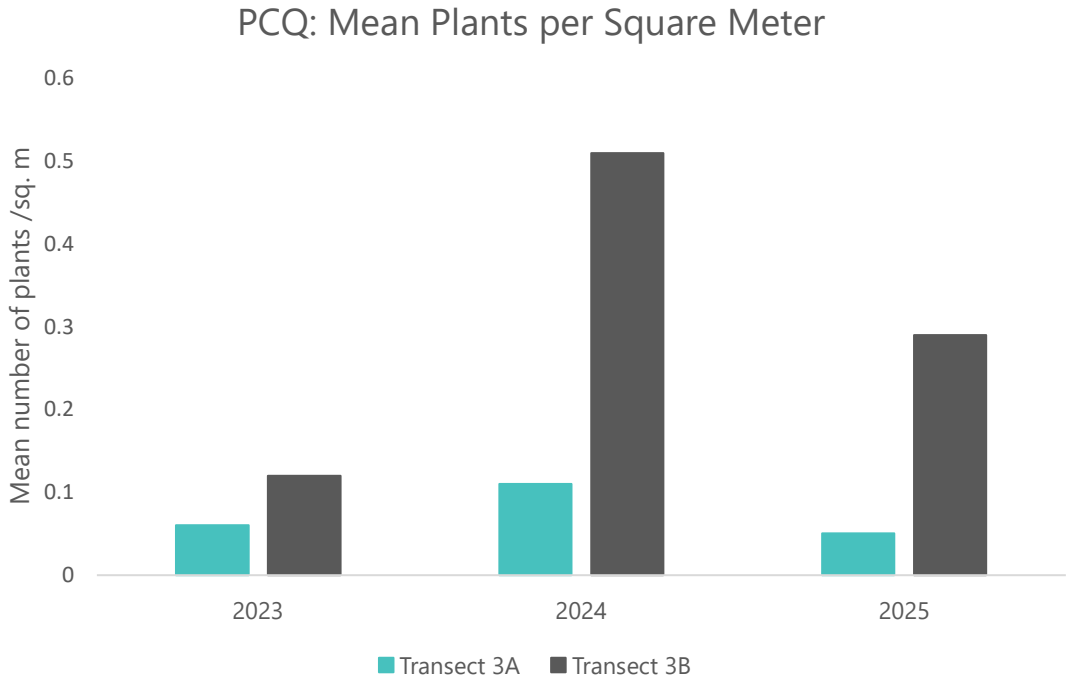


Figure 3.43: Midway Quarry mean number of plants per square meter (PCQ)

3.2.5.3 Soil Parameters

The LFA Surface Soil Assessment includes record of 11 soil parameters for each patch and inter patch. From the Surface Soil Assessment, 3 indices are derived; soil stability, soil infiltration and nutrient cycling. The following results compare data at the rehabilitation sites with 'analogue' (reference) sites. Six analogue sites were surveyed prior to the compliance/operational period (by EBS Ecology).

Soil stability

The soil stability index is derived from the following parameters scored in the field: soil cover, litter cover, cryptogram cover, crust broken-ness, erosion, deposited materials, surface resistance to disturbance and slake test.

For both the Aerodrome and Midway Quarry sites, soil stability scores have remained relatively consistent, and slightly below the analogue mean (Figure 3.44 and Table 3.20). This is because for most sites, a cryptogram cover has not yet developed and materials are not entering the sites from adjoining areas. Leaf litter is still largely confined to beneath the canopy of each plant.

Soil infiltration

The soil infiltration index is derived from the following parameters scored in the field: vegetation cover, litter cover, surface roughness, surface resistance to disturbance, slake test and soil texture.

For the Aerodrome Site LFAAL1 the soil infiltration value has remained very similar since 2021, and very close to the analogue mean value (Table 3.20 and Figure 3.45). At the Midway Quarry site, the soil infiltration value has been more variable but in 2025 was close to the analogue mean.

Nutrient cycling

The nutrient cycling index is derived from the following parameters scored in the field: vegetation cover, litter cover, cryptogram cover and surface roughness. The results show that the Aerodrome Site nutrient cycling index has scored close to the analogue mean since 2021, although declining in 2024 and 2025 (Table 3.22 and Figure 3.46). At the Midway Quarry site, the nutrient cycling index has increased since 2023 and in 2025 was close to the analogue mean, perhaps reflecting the moderate litter cover and surface roughness that is developing.

Table 3.20: LFA Surface Soil Indices[1]

Soil Parameter	Year	Aerodrome		Midway Quarry		Analogue		
		1A	1B	3A	3B	Mean	Std Dev Upper	Std Dev Lower
Soil Stability	2020	38	45			46	67	26
	2021	46	43					
	2022	45	45	40	41			
	2023	42	39	47	47			
	2024	41	38	38	37			
	2025	**39**	**39**	**40**	**42**			
Soil Infiltration	2020	19	18			29	43	15
	2021	23	34					
	2022	24	31	32	29			
	2023	33	27	20	20			
	2024	30	29	16	17			
	2025	**30**	**23**	**26**	**32**			
Nutrient Cycling	2020	14	14			19	27	10
	2021	18	19					
	2022	20	26	14	14			
	2023	26	16	9	9			
	2024	20	17	12	12			
	2025							

[1]Higher indices (percentages), reflect better landscape function

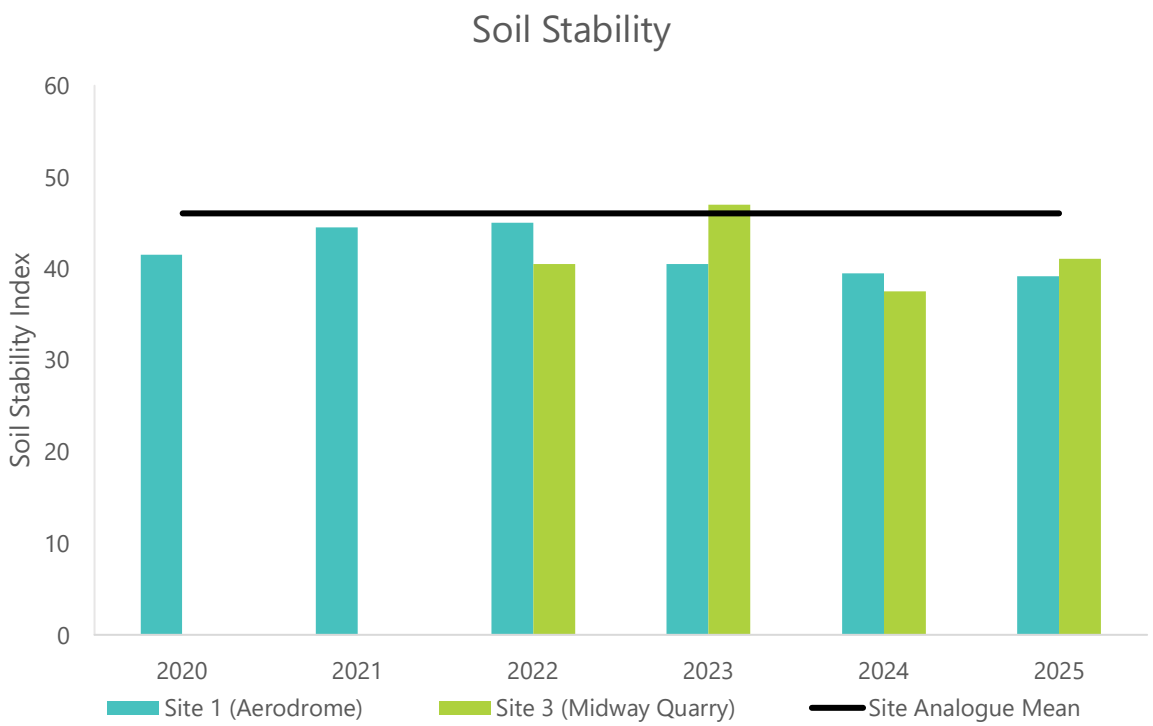


Figure 3.44: Mean soil stability index of transect based on combined patch and interpatch at LFA sites (2020 to 2025)

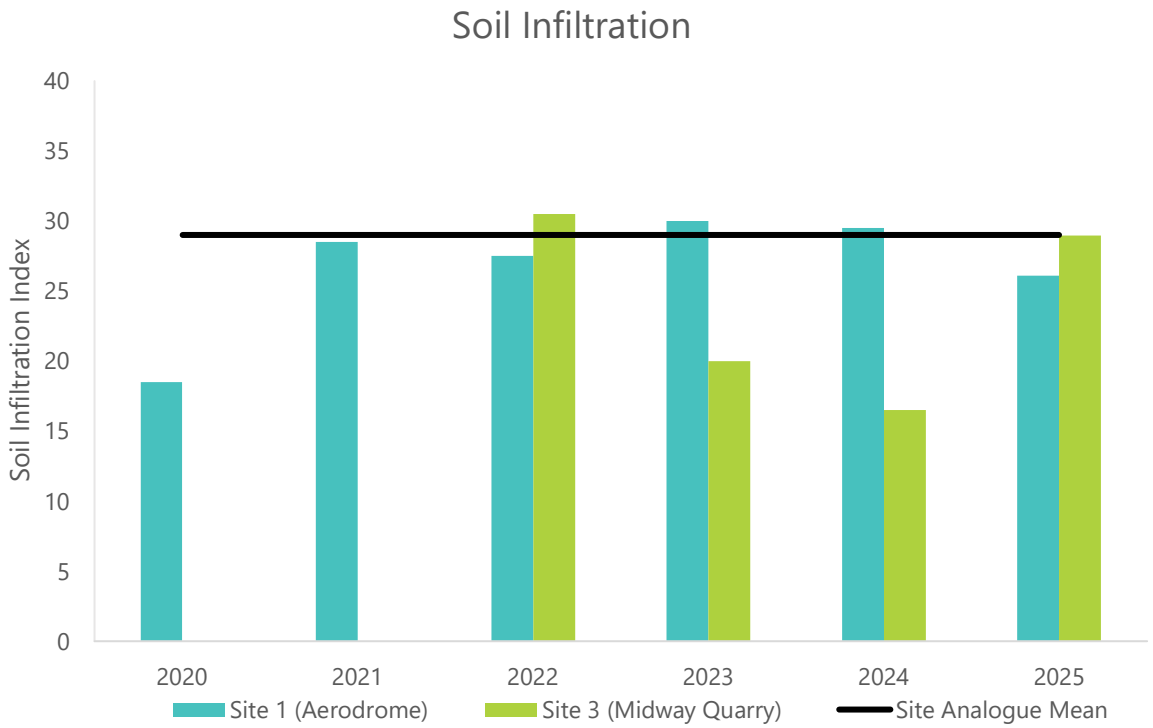


Figure 3.45: Mean soil infiltration index of transect based on SSA (combined patch and interpatch) at LFA sites (2020 to 2025)

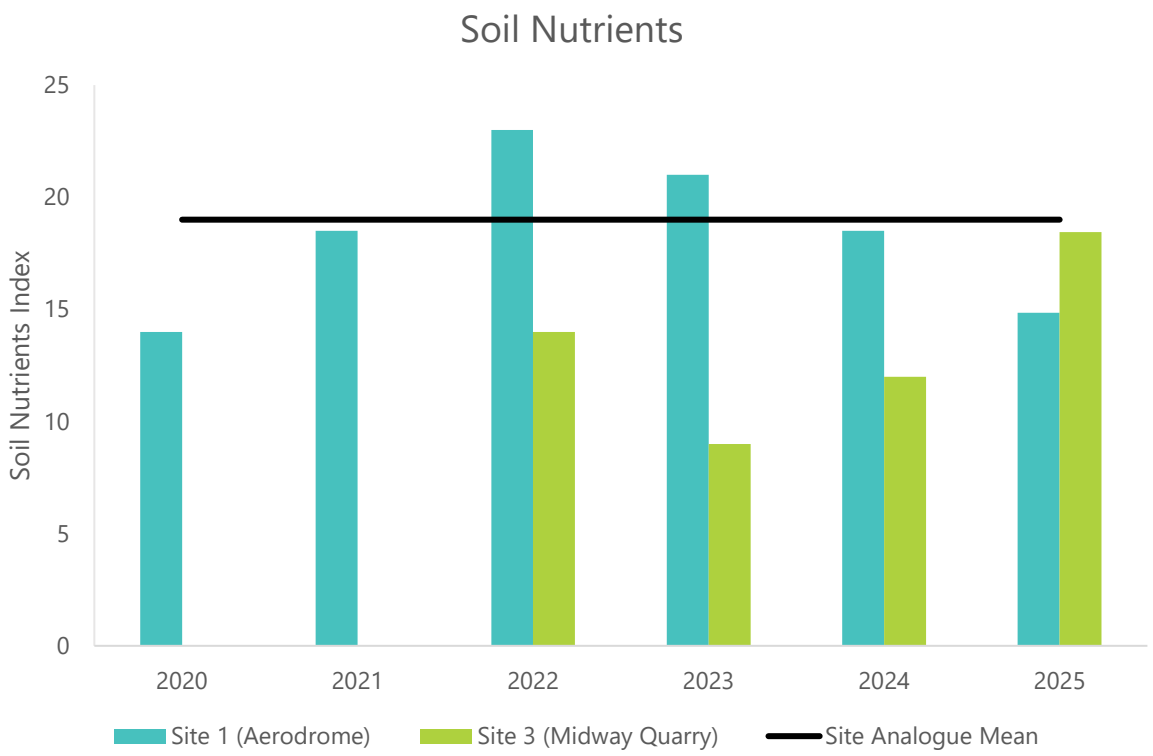


Figure 3.46: Mean nutrient cycling index of transect based on SSA (combined patch and interpatch) at LFA sites (2020 to 2025)

3.2.6 Threatened Flora

No EPBC listed flora species were detected during the spring 2025 survey.

Further detail about 1 NPW listed flora species was recorded. Rounded Sea-heath (*Frankenia subtrees*) listed as rare in South Australia is known to occur at Carrapateena near Flora Site 9, adjacent a narrow drainage channel and Boree (*Melaleuca xerophila*) low woodland (Plate 3.9, Plate 3.10). The area would require further mapping to accurately record the entire extent, given there are some dense areas and other areas where the species is sparsely present. An initial estimation suggests over 2,000 plants (adults and juveniles) occur at this location.



Plate 3.9: Rounded Sea-heath (SA Rare), north-east of Site 9



Plate 3.10: Rounded Sea-heath (SA Rare), close up

3.3 Fauna

3.3.1 Survey effort and capture rates

As per Section 2.6, fauna survey methods during compliance monitoring broadly followed the SA Vertebrate Survey guidelines (Owens 2000), with modifications aligning with the objectives of this survey, and based on recommendations from earlier surveys. The broadly accepted guidelines recommend a minimum of 4 trapping nights to ensure sufficient trapping effort for the purposes of documenting key faunal assemblages across a study area. A trapping line set up is shown in Plate 3.11.

Table 3.21 provides a summary of total trapping effort across the spring 2025 survey. Survey effort has been calculated by number of trapping nights (number of traps multiplied by the number of nights the traps were set for) and the total number of active surveys and searches. Opportunistic observations and bird surveys were also undertaken at all 8 fauna sites; the 4 sites in Eliza creek, the dune Flora sites (21 and 22) and at opportunistic sites. No spotlighting was undertaken, but opportunities for capturing nocturnal activity occurred via camera trapping and Song Meter deployment at fauna trapping sites (birds only), Site 7 (birds and bats over 4 nights) and Site 10 (birds and bats over 3 nights).



Plate 3.11: Fauna trapping set up (site 4)

Table 3.21: Fauna survey effort, spring 2025

Location	# of Trap Nights		Total Trap Effort Per Site
	Funnel trap	Pit Trap	
Fauna Site 1	16	24	40
Fauna Site 2	16	24	40
Fauna Site 3	16	24	40
Fauna Site 4	16	24	40
Fauna Site 5	16	24	40
Fauna Site 6	16	24	40
Fauna Site 15	16	24	40
Fauna Site 16	16	24	40
Total	**128**	**192**	**320**

3.3.1.1 Capture rates

The spring survey returned a total of 443 observations, captures or evidence of fauna (excludes exact numbers for sheep, kangaroos, goats, rabbits and birds which were not counted). This included 265 detections / observations of birds, 69 of mammals and 109 of reptiles (includes 43 Song Meter / camera duplicate bird detections). Of the observations, 110 were pit or funnel trap captures. The highest capture rates were made in pitfall traps (92) and there were 18 captures in funnel traps. Capture rates for the number of pits and funnels deployed at each site are summarised in Table 3.22.

Total spring 2025 trapping capture rate for funnel and pit traps was calculated by dividing total captures by total trap effort (110/320 = 0.34) (141/320 = 0.44). The total trapping capture rate was above the 2018-2022 spring capture rates (~0.23) and the autumn 2023 capture rate (0.11), but below the 2024 rate of 0.44. The 2025 total capture rate is well within the range reported during baseline surveys (0.14 to 0.97), where the lowest rates were recorded in autumn 2013 (0.14) and 2014 (0.13), and the highest rate was recorded in spring 2016 (0.97) (EBS 2017b). Capture rate numbers during the current survey are considered to be positive, particularly given the drier conditions preceding the survey.

As per above, both funnel and pit captures (110 in total) increased from the 2022 spring and 2023 autumn surveys but decreased from the 2024 spring survey (142 in total), and there were only 5 recaptures (3 reptiles, 2 dunnarts) recorded. When reviewing trends for total fauna species detections across the control and impact site, including captures and observations of additional species (opportunistic, Song Meter, bird surveys) there are no clear differences emerging between control and impact sites. It is noted that Control Site 1, Impact Site 15 and Impact Site 16 had the highest overall fauna detection (37, 28 and 28) and Control Site 2 had the lowest total species detection (12). Impact sites had variable numbers of bird species, varying levels of mammal / reptile captures and there are no clear trends when compared with spring 2022 and spring 2025 results (Figure 3.47). All sites show a trend of total mammal decline from 2022, but small mammal detection was above 2023 and 2024 in 2025. Noting this comparison primarily relates to point of time comparison across the sites.

Table 3.22: Fauna (trapping only) capture rates per site, spring 2025

Site	Treatment	Funnel Trap		Pit		Total Captures	Total Capture Rate	Total Capture Rate Comparison to spring 2024
		Captures	Capture Rates	Captures	Capture Rates			
Fauna Site 1	Control	0	0	11	0.46	11	0.28	decrease
Fauna Site 2	Control	1	0.06	6	0.25	7	0.18	decrease
Fauna Site 4	Control	1	0.06	15	0.63	16	0.40	decrease
Fauna Site 6	Control	2	0.13	13	0.54	15	0.38	decrease
Fauna Site 3	Impact	0	0	5	0.21	5	0.13	decrease
Fauna Site 5	Impact	3	0.19	14	0.58	17	0.43	increase
Fauna Site 15	Impact	5	0.31	17	0.71	22	0.55	increase
Fauna Site 16	Impact	6	0.38	11	0.46	17	0.43	increase

As per Section 2.3.2, Site 4 and Site 6 were changed from Impact to Control sites in 2024.

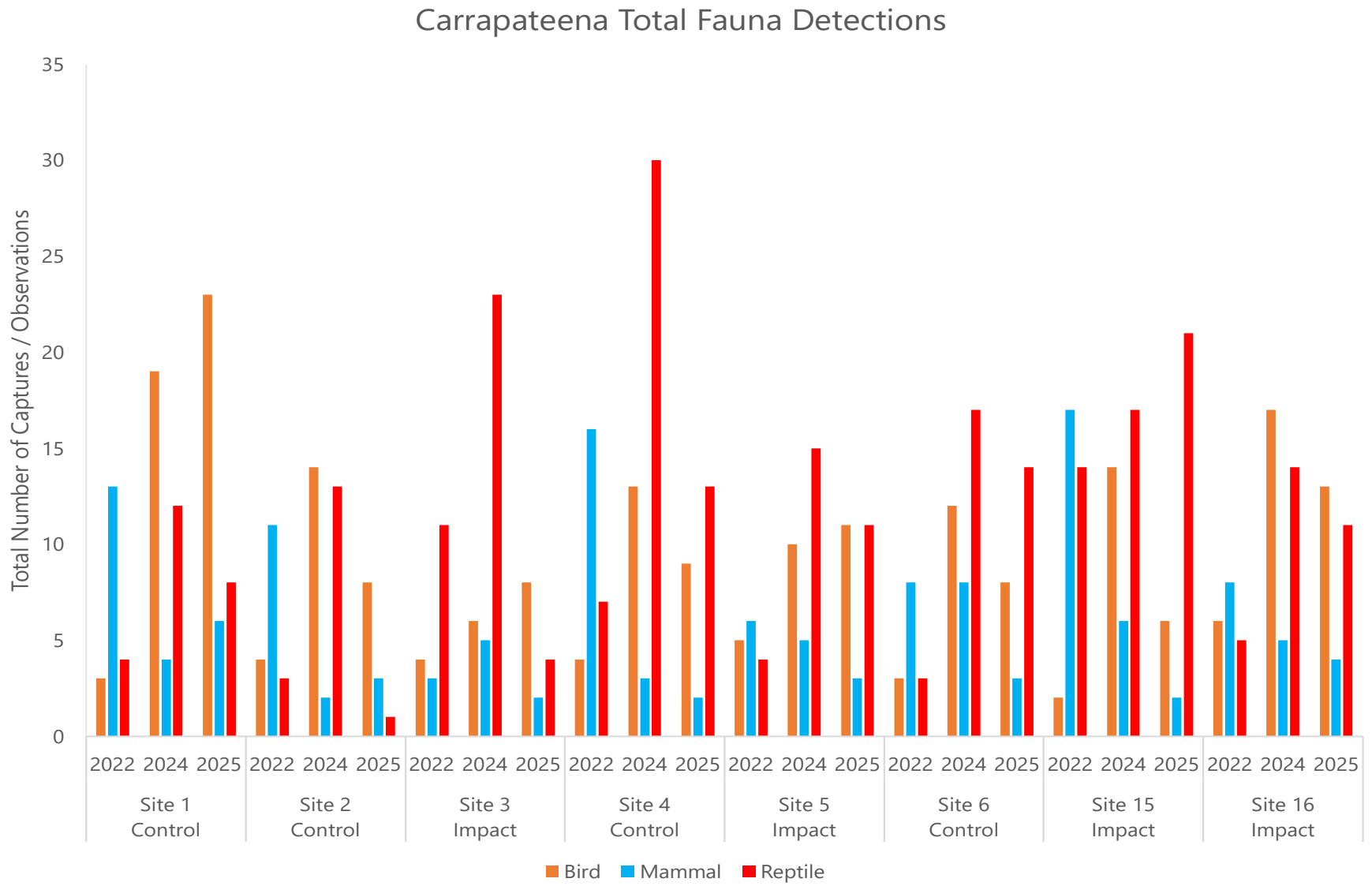


Figure 3.47: Total fauna detections (bird species present only), spring 2022, 2024 and 2025

3.3.2 Fauna diversity summary

During the 2025 spring fauna survey a total of 87 vertebrate species were detected from the 8 fauna survey sites, 20 bird survey sites and opportunistically within the study area. Of these 87 species, 3 species had not been observed / detected before or since the baseline surveys (2012-2017); Broad-banded Swimmer (*Eremiascincus richardsonii*), Brown Goshawk (*Accipiter fasciatus fasciatus*) and Rufous Whistler (*Pachycephala rufiventris rufiventris*). The site occurs within the known range for these species (Menkhorst et al. 2023; Davies et al. 2022; Hutchinson and Williams (2024c). The numbers of vertebrate species detected in the study area are summarised below:

- 57 bird species (53 at fauna sites and bird sites, 49 at opportunistic locations, includes 10 waterbirds / shorebirds)
- 17 reptile species (6 via fauna trapping, 11 via camera trap / opportunistic observation)
- 13 mammal species (4 fauna trapping captures; 9 opportunistic including 3 exotic species, 4 microbat species) (excludes sheep).

No NPW Act-listed as threatened species were detected, 1 EPBC listed species was detected; Southern Whiteface (*Aphelocephala leucopsis leucopsis*) listed as Threatened (Vulnerable). The species was detected along the WAR near CWM05, individuals have previously been detected near Site 21 (in 2019, Jacobs 2020a), and near WAT17 creek site (in 2021, Jacobs 2023a) and were detected in a similar location as part of other regional surveys (e.g. for the Northern Water Project, Z. Bull pers. comm.).

Introduced birds or mammals detected at the site included House Sparrows (in similar numbers with previous years), European Rabbits and Feral Cats (has decreased since the previous survey). Evidence of Feral Cats and European Rabbits only included scats and tracks in 2025, no live animals detected. Rock Doves (Feral Pigeon) and House Mice were not captured or detected via camera trap in 2025.

The following sections provide detail on each faunal group identified, including summary tables of species.

Given the nature of fauna data from individual surveys, movement of species, the variations in weather conditions between surveys, variations in trapping effort (to baseline) and capture rates across surveys and sites, fauna data is reflective of high-level trends over time only. Broadly, Figure 3.48 shows the total species diversity for mammals, birds, reptiles / frogs that were captured, recorded during dedicated bird surveys and recorded opportunistically across the Carrapateena location during spring baseline (2012 - 2017) surveys compared with data from the construction/operation period (2018 - 2025). Results for 2025 total diversity falling within the spring range reported from previous years, and snap shot autumn surveys from early baseline (2012), late baseline (2017) and early compliance monitoring (2017) (Figure 3.48). Similar to spring 2022 and autumn 2023, dams held water, including South Eliza Dam (SED) which has Class A wastewater, where waterbirds were present. Fewer waterbird species and families were detected in 2025 potentially as a result of survey effort at these wetted areas, windy conditions during the survey and no Song Meter being deployed at SED during the spring 2025 survey.

Similar to previous years, there was evidence of breeding activity across the site. Given the arid environment, the breeding of many species is stimulated by climate conditions, hence breeding can occur throughout the year. The small mammals showed some evidence of breeding, however sample sizes were small for some species (e.g. Fat-tailed Dunnart, Forrest's Mouse). Stripe-faced Dunnarts (Plate 3.12) were captured in higher numbers than Fat-tailed Dunnarts, as per previous surveys. Over 10 bird and reptile species were observed in breeding pairs / groups or had young present, which is a sign that species are persisting within the Operations area environment; e.g. pairs of Mulga Parrot, Australian Ringneck, Blue Bonnet, multiple family groups of two fairywren species, juveniles of Eyrean Earless Dragon, Bynoes gecko, Four-toed Slider).

No evidence of a significant reduction in species diversity was observed in spring 2025, with total species numbers on par with baseline and spring time compliance monitoring results, with detection numbers of small rodents and bird species reflective of the dry climate conditions preceding the survey (refer Section 3.1).

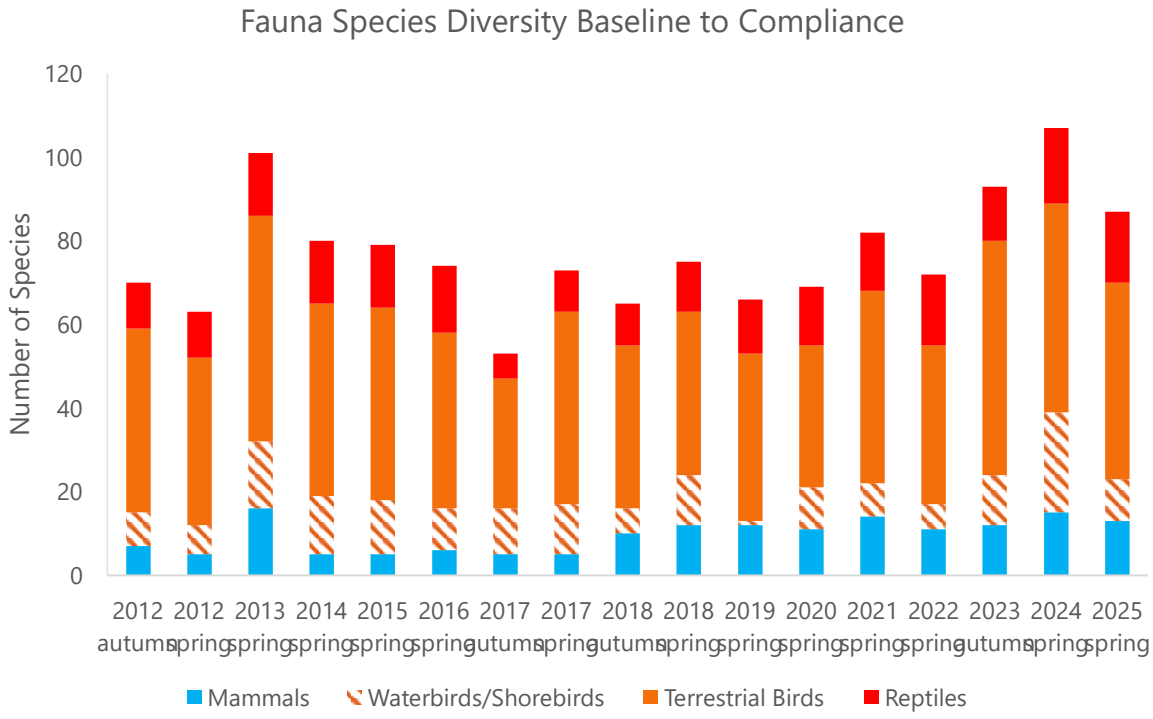


Figure 3.48: Vertebrate total species diversity, during baseline (2012 – 2017), and compliance monitoring (2018 – spring 2025, control and impact totals)



Plate 3.12: Stripe-faced Dunnart (Site 1)

3.3.2.1 Bird diversity

A total of 57 bird species were detected during the spring 2025 survey across the Carrapateena site (see Appendix F). Of these species, 53 were recorded during dedicated bird surveys across 20 sites and the additional species were recorded opportunistically when driving along tracks, around camp, effluent irrigation areas, during weed surveys and at dams (Plate 3.13). All dams that were surveyed had water including coffer dams, and waterbirds and resident shorebirds were present, similar to previous years when dams held water. One EPBC listed threatened species was detected opportunistically; Southern Whiteface (*Aphelocephala leucopsis leucopsis*), which was detected at a weed monitoring site (CWM05) along the WAR. No EPBC listed Migratory shorebird species were detected. No State listed species were recorded.

There were no new records for the Carrapateena location, but records for two bird species that had not been detected since baseline or prior; Rufous Whistler (*Pachycephala rufiventris rufiventris*), not recorded since 2006 (before baseline), was detected at both sand dunes sites (Site 21 and 22) and Brown Goshawk (*Accipiter fasciatus fasciatus*), not recorded since 2017, was detected opportunistically at weed site CWM01 (Plate 3.13).

Bird families were well represented, with birds from 32 different families detected (increased from 22 in spring 2022, but lower than 37 recorded in 2024 and 34 in 2023 (autumn)). Many families were only represented by 1 species (17 families) or by 2 species (9 families). Meliphagidae (honeyeaters and chats)

were the most represented (5 species), with Artamidae (woodswallows, butcherbirds and currawongs) and Psittacidae (parrots) represented by 4 species.

The species detected at the most fauna sites during site targeted bird surveys was the Australian Raven (13 sites), followed by Singing Honeyeater (*Gavicalis virescens*) (12 sites), White-winged Fairywren (*Malurus leucopterus leuconotus*) (10 sites) and Australian Pipit (*Anthus australis australis*), Nankeen Kestrel (*Falco cenchroides cenchroides*), Black-faced Woodswallow (*Artamus cinereus*), Welcome Swallow (*Hirundo neoxena neoxena*) and Zebra Finch (*Taeniopygia guttata castanotis*) (all at 9 sites).

Family groups of 2 different types of Fairywren (White-winged and Purple-backed (was Variegated, *Malurus assimilis assimilis*) were recorded at a number of sites (10 and 8, respectively). White-winged Fairywren groups were commonly observed across the Carrapateena Operation area in Chenopod habitats close to Western Myall Creeklines (e.g. Impact Site 3 adjacent the admin). Other species also showed breeding plumage, had juveniles present, were in breeding groups or nesting. The South Eliza Dams provided temporary nesting site for several waterbird species, but fewer species were detected than in 2024 when there were larger extents of Class A Wastewater.

The House Sparrow (*Passer domesticus*) was again observed around both site camps in 2025, as per previous years. Both males and females were present, in similar numbers than previously, numbers are not declining or increasing. No Rock Dove (feral pigeon) (*Columba livia*) were detected.



Plate 3.13: Brown Goshawk (opportunistic detection at CWM01)



Plate 3.14: Purple-backed Fairywren (Eliza Creek)

Comparison with baseline data – birds

Mean bird species diversity per bird site in spring 2025 was 8.85 (a decrease from 13.17 in spring 2024 and 9.65 in autumn 2023, and an increase from 5.6 in spring 2022), with total diversity per site ranging from 1 to 23 species detected. The mean diversity was within the range observed between 2018-2023 (5-9.65) and above the range recorded for baseline surveys (e.g. ranging from 4.1 in 2016, to 7.9 in 2013). More species were generally detected at sites within or near drainage lines (e.g. Site 7, Site 10 Plate 3.14, Plate 3.15), or sites with Western Myall Woodland nearby (i.e. sites with a tree canopy in addition to shrubland understorey, such as Site 1, Site 16). Song Meters are considered suitable to complement bird surveys, given conditions at the Carrapateena location are not always suitable to detect birds. Sites with the lowest numbers, generally received less effort as Song Meters were only deployed at fauna trapping sites and Flora Site 7 and 10 (e.g. the lowest number of species were detected was at Site 13, where a Song Meter was not deployed as conditions were less suitable on the day this site was visited (warm and windy)). Bird records per site and how they were detected are summarised in Appendix F.

Total spring bird species diversity (57) across the site was within the range of total diversity reported during baseline surveys (e.g. species diversity ranged from 42 in autumn 2017 to 70 in spring 2013; EBS 2017a, 2017b), and within compliance monitoring numbers observed to date (e.g. from 37 in 2022 to 74 in 2024). Total number of bird families (32) represented across the site was within the range recorded during baseline survey results (e.g. families recorded ranged from 29 in spring 2012 to 38 in spring 2014 (EBS 2017)) and was also within the range from previous compliance monitoring to date (e.g. 21 in 2019 to 37 in 2024). Given the presence of water in the dams, the temporary Class A wastewater at SED, small rainfall event in winter, and use of Song Meters to enhance survey effort, it is not unexpected that diversity

of species and families was within and the range of previous diversity recorded. It is noted that diversity numbers had decreased from 2024, likely associated with less sustained rainfall in 2025, and only 8 species were detected via Song Meter, but not observed during bird survey or opportunistically (e.g. Port Lincoln Parrot (*Barnardius zonarius zonarius*) Little Corella (*Cacatua sanguinea gymnopis*), Silver Gull (*Chroicocephalus novaehollandiae novaehollandiae*), Black-faced Cuckoo-shrike (*Coracina novaehollandiae*), Orange Chat (*Epthianura aurifrons*), Spotted Nightjar (*Eurostopodus argus*), Budgerigar (*Melopsittacus undulatus*) and Rainbow Bee-eater (*Merops ornatus*). The variety of species and families of different types detected in 2025 and the ongoing evidence of numerous species breeding reflects stable conditions for an arid environment. In addition, the detection of species not detected since baseline monitoring or prior is also a good indicator of stable conditions. The data collected provides no evidence to suggest mining activities are impacting bird species presence across the site.



Plate 3.15: Chestnut-rumped Thornbill (Eliza Creek)

3.3.2.2 Reptile diversity

Seventeen reptile species from 110 detections were recorded across the sites during the spring 2025 survey (Table 3.23). During 2025, 69% of the records (76 out of 110) were through physical trapping, with the remainder detected opportunistically, including via camera trap. No spotlighting was undertaken. In terms of diversity, 82% of species were detected opportunistically, and 35% of species were detected via pit / funnel captures (noting some species were detected through both pathways). As per previous surveys, the main species recorded in traps was the Saltbush Ctenotus (*Ctenotus olympicus*) with the greatest numbers being detected at Impact Site 15 (16), Control Site 4 (7) and Impact Site 5 (6). The reptile trap captures were considered commensurate with the temperatures observed during the spring survey (refer Table 3.23).

Five common reptile families were well represented during the survey; with the skinks represented by 9 species, dragons by 4 species and geckos by 2 species and 1 species each for snakes and goannas. Juveniles of several species were detected during the survey (e.g. Earless Dragons (*Tympanocryptus* sp.), Bynoe's Gecko (*Heteronotia binoei*, Plate 3.16), Saltbush Ctenotus and Southern Four-toed Slider (*Lerista dorsalis*)) indicating ongoing successful breeding activity across the site. Notable opportunistic species detected in lower numbers included Cane-grass Dragon (*Diporiphora winneckei*) at the dune sites (Plate 3.17), Eyre Peninsula Dragon (*Ctenophorus fionni*) (Plate 3.18) detected in the creek areas and Central Bearded Dragon (*Pogona vitticeps*) detected at several sites (Plate 3.19).

The Southern Four-toed Slider has not been detected since baseline surveys (in 2016) but was detected in 2024, was again detected at Site 6 in 2025 through capture of a single juvenile individual. This species was detected during baseline surveys at Site 2, 3, 6, 15 and 16 (between 2012–2016), and detection of another juvenile individual during the 2025 survey is a positive indication that the species persists in the area.

Only 1 snake species (Curl Snake (*Suta suta*)) was detected during the survey (along the fauna trapping fence at Site 4). Low detections of snakes may be related to conditions during the survey (ranging between 19 and 31°C), they are usually detected in low numbers (e.g. 23 detected during baseline period, 1–6 per survey; 13 detected during compliance monitoring period 1–5 per survey). Similarly, there were no snake relocations in the operations areas during spring 2025 (BHP site fauna interaction register).

One species was detected that has not been recorded at Carrapateena since baseline surveys (last record 2016); the Broad-banded Sand Swimmer (*Eremiascincus richardsonii*). The species has previously been detected at Site 1, 4 and 16, during baseline surveys (2013 to 2016). The species was an opportunistic observation provided (via photo) from BHP staff.



Plate 3.16: Juvenile Bynoe's Gecko (opportunistic detection at Yeltacowie Homestead)



Plate 3.17: Cane-grass Dragon (opportunistic detection at dune Site 21/22)

Table 3.23: Reptiles detected at Carrapateena in spring 2025

Family Name	Scientific Name	Common Name	Fauna Site								OP/CT Total[1]	All Total
			1 Control	2 Control	3 Impact	4 Control	5 Impact	6 Control	15 Impact	16 Impact		
Agamidae	*Tympanocryptis tetraporophora*	Eyrean Earless Dragon	3 [P]		3[P]	2[P]	5[P]	3[P]	2[P]	2[P], 1[F]	OP CF01 [1]	22
Agamidae	*Pogona vitticeps*	Central Bearded Dragon								1[OP]	OP S13 [1], S21[1], Wat17 [1]	4
Agamidae	*Ctenophorus fionni*	Eyre Peninsula Dragon									OP S9 [2 males], S19 [1 female]	3
Agamidae	*Diporiphora winneckei*	Cane-grass Dragon									OP S22 [4]	4
Elapidae	*Suta suta*	Curl Snake				[1 OP]					OP [1 along trap fence]	1
Gekkonidae	*Diplodactylus tessellatus*	Tessellated Gecko				2[P]		1[CT]		1[F]	1	4
Gekkonidae	*Heteronotia binoei*	Bynoe's Gecko									OP Yeltacowie Homestead [5]	5
Scincidae	*Ctenotus olympicus*	Saltbush Ctenotus	1[P]	1[F]	1[P]	6[P], 1[F]	3[P], 3[F]	3[P], 1[F]	12[P], 4[F]	1[P], 3[F]		40
Scincidae	*Ctenotus robustus (C. inornatus)*[2]	Eastern Striped Skink									S10[1], S20 [1]	2
Scincidae	*Ctenotus regius*	Eastern Desert Ctenotus									OP Yeltacowie Homestead [2]	2
Scincidae	*Lerista dorsalis*	Southern Four-toed Slider						1[P]			juvenile	1
Scincidae	*Menetia greyii*	Common Dwarf Skink	3[P]					2[P],1[F]	1[F], 2[P]	1[F]		10
Scincidae	*Morethia adelaidensis*	Adelaide Snake-eye						1[P, male]				1
Scincidae	*Morethia boulengeri*	Common Snake-eye									OP S19[2], Yeltacowie Homestead [1]	3
Scincidae	*Tiliqua rugosa*	Sleepy Lizard	1[OP]			1[OP]		1[OP]		1[OP]	OP S21[tracks], S22[1], SED [1], Yeltacowie Homestead [1]	8
Scincidae	*Eremiascincus richardsonii*	Broad-banded Swimmer									OP TJU Village [1]	1
Varanidae	*Varanus gouldii*	Sand Goanna									Tracks at S10, S21, S22 [3]	3
	Totals detected	110	8	1	4	13	11	14	21	11	33	
	Total species[1]	17	4	1	2	5	2	7	3	6	13	

[1] OP/CT = opportunistic (OP) / camera trap (CT), [X] = totals; all others captured in pit [P] or Funnel [F]; includes 3 recaptures (1 x Saltbush Ctenotus, 2 x Eyrean Earless Dragon); Opportune sites = Site(#), YH = Yeltacowie Homestead, Wat 17, TJU = Tjungu, CF01 (spill site).

[2] Ongoing taxonomic revision with this species.

Comparison with baseline data – reptiles

Total reptile captures / observations for spring 2025 (110) was below spring 2024 (160), well above autumn 2023 (39) and spring 2022 (88), and within the range for baseline spring surveys (49 in 2016, 184 in 2014 and 117 in spring 2017 (EBS 2017b, site fauna database), and within previous spring compliance monitoring totals (ranging from 39 to 160).

Results in 2025 for total species diversity (17) were above the baseline monitoring range (10 to 16 species, between 2012 – 2017, EBS 2017a, 2017b), and within the compliance monitoring range (12-17, between 2018 and 2024). These results continue the trend that indicates there is no notable impact from the reduction in trapping effort and the number of trap lines deployed since 2017 (i.e. only 1 trap line per site), and that there is no evidence of impacts to reptile diversity across the fauna sites as a result of mining activity.

All families previously detected in baseline and compliance monitoring were represented, with the ongoing exception of the Pygopodidae (only one individual has previously been recorded across the Carrapateena location during the 2013 baseline survey (EBS 2013a) whilst spotlighting (Black-headed Scalyfoot, *Pygopus nigriceps*,). The Pernatty Knob-tailed Gecko (Carphodactylidae family) and Centralian Blind Snake (Typhlopidae family) remain undetected since 2014, but these species were only previously reported during spotlighting opportunistically (presumably in dune habitats), which are not part of the compliance trapping program).

Detection of species that have not been detected since baseline is always a positive for the monitoring program. In 2024 a species not detected since baseline was the Southern Four-toed Slider and in 2025 another juvenile of this species was detected at Site 6, which was re-classified as a control site in 2024.

Mean reptile species diversity per fauna site was 3.75 in spring 2025, ranging from 2 to 7 species (Table 3.23). This has decreased from 4.8 in spring 2024 but is above the spring of 2022 (3.13) and 2021 (2.13) and is slightly below the baseline range (4.8 in 2012 to 6.6 in 2014). It is noted that mean diversity was not calculated in 2023 due to low reptile captures and was not reported in the baseline report in 2017. Despite a drier season, local climatic effects appear to be favouring certain species. Warmer daytime temperatures and humidity during the survey also influenced opportunistic detections, contributing to the total reptile diversity across the location during the survey period (Plate 3.18).



Plate 3.18: Female Eyre Peninsula Dragon (opportunistic detection in Eliza Creek)



Plate 3.19: Central Bearded Dragon (opportunistic detection at Site 13)

3.3.2.3 Mammal diversity

Thirteen mammal species (excluding sheep) were detected across the Carrapateena site during the spring 2025 survey (refer Table 3.24). Four small mammal species were captured via trapping; Stripe-faced Dunnart (*Sminthopsis macroura*), Fat-tailed Dunnart (*Sminthopsis crassicaudata*), Central Short-tailed Mouse (Forrest's Mouse) (*Leggadina forresti*) and Giles' Planigale (Paucident Planigale) (*Planigale gilesi*) (32 captures in total). Stripe-faced Dunnarts were captured in good numbers (24) relative to other surveys. Native rodents were recorded in lower numbers than dunnarts (3 captures, 2 via camera trap). No House Mouse (*Mus musculus*) were detected during the current survey. Other animals detected include pest or exotic fauna, 2 Kangaroo species and 4 species of microbats.

Similar to results from the 2021 to 2024 surveys, the Stripe-faced Dunnart was the most abundant small mammal captured at all sites (24 in total), above 2024 (19), 2023 (16) and 2021 (18), but still lower than 2022 when conditions were more optimal (46) (Jacobs 2019a, 2023b, 2023h). Both males and females were captured, and a range of age classes were present with some evidence of pouch activity. Only 4 Fat-tailed Dunnarts were captured. There were also low numbers of 2 less common species captured; 2 Giles' Planigale and 3 Central Short-tailed Mouse.

The White-striped Free-tail Bat is the only bat in South Australia that is audible to the human ear. Whilst spotlighting was not undertaken in Eliza Creek (Site 10), the species was detected via Song Meter at Site 10 (1 night) and Site 7 (2 nights). Three other microbat species were also detected via Song Meter; Gould's Wattled Bat, Lesser Long-eared Bat, Inland Forest Bat. The Inland Free-tailed Bat (*Ozimops (Mormopterus*) *petersi*) that was detected at Site 7 and SED was not detected. There were a total of 16 detections of microbat species at the 2 surveyed locations (Site 7 and Site 10) across 4 nights. All 4 species were detected at both sites (Specialised Zoological 2025).

There was minimal evidence of pest fauna species detected at the fauna trapping sites and as mentioned in Section 3.2 evidence of grazing was limited at flora sites. Goats were not observed during this survey, but a small group is known to occur across the broader Carrapateena site. Rabbit scats and diggings were detected opportunistically, but primarily at dune sites and creek sites with sandy areas (e.g. Site 10). Rabbits were not detected when driving past the warren on the track to Site 15. Foxes have been recorded on the site previously (2012, 2013, 2015, den in Eliza Creek 2019, dead fox at Anzac Dam in 2019). Similar to 2023 and 2024, foxes were not detected during 2025. Cats are known to occur at the site and have increased slightly in recent times, particularly around administration areas, and management of the species is ongoing. No cats were detected at the fauna sites, but tracks and scats were detected at Flora Site 21, 22 (dune sites) and Yeltacowie Homestead.

Grazing management has changed across the site, with less areas under grazing and more fencing delineating grazed areas; flocks of sheep were observed / detected (via camera trap or song meter) at 3 sites during the survey (Site 6, 12 and 16). As a result, kangaroos are also being managed more effectively across the site and there is likely less competition for resources. Red Kangaroos and Euros were observed across the study area and were noted to be in excellent health. Euros were observed in slightly larger numbers than previous years and numbers of Red Kangaroos appeared in greater numbers, as is known for the region in general for 2025.



Plate 3.20: Giles' Planigale (captured at Site 1)



Plate 3.21: Native Mouse, likely Sandy Inland Mouse (camera trap, Site 6)



Plate 3.22: Central Short-tailed Mouse (Forrest's Mouse) (captured at Site 1)

Table 3.24: Mammals recorded at Carrapateena during spring 2025 survey

Family Name	*Scientific Name*	Common Name	Fauna Site								OP [Total]1	Total[2]
			1 Control	2 Control	3 Impact	4 Control	5 Impact	6 Control	15 Impact	16 Control		
Bovidae	*Ovis aries*	Sheep (Feral Sheep)						4[CT]			Flock[3]	NA
Dasyuridae	*Sminthopsis crassicaudata*	Fat-tailed Dunnart	1[P]			1[P]	1[P]			1[P]		4
	Sminthopsis macroura	Stripe-faced Dunnart	1[P]	4[P]	1[P]	4[P]	5[P]	3[P]	1[P]	5[P]		24
	Planigale gilesi	Giles' Planigale	2[P]									2
Felidae	*Felis catus*	Cat (Feral Cat)									S21, S22, YH [3][3]	3
Leporidae	*Oryctolagus cuniculus*	Rabbit (European Rabbit)									S10, S1, S22 [3][2]	NA[3]
Macropodidae	*Macropus (Osphranter) robustus*	Euro								[3]	S7 [1], S18 [2]	NA[3]
	Macropus (Osphranter) rufus	Red Kangaroo[2]	[1]	[1]	[1]		[1]		[1]	[1]	S18 [1]	NA[3]
Muridae[4]	*Leggadina forresti*	Central Short-tailed Mouse (Forrest's Mouse)	1[CT]	2[P]							CT [1]	3
	Pseudomys hermannsburgensis	Sandy Inland Mouse	1[CT]					1[CT]			CT [1]	1
Vespertilionidae[5]	*Nyctophilus geoffroyi*	Lesser Long-eared Bat									2 x S7, 2 x S10 [4]	4
	Vespadelus baverstocki	Inland Forest Bat									2 x S7, 1 x S10 [3]	3
	Chalinolobus gouldii	Gould's Wattle Bat									3 x S7, 3 x S10 [6]	6
Molossidae	*Austronomus australis*	White-stripe Free-tailed Bat									2 x S7, 1 X S10 [3]	3
	Total Trap Captures	32	4	6	1	5	6	3	1	6		
	Total Species Detected	14	6	3	2	2	3	3	2	4		

[1]OP = Opportunistic, YH = Yeltacowie Homestead; S21 = Site CAR021, S22 = Site CAR022, S11 = CAR011 etc.; [2]Not Accurate given red kangaroos / sheep, present not always counted; CT –recorded on Camera Trap. [3] fresh tracks and / scats. [4] Mice and dunnarts caught in pitfall trap unless otherwise mentioned as CT, excludes 2 recapture dunnarts at Site 16. [5]All microbats recorded on Song Meter, number relates to nights of species detection only.

Comparison with baseline data – mammals

No Plains Mouse were detected, continuing the trend of no detections since the commencement of the compliance monitoring. Only 2 rodent species were detected, the Central Short-tailed Mouse (3 captured) and 2 Sandy Inland Mouse (2 via camera), both in very low numbers, similar to baseline and compliance surveys (Table 3.25). Low numbers of rodents in general is likely reflective of drier conditions in the preceding months before the survey, given rodents require sustained rainfall for more than 6 months and associated resources to breed in larger numbers. i.e. the rainfall events spread out between November 2024, March and July 2025, but still resulting in below average yearly totals, unlikely to sustain large rodent numbers. In addition, there are also species-specific influences, as highlighted in the results of a long-term study of the predator proof Arid Recovery Reserve. Moseby (et al. 2025) showed that smaller native rodents occur in low numbers within and outside the reserve, whereas the Plains Mouse population boom was linked to predator pressure and the population conditions prior to rainfall response. Interestingly they found limited effects of rainfall on Stripe-faced Dunnarts. Whilst results for Fat-tailed Dunnarts did not show influence of predator exclusion, it was considered Stripe-faced Dunnarts may have out competed Fat-Tailed Dunnarts limiting them from population increase within the reserve (Moseby et a. 2025). Desert dasyurids are insectivorous and many smaller dasyurids are not as responsive to rainfall, possibly due to their opportunistic foraging strategy and flexible habitat requirements Haythornthwaite et al (2006).

At Carrapateena small mammal species diversity from trapping effort alone during spring 2025 (4 small mammal species) was within the compliance monitoring range (3 – 5) and within the baseline range (4 – 6). No House Mice were caught in traps in 2025.There were more Stripe-faced Dunnart captures (24) than Fat-tailed Dunnarts (4), and they were detected at both control and impact sites. This follows the trend observed during baseline and compliance monitoring (Figure 3.47, Figure 3.48, Table 3.25, Table 3.28). Male and female dunnarts were recorded, some females with evidence of brood patch, suggesting that at least one round of breeding may have occurred prior to the survey. Planigales have been recorded in previous surveys in low numbers, and they are elusive species that are generally more active during warmer temperatures. Whilst neither of the 2 species known from the site were detected in 2024, one of the species was detected in 2025; Giles' Planigale was detected at Site 2 (two captures) (Plate 3.20). The Central Short-tailed Mouse has also previously been detected in small numbers and these were again detected in small numbers (3 captures) in 2025. Four of the 5 microbat species detected in 2024 opportunistically via acoustic methods were detected in 2025 at 2 sites with roosting habitat (e.g. Site 7 (men's site) and Site 10 (Eliza Creek, dry at time of survey) (Figure 3.49).

Mean small mammal diversity per fauna trapping site was 2.13, up from spring 2024 (1.9), and slightly below previous years, i.e. 2.4 (autumn 2023) and 2.75 (spring 2022), but still ranging from 1 to 5 species per site, which is on par with previous compliance monitoring surveys (small mammal captures only) and within the baseline surveys results presented in EBS (2017b). There was very little difference between small mammal species diversity and captures across sites, with the highest small mammal diversity recorded at control Site 1 (5 species). The next highest diversity was 2 species recorded at Control Sites 2, 4, and 6 and Impact Sites 5 and 16. Capture numbers ranged from 1-6 individuals, with 5 of the sites recording 4-6 captures (Site 1, 2, 4, 5, 16). The sites with the lowest number of small mammal captures and the lowest small mammal diversity were Site 3 and 15, both of which are impact sites in very close proximity (within

650 m) to active mining / construction. Further consideration of small mammal detection at control and impact sites is considered in Section 3.3.3.

In general, mammal species diversity did not differ notably from previous surveys. Total diversity of mammals (13) detected throughout the survey was within the range of mammal diversity reported during baseline and compliance Figure 3.48). Noting that, baseline surveys did not always report on presence of microbats, kangaroos, fox, cow, Euro, bat, sheep, and only occasionally recorded pests (e.g. spring 2014), hence it is difficult to compare data. Red Kangaroos were present across the site, and similar to 2022/2023 remain in good health compared to earlier years and were observed in moderate to high numbers (not counted). Feral Goats were not detected but are known to occur on the site in low numbers and other feral animals are still present in low numbers on par with baseline numbers. There were ongoing signs / evidence of rabbits, but detection was generally lower than in 2024 (no live individuals detected).

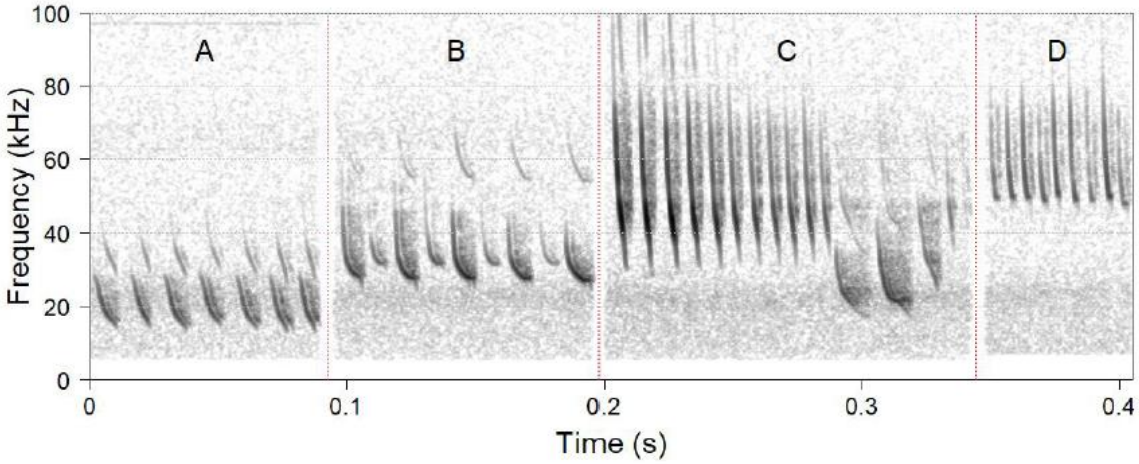


Figure 3.49: Representative echolocation call sequence portions of the species identified; (A) White-stripe Free-tailed Bat, (B) Gould's Wattled Bat, (C) Lesser Long-eared Bat (D) Inland Forest Bat, (time between pulses has been compressed)

Table 3.25: Summary of total small mammal captures, baseline (2012-2017) versus compliance monitoring (2018–2025)

Family Name	*Scientific Name*	Common Name	Baseline (2012-2017)			Compliance (2018-2025)		
			Total[1]	Range per survey	Mean per survey	Total[1]	Range	Mean
Dasyuridae	*Sminthopsis crassicaudata*	Fat-tailed Dunnart	217	4-31	18	75	1-20	8
	Sminthopsis macroura	Stripe-faced Dunnart	617	8-98	51	150	3-47	17
	Planigale gilesi	Giles Planigale	56	0-10	<3	25	0-10	>1
	Planigale tenuirostris	Narrow-nosed Planigale						
Muridae	*Leggadina forresti*	Central Short-tailed Mouse	79	0-19	<7	29	0-8	>3
	Pseudomys sp.	Native Mouse[5]	14	0-4	<1	6	0-2	<1
	Pseudomys hermannsburgensis	Sandy Inland Mouse						
	Pseudomys bolami	Bolam's Mouse						
	Pseudomys australis	Plains Mouse	39	0-20	3	0	0	0
	Mus musculus	House Mouse	11	0-10	<1	5	0-2	<1

Note: Numbers are rounded and do not account for recaptures as limited information is available for baseline data. [1]Number reflect totals, acknowledging that baseline totals include two surveys per year running 2 to 4 traplines per site and compliance surveys were reduced to one trapline per site and one survey per year from 2019 (two in 2018).

3.3.3 Control versus impact

Results from spring 2025 indicate that when combining total diversity of bird species detected, mammal species captured / detected and reptile species captured / detected at fauna trapping sites, the mean species diversity is slightly higher at control sites than impact sites regardless of whether the original treatments are compared (Table 3.26 and Table 3.26) or the treatments as revised in 2024 are compared (Table 3.28). A comparison of the mean total fauna diversity between control and impact sites for the original treatment using un-paired t-tests indicated no statistically significant difference (Control Mean +/- Standard Error (SE) = 21.50 +/- 10.50, Impact Mean +/- SE = 14.67 +/- 1.43, P = 0.2678). Similarly, comparison of means for total species diversity using the revised treatments, was also not statistically significant between control and impact sites (Control Mean +/- Standard Error (SE) = 19 +/- 4.53, Impact Mean +/- SE = 13.75 +/- 2.06, P = 0.3317). Whilst the results indicate there are no significant differences, the trends are higher for control sites and standard errors are high, particularly for diversity.

As per Section 3.3.2.3, whilst small mammal total diversity appears to be relatively stable and commensurate with the difference in survey trapping effort between baseline and compliance monitoring (e.g. more trap lines deployed during baseline than compliance), capture rates for some small mammal species were low. Further interrogation of data was undertaken for each small mammal species (Table 3.28) to determine whether there were any trends between control and impact sites. The two most common small mammal species (Stripe-faced Dunnart and Fat-tailed Dunnart) have been consistently

detected throughout baseline and compliance surveys at both control and impact sites, with the latter detected in lower numbers. The Central Short-tailed Mouse was consistently detected at both control and impact sites during baseline surveys, and continues to be regularly detected at control sites during compliance monitoring. However, this species has been detected during fewer surveys at impact sites during the compliance monitoring period. This could be related to lower numbers of detections in general during compliance monitoring with fewer trap lines deployed (i.e. variance from a smaller sample size), but is a trend that is worth watching. Results for smaller native rodents are difficult to interpret as the overall detections are low and there are difficulties in identification of the two species that are known for the site (Bolam's Mouse and Sandy Inland Mouse). However, there have been detections at both control and impact sites during the compliance period. Similarly, Planigales are detected in lower numbers, and rates of detection at control and impact sites remain relatively stable for the compliance period. The Plains Mouse has not been detected at either control or impact sites since compliance surveys commenced, but this is consistent with regional findings, and there were also extended periods of no captures during baseline surveys.

The mean number of total captures is higher at control sites than impact sites under both treatment scenarios (Table 3.26 and Table 3.27). A comparison of mean total fauna captures (reptiles and mammals only) between control and impact sites using un-paired t-tests indicated no statistically significant difference for the original treatment, Control Mean +/- SE = 6.0 +/- 3.0, Impact Mean +/- SE = 5.29 +/- 0.81, P = 0.7368; and for the updated treatment, Control Mean +/- SE = 7 +/- 1.41, Impact Mean +/- SE = 4.25 +/- 0.63, P = 0.1260.

These results indicate higher total fauna diversity and captures at control sites than impact sites, but there are no statistically significant differences between control and impact sites with either of the treatment arrangements used (original or revised). This suggests there is no evidence that mining activity is impacting fauna diversity or trap capture rates. In the future there may be a need to reallocate control Site 1 and 2 to impact sites, depending on the influence of increased Khamsin Road traffic / Northern Wellfield activities. The results for small mammals in particular show that the two common species (Stripe-faced Dunnart and Fat-tailed Dunnart) are still being detected at both control and impact sites, and that native rodent detection should be monitored. Regardless, overall diversity (birds, mammals and reptiles) and capture rates across the Carrapateena location are within baseline and compliance ranges, and are not currently indicating significant impacts to fauna as a result of mining activity at Carrapateena.

Table 3.26: Comparison of fauna diversity and captures at control and impact sites (original treatment), 2025 data

Site	Treatment	Diversity number of bird, reptile, small mammal captures / detected[1,2]	Mean diversity at fauna sites by treatment type	Captures number of reptile, small mammal captures/ detected[1]	Mean detection at fauna sites by treatment type
1	control	32	21.50	9	6
2	control	11		3	
3	impact	11	14.67	3	5.5
4	impact	16		7	
5	impact	15		4	
6	impact	17		9	
15	impact	10		4	
16	impact	19		6	

([1]Excludes kangaroos, goat, rabbit, [2]bird species only counted once as present)

Table 3.27: Comparison of fauna diversity and captures at control and impact sites (revised treatment), 2025 data

Site	Treatment	Diversity number of bird, reptile, small mammal captures / observed[1,2]	Mean diversity at fauna sites by treatment type	Captures number of reptile, small mammal captures/ observed[1]	Mean captures at fauna sites by treatment type
1	control	32	19.00	9	7
2	control	11		3	
4	control	16		7	
6	control	17		9	
3	impact	11	13.75	3	4.25
5	impact	15		4	
15	impact	10		4	
16	impact	19		6	

([1]Excludes kangaroos, goat, rabbit, [2]bird species only counted once)

Table 3.28: Summary of small mammal detections at control and impact sites during baseline and compliance surveys

		Baseline												Compliance									Total Captures
		2012		2013		2014		2015		2016		2017		2018		2019	2020	2021	2022	2023	2024	2025	
		Autumn	Spring	Autumn	Spring	Autumn	Spring	Autumn	Spring	Autumn	Spring	Autumn	Spring	Autumn	Spring	Spring	Spring	Spring	Spring	Autumn	Spring	Spring	
Stripe-faced Dunnart	Impact	23	17	29	59	29	40	27	31	4	4	45	45	4	4	0	3	12	13	8	9	14	767
	Control	32	26	33	39	26	50	18	32	4	4			2	4	3	2	8	34	8	10	12	
Fat-tailed Dunnart	Impact	1	5	14	17	14	10	4	17	3	2	17	28	2	4	2	11	9	15	1	4	2	292
	Control	3	11	9	14	16	10	5	11	2	4			1	3	3	4	3	5	2	2	2	
Central Short-tailed Mouse	Impact	12	0	1	2	2	9	1	1	3	3	13	3	0	0	0	1	0	3	2	0	0	108
	Control	6	0	1	2	4	10	1	1	3	1			2	1	1	2	4	4	6	0	3	
Bolams Mouse	Impact	2	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	14
	Control	2	4	0	0	0	0	1	1	0	1			0	0	0	0	0	0	0	0	0	
Sandy Inland Mouse	Impact	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
	Control	0	0	0		0			0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bolam or Sandy Inland Mouse (camera trap)	Impact	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	4
	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
Plains Mouse	Impact	7	2	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	39
	Control	13	6	1	4	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	
Giles Planigale	Impact	0	0	0	0	0	3	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	16
	Control	3	0	0	0	1	1	0	0	0	1			0	1	1	0	0	0	0	0	2	
Narrow Nosed Planigale	Impact	2	0	0	2	0	4	0	2	2	0	3	7	0	0	1	0	0	3	3	0	0	68
	Control	1	5	2	4	0	6	2	2	3	1			0	0	2	0	4	7	0	0	0	
House Mouse	Impact	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	16
	Control	0	0	0	0	0	5	0	1	0	0	0	0	0	0	0	0	0	0	2	1	0	
Total small mammal species per survey		**7**	**5**	**6**	**5**	**4**	**6**	**5**	**6**	**5**	**6**	**6**	**6**	**3**	**4**	**5**	**5**	**5**	**5**	**5**	**4**	**5**	

Note: Baseline survey deployed 2-4 trap lines per site, compliance surveys deployed 1 trap line per site. Data for 2017 is not available split between impact and control sites. Green cells indicate detections in that survey. Grey cells indicate detection of the EPBC listed Plains Mouse.

3.3.4 EPBC Act Protected Matters

The conditions of the PEPR require that records of 3 EPBC listed threatened species are reported if they a recorded during ecological surveys at site, namely Thick-bill Grasswren, Plains Mouse and Night Parrot. In addition, observations of the Migratory / Critically Endangered Curlew Sandpiper are to be noted as per EPBC referral commitments (BHP 2025a).

3.3.4.1 EPBC1 – Thick-billed Grasswren (Vulnerable)

No evidence of the Thick-billed Grasswren (TBGW) (*Amytornis modestus indulkanna*) (calls, direct observations) were observed during the 2025 survey, including bird surveys at 20 sites, or during opportunistic observations at dams and other likely habitat during the survey. As per 2023 and 2024, Song Meters were deployed at all dedicated fauna sites, a pastoral dam (South Eliza Dam), Eliza Creek (Site 10) and a small patch of potentially suitable Thick-bill Grasswren habitat within the Carrapateena Wellfield Expansion area (Site 7). There was no evidence of the distinctive high pitch calls on the Sonogram outputs, only calls of White-winged Fairywrens and Purple-backed Fairywrens.

A total of 57 bird species were observed throughout the survey including other similar sized species, such as 2 species of Fairy-wren (White-winged, Purple-backed) and the Rufous Fieldwren.

3.3.4.2 EPBC2 – Plains Mouse (Vulnerable)

No evidence of Plains Mouse was recorded during pitfall and unbaited camera trapping at 8 fauna sites during the spring 2025 survey, despite trapping effort within proximity to isolated patches of cracking clay habitat. However, it is noted that many gilgais did not show a large amount of activity, cracks and fauna runs into cracks. Native rodents were only captured on nocturnal cameras and in a pitfall trap at one site during the survey (Site 2). These results align with other regional surveys for 2025. No Plains Mice were detected at either of the South Gap offset areas, or inside / outside the arid recovery area adjacent Olympic Dam, and there was one detection via baited camera at Oak Dam in autumn 2025 (Nature Conservation 2026, Lathwida 2025b, 2025c, 2025d, BHP 2025b). At South Gap it is considered the population has been undergoing a low, since mid-2022, and other small mammals have also been detected in low yet stable rates (Nature Conservation 2026). The lack of in detection at South Gap in 2025, particularly given the survey effort (13 permanent camera sites, that were operational throughout the year) continues to suggest the population is currently declining (Nature Foundation 2026). At Oak Dam a single Plains Mouse was detected at a Cane-grass Swamp site with large areas of suitable gilgais (via baited camera during autumn) but was not detected during autumn or spring trapping surveys (Lathwida 2025b, 2025c, 2025d). The species has not been captured at Carrapateena since 2017 (only 3 captured) prior to commencement of the compliance monitoring phase. Lack of recent detection at Carrapateena is also likely related to additional factors (e.g. impacts from grazing and predators compared with South Grap). The preceding climate conditions such and lack of sustained rainfall that rodents require, also likely contributed to results, similar to other regional surveys.

3.3.4.3 EPBC3 – Night Parrot Records (Endangered)

During the annual flora and fauna survey (spring 2025) at the Carrapateena Mine site, there was no evidence of Night Parrot (calls, direct observations or distinct feathers) at 8 flora and fauna monitoring sites, 20 bird survey sites and a number of opportunistic observations at dams, during spotlighting. There was also no detection via Song Meter at the fauna sites or other opportunistic locations deployed (e.g. South Eliza Dam, Eliza Creek (Site 10, Site 7). A total of 57 bird species were detected throughout the survey including 4 common parrot species: Budgerigar, Eastern Blue Bonnet, Mulga Parrot, Port Lincoln Parrot.

No EPBC listed Parrots were detected during the spring 2025 survey.

3.3.4.4 Curlew Sandpiper (Critically Endangered)

The EPBC listed Critically Endangered and Migratory Curlew Sandpiper (*Calidris ferruginea*) is not covered by the PEPR conditions for Carrapateena but is one of the 4 EPBC species that was considered in the Operation's EPBC referral. Whilst it was considered unlikely to occur at the site, there is potential the shorebird could visit water habitats at the site.

No evidence of Curlew Sandpiper (calls, direct observations) were detected during the 2025 spring survey, whilst undertaking bird surveys at 20 sites, or during opportunistic observations at dams or on Song Meter outputs. All dams contained water during the survey period with little areas of exposed mud. The South Eliza Dams had overflow and temporary wetland conditions. A total of 57 bird species was observed throughout the survey; with no EPBC listed as Migratory shorebirds detected. A number of waterbird species and resident or endemic shorebirds were recorded in water habitats; Banded Lapwing, Masked Lapwing, Black-fronted Dotterel, Silver Gull and several duck / grebe species.

3.3.5 Vouchers

For the spring 2025 survey no trap deaths occurred, hence no vouchers were provided as specimens to the SA Museum as required by the ethics and fauna permit.

3.3.6 Pitfall line integrity

As mentioned earlier, the trapping effort at the site has been reduced over the years from 4 pit lines to 1 pit line per site being opened during each survey. The reduction in number of lines was undertaken to align the survey effort undertaken with the requirements of the PEPR (i.e. focus on species diversity and not focus on measures of abundance or a need for high capture rates). There has been some flexibility in the pits and lines opened during compliance monitoring to date, using only 6 of the 7 pits in a line, and potentially using different pit lines at a site over different surveys. Previously some of the pit lines contained pits that required maintenance or permanent removal as the integrity of the pit bases did not meet ethics standards (likely related to historical Planigale presence and potentially extraction of small skinks that had managed to get under the base liner). Following the 2023 survey, the site environmental team began replacing damaged pit bases with custom-made stainless-steel bases with numerous holes (2-3 mm) drilled in, to reduce ongoing maintenance and improve pitfall trap integrity across the mine site.

The new bases are easy to install and can be removed with narrow-nosed pliers and a rubber mallet (e.g. to change the pit line that is surveyed).

During the site maintenance schedule the pit lids are checked to ensure that they are secure and there are no gaps where animals (particularly very small skinks, geckos, juvenile mammals) can squeeze into cracks can get in and become trapped outside of the survey period. This is required 6 monthly as per the Wildlife Ethics Permit. The process for securing the lid involves: digging around the top of the pit, below the lip of the pit lid (e.g. ~10 cm), then aligning pit lid, banging the lid down and inserting the tech screw through the lip of the UV stable lid and the UV stable pit liner. Prior to this process the pit is checked that it is free of any fauna, particularly if pits are left open for a short time for maintenance or pit bases. These steps align with the approved permit for the site that allows for the pits to be closed with a tech (hex) screw, rather than filling the traps with non-perishable material (e.g. rocks, sand or sandbags) at the end of the survey (Section 2.2). Rocks are also placed on top of closed pits to reduce UV exposure to the lid. Ethics require photos of the closed pits, and GPS coordinates of all pits, are provided in the annual Wildlife Ethics Report (due 1 February each year - Lathwida prepares on behalf of BHP), for the Permit requirements.

4 Discussion

4.1 Summary of spring 2025 results

4.1.1 Assessment of mining impacts

Potential impacts from mining activity on vegetation would be represented by a decline in the number of native flora and fauna species present; a decline in the abundance of individuals within a species; a decline in plant health (e.g. due to potential raised dust settling on plants, saline seepage from tailings dam and/or altered groundwater levels) and/or an increase in weed presence. The discussion below outlines why the 2025 survey results do not indicate impacts on vegetation from mining at Carrapateena.

4.1.2 Native flora species diversity (RAM sites)

Monitoring of perennial species diversity (number of species present) provides an indication of long-term trends in plant populations. Prior to operational monitoring, baseline monitoring was conducted between 2012 and 2017, with full data sets available for 2013 to 2016. This period included years of average, well above-average and well below-average rainfall, hence providing a wide range of data, against which compliance data can be compared.

At the Carrapateena operational area, long-lived species diversity is monitored at 1-ha sites, and analysed at the individual site scale, at a habitat scale (stoney tableland, dunes, drainage lines) and at a landscape scale (number of plant species present across the whole operational area). Long-lived plant diversity is relatively constant in undisturbed environments. In contrast, ephemeral diversity varies greatly in response to rainfall in arid rangelands. Long-term monitoring of short-lived plant diversity however is also important because short-lived plant species often comprise most plant species in arid rangelands (Davies et al. 2018) which can dominate during periods of high rainfall (Waudby and Petit (2015). Long-term changes (10+ years) in short-lived species diversity may indicate possible irreversible changes such as due to climate change, loss of soil seed bank, grazing impacts and/or altered soil properties.

4.1.2.1 Flora diversity across the whole Carrapateena operational area

In spring 2025, a cumulative total of 134 native flora taxa was recorded at the 20 RAM flora sites across the Carrapateena Operation area. This was the median diversity recorded during compliance monitoring surveys (2018 to 2025). A relatively high diversity of short-lived species was recorded (77 species), which compares with a maximum of 83 and a minimum of 52 species recorded since 2018, and indicates that mining activities have not impacted ephemeral species. Despite below-average rainfall received from January to June 2025, long-term mean rainfall recorded in the 3 months prior to the survey (June - August) was sufficient to stimulate widespread germination of annuals. Given the survey was conducted in mid-September, annuals were still present. During the 2025 survey, 57 long-lived perennial species were recorded. This tally was 1 less than the previous minimum of 58 species recorded in both 2018 and 2023, but only 5 fewer than the maximum tally recorded in 2021. The species not recorded in 2025 were those present as only isolated individuals at the dune sites or at sites including a drainage line. Due to

boundaries not being permanently marked at these sites, it is difficult to replicate precise survey search area each year. The tally of 57 species is considered to be within the range of variation caused by variable search area rather than by mining impact. Hence the diversity of long-lived species is not considered to have been impacted by mining activities.

4.1.2.2 Flora diversity for individual sites

Plant species diversity (long-lived and short-lived) at all individual sites in 2025 was within the baseline range for each site. For each individual site, although there has been variation in species diversity between survey periods there have been no obvious increasing or decreasing trends emerging. Further, impact and control sites have recorded similar variation in magnitude and direction of changes in diversity. Given post-construction monitoring results have not shown clear trends emerging in long-lived or short-lived species diversity, and no significant difference between control and impact site mean diversity, it is considered that there has been no impact on perennial or short-lived species diversity across the site, from mining

4.1.2.3 Flora diversity for individual habitats

Eliza Creek sites. Since 2020, long-lived species diversity has varied between surveys, for each flora site. Unlike the gibber transects, the survey area along Eliza Creek is defined as a 1-hectare area, under the influence of the creek environment, the precise boundaries therefore varying between observers each year. In 2025, long-lived species diversity at each site was similar to 2020 diversities. Long-lived species diversity however, for Sites 18, 20 and 10 were below the compliance monitoring means, but the same or greater than compliance monitoring means at Sites 17 and 19. At sites 10, 18 and 20, the reduced long-lived perennial diversity in 2025 was due largely to a decrease in long-lived grass species recorded. This was likely due to most perennial grasses being heavily grazed in 2025, making positive identification difficult.

In summary there was no clear pattern emerging in flora species diversity at Eliza Creek relating to the time since TSF establishment or the distance from the TSF (Sites 17 being the closest and Site 10 being the furthest away).

Dune habitats. Flora Sites 21 and 22 were initially established to determine potential impacts from mining on sand dune habitat, given dune habitats were excluded from baseline monitoring. Site 21 is considered a control site (located > 2 km from mining infrastructure) and Site 22 is a potential impact site as it adjoins the Western Access Road (< 2 km from mining infrastructure). In 2025, perennial species diversity was within the range recorded since 2018. Yearly variations are due to the difficulty in replicating the precise survey area each year and/or difficulty in detecting species represented by one or few individuals and that may be hidden beneath other shrubs – rather than actual loss or gain of species. At both sites, no clear species diversity trend has emerged. Hence species diversity in the dune habitat is considered not to have been impacted by mining activities.

Gibber (stony tableland habitat). The gibber stony tableland is the dominant habitat within the operational area; hence 9 gibber habitat flora sites have been monitored since 2018. As at spring 2025, there were no trends emerging in species diversity at either control or impact sites in gibber (stony tableland) habitats. This includes Flora Site 3 which adjoins the western edge of the processing plant and the site potentially most liable to dust impact. For all individual sites, long-lived species diversity in 2025 was within both the baseline range, and the compliance range.

Gibber (stony tableland habitat) that include a minor drainage line. During both baseline and post-construction/ operational monitoring, diversity has fluctuated at Control Sites 1 and 7, and to a lesser extent at Control Site 9 and Impact Site 11 but overall has shown no clear trends at these sites. Variations in long-lived species diversity at these sites is largely due to slight variations in area surveyed at each survey: the presence of multiple habitats decreasing the ability to replicate survey areas precisely.

Given that there have been no consistent trends in plant diversity for individual sites, it is considered that there has been no impact on mining at either the site level, habitat level or landscape level.

4.1.3 Long-lived woody perennial species diversity and abundance (Jessup transects)

Jessup transects have been surveyed during baseline and construction monitoring, to analyse potential mining impacts on population trends (abundance) of long-lived woody plants. The transect data provides a quantitative measure of abundance based on absolute counts of individuals within a precisely defined survey area.

4.1.3.1 Gibber habitats

Since 2018, the population of the 5 most abundant and widespread shrubs at Jessup transects in gibber habitats have been analysed; Bladder Saltbush, Thyme Sea-heath, Plains Lantern-Bush, Bush Minuria and Samphire. Following declines in the abundance of all 5 species between 2020 and 2022/2023, all species increased in 2023/ 2024 and 2025 and as at 2025 populations were within the baseline range. The widespread declines in 2020 – 2022 were likely associated with well below-average rainfall in 2017, 2018 and 2019, the low rainfall having a lag impact. Although all 5 species are relatively drought tolerant, during prolonged and severe drought, Bladder Saltbush, Thyme Sea-heath, Bush Minuria and Plains Lantern drops their leaves and become less obvious in the Jessup transects. Qualitative observations of Samphire also noted higher foliage dieback during and immediately following the drought years. The increases in population abundance of all species in 2023 to 2025 have been associated with average or near-average long term annual rainfall totals. In 2025, the populations of the 5 species either remained within the baseline range or had recovered to once again be within the baseline range.

Bladder Saltbush is the dominant shrub and plant cover at all gibber sites and is slightly to moderately palatable in this environment. The species has a lifespan of approximately 25 to 30 years and is recognised as important for ecosystem stability in rangelands of southern Australia (Walsh et. al. 2005). In South Australia, due to its longevity and drought tolerance, Bladder Saltbush is used extensively as an indicator of land condition in chenopod shrublands (Baulderstone and Baird 2012). Widespread regeneration of Bladder Saltbush was recorded at the Jessup sites, in 2023, 2024, and 2025 largely contributing to the recovery of Bladder Saltbush populations since 2022. Although many of the juveniles recorded in 2025

are unlikely to survive an extended hot dry period, the survival of even a small percentage is likely to assist in maintaining a sustainable population. The high number of juveniles recorded since 2023 suggests a healthy population. In a 10-year study of Bladder Saltbush recruitment and survival in western NSW, Eldridge and Westoby (1991) recorded substantial turnover of the saltbush population with plants less than 2 years old comprising an average of 60% of the individuals present. The widespread regeneration at Carrapateena since 2023 and 2024 correlates with average to near-average yearly rainfall totals in 2023 and 2024. Since 2018 the correlation of population size with rainfall, and abundance trends being of similar magnitude at impact and control sites, indicates that climate (particularly rainfall totals) rather than mining has influenced Bladder Saltbush populations.

Similar to Bladder Saltbush, the abundance of Samphire plants in Jessup sites declined in 2020/2021 following below average rainfall years. The Samphire population means for both impact and control sites returned to being within baseline ranges, in 2023, 2024 and 2025. As per Bladder Saltbush, the greater recovery at impact sites rather than control sites indicates that Samphire abundance has not been affected by mining related activities. During compliance monitoring, the population of Thyme Sea-heath recorded at Jessup transects also declined during the below average rainfall years of 2018 – 2020 but both control and impact site mean populations have increased since 2021 with increased yearly rainfall. In 2025, the mean populations of impact and control sites were within the baseline range. Samphire and Thyme Sea-heath are relatively unpalatable species not grazed by stock, kangaroos or feral animals (with the possible exception of young foliage). Hence changes in abundance are potentially due to mining activities or climate changes. Impact sites, however, have either shown similar population trends to control sites, or a greater increase in population. Changes in abundance for all 5 species analysed have shown a strong correlation with rainfall totals – decline during and immediately following the drought years, followed by recovery at both impact and control sites to be within the baseline range. At control sites, the declines were either similar or greater than at impact sites. Samphire and Thyme Sea-heath are non-palatable, removing grazing as a cause of the decline experienced in these species. Hence this suggests that changes in abundance in these species are related to climatic changes rather than impacts from mining. Plains Lantern Bush and Bladder Saltbush are moderately palatable, and their increased abundance may be due to both increased rainfall and widespread destocking across the lease area.

4.1.3.2 Eliza Creek

To provide data against which to assess potential impacts on vegetation downstream of the TSF, 4 flora sites, which included Jessup transects, were established in autumn 2018, located progressively downstream from the TSF embankment within Eliza Creek. A fifth site (established during baseline surveys) is located furthest from the TSF on Eliza Creek. At all sites, the total number of long-lived woody perennials present in the Jessup transect, has increased since 2018. To analyse potential impacts of the TSF on individual species, species of shrubs/trees were chosen that were common at site 17 (closest to TSF) and common at 2 or more other Eliza Creek sites; Western Myall, Lobed-leaf Hop-bush, Silver Mulla Mulla, Senna species, Spiny Fanflower and Spongy-fruit Bluebush. It is expected that if there were potential impacts due to the TSF they would appear first at Site 17. However, whilst all 6 species have shown yearly fluctuations, they have either recorded no long-term change in abundance, or an increasing abundance trend, which does not suggest the any impacts associated with the TSF.

Western Myall is the dominant tree at Jessup Sites 17 and 18. Since 2018 Western Myall abundance has fluctuated yearly at these sites, but without displaying a downward trend. The population fluctuations are largely due to fluctuations in seedling abundance (including some seedlings likely not surviving beyond a year) and/or slight changes in Jessup alignment. Nine juveniles and 18 adults were recorded at Site 17 in both 2024 and 2025. This is notable as Site 17 is just 270 m from the TSF and the adult and juvenile Western Myall trees remain healthy with regular recruitment and/or growth of trees.

The Eliza Creek Jessup transects have shown an increase in the abundance of perennial individuals during compliance monitoring, as well as no decline in individual species abundance. Hence, no impact from mining activities is considered evident at the Eliza Creek flora sites.

4.1.4 Plant health

During the spring 2025 survey, no dust layer was noted on plants at any flora site, including Site 3 which adjoins the processing plant and nearby spoil heap. No signs of saline impact on plant health were noted (e.g. no salt crust on the ground or on leaves). This aligns with findings of the Dust Impact study (Jacobs 2020b) which recorded no significant decline in plant health or vigour at distances greater than 10 m from roads.

In both 2024 and 2025, qualitative observations of Bladder Saltbush noted that dieback/ leaf loss was much reduced compared to 2020 levels, and that almost all shrubs were heavily in fruit, perhaps the most since compliance monitoring began (pers obs. S Croft who has conducted all surveys since 2018). In 2025, mean dieback of Bladder Saltbush across the survey sites was an estimated 10 – 20%, considered to be within the range of dieback when plants are not under undue stress. Bladder Saltbush has good salt tolerance and high drought tolerance but will shed leaves to conserve moisture (State Government of Victoria 2024).

Mean dieback of Samphire across the survey sites in 2025 was an estimated 10 – 30%, considered to be within the range of dieback when Samphire plants are not under undue stress.

In 2025 qualitative observations of high leaf loss on mature plants was noted at the flora sites, but the majority of mature plants were also recovering with new growth and fruiting, and a smaller proportion of plants were flowering. There was also widespread regeneration with juveniles healthy and comprising one third of the 2025 Jessup Lantern Bush population (including at impact sites).

Thyme Sea-heath is not impacted by grazing, and no dust has been recorded on any plant at flora sites, hence potential causes of notable changes in abundance are largely confined to climate and mining impacts. Qualitative observations during the 2025 survey noted that the Thyme Sea-heath plants were healthy, with abundance at impact sites increasing, and abundance remaining stable at control sites. Hence mining is not considered to be impacting Thyme Sea-heath abundance or plant health.

Bush Minuria is one of the more palatable species within the survey area, and usually only recorded growing in the protection of Bladder Saltbush. With prolonged drought, bushes will defoliate and become less obvious. However, the population at Jessup transects has increased during compliance monitoring at both control and impact sites by similar percentages. In 2025, juveniles were recorded at 3 of the 7 impact sites and at one of the 4 control sites Hence, mining is not considered to be impacting Bush Minuria populations.

In general vegetation within gilgais exhibited dieback, with the majority of plants being short-lived plants. At some sites, the long-lived Cotton-Bush (*Maireana aphylla*) was sparsely present and largely confined to gilgais, where it appeared droughted. The friable soils would be more susceptible to summer/autumn drought (as experienced in 2025) with these soils having a more limited water holding capacity compared to surrounding non-gibber soils. The 2025 gilgai dieback is considered short-term, with recovery likely as gilgai soils re-hydrate.

Sclerolaena species (Bindyi sp.) are short-lived sub-shrubs and are a prominent plant cover at all the gibber sites. In 2025, at flora sites where there was high dieback of these short-lived sub-shrubs, it was always accompanied by a similar amount of new growth.

At the Eliza Creek flora sites, qualitative observations noted that the only species with reduced vigour included Dead Finish (*Acacia tetragonophylla*) and Lobed-leaf Hop-bush (*Dodonaea lobulata*), where approximately 5% of bushes appeared droughted and/or > 90% dieback. Similar observations have been made on these species in previous years at the Eliza Creek sites and this relatively minor percentage of shrubs recording dieback is likely due to low rainfall and/or heat stress rather than mining impacts. At sites 19 and 20 (3 km and 4.7 km downstream from the TSF) the Lignum bushes appeared droughted, but no dead lignum was recorded and Jessup transects recorded no obvious decline in abundance (Lignum was not present at sites 17 and 18). In 2024, it was noted that Green Emubush (*Eremophila serrulata*) and Crimson Emubush (*Eremophila latrobei*) displayed leaf yellowing in approximately 25% of the population. However, this was not evident in 2025 and there was no decline noted in the Jessup populations.

At all Eliza Creek sites, the creek bed appeared very dry with higher water-requiring plants such as Darling Lily (*Crinum flaccidum*) and sedges (Cyperus species) absent or much reduced in density compared with higher rainfall years of 2023 and 2024.

At gibber flora sites, grazing impacts were evident on the long-lived perennial grasses, particularly Neverfail (*Eragrostis setifolia*) and on the palatable shrubs, Bush Minuria and Spongy-fruit Bluebush (*Maireana spongiocarpa*). However, juveniles of both Bush Minuria and Spongy-fruit Bluebush were also present. Sheep grazing at the time of the spring 2025 survey was evident at several sites (e.g. control Sites 6 and 12 and impact Site 16) but no decline in abundance of species was noted. Cattle dung was present at the dune sites during each compliance survey, but no species was noted to be severely modified by grazing. At the Eliza Creek sites, grazing impact was most notable on the perennial grasses, Neverfail and Cotton Grass (*Digitaria brownii*), and on the palatable shrubs Sponge-fruit Bluebush, Spiny Fanflower (*Scaevola spinescens*) and Opposite-leaf Emubush (*Eremophila oppositifolia*). However, CSR abundance estimates and/or Jessup abundance counts indicate no obvious decline in abundance in these species.

In summary, 2025 survey results indicate that there are no current detectable impacts from mining on flora health, diversity or abundance, i.e. no long-term decline in the number of native species present; no long-term decline in abundance of any species, no differential decline between control and impact sites in the abundance of individuals within a species; and no decline in plant health (e.g. due to potential raised dust settling, saline seepage).

4.1.5 Tree health (canopy cover)

The canopy health of the dominant tree species at Eliza Creek sites (17, 18, 19 and 20) has been assessed since 2018 using both a hand-held GRS densitometer and visual estimates of canopy intactness. This was to assess possible impacts on tree health due to potential seepage from the TSF or reduced water flows down the catchment. Comparing the total number of densitometer foliage records along a transect over time provides an indication of changes in total canopy cover. Potential changes in total canopy cover may be a combination of canopy expansion of existing trees; recruitment of trees and/or canopy decline of existing trees. At each Eliza Creek site, there are 2 parallel transects. Along each 100 m transect, readings were taken every metre, hence the number of readings showing canopy cover equates to the percent canopy cover along the transect. Additionally, visual estimates were made (with no tool) of the entire canopy of individual trees, to assess the extent of foliage compared to the potential extent of foliage expected of a tree in good health.

4.1.5.1 Western Myall trees

At the Western Myall dominant transects (Sites 17 and 18), the total number of Western Myall foliage records has trended strongly upwards since 2018. The increase in foliage records at each site is due to both additional trees and expansion of existing tree canopies along each transect. Since 2018, there have been 2 Western Myall tree deaths and 26 new Western Myall trees recorded along the combined transects. Visual estimates of Western Myall canopy intactness were relatively consistent from 2018 to 2024, but visual estimates recorded a decline in canopy intactness in 2025. These visual estimates of decline in 2025 did not align with the increase in foliage records using the densitometer. Some variation in visual estimates between survey periods is likely due to observer variation rather than actual declines/increases. Different observers are likely to differ slightly in their estimates of canopy extent and/or there may be variation in estimates by the same observer at different survey periods. The mean decline in visual estimates of canopy extent at transect 17A was 6%, possibly within the range of observer variation. Site 17 is closest to the TSF (approximately 250 to 350 m downstream). Conversely, mean estimates of canopy extent at Transect 19B increased.

The continued increase in the number of canopy (live foliage) recordings along the Western Myall transects, the net increase in trees and visual estimates that align with densitometer readings (within the margin of estimating error) indicate that as at 2025, mining related activities (impacts from TSF) have not impacted Western Myall abundance or health along the Eliza Creek canopy cover transects.

4.1.5.2 River Red Gums

Since 2018, the number of River Red Gum foliage densitometer records for Sites 19 and 20 (Eliza Creek) has fluctuated, often quite markedly, between survey periods. However, there has been no distinct trend apparent at Site 19, and a slight upward trend in total foliage records at Site 20. Site 19 is 3 km from the TSF, and the first occurrence of River Red Gums downstream from the TSF. Site 20 is 4.6 km from the TSF. Visual estimates have also indicated that Red Gum canopy extent has varied notably between surveys. Visual estimates recorded declines in canopy extent for all transects at Sites 19 and 20 in 2024 and 2025, following large increases in canopy extent in 2022 and 2023. River Red Gums shed leaves during periods

of low rainfall (NSW government undated) and changes in canopy extent of River Red Gum seem to be more responsive to yearly rainfall totals than the Western Myall canopies that are present in Eliza Creek. The canopy of Western Myall trees, however, is relatively dense and less prone to defoliation as a drought strategy. Acacia species in general tend to retain their "leaves" (phyllodes) during drought, with the ability to extract water from dry soils (Tunstall 2005). At the Eliza Creek canopy cover transects, the Western Myall canopies appear to be less affected by changing yearly rainfall totals than do the River Red Gum trees. Changes in the cover of River Red Gum canopies during operation monitoring is likely to reflect seasonal conditions, which in turn, will have varying impacts depending on unquantified variables such as age and size of tree (which will determine root depth and access to water). Compliance monitoring at the Eliza Creek sites indicates that the impact of well above-average or well below-average rainfall on the River Red Gums seems to be apparent within 12 months, with foliage shedding recorded in 2019 (low rainfall year) and increased foliage being recorded in 2021. Foliage records for transects at Site 19 and 20 in both 2023 and 2024 showed that River Red Gums had regained canopy losses in 2018-2020. Rainfall totals in 2025, however, were slightly below long-term means, and the reduced canopy extent may be a response. Since 2018, there has been 1 new Red Gum intercepted (Site 19, in 2024) and one River Red Gum has died.

As with Myall trees, the variation in visual estimates of canopy intactness for Red Gums has been greater than the variation recorded in densitometer foliage records. However, for both species, despite yearly variations in canopy extent, there is no obvious long-term decline in canopy health and no potential impacts resulting from the construction and operation of the TSF to the dominant trees within Eliza Creek are evident.

4.1.6 Weed diversity and abundance

4.1.6.1 Diversity

There were no new weed species recorded in 2025.

4.1.6.2 Increase in abundance/ extent

Excluding the dam locations (namely, excluding non-mineral lease sites), 3 weed species were recorded with increased abundance in 2025, compared with previous compliance surveys (2018 – 2024); common Sow Thistle (*Sonchus oleraceus*), Cut-leaf Heron's-bill (*Erodium cicutarium*) and Bathurst Burr (*Xanthium occidentale*).

Cut-leaf Heron's-bill and Sow Thistle are annual species and not Declared under legislation. Their occurrence in any 1 year is likely to be random. Sow Thistle has been previously recorded at 12 locations during baseline and compliance monitoring but was recorded at 18 locations in 2025. Sow thistle reproduces by seed, which is spread primarily by wind, but also be animals and machinery tyres. Each plant can produce up to 8000 seeds and seeds remain viable for up to 8 years (Coleman et. al. 2021). Seeds germinate following rainfall with an ideal maximum/minimum temperature range of 250C/100C being observed (Coleman et. al. 2021). At the Carrapateena operational area, optimal germination conditions were present immediately preceding the survey, with mean winter rainfall totals and diurnal temperature ranges being within the optimum range. Hence the widespread occurrence of Sow thistle

during the spring 2025 survey (albeit at low densities) was likely due to weather conditions rather than mining related activities. Cut-leaf Heron's-bill was recorded for the first time at 3 Rangeland flora sites in 2025, (2 control sites and 1 impact site). Like Sow Thistle, Cut-leaf Heron's-bill also produces a large number of seeds (up to 9900 per plant) which can remain viable in the soil for several years. Seeds can spread in the wool or fur of animals. Germination is optimal in moist soils at soil temperatures of 5-200℃ and optimal growth occurs at 15-200℃ (Neudorf 2024). Such conditions occurred during the 2025 survey. Hence the species' increased abundance at the Carrapateena Operation in 2025 likely reflects optimal germination and growth conditions being met, rather than mining impacts.

Bathurst Burr (listed as Declared under the *Landscape South Australia Act 2019*) was detected at a new location in 2025, albeit a small population. It was recorded along the Western Access Road at weed transect CWM05, approximately 5 km from the Stuart Highway. A total of 10 plants were recorded at the western end of the weed transect. The plants appeared dead and no fruit were observed either on the plants or on the ground. It is possible that seeds were spread to this location from vehicle tyres and/or animals. It is recommended that this population be monitored and if found to be viable plants, implement control measures.

4.1.6.3 Weed species Declared or listed under legislation (*Landscape South Australia Act 2019*)

Declared weed species recorded during compliance/operational surveys include Bathurst Burr, Athel Pine (*Tamarix aphylla*) and Prickly Pear (*Opuntia* species). These species have been recorded during all operational surveys, primarily in off lease areas adjacent the operational area. Athel Pine and Prickly Pear species are also considered to be Weeds of National Significance (WoNS).

During baseline and compliance surveys to date, Bathurst Burr has only been recorded at the dam sites (which are outside of the mineral lease), in the vicinity of dam sites, and along weed transects CWM01 and CWM02, associated with drainage lines intersecting the Southern Access Road. These populations have not increased during compliance monitoring. However, as noted above, in 2025, a new population was recorded along Weed Transect CWM05. In the SA Arid Lands, control is not enforced, but landholders are encouraged to manage infestations (Government of South Australia (2022)). Weed transect CWM02 occurs within Mineral Lease 6172 and CWM01 falls within the Southern Access Road and Radial Wellfield MPL 154. It is recommended that BHP continue to work with the station owner to manage infestations at Dawson Dam and South Eliza Dam.

Athel Pine has been recorded as clustered trees around Yeltacowie Homestead and the nearby dam. These trees are being actively controlled with numerous dead trees and/or cut trees present. In 2025, the population had not increased and comprised up to 10 previously cut trees that were now suckering and/or supporting regrowth shoots, and two large old trees, up to 10 m tall. Ongoing control of these trees is recommended.

The isolated population of Prickly Pear near the Yeltacowie homestead (outside of the operational area) has been actively managed since 2021 (and including 2025) by poisoning with cochineal. In 2025 this population had been reduced to approximately 10 m^2. In 2024, however, BHP environmental staff reported two additional occurrences of Prickly Pear (not sighted during the 2025 survey). These two small

occurrences have been treated for the last couple of years and are also reducing (both are outside the operations area (SED and Emmie's Buff)).

4.1.7 Landscape Function Analysis

The spring 2025 survey included the seventh assessment of Landscape Function at the Aerodrome site prepared for rehabilitation in 2019 and the fourth assessment at the Midway Quarry site prepared for rehabilitation in 2022. Both sites were devoid of plants when initially prepared for rehabilitation and are sites that formerly supported Bladder Saltbush +/- Samphire low shrubland on stony tableland.

The Ventia site was prepared for rehabilitation in 2019 but was decommissioned in 2024 due to lack of plant re-establishment and the site being encroached upon by road work activities. Areas nearby have been re-ripped and hand-seeded, hence a new LFA site will be established, once seedlings emerge. A fourth rehabilitation (Tjungu on the WAR) was prepared for rehabilitation in 2022. The site was assessed using the LFA method from 2022 to 2024. By 2024, plant cover and soil parameters recorded with the LFA method were equal to those measured in reference (analogue) habitats. The rehabilitation success of this site correlated with the deep ripping and seeding that occurred, not only providing deep trenches to capture water and seed, but also to create high volume surface rock cover that assisted in trapping nutrients.

For the 2 surveyed sites in 2025 (Aerodrome and Midway Quarry), the Point-Centred Quarter (PCQ) method has been used to complement the LFA survey; namely, to additionally record plant density and diversity in the early stages of rehabilitation when plant density along the LFA transect line is sparse. PCQ monitoring began in 2020 for the Aerodrome site but was discontinued in 2024 by which time plant density and diversity was sufficient to show yearly changes using the LFA method alone. The PCQ was first used in 2023 for the Midway Quarry site and was continued in 2024 and 2025, because plant re-establishment had been insufficient to show changes using the LFA method alone.

At the Aerodrome site, both LFA transects a steady increase in the vegetation cover along the transect was recorded between 2020 and 2024. However, in 2025, the percentage of vegetation intercepted along the transect was only 11% compared with 25% in 2024. Since 2024, Lathwida ecologists have collected species composition data, in addition to the LFA method requirements. The additional data has enabled a comparison of the floristic composition with adjoining reference vegetation. Despite a decline in vegetation cover along the Aerodrome transects in 2025, the diversity of species has continued to increase. In 2025, 8 species were intercepted (6 short-lived and 2 long-lived) with 23% of the vegetation patches intercepted along the transects contained long-lived species. Soil parameter indices at the Aerodrome site have remained relatively consistent since 2021, and slightly below or close to the analogue mean. This reflects that the soil surface is stable but still developing a cryptogram and litter cover. Although re-establishment has been successful over approximately two thirds of the transects, one third of each LFA transect remains devoid of vegetation. These areas are likely to slowly recolonise, the process prolonged due to lack of deep troughs.

At the Midway Quarry site, re-establishment of vegetation has been very sparse and confined to a few individuals of the 2 short-lived species. Salt Bindyi (*Sclerolaena ventricosa* and Pop Saltbush (*Atriplex holocarpa*). In 2025, only 2% of the transects were intercepted by vegetation, a decline since 2024, and well below the analogue mean of 34% of the transect. Despite the very limited re-establishment of

vegetation cover, the LFA soil indices were only slightly below the analogue means, perhaps reflecting the moderate litter cover developing and the relatively stable clay soils. At the Midway Quarry site, the troughs that were initially ripped have largely levelled out.

LFA summary and recommendations

At the Aerodrome site given there is an unevenness of plant cover, rehabilitation is not yet complete and further monitoring is recommended for at least one more year. The re-establishment of vegetation would be facilitated by deep ripping and / or hand seeding the larger areas currently lacking vegetation.

At the Midway Quarry site, vegetation cover is sparse and ongoing monitoring is recommended for several more years. It is recommended that the site be re-ripped to a greater depth and supplemented with hand direct-seeding of Bladder Saltbush seeds.

A new LFA site should be established along the WAR near the Ventia LFA site and at Flora Site 3 in areas that were deep ripped and hand seeded in September 2025 (Plate 4.1).



Plate 4.1: Deep ripped and hand direct-seeded section of WAR for proposed LFA

It is noted that 2024 LFA reporting included patch density as an LFA index. The patch density in 2024 was close to analogue means, but the use of this parameter is considered misleading and not reported upon in 2025. A patch density increase may be due to fragmentation of existing larger patches, rather than an increase in the number of new patches.

Analogue sites could be established at the nearest Flora site to LFA sites, using the established 100 m Jessup transects, allowing for 2 x 50 m duplicates along that existing transect.

OMC LUP4 is considered to be in-progress / compliant at, Aerodrome and Midway Quarry sites.

4.1.8 Fauna

4.1.8.1 Diversity and abundance

A total of 87 vertebrate species were detected during the 2025 spring fauna survey from the 8 trapping sites and opportunistically within the broader study area. Total species diversity (birds, mammals and reptiles) was generally within the range of baseline and previous compliance survey results. The capture rate for small mammals and reptiles combined (0.34) was below the previous spring compliance monitoring rates (0.44 in spring 2024), but within the compliance range (~0.23 to 0.44 between 2018 and 2024) and within the range reported during baseline surveys (0.17 to 0.97 between 2012 and 2017). The rate in 2025 was largely influenced by the number of reptile captures and warmer temperatures during some days of the survey. There is also likely an influence for some fauna species from presence of slightly above average short-lived flora species, sustained by rainfall events in March and July.

Whilst the site has experienced ongoing drought conditions and below average rainfall, above average rainfall events in the late spring of 2024 and autumn/winter 2025, interspersed with periods of well below above average rainfall likely influenced these results. Presence of water in the dams would have contributed to maintaining stable bird diversity, a winter rainfall event and presence of short-lived flora would have provided resources to the resident dunnart and reptiles species. For small mammals, small native rodent numbers were low, likely reflective of fluctuating but not excessive rainfall throughout the preceding years, and they also only detected at control sites in 2025. Both dunnart species remain consistently detected at both control and impact sites. There was evidence of all fauna breeding, in family groups or pairs, some small mammals had evidence of brood patches. In addition, a few species (bird and reptile) were detected that had not been detected since baseline or prior and only is low numbers. The presence of species that have not been recorded since the baseline monitoring and moderate bird and high reptile diversity is also a positive sign for the overall condition of the Carrapateena site.

Mammals

In terms of small mammal diversity, several species were not detected in 2025 or detected in very low numbers (e.g. Central Short-tailed Mouse, Planigales), or only via camera trap (e.g. Sandy Inland Mouse), however these species have historically been recorded in lower numbers and have not been recorded during all previous surveys. The Central Short-tailed Mouse being the exception that has been recorded from 90% of surveys. No Plains Mouse were detected in 2025, consistent with previous compliance monitoring surveys, extended periods of the baseline monitoring, and with regional findings in 2025. Small rodents (as a group) were not detected at impact sites in 2025, although in 2024 they were detected at impact sites, but not control sites. Whilst this is worth watching, it is more likely related to climatic conditions preceding the survey and lower numbers of detections (sample size). It is well known that a characteristic of desert or arid dwelling small mammals is dramatic abundance fluctuations in response to periods of high rainfall and drought, which are further influenced by resource competition and

predation (Read 1988, Letnic et al. 2011). For example, Pseudomys species have been shown to respond to significant weather events 3-10 months after the event, with the variability in response dependent on both pre-existing population abundance and resource availability (Dickman et. al. 1999). In addition, long-term monitoring of native mammals within and outside the Arid Recovery Reserve (where predators and pest are excluded) north of the Olympic Dam mine also suggest differences in succession responses to impacts from pest and predators, similar to that expected following disturbance such as vegetation clearance, fire, mining and agriculture (Moseby et al. 2025). Moseby (et al. 2025) recently found that smaller rodent communities (e.g. Sandy Inland Mouse, Bolam's Mouse, House Mouse) responded to high rainfall events within approximately 12-18 months, but the degree of the response was likely linked to predator pressure and the population conditions prior to rainfall response. These findings could also suggest that rodent numbers at Carrapateena are currently low as a combined result of competition from native and pest grazers, predators and low rainfall. Interestingly, Moseby et al. 2025 found that Dunnart responses were comparably delayed and muted in comparison to rodent response, suggesting less influence from predators, non-native competition and rainfall.

Of the small mammal captures from the 2025 spring survey, Stripe-faced Dunnarts were again represented in greater numbers than Fat-tailed Dunnarts, aligning with trends observed during baseline and compliance monitoring prior to 2025 where they have consistently been detected at both control and impact sites. Stripe-faced Dunnarts are known to prefer habitats with greater plant diversity and healthier (denser) understorey (Animalia 2018, OEH 2020). Stripe-faced Dunnarts were present in several age classes and larger numbers, suggesting conditions were suitable for that species, whereas Fat-tailed Dunnarts were present in much lower numbers and may not have commenced breeding. Fat-tailed Dunnarts are known to continue to breed for to up 6 months without breaks once the breeding season commences, hence smaller numbers may suggest drier conditions earlier in the season may have limited the opportunity for a continuous breeding cycle. Similarly, dunnarts are known to use daily torpor to thrive in adverse environmental conditions and exploit resource poor environments and they are known to adjust the breeding period depending on climatic conditions. Whilst results showed lower numbers for native rodents, small mammal detections in total were towards the highest recorded during the compliance monitoring period (2022 being the highest), with no significant differences between control versus impact. There is no evidence to suggest mining is impacting small mammal presence across the site.

While the survey effort used for detection of microbats has not been consistent across compliance monitoring, when compared with baseline monitoring, a number of species were previously detected and it is considered good practice to occasionally monitor for these species to confirm ongoing existence at the location. During the 2024 survey 5 microbat species were detected at sites with suitable roosting or feeding habitat, and 4 of these species were also detected in 2025. Two of these species have been regularly detected at site (White-stripe Free-tailed Bat, audible to the human ear, and the Lesser Long-eared Bat), 2 other less common species were also detected in 2025 (Gould's Wattled Bat, Inland Forest Bat) and 1 species was not detected (Inland Free-tailed Bat). Prior to 2024, there were only 4 records for the Inland Free-tailed Bat (1 from autumn 2013, 3 from spring 2007).

Comparisons of mean total species diversity and capture rates between control and impact sites showed slightly higher species diversity at control sites compared with impact sites. Trends were similar for the older treatment and the new revised treatment (e.g. Site 4 and 6 as Control sites). Regardless, differences

between control and impact means of mean diversity and captures were not statistically significant. The updated treatment continues to provide more statistical rigour having an equal number of control sites (4) compared with impacts sites (4) and aligns more with delineation of control and impacts sites (e.g. previously related to dust contour monitoring, distance to infrastructure) in relation to the operations phase, now that the WAR has been completed, and traffic along the SAR is greatly reduced. The findings for fauna also align with the flora results. Regardless, significant mining related impacts to common fauna are not evident from the 2025 data or from comparisons of previous baseline and compliance data.

Birds

A total of 57 bird species were detected during the spring 2025 survey across the Carrapateena site. Similar to recent years (except for autumn 2023), Splendid Fairywrens were not detected in the sand dune habitats. Whilst resident White-winged Fairywrens and Purple-backed (Variegated) Fairywrens have been generally detected every year during baseline and compliance monitoring, Splendid Fairywrens are not recorded every year, suggesting transient presence, or population fluctuations that may be dependent of more sustained rainfall. Similarly, Rufous Fieldwren are not detected every year (e.g. absent in 2020, limited detection in 2021). However, this species was detected at most fauna sites in 2024 and 2025 and regularly recorded on Song Meters.

Similar to spring 2022-2024 there was water present in all the dams in 2025. Water in the South Eliza temporary water source (less extensive than the spring 2024 survey) also attracted some waterbirds species to the location. One EPBC listed threatened species was detected opportunistically; Southern Whiteface was detected at a weed monitoring site along the WAR (CWM05). No EPBC listed Migratory shorebird species were detected. No State listed species were recorded.

There were no new records for the site, but for 2 bird species that had not been detected since before baseline surveys; Rufous Whistler (not since 2006), was detected at both sand dunes sites (Site 21 and 22) and Brown Goshawk (not since 2017) was detected opportunistically at weed site CWM01. The total number of bird species was below 2023 (68) and 2024 (74) but within the baseline range (42-70) and compliance range (46-74) and is likely reflective of the preceding below average rainfall and associated impacts on short-lived vegetation and Song Meter detection (increased windy periods) at some sites. Noting only 8 additional species were detected via Song Meter, that were not detected via bird survey and Song Meters were also deployed in 2023/2024.

Reptiles

A total of 17 reptile species were detected during the spring 2025 survey across the Carrapateena site, the majority were detected via physical trapping (76 of 110 records). As per previous surveys, the main species recorded in traps was the Saltbush Ctenotus (*Ctenotus olympicus*) with the greatest numbers being detected at Impact Site 15 (16), Control Site 4 (7) and Impact Site 5 (6). The reptile trap captures were considered commensurate with the temperatures observed during the spring survey.

Five common reptile families were well represented during the survey; with the skinks represented by 9 species, dragons by 4 species, geckos by 2 species, and snakes and goannas by one species. Juveniles of several species were detected during the survey (e.g. Southern Four-toed Slider (*Lerista dorsalis*) (Plate 4.2) indicating ongoing successful breeding activity across the site.

Detection of species that have not been detected since baseline is always a positive for the monitoring program. In 2025 the Southern Four-toed Slider that was detected during baseline and then not until spring 2024 was captured at Site 6 (another juvenile of this species). In addition, a Broad-banded Swimmer was detected opportunistically by BHP staff in the accommodation area. The species has not been detected since baseline surveys (2016). There are no clear patterns emerging for reptile diversity or captures between control and impact sites.



Plate 4.2: Juvenile Southern Four-toed Slider captured again at Site 6

EPBC listed species

Only 1 EPBC listed threatened fauna was detected throughout the spring 2025 survey; Southern Whiteface (Vulnerable), detected opportunistically at a weed monitoring transect. This species has been recorded at the site previously, most recently in 2021 at opportunistic site WAT17. No other EPBC threatened or Migratory bird species were detected. EPBC listed Plains Mouse were not detected (via trapping or camera), and there was limited evidence of surface activity around gilgais. This species has not been detected since baseline surveys in 2017 (via standard fauna trapping) and is detected typically following a prolonged period of good rainfall. Similarly, the species was detected in very low numbers (only one detection) at South Gap in 2024, but there were no records in 2025. Baited camera trapping was deployed at two South Gap offsets areas in 2025 (cameras deployed at 20 sites ongoing, although results were only obtained from 13 cameras in 2025). Detection rates for other small mammals (e.g. dunnarts and smaller rodents) remained low and stable at the South Gap areas in 2025 (Nature Foundation 2026). The offset areas, located southeast of Carrapateena on the banks of Lake Torrens, received below average rainfall of 110 mm in 2025, with most falling in November of 2024. This follows an ongoing decrease in numbers of Plains Mouse detection. Plains Mice were also not detected by trapping during autumn and spring surveys near Olympic Dam (outside of Arid Recovery Reserve) and Oak Dam in 2025 (Lathwida 2026a,b,c). There was 1 detection via non-baited camera trapping at Oak Dam in autumn 2025 (Lathwida 2026c). Whist Plains Mice were originally detected at Carrapateena via annual pitfall trapping, future consideration could be given to establishing a baited camera trap program, similar to South Gap to increase detection. In addition, review of rainfall conditions preceding the next annual survey should be considered, prior to deciding whether the annual 2025 survey should be in autumn or spring. One option may be to deploy cameras in autumn through to the physical trapping survey in spring. Autumn deployment of cameras would need to follow suitable sustained rainfall and could coincide with other monitoring that is not season dependent in arid locations (e.g. LFA, weed monitoring).

Pest species

Whilst evidence of pest species was noted (House Sparrows at camps, Rabbits at several locations), there was no major increase in presence of pest fauna species was observed as part of the survey, i.e. observations of rabbits, sparrow numbers and cats was maintained / less than previous and House Mice were not detected. The rabbit warren along the track to Site 15 was not notably active. No Feral Pigeons or foxes were detected. All of these species have been recorded previously, in low numbers and hence does not constitute an increase in pest species present, therefore the site is considered compliant against OMC criteria related to pests.

4.2 Compliance against obligations

As indicated in Section 1.1.1 above, the approved PEPR for ML 6471 outlines a number of monitoring commitments required to demonstrate compliance against the mine lease 6471 conditions (Table 1.1) and the approved environmental outcomes (Table 1.2) for the Operation. Table 4.1 below provides a summary of compliance against the conditions and outcomes based on the results of the spring 2025 survey.

All mine lease conditions and outcomes are currently being met.

Table 4.1: PEPR ML 6471 Compliance Reporting, spring 2025

Date	Monitoring Requirement/s	Achievement Value	Locations	Compliant / Non-Compliant	Evidence	Actions / Recommendations
September 2025 (spring)	ML 6471 Schedule 6, Condition 6, Condition 28.1 MPL 149 Schedule 6, Condition 10, MLP 152 to 154 Schedule 6 Condition 6 MLP 156 Schedule 6 Condition 3 OMC WP1 / WP2 Annual (spring) survey	No introduction of • new species of weeds declared or listed under relevant legislation • plant pathogens • pests (including feral animals) when compared to previously recorded weed species and introduced fauna. No sustained increase in the abundance of existing weed or pest species in the land compared to previous survey records.	Weed monitoring transects (CWM01-CWM07, NWM01-NWM03) Flora Sites 1- 7; 9 – 13; 15 - 22 Opportunistic and targeted observations across Operation area	Compliant	No new species of weeds declared or listed under relevant legislation were recorded at flora sites, weed transects, or elsewhere within the Operational area in September 2025. No new species of weeds declared or listed under relevant legislation were recorded at flora sites, weed transects, or elsewhere within the Operational area in September2025. Existing known Declared weeds are Bathurst Burr, Athel Pine and Prickly Pear (although Prickly Pear is outside the operations area, and Athel Pine is on the edge). One new small population of Bathurst Burr recorded in spring 2025, totalling 10 plants along Western Access Road. No increase in known populations. No increase in size of the known small populations of Athel Pine, which is being actively controlled. No increase in the size of the existing documented small population of Prickly Pear, which is being actively controlled. Two additional small patches are also being treated, but these are outside of the operations area. In 2025, new locations of existing weeds were recorded for 2 annual herbaceous species Cut-leaf Heron's-bill (Erodium cicutarium) and Sow Thistle (Sonchus oleraceus). The increased occurrence of these species was related to optimum germination conditions prior to and during the survey, namely winter rainfall, cool to mild soil temperatures and diurnal temperatures These species produce 8000 or more seeds per plant which remain viable for several years. Seed spread for Sow Thistle is primarily by wind. Hence their occurrence can be widespread, random and temporary. New locations for both species were represented by both control and impact sites. Hence their increased occurrence is expected to be temporary and was likely due to climatic conditions rather than mining activities. In summary, in 2025 a new but small population of Bathurst Burr was recorded along the WAR. This population should be removed and monitored to ensure no new propagules occur. Apart from this population, there has been no net or sustained increases in the population of any other weed species recorded. House Sparrow (previously during baseline) numbers were slightly reduced at the exploration camp, where worker occupancy was reduced at the time of survey. Rabbit presence observed at less sites, presence is maintained or less. Cats only detected at one location (sand dunes).	Ongoing weed monitoring at flora sites 1-22 and weed transects CWM01 - CWM07, and opportunistic and targeted observations (villages, spill areas, dams). Ongoing opportunistic observations, including revisiting sites where weeds have been identified in spring 2025. Weed management by BHP in response to data reported here, in particular control of Bathurst Burr population along the WAR, and continued ongoing management of Bathurst Burr at existing known locations. Any new individuals to be controlled by environmentally sensitive methods, including manual grubbing and disposal of vegetative matter or spraying where appropriate and will not impact drainage lines / water habitats. Continue control and monitoring of Athel Pine and Prickly Pear (supporting the station owner) at the homestead and other locations that are off lease. Ongoing monitoring of birds, including House Sparrows. Monitoring of rabbit / cat population and control as required (e.g. warren at Site 15).

Date	Monitoring Requirement/s	Achievement Value	Locations	Compliant / Non-Compliant	Evidence	Actions / Recommendations
September 2025 (spring)	ML 6741 Schedule 6 Condition 14 OMC AQ2 Annual (spring) survey	No adverse impacts on the diversity and abundance of native vegetation at monitoring sites directly attributed to dust deposition from mining operations or mine related activities when compared to baseline native vegetation conditions unless an SEB has been approved in accordance with the relevant legislation	Flora Sites 1-22 See Figure 9.3 of the PEPR. Figure 2.1	Compliant	Specific dust transects established and surveyed in 2020 covering a range of habitats including sites downwind from spoil heap. The 2020 results indicated that no dust was detected at transects and no death of vegetation was noted. In 2025, no dust was noted on vegetation at existing survey locations, or elsewhere across the Operations area. Existing flora survey sites (1-16, excluding 8 and 14, plus 17- 22) were monitored for native plant species diversity (RAM flora sites) and abundance (Jessup transects) in spring 2025 and data collected was compared with baseline data. Total plant species diversity at all individual sites in 2025 was within the baseline range for each site. Mean long-lived species diversity at control sites and at impact sites has also been within the baseline range, during all compliance surveys. The diversity of long-lived drought-resistant species has remained relatively stable since 2018, and in line with baseline data. Short-lived species diversity has varied widely during compliance monitoring has correlated with seasonal rainfall but has remained within the baseline range during compliance monitoring, including in 2025. There is no clear difference in species diversity between control and impact sites, either in long-term species diversity or in total species diversity. Control and impact sites have recorded similar directional changes in long-lived species diversity during compliance monitoring. No adverse impacts on the diversity and abundance of native vegetation at monitoring sites due to mining activities have been detected.	Nine years of compliance monitoring has established that flora species diversity has remained within the baseline range, and that trends in flora diversity at control sites have been similar to those at impact sites. To streamline reporting, it is recommended that there be ongoing vegetation monitoring at all existing RAM and Jessup flora sites, but that trends in diversity need only be compared between control and impact sites, rather than with baseline means. As the time from baseline data increases, it becomes less valid to compare diversity in a changing climate with diversity from a set time (2013 to 2016).

Date	Monitoring Requirement/s	Achievement Value	Locations	Compliant / Non-Compliant	Evidence	Actions / Recommendations
September 2025 (spring)	ML 6471 Schedule 6 Condition 17 OMC TSF6 / SWRF1 Annual survey	No adverse impact on the diversity and abundance of native vegetation and water dependent ecosystems attributed to tailings seepage or reduced surface flows caused by mining operations when compared to baseline conditions (unless an SEB has been approved). Linked to Native Vegetation Outcome (Schedule 6 Condition 11)	Eliza Creek monitoring (Flora Sites 10, and 17-20 (which include Canopy Cover transects). See Figure 9.3 of the PEPR (BHP 2025a).	Compliant	<u>Decant Dam seepage event</u> In late 2022 / early 2023 saline seepage from the TSF extended beyond the approved impact zone. The area impacted by the saline seepage was surveyed in May 2023, and April 2024, and damage to native vegetation (death and dieback) was recorded over an area of approximately 0.4 ha beyond the approved impact zone. Repeat surveys in October 2024 and September 2025 noted no further impact on vegetation, and it was considered that no increased area of impact from the saline seepage was likely. A Significant Environmental Benefit (SEB) offset under the Native Vegetation Act 1991) has been paid as per the NVMP associated with the PEPR (Appendix C BHP 2025a). <u>Regular monitoring sites</u> Eliza Creek monitoring results indicate no adverse impact on the diversity and abundance of native vegetation due to mining activities. Vegetation is monitored at Flora Sites 17-20 at increasing distance from the proposed TSF dam wall, covering both Western Myall and Red Gum habitat. RAM, Jessup transects and Canopy Cover data is collected at all 4 sites. Data collected in 2018 and 2019 represents baseline condition, species diversity, abundance and tree health prior to TSF construction. Monitoring at Flora Site 10 (furthest distance from TSF,), also includes Jessup and RAM surveyed 2012 – 2017, and during compliance surveys (2018 to present). RAM flora sites show no obvious trends in long-lived species diversity during compliance monitoring. In 2025, long-lived species diversity was below baseline means at 3 sites, but the same or greater than baseline means at 2 sites, including Site 17 closest to the TSF. RAM site results also indicated no obvious trends in total flora species diversity. Jessup transect results indicate no obvious trends in abundance of long-lived perennial species at all sites, including gibber sites and the Eliza Creek sites. Canopy Cover transect results indicate increasing canopy cover for Western Myall at sites closest to the TSF, and no obvious trends in canopy cover for Western Myall at sites furthest from the TSF). At the Red Gum dominated sites, Red Gum canopy cover records using the hand-held densitometer show no obvious trends. Visual estimates of canopy extent declined in 2025 but data from future surveys is needed to indicate whether this is a longer-term trend. Tailings dam storage facility Stage 1 construction completed just prior to spring 2019 survey, and now operational. Eliza Creek has not flowed since pre TSF construction, there was however a controlled release from the decant dam in June 2019, with flow only recorded to 600 m downstream of the TSF and no adverse impact on flora at the downstream monitoring sites has resulted from this controlled release.	Ongoing vegetation monitoring at Flora Sites 17-20 for RAM, Jessup transects and Canopy Cover (reflects a leading indicator of tree health) to enable monitoring of potential impacts, and trends in diversity and abundance of native vegetation. Adaptive management of monitoring program as required if leading indicators indicate potential impacts (e.g. canopy cover measures in close proximity to tailings dam wall). Consideration of repeat of remote sensing vegetation cover estimates on a periodic basis, as a cost-effective way to track changes in vegetation cover downstream of the TSF embankment. No further formal monitoring of Decant Dam seepage is considered necessary as no further extent of damage is considered likely. If permission is provided, install star droppers at dune flora sites and more at Eliza Creek flora sites to assist with more precisely replicating area surveyed each year.
September 2025 (spring)	ML 6471 Schedule 2 Condition 28.2 MPL 152 Schedule 2 Condition 13.2 OMC EPBC1 Annual survey or opportunistic sighting	Any records of sightings and recordings of the Thick-billed Grasswren are provided to the BDBSA to enable effective monitoring and record keeping, as per the Recovery Plan Actions.	Bird monitoring Sites 1-22 (which overlap with Flora Sites 1-22, and include Fauna sites 1-6, 15, 16). See Figure 9.2, 9.3 of the PEPR (BHP 2025a). Opportunistic observations across project area.	Compliant	EPBC1: No records of the Thick-billed Grasswren were reported during the spring 2025 survey at any of the 20 bird survey locations or opportunistically, including sites where Song Meters were deployed, so no records were provided to the BDBSA to facilitate effective population monitoring and record keeping. Song meters were deployed at 8 fauna sites, Eliza Creek (Site 10) and Site 7 in Bosworth creek. One EPBC listed species (Southern Whiteface) was detected and results will be provided to the BDBSA during annual reporting as per fauna permit requirements.	Ongoing bird surveys across all flora sites 1-22 and opportunistically to establish trends with baseline and compliance data. Report any future records of Thick- billed Grasswren to the BDBSA.

Date	Monitoring Requirement/s	Achievement Value	Locations	Compliant / Non-Compliant	Evidence	Actions / Recommendations
September 2025 (spring)	ML 6471 Schedule 2 Condition 28.2 MPL 152 Schedule 2 Condition 13.3 OMC EPBC 2 Annual survey or opportunistic sighting	Any records of sightings or captures of the Plains Mouse are provided to the BDBSA to enable effective monitoring and record keeping, as per the Recovery Plan Actions.	Fauna sites 1-6, 15, 16 for fauna trapping. See 9.2 of the PEPR (BHP 2025a).	Compliant	EPBC2: No records of the Plains Mouse were reported during the spring 2025 survey at any of the 8 established fauna trapping sites, so no records were provided to the BDBSA to facilitate effective monitoring and record keeping.	Ongoing pitfall trapping at 8 established fauna trapping sites to demonstrate species ongoing presence at site during periods of irruptive population growth and that refuge habitat continues to be effective despite mine operation. Report any future records of Plains Mouse to the BDBSA.
September 2025 (spring)	ML 6471 Schedule 2 Condition 28.2 MPL 152 Schedule 2 Condition 13.4 OMC EPBC 3 Annual survey or opportunistic sighting	Any records of sightings or recordings of the Night Parrot are provided to the Night Parrot Recovery Team to enable effective monitoring and record keeping.	Bird monitoring sites 1-22 (which overlap with Flora Sites 1-22, and include Fauna sites 1-6, 15, 16). See Figure 9.2 of the PEPR (BHP 2025a). Opportunistic observations across project area.	Compliant	EPBC3: No records of the Night Parrot were reported during the spring 2025 survey at any of the 20 bird survey locations or opportunistically or via Song Meter, so no records were provided to the Night Parrot Recovery Team to facilitate effective monitoring and record keeping. One EPBC listed species (Southern Whiteface) was detected and results will be provided to the BDBSA during annual reporting as per fauna permit requirements.	Ongoing bird surveys across all flora sites 1-22 and opportunistically to establish trends with construction now underway. Report any future records of Night Parrot to the BDBSA.
September 2025 (spring)	ML 6471 Schedule 6 Condition 1, 5, 8, 9 OMC LUP4 Annual LFA monitoring	Rehabilitation has achieved, or is likely to achieve, a landscape function equivalent to that of adjacent analogue LFA sites.	Baseline (analogue) LFA data from sites CEF1-CEF7 (shown in Figure 9.3 of the Carrapateena PEPR BHP 2025a). Rehabilitation monitoring at 4 locations to date (Airport Laydown and Ventia Laydown, Midway Quarry, Tjungu).	Compliant	Baseline LFA data established from analogue sites. Rehabilitation monitoring established at 2 sites in 2020 and 2 sites in 2023. But in 2025, monitoring discontinued from Ventia Laydown (established 2020) due to absence of rehabilitation and site being used for roadwork activities, and discontinued at Tjungu (established 2023) due to successful and complete rehabilitation. In spring 2025ite rehabilitation monitoring continued at 2 locations (LFAAL1 (Airport Laydown) and LFQUA3 (Midway Quarry), LFATJU4) with 2 transects at each site. LFA results at the Airport Laydown showed continued increases in vegetation cover until 2024 but a decline in vegetation cover along transects in 2025. LFA results at the Midway Quarry showed sparse rehabilitation in 2024 but a decline in 2025 with plants very sparse to largely absent. Data showed increasing long-lived species establishing at the Airport Laydown but only short-lived species present at the Midway Quarry. Ripping depth during site preparation at both sites was less deep than the more successful Tjungu site.	Midway Quarry site unlikely to re-establish in the short to medium term. Recommend that this site be ripped to a greater depth, combined with direct seeding of Bladder Saltbush. Consider re-ripping areas of Airport Laydown site where re-establishment has not occurred (up to 15 m lengths along transect). Continue LFA monitoring at Airport Laydown and Midway Quarry rehabilitation sites. Establish new LFA sites along WAR where deep ripping and hand seeding occurred in 2025. Establish new analogue sites adjacent to any new sites that are established.

4.3 Suitability of data for Informing compliance

4.3.1 Overview

The data collected during the spring 2025 survey is considered to provide meaningful data to determine compliance against the mine conditions and approved outcomes. The survey methods employed enabled comparison between impact and control sites, as well as comparison with baseline data. Construction / operational compliance monitoring data has now been collected since 2018. Results have been presented as text, tables and graphs, enabling demonstration of compliance against the established outcomes and measurement criteria, and representation of initial construction/operational compliance data trends.

4.3.2 RAM quadrats

The RAM data has provided quantitative data on species diversity present within each of the Flora Sites assessed. Further classification of species into woody long-lived perennial species vs short-lived species enables a more thorough examination of the difference between climate and/or grazing impacts against potential impacts from mining operations. Comparison with the baseline species diversity range has facilitated determination of the status of current site diversity. The RAM quadrats have enabled species diversity trends to be analysed in 4 ways; cumulative totals for all monitoring sites, comparisons of impact vs control sites, at the habitat level (gibber, dune, creek) and at the individual site level. Comparing species diversity for sites of similar habitat will help determine potential trends in species diversity regardless of distance to mining infrastructure. Comparing diversity trends for each site has been done to identify potential site-specific causes of impacts to flora (which may or may not include mining impacts).

All sites other than dune sites and Eliza Creek sites have been well defined, which has meant that the survey area has been accurately repeatable, providing consistent results. Long-lived perennial diversity has been relatively stable, while short-lived species diversity has shown a very strong correlation with yearly rainfall totals, indicating the survey method provides accurate and meaningful data. However, the dune sites are not defined on the ground (relying on surveying a 55 m radius from a known coordinate) and the Eliza Creek sites are loosely defined – beginning at the Jessup transect and surveying an estimated 1-hectare area that comes under the influence of the creek system.

It is recommended that permission be sought to install 4 star droppers at each dune site, and an additional 4 star droppers at each Eliza Creek site to assist with RAM boundary determination during surveys.

4.3.3 Jessup transects

The Jessup transects provide quantitative data on the number of adults and juveniles present for long-lived shrubs. This provides information on the health and vitality of individuals within a population, for example, it indicates if recruitment is occurring, or whether the population is declining, increasing, or staying the same. Combined with qualitative observations made on plant health (including defoliation and/or presence of dust on foliage) this will help inform if there has been an adverse impact on the diversity and abundance of long-lived woody native vegetation directly attributed to dust deposition from mining operations or mining related activities. To date, species abundance has been compared between baseline and compliance monitoring and also control site trends have been compared with impact site

trends for the compliance period. Results from these surveys enables reporting against compliance conditions.

Since 2020, the number of species analysed for the Stoney Tableland sites, has increased from 2 (Bladder Saltbush and Plains Lantern Bush) to 5 species (additionally, Samphire, Plains Lantern Bush and Thyme Sea-heath), in response to widespread foliage loss of the 2 dominant species (Bladder Saltbush and Samphire) at the Stony Tableland sites. These 5 species are the most abundant species and widespread long-lived shrubs at the Stony Tableland sites. Analysing their abundance trends provides insightful data on trends in population abundance in both palatable and non-palatable species. For all 5 species, the Jessup data has been very effective in reflecting population changes due to varying yearly rainfall totals. Species abundance at both control and impact sites have shown similar trends, that align with rainfall. Where there have been small differences between control and impact site trends, impact site abundance has increased more than at control sites. The Jessup data has shown that mining has had no impact on the long-lived shrubs at Jessup sites.

Prior to the 2021 survey, at the Eliza Creek sites, analysis was confined to comparison of net perennial species abundance between recording periods. In 2021, the analysis was expanded to compare trends in the abundance of individual perennial species. In 2025 the analysis focussed on 6 species that were common at Site 17 and 18, and also common at least one other site. Site 17 is closest to the TSF (270 m downstream), hence potential impacts related to the TSF would become evident first at that site and progressively downstream. The species analysis includes Western Myall, the dominant overstorey species at Site 17 and 18. To date the Jessup tallies have shown no distinct trend in abundance of the prominent shrubs and trees. This has proven a valuable tool for determining potential trends in populations of individual species, rather than simply comparing total species diversity.

4.3.4 Canopy cover transects

The Canopy Cover transects are used to record the presence of canopy foliage along a fixed 100 m transect at 1 m intervals. Within individual canopies, there may be from 1 to 5 or more recordings, depending on the width of the canopy. The technique is objective and does not rely on observer estimations of individual tree canopy intactness. By repeating the survey along a fixed transect, it is estimated that the technique can detect changes in canopy cover for the whole tree stand, and less accurately for larger individual canopies. It is estimated that the method has the ability to detect foliage cover changes at the stand level where there has been a real change in foliage extent of as little as 20%. Tree stress or death is expected to show up in densitometer results.

The technique is considered suitable for informing whether there has been a change in the health of the dominant trees on Eliza Creek and is seen as a leading indicator of tree stress. The technique proved very informative for determining the extent of impact from the TSF seepage in December 2022. Surveying the canopy cover transects at Site 17 (aligning with the downstream extent of seepage impact) in 2023, 2024 and 2025 showed that the seepage had no impact on Western Myall health at Site 17. These surveys will therefore contribute to the reporting against compliance conditions related to impacts in Eliza Creek.

Since 2019 visual estimates of canopy cover are also undertaken to complement the densitometer canopy cover assessments. Visual estimates of individual tree canopies enable record of individual tree canopy health and provide a time frame for potential canopy loss and in some cases, tree death. Results to 2024

show that the densitometer results are broadly in alignment with visual estimates, but in 2025 the visual estimates indicated declines in canopy health, which were not detected by the densitometer. It may be that the visual estimates have detected declines in canopy health slightly ahead of time lines for densitometer detection. Both methods should continue to be used.

Since 2021 additional trees have been recorded along the transects. These were new trees that meet the survey requirements along the transects as they mature. The transition in age classes and maturation of new recruits has been effectively demonstrated by the results of Canopy Cover transects.

The canopy cover data is considered to provide an objective method of determining trends in canopy health across the whole of the transect, including documenting tree deaths and recruitment. The visual estimate (no tool) is considered a more accurate assessment of tree health for individual trees, but the densitometer assessment is considered a more repeatable and objective assessment of the tree population, namely at the stand level. The trial in 2019 of using remote sensing of aerial imagery to estimate vegetative cover in increments downstream from the TSF embankment is considered a useful additional tool to monitor vegetation health within Eliza Creek.

4.3.5 Weed transects

Weed transects represent a repeatable, temporal examination of weed diversity and abundance at the site and are not time consuming to conduct. They are aligned along roads and intersect drainage lines and dam outlets, which are considered to be the key sources and/or vectors of seed spread. The weed transects have detected new occurrences of higher threat weeds such as Bathurst Burr and Wards Weed. As such, the weed transects represent a key method (when coupled with weed data from Rangelands assessments and opportunistic observations) to directly address a number of mine conditions and outcomes.

4.3.6 LFA transects

LFA at 2 rehabilitation sites at the mine site commenced in 2019, and 2 more were introduced in 2022. In 2023, all sites were surveyed using the established LFA method (as opposed to the Bank and Trough method applicable only for the very early stages of assessment). Introduction of the PCQ Method (an optional extension of the Established Method) has proven very useful for reporting on the density of vegetation in the early stages of rehabilitation, especially when vegetation along the LFA transect has been absent or very sparse.

Since 2024, Lathwida ecologists have also reported on the species composition of re-establishing vegetation. This has been very important in determining whether the re-establishing community matches the analogue community floristic composition and/or success of direct seeding. The LFA method does not provide this information, because the method does not identify species (Spain et al. 2025).

The current methods (LFA, PCQ and reporting on species floristic composition) are considered suitable to demonstrate change at the rehabilitation sites over time, as vegetation trends towards the 'baseline' / analogue condition. Current methods have already been successful in detecting notable differences in the success of the 4 sites, reflective of the different rehabilitation methods applied on the ground. For example, the deep cross ripped / handed seeded Tjungu site no longer requires monitoring, and the deep

ripped Aerodrome site now only requires the LFA established method. This data is useful for future rehabilitation around the broader mining lease area and meeting OMC requirements.

4.3.7 Fauna surveys

Fauna trapping undertaken during spring 2025 was comparable to the effort undertaken in spring 2018-2024, on the basis that the most important data is species diversity rather than species abundance. Despite moderate conditions and a drier preseason, overall fauna diversity was comparable with previous baseline survey periods and with the spring/autumn 2018-2024 survey numbers. Whilst there was water present in farm dams, bird diversity detection across Carrapateena was moderate. The overall capture rate was above within the compliance capture rate to date and well within the baseline range. For mammals, diversity rates were moderate, and captures were low for rodents, planigales and Fat-tailed Dunnarts, which is consistent with previous surveys during drier times and baseline and compliance monitoring results. Stripe-faced Dunnarts and Fat-tailed Dunnarts were again consistently detected at both control and impact sites (Plate 4.3). Small rodents were only detected at control sites in 2025, a new trend to watch, however they were only detected at impact sites in 2024 and lower numbers in general align with results of other regional surveys. For reptiles, captures were moderate and the diversity was on par with compliance and baseline; 17 species detected. Fauna trapping represents the greatest opportunity to definitively record the EPBC listed Plains Mouse, and to demonstrate persistence of this species at the site throughout mining operations, which is an important outcome for BHP. As such, fauna trapping is still considered a requirement for informing impacts of the mining operation on conservation significant fauna. As suggested previously, baited camera trapping at the designated fauna sites (outside of the fauna trapping program) may provide improved results, however this would need to align with preceding rainfall conditions. During the annual compliance surveys non-baited camera trapping has been used in 2021 - 2025 concurrently with open pitfall sites and a range of species detected (e.g. during 2025 species include Fat-tailed Dunnart, Stripe-faced Dunnart, Tessellated Gecko, Central Short-tailed Mouse and small *Pseudomys sp.* likely *P. hermannsburgensis*). Baited camera trapping without opening pits similar to the South Gap EPBC offset program may detect Plains Mouse, along with other small rodents, particularly following suitable rainfall events. However, it is noted that Plains Mouse were not detected via baited camera traps at the South Gap in 2025, and only one Plains Mouse was detected via baited camera trapping at Oak Dam in 2025. These results continue to suggest that the population is currently declining as occurs naturally in response to climatic factors (e.g. lower rainfall).

Bird surveys continue to provide good indications of overall site species diversity, with numbers increasing from 2020-2023 and reflective of baseline conditions. Most of the historic sites are relatively homogeneous from a habitat perspective, but greater diversity observed at some sites appears to align with creek line sites, drainage lines and dune sites with taller and diverse vegetation. There are no historic records of any EPBC listed threatened birds at the site (apart from newly listed Blue-winged Parrot, Southern Whiteface and Sharp-tailed Sandpiper), but regardless, the mine conditions require reporting of future records of EPBC listed species. This would not be possible without some level of bird survey. In some years State-listed species are also detected, however no State-listed species were detected in 2025. Southern Whiteface were opportunistically detected at one of the weed monitoring sites along the WAR. A number of common waterbirds and shorebirds were detected at dams and the South Eliza temporary wetland during the survey, but none are EPBC listed as threatened or Migratory. Many resident birds were

breeding, and different types of bird families were well represented. Resident White-wing Fairy Wrens, Purple-backed Fairywrens and Rufous Fieldwrens were present across the site at multiple locations, and the nomadic Splendid Fairywrens were not detected. Two bird species had not been detected at the site since baseline surveys; Brown Goshawk and Rufous Whistler. The bird survey results are in compliance with the OMC and provide a positive story at Carrapateena for balancing mining and the environment in arid conditions.

Opportunistic reptile observations provide a good return on investment and are considered an important part of the overall fauna survey program to inform diversity data. As per active fauna trapping, opportunistic reptile observations are considered suitable for informing overall impacts of the mining operation on fauna diversity. Both reptile and mammal diversity was in the range of baseline surveys, with reptile diversity in upper levels. In 2025, the bulk of the reptile diversity was from trap captures, given the warmer day time temperatures, this data contributes to the 'capture rate' as a snapshot measure of abundance. Of the reptiles that were detected, several species had juveniles present (e.g. Earless Dragons, Bynoe's Gecko, Southern Four-toed Slider). The Four-toed Slider (a juvenile) had only been previously detected during baseline and then during compliance monitoring in 2024 and now 2025. The Broad Banded Swimmer had not been detected since baseline and this was detected opportunistically in the accommodation area by BHP staff.

Feral mice were not detected, no cats were physically detected, aside from tracks at dune sites. Evidence of rabbits were detected at several locations. Hence ongoing feral animal control is required.



Plate 4.3: Dunnarts snuggled in stubbie holder at base of pitfall trap

4.4 Recommendations for future surveys and data analysis

Construction / operational compliance monitoring has been conducted since autumn 2018, involving 2 surveys in 2018, and annual surveys thereafter. Hence there have been 9 complete fauna and flora surveys, and additionally, a separate dust impact survey and separate Eliza Creek flora and canopy cover survey. There have been 2 autumn and 7 spring surveys. The period 2018 to 2025 has covered extreme low rainfall years (2018 and 2019 when yearly rainfall totals for the year were in the 10% decile), average rainfall years and well above average seasonal rainfall events. This compares well with the baseline survey duration and climate patterns, namely 2012 to 2017 when rainfall totals varied from below average to well above average. During the compliance monitoring period to date, there has been no evidence of impact from mining activity on any of the PEPR Leading Indicators that relate to fauna and flora outcome measurement criteria. Fauna and flora species diversity has been within the baseline range and compliance range, with the exception of a minor indication that small rodents are not being detected at impact sites. There have been no new declared weeds or increase in abundance of declared or listed weeds, with the exception of a small location of Bathurst Burr along the WAR. The health of Eliza Creek vegetation has remained stable. All short-term changes to date in flora and fauna diversity, perennial plant population abundances, and canopy health at Eliza Creek transects have been attributed to variation in seasonal and/or yearly rainfall.

The compliance OMC require annual monitoring to occur at the sites. Plains Mouse have not been detected and there is a minor new trend that small rodents are not being detected at impact sites. Formal fauna trapping surveys should continue and be supplemented annually with other techniques such as camera trapping, Song Meter deployment and bird surveys. Baited camera trapping, which require less survey effort, could also be deployed outside of formal trapping / following larger rainfall events, to facilitate detection of rodents at control and impact sites.

It is recommended that all sites surveyed in 2025 be re-surveyed in either autumn or spring 2026, using the same survey techniques. It is recommended that the seasonal timing of the survey remain flexible. In the arid zone, flora diversity, and often fauna diversity, reflects rainfall events, rather than a specific season. Mean monthly rainfall for the nearest long-term weather station, Woomera indicates highest rainfall means occur between November and March rather than winter; but can be extremely variable year to year. Hence for compliance monitoring, comparison of data across the operation for sites undergoing the same climatic conditions, as well as comparison of baseline and previous compliance monitoring ranges for a range a climatic and grazing conditions is good practice, rather than a focus on comparisons to baseline data alone.

The spring 2025 survey was conducted in September 2025, when conditions were mild to warm and there windy days. Reptile diversity and abundance was high, bird diversity was moderate and mammal diversity and abundance was low but within the baseline range. For the small mammals, rodents were in low numbers, but this is reflective of the climate in the months preceding the survey (i.e. fluctuating rainfall, below average). Rodents have also historically been detected in lower numbers in the baseline and compliance surveys, with the exception of higher rainfall years (e.g. 2012, 2014, 2017 and 2022). Flora diversity was moderate to high due to the diversity of short-lived species. It is recommended that surveys be conducted in either September/October or late March to April, when daily temperatures are not extreme and compliant with animal ethics requirements. The preference for an autumn or spring survey should be determined by seasonal conditions in the preceding 6 months, namely consideration should be given to conducting the survey in response to particular climatic conditions (i.e., good rainfall) in order

to maximise the chance of demonstrating compliance against some conditions (in particular, the presence of Plains Mouse).

Baseline survey in Eliza Creek commenced in 2018 and includes survey of 8 canopy cover transects, as well as RAM and Jessup transects. This has provided an indication of the inherent variability in the data, and the dynamic response of River Red Gum and Western Myall canopies to seasonal conditions. At Eliza Creek medium to longer term trends in plant health are of major concern, rather than seasonal changes. Given that monitoring has been established since 2018, and additional reporting of individual tree health has been established, yearly surveys of Eliza Creek are considered sufficient. It is recommended that additional remote sensing reporting be continued, to supplement on-ground data.

Further details regarding future recommendations are provided below.

4.4.1 RAM quadrats

RAM sites represent a key measure of flora species diversity, abundance (as per CSR categories) and grazing impact and should continue across the site, annually, as per the outcome measurement criteria for the mine lease (OMC SWRF1, TSF6, AQ2). To date, the construction / operational phase monitoring data results have indicated species diversity has remained within the baseline range. This survey technique used during compliance monitoring reports upon both long-lived and short-lived species diversity, the latter largely influenced by weather events.

Flora Sites 21 and 22, were established on dunes in autumn 2018 to monitor this previously un-surveyed dune habitat within the operation area. This monitoring should continue annually to address potential impacts from the WAR on dune habitat to address the agreed outcomes for OMCs WP1 and WP2. Jessup sites are not undertaken due to insufficient density of long-lived shrubs and trees, and the absence of on-ground markers to delineate the transect. Given these factors, Jessup transects are not considered necessary on the dunes. RAM sites on the dunes assess species diversity and abundance.

The Jessup transects monitor populations only of long-lived perennial shrubs and trees. Despite the longevity of the species monitored, compliance monitoring has shown relatively large fluctuations in populations that correlate with large variations in yearly rainfall totals. Some species monitored have relatively small populations. Annual monitoring is considered necessary for early detection of changes in populations that may result in the potential loss of the more abundant and widespread species at a site.

For all sites excluding Site 21 and 22, Jessup monitoring should continue annually to address the agreed outcomes for the operation (OMC SWRF1, TSF6, AQ2).

4.4.2 Data analysis of RAM quadrats and Jessup transects

To date compliance monitoring has categorised sites as either control or potential impact sites, defined as sites either greater than 2 km or less than 2 km, respectively from mining infrastructure. The 2 km criteria was based on a literature review of the likely potential distance of dust and/or noise impact upon vegetation and dust impact modelling. All sites along Eliza Creek, however, were deemed to be potential impact sites, regardless of distance downstream from the TSF. During compliance monitoring, however, the WAR has been developed, the Northern Wellfield Supply Road (Khamsin Road) receives greater usage, and the SAR is no longer widely used. The 2023 reporting (Jacobs 2023) recommended a review of the

classification of sites as impact or control. In particular, recommended that impact Sites 4 and 6 be changed from impact to control. This recommendation was implemented in the 2024 report and continued in the current report. Currently Flora Sites 1 and 2 adjoin the Northern Wellfield Road, but due to the low traffic volume on this road, have remained designated as control sites. Should traffic volume substantially increase on this road, the control status of these sites should be reviewed.

In addition to analysing results collectively for control sites and collectively for impact sites, past and current reporting analysis has included plant species abundance and diversity trends at a site level, by habitat, and at a landscape level for the whole Operational Area. To date there are no emerging trends related to mining, with only climate related variation for some species recorded, particularly annuals and short-lived perennials. Analysis at these different levels should continue.

For the RAM and Jessup sites, complete baseline data sets are available for the years 2013 to 2016 (sites 15 and 16 not surveyed in 2012 and survey data from 2017 is not available). Compliance monitoring analysis to date (2018 to 2025) has compared compliance data with baseline data, and also examined trends during compliance monitoring. Consideration should be given to streamlining reporting and adjusting for climate change, given the time since baseline data was collected and availability of complete data sets. Further, as the time since baseline data increases, with climate change occurring in the region (Enviro Data SA 2025), the validity for comparing compliance data with data from a fixed point in time diminishes. To streamline reporting and to negate the effects of climate change, it is recommended that future data analysis need only compare trends in control sites vs trends in impact sites during the operational period, and not with baseline data. This already occurs for the 2 flora sites established on the dunes in 2018. In addition to comparing trends in control data with impact data, continued examination of trends in population abundance, species diversity and plant health at an individual site level is also recommended. Further revisions of the PEPR would need to consider the above.

4.4.3 Canopy cover transects

Canopy cover assessment should continue, given transects have been assessed in Eliza Creek on 10 occasions since 2018. This has provided an indication of variability in the data, both actual variation in tree canopy health (due to long term change and/or seasonal variability) and inherent variability or "noise" in the assessment method. The numbering of individual trees and installation of permanent posts along each transects has increased the precision of the transect alignment each survey. This has reduced the inherent "noise" in the data. The continued use of the densitometer rather than relying purely on visual estimates of crown intactness, is strongly recommended. The canopy cover transects are 100 m long, providing a sufficient number of densitometer canopy readings to provide precision and accuracy in quantifying canopy cover for the transect as a whole. The method is relatively objective as it does not rely on "eyeball" estimates of whole canopy intactness where there is often variation between observers' estimates. For assessment of individual tree canopy intactness, "eyeball" assessments (no tools) of canopy intactness provide data on population trends – detecting loss of trees or tree gain along the transect and perhaps more accurate estimates of individual canopy intactness than provided by a densitometer which provides only a few foliage recordings per canopy.

The densitometer method, and visual estimates of individual canopy intactness therefore, are complementary, and both methods should be used to assess tree health at each survey. It is recommended than annual surveys are sufficient. Continuation of the Eliza Creek canopy cover data is

expected to detect potential tree stress and death overtime, if it occurs, and will contribute to addressing the agreed outcomes for the Operation (OMC SWRF1, TSF6, AQ2).

4.4.4 Weed transects

The monitoring program includes 10 weed transects, that include the Northern Wellfield, SAR, WAR and station tracks near Anzac Dam. These transects are considered to provide good representation across the mineral leases that capture locations for potential spread of weeds due to mining related activities. There are 3 weed transects along the WAR (near the Gatehouse, near the administration and spoil heap area, and near the Stuart Highway), 2 sites along the SAR, 3 sites along the Northern Wellfield Road and along minor access roads. Targeted locations, where weed populations are considered most likely on site (including dams and the villages) were also re-surveyed recording the general location and densities of all weeds present. Weed transects CWM01 and CWM02 are located along the SAR, which now receives very little mining-related vehicle traffic. However, the transects are still within current mineral leases, and include populations of the declared weed, Bathurst Burr, plus several non-declared weeds that favour high moisture habitats. For this reason, it is recommended that these 2 transects continue.

The weed transects and targeted survey locations are considered a very efficient way of detecting new weeds or an increase (or decline) in existing weed populations, as evidenced by the post-construction data. Collection of weed data should continue as per the spring 2025 survey at assigned transects and opportunistically around the site to address the agreed outcomes for the Operation (Outcome measurement criteria WP1, WP2) and Mineral Lease condition 6 (sixth schedule) and MPL 156 conditions. Populations of Bathurst Burr should be revisited and monitored to determine success of control efforts.

4.4.5 LFA

The LFA data collected presents a simple means to graphically show changes in indices, and to also compare the indices with previously collected data from analogue sites considered broadly representative of natural conditions across the mine lease. The establishment of the Midway Quarry and Tjungu sites in 2023 provided a greater opportunity to monitor rehabilitation success as well as variation in techniques (e.g. deep cross ripping, plus hand seeding). Continued data collection will enable opportunities for ongoing data analysis, and a determination of when recorded indices approach or reach the range of the analogue data.

The LFA data collected (and PCQ data) indicates that the Tjungu site has successfully rehabilitated to a level comparable with, or even exceeding reference habitat. Likewise, plant and soil parameter data at aerodrome site shows that this site is approaching reference site means. The LFA Established method and PCQ data at the Midway Quarry shows the site is still at the very early stages of landscape restoration in terms of vegetation cover. Collection of species identification data since 2023 (which is additional to the LFA method) has shown that only short-lived species are present at the Midway Quarry site. The sparsity of short-lived species and absence of long-lived species suggests that the depth of ripping was insufficient for the successful rehabilitation of the analogue (reference) community.

To date, the LFA soil parameters have shown that the sites are approaching the analogue soil parameter means, even when the vegetation cover has been much below the analogue. The soil parameter data collection requires 3 replicates per zone per transect and is time intensive. The soil parameter data tends

to quickly get close to the analogue mean in the Stoney Tableland habitat, where leaf litter, erosivity and soil surface unevenness is natural low. The primary aim of the rehabilitation monitoring is to determine whether the re-established community achieves a stable self-sustaining community that resembles adjoining analogue communities. LFA indices tend to plateau once soil structure has stabilised and vegetation cover has maximised (Spain et al. 2025). Once a plateau has been reached, the LFA indices are less indicative of ecosystem function, e.g. they do not record floristic composition or recruitment of dominant species. Future monitoring should consider streamlining the soil parameter attributes recorded, or simply only reporting on vegetation cover and composition. As per Section 4.1.7 new LFA sites should be established at Ventia in the nearby newly deep-ripped and seeded section of the WAR. There is also opportunity to establish new analogue sites within the existing Jessup transects.

4.4.6 Fauna surveys

Single pitfall trapping lines continued to allow for suitable capture of small mammals and reptiles during the 2025 survey. The most common mammal species that have been captured across all baseline surveys were still detected at both control and impact sites, with all small mammal captures via pitfall traps and camera trap. It is recommended that pitfall trapping is retained in order to detect presence or absence of Plains Mouse as per PEPR condition EPBC2, in addition to continuing to monitor habitat condition (flora monitoring). As suggested following the spring 2022 survey, increased rainfall in the region (spring and summer) resulted in an autumn survey in 2023 instead of spring survey, however Plains Mouse were not detected. Sustained rainfall did not occur in 2025, where similar to 2024, the survey occurred in spring. Regardless, Plains Mouse remain undetected in 2025. As per 4.3.7 above, Plains Mouse has been detected via baited camera trap at the South Gap offset area, but in low numbers since mid- 2022, and not in 2025, but was detected at Oak Dam via baited camera in autumn 2025, so detection at Carrapateena may still occur in the future, but more likely following periods of above average rainfall.

To increase the chance of detection of Plains Mouse at Carrapateena, particularly at control sites 1, 2, 4 and 6 options may include:

- increasing the number of lines and pits open at fauna sites during the next survey
- setting up targeted baited Elliot traps at good quality gilgais, at the established fauna sites. E.g. 5 baited Elliot traps at 10 sites, 100m apart, for a standard 4 night survey
- setting up baited camera traps similar to South Gap (noting there would be greater success at sites where predators (e.g. cats) are under control. Flora site 12 is noted to have good areas of gilgais. These could be set up away from fauna trap lines, if trapping occurs concurrently.

As 3.3.6 above, replacement metal bases have been installed in the pitfall traps for the majority of the lines. These bases have been successful; easy to install/remove, drain well and do not get too hot (remain at least 2-5 degrees lower than ambient temperature) and also facilitate visual id of the trapped fauna (given pits are 60 cm deep). As per previous surveys, the lids of the semi-permanent pits need to be pushed down correctly before tech screws are applied to ensure there are no gaps that enable small mammals or reptiles to get through and be trapped outside of a survey period. It is also a requirement of the ethics permit that the status of the lids are checked every 6 months and an email forwarded to the Wildlife Ethics Committee.

Results for single pit line trapping continues to be comparable to baseline results and in general, mid-late spring appears suitable time to undertake the annual survey. For 2026, spring is probably ideal given the dry preceding summer of 2025/2026, an autumn survey would only be an option if there was heavy steady rainfall in later summer and early autumn, to maximise the chance of demonstrating compliance with the PEPR conditions. Fauna trapping should continue at the mine site until such time as it can be clearly demonstrated that conservation significant species (in particular) persist alongside the operational mine, or until a downward trend in mammal diversity / abundance at impact sites is confirmed real or otherwise. This should be considered and discussed following the next PEPR update. It is noted that 1 EPBC listed species was detected in spring 2025 opportunistically, rather than via formal trapping. Camera trapping outside the survey period, given the success at South Gap offset area, using alternate, less labour-intensive methods (without baits) or more labour intensive (with baits) may also be an option, i.e. aligning cameras with short lengths of fauna fence line to direct fauna into view. However, given the presence of cats at the site, regular checks would be required to avoid increasing predation of small mammals at trapping sites.

Whilst reptile diversity is interesting and provides a good indicator for overall site conditions, it relates more broadly to PEPR OMC about fauna diversity and abundance, therefore use of funnel traps could be ceased in the future and reptile diversity could be collected opportunistically and via pitfall captures alone, particularly during the spring surveys when reptiles are more active (Plate 4.4). However, setting and checking funnel traps requires minimal additional effort compared with additional pitfall lines and provides opportunity to trap snakes, where present, therefore it is suggested that funnel trapping be retained at the current time.

The bird surveys at fauna sites, flora sites and water points currently provide valuable data regarding overall avifauna diversity at the sites, and birds are expected to respond to mine impacts such as noise and traffic if levels are unacceptable to them. In addition, pest bird species are also monitored e.g. House Sparrows still present (low numbers). For this reason, bird surveys should be continued during operational compliance monitoring until data patterns are clear, and to meet PEPR conditions related to Thick-billed Grasswren and Night Parrot records (EPBC1 and EPBC 3) as well as conditions related to pests (WP1, WP2). Survey at water points (particularly pre-dawn and post-dusk) as well as spotlighting / night call detection is also an important survey technique to detect whether the Night Parrot is present at the site. Song Meters (only deployed from 2023) are a valuable tool to detect nocturnal, dawn and dusk species at both chenopod shrubland sites and representative creekline sites (e.g. Eliza Creek Site 10, Bosworth Creek Site 7). In 2025 Song Meter results included detection of 8 species not detected via bird surveys or opportunistic sightings, of these 1 was a common pre-dawn and post-dusk species; Spotted Nightjar. This species was last detected in 2022 via bird survey at North Eliza Dam (dead remains). No other nocturnal / dusk bird species were detected. Four diurnal microbat species were also detected on Song Meters that can be deployed to capture both bird and bat call data. Detection via acoustic methods is far more efficient than trapping or spotlighting for microbat fauna and useful to regularly compare against baseline data.



Plate 4.4: Female Eyre Peninsula Dragon (opportunistic detection in Eliza Creek)

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Appendices

Appendix A. Photologs spring 2025

Appendix A1. Photolog, Rangeland Flora Sites

CAR001	
	
Appendix Plate A1.1: Facing north	Appendix Plate A1.2: Facing east
	
Appendix Plate A1.3: Facing west	Appendix Plate A1.4: Facing south

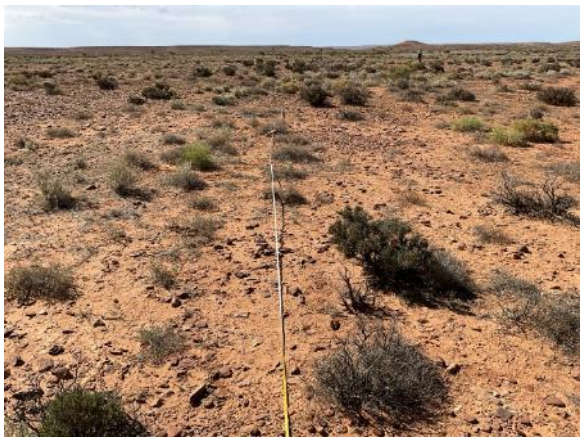
CAR002	
	
Appendix Plate A1.5: Facing north	Appendix Plate A1.6: Facing east
	
Appendix Plate A1.7: Facing west	Appendix Plate A1.8: Facing south

CAR003	
	
Appendix Plate A1.9: Facing north	Appendix Plate A1.10: Facing east
	
Appendix Plate A1.11: Facing west	Appendix Plate A1.12: Facing south

CAR004	
	
Appendix Plate A1.13:Facing north	Appendix Plate A1.14: Facing east
	
Appendix Plate A1.15: Facing west	Appendix Plate A1.16: Facing south

CAR005	
	
Appendix Plate A1.17: Facing north	Appendix Plate A1.18: Facing east
	
Appendix Plate A1.19: Facing west	Appendix Plate A1.20: Facing south

CAR006	
	
Appendix Plate A1.21: Facing north	Appendix Plate A1.22: Facing east
	
Appendix Plate A1.23: Facing west	Appendix Plate A1.24: Facing south

CAR007	
	
Appendix Plate A1.25: Facing north	Appendix Plate A1.26: Facing east
	
Appendix Plate A1.27: Facing west	Appendix Plate A1.28: Facing south

CAR009	
	
Appendix Plate A1.29: Facing north	Appendix Plate A1.30: Facing east
	
Appendix Plate A1.31: Facing west	Appendix Plate A1.32: Facing south

CAR010	
	
Appendix Plate A1.33: Facing north	Appendix Plate A1.34: Facing east
	
Appendix Plate A1.35: Facing west	Appendix Plate A1.36: Facing south

CAR011	
	
Appendix Plate A1.37: Facing north	Appendix Plate A1.38: Facing east
	
Appendix Plate A1.39: Facing west	Appendix Plate A1.40: Facing south

CAR012	
	
Appendix Plate A1.41: Facing north	Appendix Plate A1.42: Facing east
	
Appendix Plate A1.43: Facing west	Appendix Plate A1.44: Facing south

CAR013	
	
Appendix Plate A1.45:Facing north	Appendix Plate A1.46: Facing east
	
Appendix Plate A1.47: Facing west	Appendix Plate A1.48: Facing south

CAR015	
	
Appendix Plate A1.49: Facing north	Appendix Plate A1.50: Facing east
	
Appendix Plate A1.51: Facing west	Appendix Plate A1.52: Facing south

CAR016	
	
Appendix Plate A1.53: Facing north	Appendix Plate A1.54: Facing east
	
Appendix Plate A1.55: Facing west	Appendix Plate A1.56: Facing south

CAR017	
	
Appendix Plate A1.57: Facing north	Appendix Plate A1.58: Facing east
	
Appendix Plate A1.59: Facing west	Appendix Plate A1.60: Facing south

CAR018	
	
Appendix Plate A1.61: Facing north	Appendix Plate A1.62: Facing east
	
Appendix Plate A1.63: Facing west	Appendix Plate A1.64: Facing south

CAR019	
	
Appendix Plate A1.65: Facing north	Appendix Plate A1.66: Facing east
	
Appendix Plate A1.67: Facing west	Appendix Plate A1.68: Facing south

CAR020	
	
Appendix PlateA1.69: Facing north	Appendix Plate A1.70: Facing east
	
Appendix Plate A1.71: Facing west	Appendix Plate A1.72: Facing south

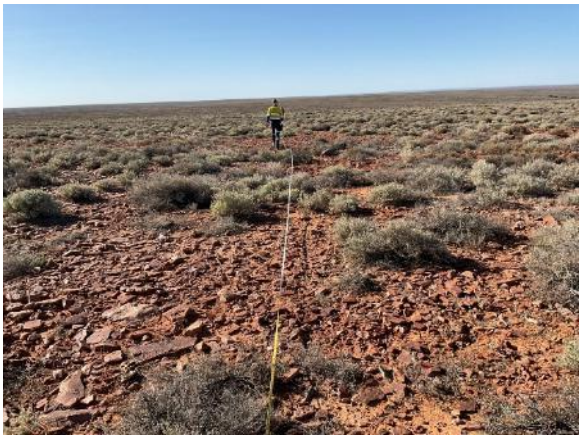
CAR021	
	
Appendix Plate A1.73: Facing north	Appendix Plate A1.74: Facing east
	
Appendix Plate A1.75: Facing west	Appendix Plate A1.76: Facing south

CAR022	
	
Appendix Plate A1.77: Facing north	Appendix Plate A1.78: Facing east
	
Appendix Plate A1.79: Facing west	Appendix Plate A1.80: Facing south

Appendix A2. Photolog, Jessup Transects

	
Appendix Plate A2.1: CAR001, start facing end	Appendix Plate A2.2: CAR002, start facing end
	
Appendix Plate A2.3: CAR003, start facing end	Appendix Plate A2.4: CAR004, start facing end

	
Appendix Plate A2.5: CAR005, start facing end	Appendix Plate A2.6: CAR006, start facing end
	
Appendix Plate A2.7: CAR007, start facing end	Appendix Plate A2.8: CAR009, start facing end
	
Appendix Plate A2.9: CAR010, start facing end	Appendix Plate A2.10: CAR011, start facing end

	
Appendix Plate A2.11: CAR012, start facing end	Appendix Plate A2.12: CAR013, start facing end
	
Appendix Plate A2.13: CAR015	Appendix Plate A2.14: CAR016
	
Appendix Plate A2.15: CAR017	Appendix Plate A2.16: CAR018

	
Appendix Plate A2.17: CAR019	Appendix Plate A2.18: CAR020

Appendix A3. Photolog, Canopy Cover Transects Eliza Creek

CAR017	
	
Appendix Plate A3.1: Transect A	Appendix Plate A3.2: Transect B

CAR018	
	
Appendix Plate A3.3: Transect A	Appendix Plate A3.4: Transect B

CAR019	
	
Appendix Plate A3.5: Transect A	Appendix Plate A3.6: Transect B

CAR020	
	
Appendix Plate A3.7: Transect A	Appendix Plate A3.8: Transect B

Appendix A4. Photolog, Weed Survey

CWM01 0m	
	
Appendix Plate A4.1: **Left road side, facing away from start**	**Appendix Plate A4.2:** **Right road side, facing away from start**
	
Appendix Plate A4.3: **Left road side, facing end**	**Appendix Plate A4.4:** **Right road side, facing end**

CWM01 250m	
	
Appendix Plate A4.5: Left road side, facing start	Appendix Plate A4.6: Right road side, facing start
	
Appendix Plate A4.7: Left road side, facing end	Appendix Plate A4.8: Right road side, facing end

CWM01 500m	
	
Appendix Plate A4.9: Left road side, facing start	Appendix Plate A4.10: Right road side, facing start
	
Appendix Plate A4.11: Left road side, facing end	Appendix Plate A4.12: Right road side, facing end

CWM01 750m	
	
Appendix Plate A4.13: Left road side, facing start	Appendix Plate A4.14: Right road side, facing start
	
Appendix Plate A4.15: Left road side, facing end	Appendix Plate A4.16: Right road side, facing end

CWM01 1000m	
	
Appendix Plate A4.17: Left road side, facing start	Appendix Plate A4.18: Right road side, facing start
	
Appendix Plate A4.19: Left road side, facing away from end	Appendix Plate A4.20: Right road side, facing away from end

CWM02 0m	
	
Appendix Plate A4.21: Left road side, facing away from start	Appendix Plate A4.22: Right road side, facing away from start
	
Appendix Plate A4.23: Left road side, facing end	Appendix Plate A4.24: Right road side, facing end

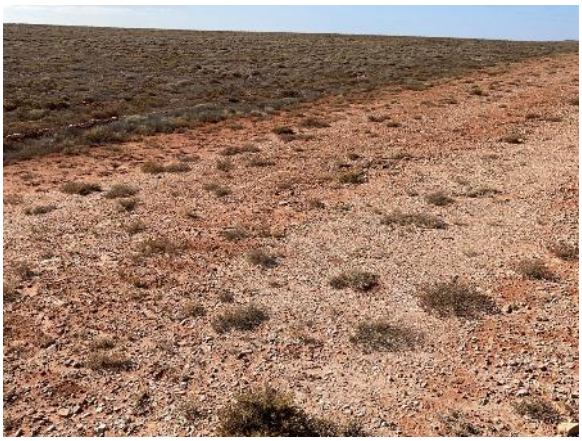
CWM02 250m	
	
Appendix Plate A4.25: Left road side, facing start	Appendix Plate A4.26: Right road side, facing start
	
Appendix Plate A4.27: Left road side, facing end	Appendix Plate A4.28: Right road side, facing end

CWM02 500m	
	
Appendix Plate A4.29: Left side of road, facing start	Appendix Plate A4.30: Right side of road, facing start
	
Appendix Plate A4.31: Left side of road, facing end	Appendix Plate A4.32: Right side of road, facing end

CWM02 750m	
	
Appendix Plate A4.33: Left side of road, facing start	Appendix Plate A4.34: Right side of road, facing start
	
Appendix Plate A4.35: Left side of road, facing end	Appendix Plate A4.36: Right side of road, facing end

CWM02 1000m	
	
Appendix Plate A4.37: Left side of road, facing start	Appendix Plate A4.38: Right side of road, facing start
	
Appendix Plate A4.39: Left side of road, facing away from end	Appendix Plate A4.40: Right side of road, facing away from end

CWM03 0m	
	
Appendix Plate A4.41: Left side of road, facing end	Appendix Plate A4.42: Right side of road, facing end
	
Left side of road, facing away from start	Appendix Plate A4.43: Right side of road, facing away from start

CWM03 250m	
	
Appendix Plate A4.44: **Left side of road, facing end**	**Appendix Plate A4.45:** **Right side of road, facing end**
	
Appendix Plate A4.46: **Left side of road, facing start**	**Appendix Plate A4.47:** **Right side of road, facing start**

CWM03 500m	
	
Appendix Plate A4.48: Left side of road, facing end	Appendix Plate A4.49: Right side of road, facing end
	
Appendix Plate A4.50: Left side of road, facing start	Appendix Plate A4.51: Right side of road, facing start

CWM03 750m	
	
Appendix Plate A4.52: Left side of road, facing end	Appendix Plate A4.53: Right side of road, facing end
	
Appendix Plate A4.54: Left side of road, facing start	Appendix Plate A4.55: Right side of road, facing start

CWM03 1000m	
	
Appendix Plate A4.56: Left side of road, facing away from end	Appendix Plate A4.57: Right side of road, facing away from end
	
Appendix Plate A4.58: Left side of road, facing start	Appendix Plate A4.59: Right side of road, facing start

CWM04 0m	
	
Appendix Plate A4.60: Left side of road, facing away from start	Appendix Plate A4.61: Right side of road, facing away from start (note newly ripped / seeded area of WAR for future LFA)
	
Appendix Plate A4.62: Left side of road, facing end	Appendix Plate A4.63: Right side of road, facing end (note newly ripped / seeded area of WAR for future LFA)

CWM04 250m	
	
Appendix Plate A4.64: Left side of road, facing end	Appendix Plate A4.65: Right side of road, facing end
	
Appendix Plate A4.66: Left side of road, facing start	Appendix Plate A4.67: Right side of road, facing start

CWM04 500m	
	
Appendix Plate A4.68: Left side of road, facing end	Appendix Plate A4.69: Right side of road, facing end
	
Appendix Plate A4.70: Left side of road, facing start	Appendix Plate A4.71: Right side of road, facing start

CWM04 750m	
	
Appendix Plate A4.72: Left side of road, facing end	Appendix Plate A4.73: Right side of road, facing end
	
Appendix Plate A4.74: Left side of road, facing start	Appendix Plate A4.75: Right side of road, facing start

CWM04 1000m	
	
Appendix Plate A4.76: Left side of road, facing start	Appendix Plate A4.77: Right side of road, facing start
	
Appendix Plate A4.78: Left side of road, facing away from end	Appendix Plate A4.79: Right side of road, facing away from end

CWM05 0m	
	
Appendix Plate A4.80: **Left side of road, facing away from start**	**Appendix Plate A4.81:** **Right side of road, facing away from start**
	
Appendix Plate A4.82: **Left side of road, facing end**	**Appendix Plate A4.83:** **Right side of road, facing end**

CWM05 250m	
	
Appendix Plate A4.84: Left side of road, facing start	Appendix Plate A4.85: Right side of road, facing end
	
Appendix Plate A4.86: Left side of road, facing start	Appendix Plate A4.87: Right side of road, facing end

CWM05 500m	
	
Appendix Plate A4.88: Left side of road, facing start	Appendix Plate A4.89: CWM05 500m Right side of road, facing start
	
Appendix Plate A4.90: Left side of road, facing end	Appendix Plate A4.91: Right side of road, facing end

CWM05 750m	
	
Appendix Plate A4.92: Left side of road, facing start	Appendix Plate A4.93: Right side of road, facing start
	
Appendix Plate A4.94: Left side of road, facing end	Appendix Plate A4.95: Right side of road, facing end

CWM05 1000m	
	
Appendix Plate A4.96: Left side of road, facing start	Appendix Plate A4.97: Right side of road, facing start
	
Appendix Plate A4.98: Left side of road, facing away from end	Appendix Plate A4.99: Right side of road, facing away from end

CWM06 0m	
	
Appendix Plate A4.100: Left side of road, facing away from start	Appendix Plate A4.101: Right side of road, facing away from start
	
Appendix Plate A4.102: Left side of road, facing end	Appendix Plate A4.103: Right side of road, facing end

CWM06 250m	
	
Appendix Plate A4.104: Left side of road, facing start	Appendix Plate A4.105: Right side of road, facing start
	
Appendix Plate A4.106: Left side of road, facing end	Appendix Plate A4.107: Right side of road, facing end

CWM06 500m	
	
Appendix Plate A4.108: Left side of road, facing start	Appendix Plate A4.109: Right side of road, facing start
	
Appendix Plate A4.110: Left side of road, facing end	Appendix Plate A4.111: Right side of road, facing end

CWM06 750m	
	
Appendix Plate A4.112: Left side of road, facing start	Appendix Plate A4.113: Right side of road, facing start
	
Appendix Plate A4.114: Left side of road, facing end	Appendix Plate A4.115: Right side of road, facing end

CWM06 1000m	
	
Appendix Plate A4.116: Left side of road, facing start	Appendix Plate A4.117: Right side of road, facing start
	
Appendix Plate A4.118: Left side of road, facing away from end	Appendix Plate A4.119: Right side of road, facing away from end

CWM07 0m	
	
Appendix Plate A4.120: Facing away from start	Appendix Plate A4.121: Facing end

CWM07 250m	
	
Appendix Plate A4.122: Facing start	Appendix Plate A4.123: Facing end

CWM07 500m	
	
Appendix Plate A4.124: Facing start	Appendix Plate A4.125: Facing end

CWM07 750m	
	
Appendix Plate A4.126: Facing start	Appendix Plate A4.127: Facing end

CWM07 1000m	
	
Appendix Plate A4.128: Facing start	Appendix Plate A4.129: Facing away from end

NWM01 0m	
	
Appendix Plate A4.130: Facing away from start	Appendix Plate A4.131: Facing end

NWM01 250m	
	
Appendix Plate A4.132: Facing start	Appendix Plate A4.133: Facing end

NWM01 500m	
	
Appendix Plate A4.134: Facing start	Appendix Plate A4.135: Facing end

NWM01 750m	
	
Appendix Plate A4.136: Facing start	Appendix Plate A4.137: Facing end

NWM01 1000m	
	
Appendix Plate A4.138: Facing start	Appendix Plate A4.139: Facing away from end

NWM02 0m	
	
Appendix Plate A4.140: Facing away from start	Appendix Plate A4.141: Facing end

NWM02 250m	
	
Appendix Plate A4.142: Facing start	Appendix Plate A4.143: Facing end

NWM02 500m	
	
Appendix Plate A4.144: Facing start	Appendix Plate A4.145: Facing end

NWM02 750m	
	
Appendix Plate A4.146: Facing start	Appendix Plate A4.147: Facing end

NWM02 1000m	
	
Appendix Plate A4.148: Facing start	Appendix Plate A4.149: Facing away from end

NWM03 0m	
	
Appendix Plate A4.150: Facing away from start	Appendix Plate A4.151: Facing end

NWM03 250m	
	
Appendix Plate A4.152: Facing start	Appendix Plate A4.153: Facing end

NWM03 500m	
	
Appendix Plate A4.154: Facing start	Appendix Plate A4.155: Facing end

NWM03 750m	
	
Appendix Plate A4.156: Facing start	Appendix Plate A4.157: Facing end

NWM03 1000m	
	
Appendix Plate A4.158: Facing start	Appendix Plate A4.159: Facing away from end

Appendix A5. Photolog, LFA Sites



Appendix Plate A5.1: LFA Site 1 Aerodrome, transect 1A, start facing north



Appendix Plate A5.2: LFA Site 1 Aerodrome, transect 1A, end facing south



Appendix Plate A5.3: LFA Site 1 Aerodrome, transect 1A, vegetation patch off transect



Appendix Plate A5.4: LFA Site 1 Aerodrome, transect 1B, start facing north-west



Appendix Plate A5.5: LFA Site 1 Aerodrome, transect 1B, end facing south-east



Appendix Plate A5.6: LFA Site 2 Ventia, transect 2A, start facing north, transect decomissioned. No regeneration has occurrred along the transect.



Appendix Plate A5.7: LFA Site 2 Ventia, transect 2B, start facing north; no regeneration has occurred



Appendix Plate A5.8: LFA Site 2 Ventia, transect 2B, end facing south



Appendix Plate A5.9: LFA Site Midway Quarry, transect 3A, start facing end



Appendix Plate A5.10: LFA Site 3 Midway Quarry, transect 3A, end facing start



Appendix Plate A5.11: LFA Site 3 Midway Quarry, transect 3B, start facing end

Appendix B. Rangeland (RAM) Data

Appendix B1. Cumulative species list

The following is a cumulative list of flora species recorded at RAM sites (Flora Sites 1 – 22), spring 2024, including life span status, and the number of sites at which they were recorded.

Table B1.1: Cumulative flora list (RAM sites) for Carrapateena, spring 2025

Family	Scientific Name	Common Name	Status[1]	Number of Records	
				Long-lived	Short-lived
MALVACEAE	*Abutilon halophilum*	Plains Lantern-bush		11	
MALVACEAE	*Abutilon otocarpum*	Desert Lantern-bush		4	
FABACEAE	*Acacia aneura complex*	Mulga		1	
FABACEAE	*Acacia aptaneura*	Slender Mulga		1	
FABACEAE	*Acacia ligulata*	Umbrella Bush		2	
FABACEAE	*Acacia oswaldii*	Umbrella Wattle		1	
FABACEAE	*Acacia papyrocarpa2*	Western Myall		7	
FABACEAE	*Acacia ramulosa var. ramulosa*	Horse Mulga		1	
FABACEAE	*Acacia tetragonophylla*	Dead Finish		6	
SAPINDACEAE	*Alectryon oleifolius ssp. canescens*	Bullock Bush		1	
AMARANTHACEAE	*Alternanthera sp.*	Joyweed			1
ANACAMPSEROTACEAE	*Anacampseros australiana*	Australian Anacampseros			5
BRASSICACEAE	*Arabidella nasturtium*	Yellow Cress			5
POACEAE	*Aristida contorta*	Curly Wire-grass			2
POACEAE	*Aristida holathera var. holathera*	Tall Kerosene Grass			2
POACEAE	*Astrebla pectinata*	Barley Mitchell-grass		7	
AMARANTHACEAE	*Atriplex fissivalvis*	Gibber Saltbush			5
AMARANTHACEAE	*Atriplex holocarpa*	Pop Saltbush			11
AMARANTHACEAE	*Atriplex lindleyi ssp.*	Baldoo			5
AMARANTHACEAE	*Atriplex lindleyi ssp. conduplicata*	Baldoo			2
AMARANTHACEAE	*Atriplex velutinella*	Sandhill Saltbush			1
AMARANTHACEAE	*Atriplex vesicaria*	Bladder Saltbush		17	
POACEAE	*Austrostipa sp.*	Spear-grass			2
NYCTAGINACEAE	*Boerhavia dominii*	Tar-vine			5
ASTERACEAE	*Brachyscome ciliaris var. ciliaris*	Variable Daisy			1
ASPHODELACEAE	*Bulbine semibarbata (may also include Bulbine alata)*	Small Leek-lily			9
MONTIACEAE	*Calandrinia eremaea*	Dryland Purslane			1
ASTERACEAE	*Calotis hispidula*	Hairy Burr-daisy			7
ASTERACEAE	*Centipeda crateriformis ssp.*	Sneezeweed			2
PTERIDACEAE	*Cheilanthes lasiophylla*	Woolly Cloak-fern			1
AMARANTHACEAE	*Chenopodium curvispicatum*	Cottony Goosefoot		1	
AMARANTHACEAE	*Chenopodium desertorum ssp.*	Desert Goosefoot		1	
CONVOLVULACEAE	*Convolvulus remotus*	Grassy Bindweed			1
CRASSULACEAE	*Crassula colorata var.*	Dense Crassula			1
AMARYLLIDACEAE	*Crinum flaccidum*	Murray Lily			6
FABACEAE	*Crotalaria eremaea ssp.*	Loose-flowered Rattle-pod			1
FABACEAE	*Cullen cinereum*	Annual Scurf-pea			2
POACEAE	*Cymbopogon ambiguus*	Lemon-grass		3	
APIACEAE	*Daucus glochidiatus*	Native Carrot			8
POACEAE	*Digitaria brownii*	Cotton Panic-grass		4	
AMARANTHACEAE	*Dissocarpus biflorus var. biflorus*	Two-horn Saltbush			8
AMARANTHACEAE	*Dissocarpus paradoxus*	Ball Bindyi			7
SAPINDACEAE	*Dodonaea lobulata*	Lobed-leaf Hop-bush		5	
SAPINDACEAE	*Dodonaea viscosa ssp. angustissima*	Narrow-leaf Hop-bush		2	
POLYGONACEAE	*Duma florulenta*	Lignum		2	
AMARANTHACEAE	*Einadia nutans ssp.*	Climbing Saltbush		2	
AMARANTHACEAE	*Enchylaena tomentosa var. tomentosa*	Ruby Saltbush		7	
POACEAE	*Enteropogon acicularis*	Umbrella Grass			2
POACEAE	*Eragrostis australasica*	Cane-grass		1	

Family	Scientific Name	Common Name	Status[1]	Number of Records	
				Long-lived	Short-lived
POACEAE	*Eragrostis setifolia*	Bristly Love-grass		14	
SCROPHULARIACEAE	*Eremophila latrobei ssp.*	Crimson Emubush		2	
SCROPHULARIACEAE	*Eremophila oppositifolia ssp.*	Opposite-leaved Emubush		2	
SCROPHULARIACEAE	*Eremophila serrulata*	Green Emubush		4	
GERANIACEAE	*Erodium cicutarium*	Cut-leaf Heron's-bill	*		3
GERANIACEAE	*Erodium crinitum*	Blue Heron's-bill			5
MYRTACEAE	*Eucalyptus camaldulensis ssp. arida*	Northern River Red Gum		3	
POACEAE	*Eulalia aurea*	Silky Brown-top		2	
EUPHORBIACEAE	*Euphorbia drummondii group*	Spurge			1
EUPHORBIACEAE	*Euphorbia stevenii*	Bottletree Spurge			7
SANTALACEAE	*Exocarpos aphyllus*	Leafless Cherry		4	
FRANKENIACEAE	*Frankenia serpyllifolia*	Thyme Sea-heath		12	
GOODENIACEAE	*Goodenia fascicularis*	Silky Goodenia			4
GOODENIACEAE	*Goodenia pinnatifida*	Cut-leaf Goodenia			3
MALVACEAE	*Hibiscus krichauffianus*	Velvet-leaf Hibiscus			2
BRASSICACEAE	*Lepidium phlebopetalum*	Veined Peppercress			5
FABACEAE	*Lotus cruentus*	Red-flower Lotus			9
PHYLLANTHACEAE	*Lysiandra fuernrohrii*	Sand Spurge		1	
PRIMULACEAE	*Lysimachia arvensis*	Pimpernel	*		1
AMARANTHACEAE	*Maireana aphylla*	Cotton-bush		7	
AMARANTHACEAE	*Maireana appressa*	Pale-fruit Bluebush		9	
AMARANTHACEAE	*Maireana astrotricha*	Low Bluebush		1	
AMARANTHACEAE	*Maireana eriantha*	Woolly Bluebush		6	
AMARANTHACEAE	*Maireana georgei*	Satiny Bluebush		1	
AMARANTHACEAE	*Maireana integra*	Entire-wing Bluebush		1	
AMARANTHACEAE	*Maireana pyramidata*	Black Bluebush		3	
AMARANTHACEAE	*Maireana spongiocarpa*	Spongy-fruit Bluebush		7	
MALVACEAE	*Malvastrum americanum var. americanum*	Malvastrum			3
ASTERACEAE	*Minuria cunninghamii*	Bush Minuria		10	
SCROPHULARIACEAE	*Myoporum montanum*	Native Myrtle		6	
SOLANACEAE	*Nicotiana velutina*	Velvet Tobacco			2
AMARANTHACEAE	*Osteocarpum dipterocarpum*	Two-wing Bonefruit			4
AMARANTHACEAE	*Osteocarpum sp.*	Bonefruit			1
POACEAE	*Paractaenum novae-hollandiae ssp. reversum*	Barbed-wire Grass			2
THYMELAEACEAE	*Pimelea microcephala ssp.*	Shrubby Riceflower		2	
PLANTAGINACEAE	*Plantago drummondii*	Dark Plantain			5
ASTERACEAE	*Pluchea rubelliflora*				2
ASTERACEAE	*Podolepis davisiana*	Button Podolepis			2
ASTERACEAE	*Polycalymma stuartii*	Poached-egg Daisy			2
PORTULACACEAE	*Portulaca oleracea*	Common Purslane			10
ASTERACEAE	*Pterocaulon sphacelatum*	Apple-bush			2
AMARANTHACEAE	*Ptilotus obovatus*	Silver Mulla Mulla		6	
AMARANTHACEAE	*Rhagodia spinescens*	Spiny Saltbush		7	
ZYGOPHYLLACEAE	*Roepera eremaea*	Twinleaf			7
ZYGOPHYLLACEAE	*Roepera howittii*	Clasping Twinleaf			1
ZYGOPHYLLACEAE	*Roepera prismatotheca*	Square-fruit Twinleaf			1
ACANTHACEAE	*Rostellularia adscendens ssp.*	Pink Tongues			5
AMARANTHACEAE	*Salsola australis*	Buckbush			4
SANTALACEAE	*Santalum lanceolatum*	Plumbush		3	
GOODENIACEAE	*Scaevola spinescens*	Spiny Fanflower		4	
AMARANTHACEAE	*Sclerolaena brachyptera*	Short-wing Bindyi			9
AMARANTHACEAE	*Sclerolaena diacantha*	Grey Bindyi			2
AMARANTHACEAE	*Sclerolaena divaricata*	Tangled Bindyi			11
AMARANTHACEAE	*Sclerolaena intricata*	Tangled Bindyi			12
AMARANTHACEAE	*Sclerolaena obliquicuspis*	Oblique-spined Bindyi			1
AMARANTHACEAE	*Sclerolaena sp. Pernatty3*				1
AMARANTHACEAE	*Sclerolaena ventricosa*	Salt Bindyi			11
ASTERACEAE	*Senecio glossanthus*	Annual Groundsel			6
FABACEAE	*Senna artemisioides ssp. helmsii*	Blunt-leaf Senna		5	
FABACEAE	*Senna artemisioides ssp. oligophylla*	Limestone Senna		1	

Family	Scientific Name	Common Name	Status[1]	Number of Records	
				Long-lived	Short-lived
FABACEAE	*Senna artemisioides ssp. X artemisioides*	Silver Senna		5	
FABACEAE	*Senna artemisioides ssp. X sturtii*	Grey Senna		1	
MALVACEAE	*Sida ammophila*	Sand Sida			2
MALVACEAE	*Sida corrugata var.*	Corrugated Sida			4
MALVACEAE	*Sida fibulifera*	Pin Sida			7
MALVACEAE	*Sida intricata*	Twiggy Sida		3	
MALVACEAE	*Sida petrophila (may include one record of Sida calyxhymenia)*	Rock Sida		6	
BRASSICACEAE	*Sisymbrium erysimoides*	Smooth Mustard	*		3
SOLANACEAE	*Solanum lithophilum*	Velvet Potato-bush			7
SOLANACEAE	*Solanum quadriloculatum*	Plains Nightshade			4
ASTERACEAE	*Sonchus oleraceus*	Common Sow-thistle			12
POACEAE	*Sporobolus actinocladus*	Ray Grass			11
ASTERACEAE	*Streptoglossa sp.*	Daisy			1
AMARANTHACEAE	*Tecticornia indica ssp.*	Brown-head Samphire		1	
AMARANTHACEAE	*Tecticornia medullosa*	Samphire		12	
AMARANTHACEAE	*Tecticornia pergranulata ssp.*	Black-seed Samphire		2	
AMARANTHACEAE	*Tecticornia tenuis*	Slender Samphire		2	
AIZOACEAE	*Tetragonia sp. (likely T. eremaea)*	Annual Spinach			8
LAMIACEAE	*Teucrium racemosum*	Grey Germander			4
AIZOACEAE	*Trianthema triquetrum*	Red Spinach			2
BORAGINACEAE	*Trichodesma zeylanicum var. zeylanicum*	Camel Bush			1
CAMPANULACEAE	*Wahlenbergia sp.*	Native Bluebell			1
COLCHICACEAE	*Wurmbea sp.*	Nancy			2
POACEAE	*Zygochloa paradoxa*	Sandhill Cane-grass		2	
		Totals		57	77

[1] Blank = Native * = Naturalised (introduced and reproducing itself without human assistance)

[2]*Acacia sp. Blyth Range* is a poorly known entity, formerly known as *Acacia affin. papyrocarpa*. It is most common in the vicinity of Lake Torrens, NW edge of Flinders Ranges and near Bltyh Range in WA. Factsheet - Acacia sp. Blyth Range (W.V.Fitzgerald s.n. 1898) [affin. papyrocarpa] "Further field and laboratory studies are needed to determine the status of this taxon. It is clearly related to *A. papyrocarpa,* but differs most obviously in having rather rigid, often subterete, ±pungent phyllodes and minutely appressed hairy pods." In the Carrapateena operational area, the taxon of the trees is still under review.

[3] *Sclerolaena* sp. Pernatty is not recognised as an official species. It has been recorded as *Sclerolaena* sp. Pernatty since baseline surveys and no further taxonomic work has been done.

Appendix B2. Site specific descriptive statistics, grazing impact

Table B2.1: Plant diversity, life span, grazing impact, life stages and cover/abundance per RAM Site

RAM Site	Scientific Name	Common Name	Long-lived[1]	CSR[2]	Age Class[3]	Grazing Level % of Total Population		
						Intact	Modified	Over-utlised
Flora Site 1 / CAR001	*Abutilon halophilum*	Plains Lantern-bush	Y	3	Mixed	0	>50	<50
	Astrebla pectinata	Barley Mitchell-grass	Y	3	Adult	0	>50	<50
	Atriplex holocarpa	Pop Saltbush	N	3				
	Atriplex vesicaria	Bladder Saltbush	Y	5	Mixed	>50	<50	<50
	Brachyscome ciliaris var. *ciliaris*	Variable Daisy	N	1				
	Dissocarpus paradoxus	Ball Bindyi	N	2				
	Frankenia serpyllifolia	Thyme Sea-heath	Y	2	Adult	>50	0	0
	Goodenia pinnatifida	Cut-leaf Goodenia	N	1				
	Lotus cruentus	Red-flower Lotus	N	2				
	Maireana aphylla	Cotton-bush	Y	1	Adult	>50	<50	0
	Maireana eriantha	Woolly Bluebush	Y	3	Adult	>50	<50	0
	Maireana spongiocarpa	Spongy-fruit Bluebush	Y	2	Adult	<50	>50	0
	Sclerolaena diacantha	Grey Bindyi	N	3				
	Sclerolaena divaricata	Tangled Bindyi	N	4				
	Sclerolaena intricata	Tangled Bindyi	N	4				
	Senecio glossanthus	Annual Groundsel	N	1				
	Sida fibulifera	Pin Sida	N	2				
	Solanum lithophilum	Velvet Potato-bush	N	1				
	Sporobolus actinocladus	Ray Grass	N	2				
	Streptoglossa sp.	Daisy	N	1				
	Tecticornia medullosa	Samphire	Y	3	Adult	>50	<50	0
	Site 1 Totals: 21 (long-lived = 13, short-lived = 8)							
Flora Site 2 / CAR002	*Abutilon halophilum*	Plains Lantern-bush	Y	2/4	Mixed	>50	<50	<50
	Anacampseros australiana	Australian Anacampseros	N	1				
	Arabidella nasturtium	Yellow Cress	N	1				
	Atriplex holocarpa	Pop Saltbush	N	2				
	Atriplex lindleyi ssp.	Baldoo	N	3				
	Atriplex vesicaria	Bladder Saltbush	Y	5	Mixed	>50	<50	0
	Calotis hispidula	Hairy Burr-daisy	N	1				
	Dissocarpus paradoxus	Ball Bindyi	N	2/4				
	Eragrostis setifolia	Bristly Love-grass	Y	2	Adult	0	0	>50
	Erodium crinitum	Blue Heron's-bill	N	1				
	Euphorbia stevenii	Bottletree Spurge	N	1				
	Frankenia serpyllifolia	Thyme Sea-heath	Y	1	Adult	>50	0	0
	Lotus cruentus	Red-flower Lotus	N	1				
	Maireana spongiocarpa	Spongy-fruit Bluebush	Y	1	Adult	>50	0	0
	Portulaca oleracea	Common Purslane	N	1				
	Salsola australis	Buckbush	N	2				
	Sclerolaena brachyptera	Short-wing Bindyi	N	4/5				
	Sclerolaena divaricata	Tangled Bindyi	N	4				
	Sclerolaena intricata	Tangled Bindyi	N	2/4				
	Sclerolaena ventricosa	Salt Bindyi	N	2/4				
	Tecticornia medullosa	Samphire	Y	2	Adult	>50	0	0
	Site 2 Totals: 21 (long-lived = 6, short-lived = 15)							
Flora Site 3 / CAR003	*Abutilon halophilum*	Plains Lantern-bush	Y	3	Mixed	<50	>50	0
	Anacampseros australiana	Australian Anacampseros	N	3				
	Arabidella nasturtium	Yellow Cress	N	2				
	Astrebla pectinata	Barley Mitchell-grass	Y	3	Adult	0	>50	<50
	Atriplex fissivalvis	Gibber Saltbush	N	2				
	Atriplex holocarpa	Pop Saltbush	N	2				
	Atriplex lindleyi ssp.	Baldoo	N	1				
	Atriplex vesicaria	Bladder Saltbush	Y	4	Mixed	>50	<50	0
	Bulbine semibarbata	Small Leek-lily	N	1				
	Calotis hispidula	Hairy Burr-daisy	N	1				
	Centipeda crateriformis ssp.	Sneezeweed	N	1				
	Daucus glochidiatus	Native Carrot	N	3				
	Dissocarpus paradoxus	Ball Bindyi	N	3				
	Eragrostis setifolia	Bristly Love-grass	Y	2	Adult	0	0	>50
	Euphorbia stevenii	Bottletree Spurge	N	2				
	Frankenia serpyllifolia	Thyme Sea-heath	Y	3	Adult	>50	<50	0
	Lotus cruentus	Red-flower Lotus	N	1				

RAM Site	Scientific Name	Common Name	Long-lived[1]	CSR[2]	Age Class[3]	Grazing Level % of Total Population		
						Intact	Modified	Over-utlised
	Maireana appressa	Pale-fruit Bluebush	Y	2	Mixed	>50	0	0
	Maireana eriantha	Woolly Bluebush	Y	3	Mixed	>50	<50	0
	Minuria cunninghamii	Bush Minuria	Y	3	Mixed	0	<50	>50
	Osteocarpum dipterocarpum	Two-wing Bonefruit	N	1				
	Plantago drummondii	Dark Plantain	N	3				
	Portulaca oleracea	Common Purslane	N	1				
	Sclerolaena brachyptera	Short-wing Bindyi	N	2				
	Sclerolaena divaricata	Tangled Bindyi	N	3				
	Sclerolaena intricata	Tangled Bindyi	N	3				
	Senecio glossanthus	Annual Groundsel	N	2				
	Sida fibulifera	Pin Sida	N	2				
	*Sonchus oleraceus**	Common Sow-thistle	N	1				
	Tecticornia medullosa	Samphire	Y	5	Mixed	>50	<50	0
	Site 3 Totals: 30 (long-lived = 9, short-lived = 21)							
Flora Site 4 / CAR004	*Arabidella nasturtium*	Yellow Cress	N	1				
	Atriplex holocarpa	Pop Saltbush	N	2				
	Atriplex vesicaria	Bladder Saltbush	Y	4	Mixed	>50	<50	0
	Boerhavia dominii	Tar-vine	N	3				
	Bulbine sp.	Bulbine-lily	N	3				
	Daucus glochidiatus	Native Carrot	N	1				
	Dissocarpus biflorus var. *biflorus*	Two-horn Saltbush	N	3				
	Dissocarpus paradoxus	Ball Bindyi	N	1				
	Eragrostis setifolia	Bristly Love-grass	Y	3	Adult	0	0	>50
	*Erodium cicutarium**	Cut-leaf Heron's-bill	N	1				
	Erodium crinitum	Blue Heron's-bill	N	1				
	Euphorbia stevenii	Bottletree Spurge	N	1				
	Frankenia serpyllifolia	Thyme Sea-heath	Y	3	Adult	>50	0	0
	Lotus cruentus	Red-flower Lotus	N	3				
	Maireana appressa	Pale-fruit Bluebush	Y	1	Mixed	0	>50	0
	Minuria cunninghamii	Bush Minuria	Y	1	Adult	0	<50	>50
	Plantago drummondii	Dark Plantain	N	3				
	Portulaca oleracea	Common Purslane	N	1				
	Roepera prismatotheca	Square-fruit Twinleaf	N	1				
	Sclerolaena brachyptera	Short-wing Bindyi	N	2				
	Sclerolaena divaricata	Tangled Bindyi	N	4				
	Sclerolaena intricata	Tangled Bindyi	N	3				
	Sclerolaena ventricosa	Salt Bindyi	N	2/4				
	Sida fibulifera	Pin Sida	N	3				
	Sida intricata	Twiggy Sida	Y	1	Adult	0	0	>50
	*Sonchus oleraceus**	Common Sow-thistle	N	1				
	Sporobolus actinocladus	Ray Grass	N	2				
	Tecticornia medullosa	Samphire	Y	2	Mixed	>50	0	0
	Tetragonia sp.	False Spinach	N	2				
	Site 4 Totals: 29 (long-lived = 7, short-lived = 22)							
Flora Site 5 / CAR005	*Abutilon halophilum*	Plains Lantern-bush	Y	4	Mixed	>50	<50	0
	Anacampseros australiana	Australian Anacampseros	N					
	Astrebla pectinata	Barley Mitchell-grass	Y	2	Adult	0	0	>50
	Atriplex fissivalvis	Gibber Saltbush	N					
	Atriplex holocarpa	Pop Saltbush	N					
	Atriplex vesicaria	Bladder Saltbush	Y	5	Mixed	>50	<50	0
	Austrostipa sp.	Spear-grass	N					
	Bulbine sp.	Bulbine-lily	N					
	Calotis hispidula	Hairy Burr-daisy	N					
	Crassula colorata var.	Dense Crassula	N					
	Cullen cinereum	Annual Scurf-pea	N					
	Eragrostis setifolia	Bristly Love-grass	Y	2/4	Adult	0	0	>50
	*Erodium cicutarium**	Cut-leaf Heron's-bill	N					
	Erodium crinitum	Blue Heron's-bill	N					
	Frankenia serpyllifolia	Thyme Sea-heath	Y	4	Mixed	>50	0	0
	Maireana appressa	Pale-fruit Bluebush	Y	3	Adult	0	>50	0
	Maireana eriantha	Woolly Bluebush	Y	2	Mixed	>50	<50	0
	Maireana georgei	Satiny Bluebush	Y	2	Mixed	<50	>50	0
	Minuria cunninghamii	Bush Minuria	Y	3	Mixed	<50	>50	0
	Portulaca oleracea	Common Purslane	N					
	Sclerolaena brachyptera	Short-wing Bindyi	N					

RAM Site	Scientific Name	Common Name	Long-lived[1]	CSR[2]	Age Class[3]	Grazing Level % of Total Population		
						Intact	Modified	Over-utlised
	Sclerolaena intricata	Tangled Bindyi	N					
	Sclerolaena sp. *Pernatty*		N	2				
	Sclerolaena ventricosa	Salt Bindyi	N					
	Senecio glossanthus	Annual Groundsel	N					
	Sida intricata	Twiggy Sida	Y	1	Adult	0	0	>50
	Solanum lithophilum	Velvet Potato-bush	N					
	Sporobolus actinocladus	Ray Grass	N					
	Tecticornia medullosa	Samphire	Y	4	Mixed	>50	0	0
	Site 5 Totals: 29 (long-lived = 11, short-lived = 18)							
Flora Site 6 / CAR006	*Abutilon halophilum*	Plains Lantern-bush	Y	2	Adult	0	>50	<50
	Arabidella nasturtium	Yellow Cress	N	1				
	Astrebla pectinata	Barley Mitchell-grass	Y	1	Adult	0	0	>50
	Atriplex holocarpa	Pop Saltbush	N	3				
	Atriplex vesicaria	Bladder Saltbush	Y	5	Mixed	<50	>50	<50
	Bulbine semibarbata	Small Leek-lily	N	3				
	Calotis hispidula	Hairy Burr-daisy	N	1				
	Centipeda crateriformis ssp.	Sneezeweed	N	1				
	Daucus glochidiatus	Native Carrot	N	1				
	Eragrostis setifolia	Bristly Love-grass	Y	3	Adult	0	0	>50
	Goodenia fascicularis	Silky Goodenia	N	1				
	Lotus cruentus	Red-flower Lotus	N	2				
	Maireana appressa	Pale-fruit Bluebush	Y	2	Adult	0	>50	0
	Minuria cunninghamii	Bush Minuria	Y	4	Mixed	0	0	>50
	Osteocarpum dipterocarpum	Two-wing Bonefruit	N	1				
	Plantago drummondii	Dark Plantain	N	2				
	Podolepis davisiana	Button Podolepis	N	1				
	Portulaca oleracea	Common Purslane	N	1				
	Roepera eremaea	Twinleaf	N	1				
	Sclerolaena brachyptera	Short-wing Bindyi	N	2				
	Sclerolaena divaricata	Tangled Bindyi	N	4				
	Sclerolaena intricata	Tangled Bindyi	N	3				
	Sclerolaena ventricosa	Salt Bindyi	N	4				
	Sida fibulifera	Pin Sida	N	3				
	Sida intricata	Twiggy Sida	Y	1	Adult	0	0	>50
	*Sonchus oleraceus**	Common Sow-thistle	N	1				
	Tecticornia medullosa	Samphire	Y	3	Mixed	<50	>50	0
	Wahlenbergia sp.	Native Bluebell	N	1				
	Site 6 Totals: 28 (long-lived = 8, short-lived = 20)							
Flora Site 7 / CAR007	*Astrebla pectinata*	Barley Mitchell-grass	Y	4	Adult	0	<50	>50
	Atriplex holocarpa	Pop Saltbush	N	1				
	Atriplex vesicaria	Bladder Saltbush	Y	5	Mixed	>50	<50	0
	Enteropogon acicularis	Umbrella Grass	N	1				
	Frankenia serpyllifolia	Thyme Sea-heath	Y	2	Adult	>50	<50	0
	Maireana appressa	Pale-fruit Bluebush	Y	3	Mixed	>50	<50	0
	Maireana astrotricha	Low Bluebush	Y	3	Adult	>50	<50	0
	Maireana pyramidata	Black Bluebush	Y	2	Adult	<50	>50	0
	Maireana spongiocarpa	Spongy-fruit Bluebush	Y	3	Mixed	<50	>50	<50
	Minuria cunninghamii	Bush Minuria	Y	2	Adult	0	>50	<50
	Myoporum montanum	Native Myrtle	Y	1	Juveniles	>50	0	0
	Osteocarpum sp.	Bonefruit	N	3				
	Plantago drummondii	Dark Plantain	N	1				
	Portulaca oleracea	Common Purslane	N	1				
	Sclerolaena diacantha	Grey Bindyi	N	3				
	Sclerolaena intricata	Tangled Bindyi	N	2				
	Sclerolaena obliquicuspis	Oblique-spined Bindyi	N	3				
	Sclerolaena ventricosa	Salt Bindyi	N	3				
	Sida calyxhymenia	Tall Sida	N	2				
	Solanum lithophilum	Velvet Potato-bush	N	1				
	Sporobolus actinocladus	Ray Grass	N	2				
	Tecticornia indica ssp.	Brown-head Samphire	Y	3	Mixed	>50	0	0
	Tecticornia pergranulata ssp.	Black-seed Samphire	Y	3	Adult	>50	<50	<50
	Tecticornia tenuis	Slender Samphire	Y	2	Mixed	<50	>50	0
	Tetragonia tetragonoides	New Zealand Spinach	N	1				
	Site 7 Totals: 25 (long-lived = 12, short-lived = 13)							

RAM Site	Scientific Name	Common Name	Long-lived[1]	CSR[2]	Age Class[3]	Grazing Level % of Total Population		
						Intact	Modified	Over-utlised
Flora Site 9 / CAR009	*Abutilon halophilum*	Plains Lantern-bush	Y	2/4	Mixed	>50	<50	0
	Acacia aneura complex	Mulga	Y	2	Mixed	<50	>50	0
	Acacia papyrocarpa	Western Myall	Y	5	Mixed	>50	<50	0
	Acacia tetragonophylla	Dead Finish	Y	1	Adult	>50	<50	0
	Anacampseros australiana	Australian Anacampseros	N	1				
	Atriplex fissivalvis	Gibber Saltbush	N	1				
	Atriplex holocarpa	Pop Saltbush	N	2				
	Atriplex lindleyi ssp.	Baldoo	N	1				
	Atriplex vesicaria	Bladder Saltbush	Y	3	Mixed	>50	<50	<50
	Cymbopogon ambiguus	Lemon-grass	Y	3	Adult	0	0	>50
	Dissocarpus paradoxus	Ball Bindyi	N	1				
	Enchylaena tomentosa var. *tomentosa*	Ruby Saltbush	Y	2	Mixed	0	>50	0
	Eragrostis setifolia	Bristly Love-grass	Y	2	Adult	0	0	>50
	Eremophila oppositifolia ssp.	Opposite-leaved Emubush	Y	1	Adult	0	0	>50
	*Erodium cicutarium**	Cut-leaf Heron's-bill	N	1				
	Frankenia serpyllifolia	Thyme Sea-heath	Y	3	Adult	<50	>50	0
	Maireana aphylla	Cotton-bush	Y	3	Adult	0	>50	0
	Maireana appressa	Pale-fruit Bluebush	Y	2/4	Mixed	0	>50	0
	Maireana eriantha	Woolly Bluebush	Y	2/4	Adult	0	>50	<50
	Minuria cunninghamii	Bush Minuria	Y	3	Mixed	0	<50	>50
	Myoporum montanum	Native Myrtle	Y	1	Juveniles	>50	0	0
	Portulaca oleracea	Common Purslane	N	1				
	Ptilotus obovatus	Silver Mulla Mulla	Y	2	Mixed	>50	0	0
	Rostellularia adscendens ssp.	Pink Tongues	N	1				
	Sclerolaena divaricata	Tangled Bindyi	N	3				
	Sclerolaena intricata	Tangled Bindyi	N	3				
	Sclerolaena ventricosa	Salt Bindyi	N	3				
	Sida fibulifera	Pin Sida	N	1				
	Solanum quadriloculatum	Plains Nightshade	N	1				
	*Sonchus oleraceus**	Common Sow-thistle	N	1				
	Sporobolus actinocladus	Ray Grass	N	2				
	Tecticornia medullosa	Samphire	Y	2/4	Mixed	<50	>50	<50
	Tecticornia pergranulata ssp.	Black-seed Samphire	Y	1/5	Mixed	<50	>50	<50
	Tecticornia tenuis	Slender Samphire	Y	4	Mixed	>50	0	0
	Site 9 Totals: 34 (long-lived = 19, short-lived = 15)							
Flora Site 10 / CAR010	*Abutilon otocarpum*	Desert Lantern-bush	Y	1	Adult	0	<50	>50
	Acacia papyrocarpa	Western Myall	Y	4	Mixed	>50	<50	0
	Acacia tetragonophylla	Dead Finish	Y	4	Mixed	<50	>50	<50
	Aristida contorta	Curly Wire-grass	N	3				
	Atriplex vesicaria	Bladder Saltbush	Y	3	Mixed	<50	>50	0
	Austrostipa sp.	Spear-grass	N	1				
	Boerhavia dominii	Tar-vine	N	1				
	Crinum flaccidum	Murray Lily	N	2				
	Cymbopogon ambiguus	Lemon-grass	Y	4	Adult	0	<50	>50
	Daucus glochidiatus	Native Carrot	N	1				
	Digitaria brownii	Cotton Panic-grass	Y	2/4	Adult	0	>50	0
	Dodonaea lobulata	Lobed-leaf Hop-bush	Y	4	Mixed	0	>50	0
	Duma florulenta	Lignum	Y	2	Mixed	0	>50	0
	Enchylaena tomentosa var. *tomentosa*	Ruby Saltbush	Y	3	Mixed	<50	>50	0
	Eragrostis setifolia	Bristly Love-grass	Y	4	Adult	0	0	>50
	Eucalyptus camaldulensis ssp. *arida*	Northern River Red Gum	Y	4	Adult	>50	0	0
	Eulalia aurea	Silky Brown-top	Y	3	Adult	0	0	>50
	Eulalia aurea	Silky Brown-top	Y	1	Adult	0	0	>50
	Exocarpos aphyllus	Leafless Cherry	Y	1	Mixed	<50	>50	0
	Goodenia pinnatifida	Cut-leaf Goodenia	N	1				
	Lepidium phlebopetalum	Veined Peppercress	N	1				
	Malvastrum americanum var. *americanum*	Malvastrum	N	1				
	Myoporum montanum	Native Myrtle	Y	4	Mixed	>50	<50	0
	Pterocaulon sphacelatum	Apple-bush	N	1				
	Ptilotus obovatus	Silver Mulla Mulla	Y	4	Mixed	0	>50	<50
	Rhagodia spinescens	Spiny Saltbush	Y	1	Adult	0	>50	0
	Rostellularia adscendens ssp.	Pink Tongues	N	3				

RAM Site	Scientific Name	Common Name	Long-lived[1]	CSR[2]	Age Class[3]	Grazing Level % of Total Population		
						Intact	Modified	Over-utlised
	Scaevola spinescens	Spiny Fanflower	Y	4	Mixed	0	>50	<50
	Senna artemisioides ssp. *helmsii*	Blunt-leaf Senna	Y	3	Adult	>50	<50	0
	Senna artemisioides ssp. *X artemisioides*	Silver Senna	Y	4	Mixed	>50	<50	0
	Sida corrugata var.	Corrugated Sida	N	1				
	Sida petrophila	Rock Sida	Y	4				
	Solanum lithophilum	Velvet Potato-bush	N	1				
	Solanum quadriloculatum	Plains Nightshade	N	1				
	*Sonchus oleraceus**	Common Sow-thistle	N	3				
	Sporobolus actinocladus	Ray Grass	N	1				
	Teucrium racemosum	Grey Germander	N	1				
	Site 10 Totals: 37 (long-lived = 21, short-lived = 16)							
Flora Site 11 / CAR011	*Abutilon halophilum*	Plains Lantern-bush	Y	3	Mixed	>50	<50	0
	Acacia papyrocarpa	Western Myall	Y	1	Mixed	>50	<50	0
	Anacampseros australiana	Australian Anacampseros	N	2				
	Astrebla pectinata	Barley Mitchell-grass	Y	3/4	Adult	0	<50	>50
	Atriplex fissivalvis	Gibber Saltbush	N	1				
	Atriplex lindleyi ssp.	Baldoo	N	1				
	Atriplex vesicaria	Bladder Saltbush	Y	4	Mixed	>50	>50	0
	Bulbine sp.	Bulbine-lily	N	2				
	Calotis hispidula	Hairy Burr-daisy	N	3				
	Crinum flaccidum	Murray Lily	N	1				
	Daucus glochidiatus	Native Carrot	N	3				
	Dissocarpus biflorus var. *biflorus*	Two-horn Saltbush	N	3				
	Eragrostis australasica	Cane-grass	Y	1	Adult	>50	0	0
	Eragrostis setifolia	Bristly Love-grass	Y	2/4	Adult	0	0	>50
	Euphorbia stevenii	Bottletree Spurge	N	1				
	Exocarpos aphyllus	Leafless Cherry	Y	1	Adult	0	>50	0
	Frankenia serpyllifolia	Thyme Sea-heath	Y	3	Mixed	>50	0	0
	Goodenia fascicularis	Silky Goodenia	N	1				
	Lotus cruentus	Red-flower Lotus	N	3				
	Maireana aphylla	Cotton-bush	Y	1	Adult	<50	>50	0
	Maireana appressa	Pale-fruit Bluebush	Y	3	Adult	<50	>50	0
	Maireana eriantha	Woolly Bluebush	Y	1	Adult	<50	>50	0
	Maireana spongiocarpa	Spongy-fruit Bluebush	Y	2	Mixed	0	>50	0
	Minuria cunninghamii	Bush Minuria	Y	1	Mixed	0	>50	<50
	Osteocarpum dipterocarpum	Two-wing Bonefruit	N	2				
	Plantago drummondii	Dark Plantain	N	1				
	Podolepis davisiana	Button Podolepis	N	1				
	Rhagodia spinescens	Spiny Saltbush	Y	1	Adult	>50	0	0
	Sclerolaena brachyptera	Short-wing Bindyi	N	2				
	Sclerolaena divaricata	Tangled Bindyi	N	2				
	Sclerolaena intricata	Tangled Bindyi	N	1				
	Sclerolaena ventricosa	Salt Bindyi	N	2/4				
	Senecio glossanthus	Annual Groundsel	N	2				
	Sida fibulifera	Pin Sida	N	3				
	Sporobolus actinocladus	Ray Grass	N	3				
	Tecticornia medullosa	Samphire	Y	5	Mixed	>50	O	O
	Tetragonia sp.	False Spinach	N	2				
	Site 11 Totals: 37 (long-lived = 15, short-lived = 22)							
Flora Site 12 / CAR012	*Abutilon halophilum*	Plains Lantern-bush	Y	1	Mixed	0	<50	0
	Atriplex holocarpa	Pop Saltbush	N	2				
	Atriplex lindleyi ssp. *conduplicata*	Baldoo	N	1				
	Atriplex vesicaria	Bladder Saltbush	Y	5	Mixed	>50	<50	0
	Bulbine semibarbata	Small Leek-lily	N	3				
	Dissocarpus biflorus var. *biflorus*	Two-horn Saltbush	N	3				
	Dissocarpus paradoxus	Ball Bindyi	N	2				
	Eragrostis setifolia	Bristly Love-grass	Y	4	Adult	0	0	>50
	Euphorbia stevenii	Bottletree Spurge	N	3				
	Frankenia serpyllifolia	Thyme Sea-heath	Y	1	Adult	>50	0	0
	Minuria cunninghamii	Bush Minuria	Y	2	Adult	0	0	>50
	Osteocarpum dipterocarpum	Two-wing Bonefruit	N	3				
	Roepera eremaea	Twinleaf	N	1				
	Salsola australis	Buckbush	N	1				
	Sclerolaena divaricata	Tangled Bindyi	N	2/4				

RAM Site	Scientific Name	Common Name	Long-lived[1]	CSR[2]	Age Class[3]	Grazing Level % of Total Population		
						Intact	Modified	Over-utlised
	Sclerolaena intricata	Tangled Bindyi	N	4				
	Sclerolaena ventricosa	Salt Bindyi	N	2/4				
	Sida fibulifera	Pin Sida	N	2				
	*Sonchus oleraceus**	Common Sow-thistle	N	1				
	Sporobolus actinocladus	Ray Grass	N	3				
	Tecticornia medullosa	Samphire	Y	4	Adult	0	0	>50
	Site 12 Totals: 21 (long-lived = 6, short-lived = 15)							
Flora Site 13 / CAR013	*Abutilon halophilum*	Plains Lantern-bush	Y	2	Mixed	>50	0	0
	Atriplex fissivalvis	Gibber Saltbush	N	2				
	Atriplex lindleyi ssp.	Baldoo	N	3				
	Atriplex lindleyi ssp. *conduplicata*	Baldoo	N	1				
	Atriplex vesicaria	Bladder Saltbush	Y	5	Mixed	<50	>50	<50
	Bulbine sp.	Bulbine-lily	N	1				
	Calotis hispidula	Hairy Burr-daisy	N	2				
	Daucus glochidiatus	Native Carrot	N	1				
	Dissocarpus biflorus var.	Two-horn Saltbush	N	1				
	Eragrostis setifolia	Bristly Love-grass	Y	4	Adult	0	0	>50
	Frankenia serpyllifolia	Thyme Sea-heath	Y	3	Adult	>50	0	0
	Lotus cruentus	Red-flower Lotus	N	2				
	Maireana appressa	Pale-fruit Bluebush	Y	3	Adult	0	0	>50
	Minuria cunninghamii	Bush Minuria	Y	1	Adult	0	0	>50
	Portulaca oleracea	Common Purslane	N	1				
	Roepera eremaea	Twinleaf	N	1				
	Sclerolaena brachyptera	Short-wing Bindyi	N	2				
	Sclerolaena divaricata	Tangled Bindyi	N	2/4				
	Sclerolaena ventricosa	Salt Bindyi	N	2/4				
	Solanum quadriloculatum	Plains Nightshade	N	1				
	*Sonchus oleraceus**	Common Sow-thistle	N	1				
	Tecticornia medullosa	Samphire	Y	4	Mixed	>50	0	0
	Tetragonia sp.	False Spinach	N	1				
	Site 13 Totals: 23 (long-lived = 7, short-lived = 16)							
Flora Site 15 / CAR015	*Abutilon halophilum*	Plains Lantern-bush	Y	3	Adult	>50	<50	0
	Atriplex holocarpa	Pop Saltbush	N	2				
	Atriplex vesicaria	Bladder Saltbush	Y	4	Mixed	>50	<50	0
	Bulbine semibarbata	Small Leek-lily	N	1				
	Calotis hispidula	Hairy Burr-daisy	N	1				
	Dissocarpus biflorus var.	Two-horn Saltbush	N	1				
	Dissocarpus paradoxus	Ball Bindyi	N	2				
	Eragrostis setifolia	Bristly Love-grass	Y	1	Adult	0	0	>50
	Erodium crinitum	Blue Heron's-bill	N	1				
	Euphorbia stevenii	Bottletree Spurge	N	1				
	Frankenia serpyllifolia	Thyme Sea-heath	Y	2	Mixed	>50	0	0
	Lotus cruentus	Red-flower Lotus	N	2				
	Maireana aphylla	Cotton-bush	Y	2	Adult	>50	<50	0
	Maireana spongiocarpa	Spongy-fruit Bluebush	Y	1	Mixed	0	>50	0
	Roepera sp.	Twinleaf	N	1				
	Salsola australis	Buckbush	N	3				
	Sclerolaena brachyptera	Short-wing Bindyi	N	2/4				
	Sclerolaena divaricata	Tangled Bindyi	N	4				
	Sclerolaena ventricosa	Salt Bindyi	N	4/5				
	Tecticornia medullosa	Samphire	Y	3	Mixed	>50	0	0
	Tetragonia sp.	False Spinach	N	2				
	Wurmbea sp.	Nancy	N	1				
	Site 15 Totals: 22 (long-lived = 7, short-lived = 15)							
Flora Site 16 / CAR016	*Abutilon halophilum*	Plains Lantern-bush	Y	2/4	Mixed	>50	<50	0
	Arabidella nasturtium	Yellow Cress	N	3				
	Astrebla pectinata	Barley Mitchell-grass	Y	1	Adult	0	0	>50
	Atriplex holocarpa	Pop Saltbush	N	2				
	Atriplex vesicaria	Bladder Saltbush	Y	5	Mixed	>50	0	0
	Bulbine semibarbata	Small Leek-lily	N	2				
	Cullen cinereum	Annual Scurf-pea	N	1				
	Dissocarpus biflorus var. *biflorus*	Two-horn Saltbush	N	2				
	Eragrostis setifolia	Bristly Love-grass	Y	2	Adult	0	0	>50
	Erodium crinitum	Blue Heron's-bill	N	1				
	Euphorbia stevenii	Bottletree Spurge	N	1				

RAM Site	Scientific Name	Common Name	Long-lived[1]	CSR[2]	Age Class[3]	Grazing Level % of Total Population		
						Intact	Modified	Over-utlised
	Frankenia serpyllifolia	Thyme Sea-heath	Y	3	Mixed	>50	0	0
	Goodenia fascicularis	Silky Goodenia	N	1				
	Lepidium phlebopetalum	Veined Peppercress	N	2				
	Lotus cruentus	Red-flower Lotus	N	3				
	Maireana appressa	Pale-fruit Bluebush	Y	1	Adult	>50	<50	0
	Maireana eriantha	Woolly Bluebush	Y	2	Adult	>50	<50	0
	Minuria cunninghamii	Bush Minuria	Y	1	Adult	>50	<50	0
	Roepera sp.	Twinleaf	N	1				
	Sclerolaena brachyptera	Short-wing Bindyi	N	2/4				
	Sclerolaena divaricata	Tangled Bindyi	N	2/4				
	Sclerolaena intricata	Tangled Bindyi	N	4				
	Sclerolaena ventricosa	Salt Bindyi	N	4				
	Senecio glossanthus	Annual Groundsel	N	1				
	*Sonchus oleraceus**	Common Sow-thistle	N	1				
	Sporobolus actinocladus	Ray Grass	N	1				
	Tecticornia medullosa	Samphire	Y	4	Mixed	>50	0	0
	Tetragonia tetragonoides	New Zealand Spinach	N	2				
	Trianthema triquetrum	Red Spinach	N	1				
	Site 16 Totals: 29 (long-lived = 9, short-lived = 20)							
Flora Site 17 / CAR017	*Abutilon otocarpum*	Desert Lantern-bush	Y	1	Mixed	>50	0	0
	Acacia papyrocarpa	Western Myall	Y	5	Mixed	<50	>50	0
	Acacia tetragonophylla	Dead Finish	Y	2/4	Mixed	>50	0	0
	Atriplex vesicaria	Bladder Saltbush	Y	2/4	Mixed	0	>50	0
	Chenopodium desertorum ssp.	Desert Goosefoot	Y	3	Mixed	<50	<50	>50
	Crinum flaccidum	Murray Lily	N	2				
	Dodonaea lobulata	Lobed-leaf Hop-bush	Y	4/5	Mixed	>50	<50	0
	Enchylaena tomentosa var. *tomentosa*	Ruby Saltbush	Y	4	Mixed	>50	<50	0
	Eragrostis setifolia	Bristly Love-grass	Y	2	Adult	0	0	>50
	Eremophila latrobei ssp.	Crimson Emubush	Y	3	Mixed	>50	0	0
	Eremophila serrulata	Green Emubush	Y	3	Mixed	>50	0	0
	Exocarpos aphyllus	Leafless Cherry	Y	1	Adult	0	>50	0
	Goodenia sp.	Goodenia	N	1				
	Lepidium phlebopetalum	Veined Peppercress	N	1				
	Maireana aphylla	Cotton-bush	Y	1	Adult	<50	>50	0
	Maireana spongiocarpa	Spongy-fruit Bluebush	Y	2/4	Adult	0	>50	<50
	Portulaca oleracea	Common Purslane	N	1				
	Ptilotus obovatus	Silver Mulla Mulla	Y	4	Mixed	>50	<50	0
	Rhagodia spinescens	Spiny Saltbush	Y	2	Mixed	>50	<50	0
	Rostellularia adscendens ssp.	Pink Tongues	N	3				
	Scaevola spinescens	Spiny Fanflower	Y	3	Mixed	<50	<50	>50
	Senna artemisioides ssp. *helmsii*	Blunt-leaf Senna	Y	2	Mixed	>50	0	0
	Senna artemisioides ssp. *oligophylla*	Limestone Senna	Y	2/4	Mixed	>50	0	0
	Senna artemisioides ssp. *X artemisioides*	Silver Senna	Y	2	Adult	>50	0	0
	Senna artemisioides ssp. *X sturtii*	Grey Senna	Y	1	Adult	>50	0	0
	Sida petrophila	Rock Sida	Y	2/4	Mixed	>50	0	0
	Solanum lithophilum	Velvet Potato-bush	N	1				
	Sporobolus actinocladus	Ray Grass	N	2				
	Site 17 Totals: 28 (long-lived = 20, short-lived = 8)							
Flora Site 18 / CAR018	*Acacia papyrocarpa*	Western Myall	Y	5	Mixed	>50	<50	0
	Acacia tetragonophylla	Dead Finish	Y	4	Adult	>50	0	0
	Alternanthera sp.	Joyweed	N	1				
	Atriplex vesicaria	Bladder Saltbush	Y	2/4	Mixed	>50	<50	0
	Boerhavia dominii	Tar-vine	N	1				
	Cheilanthes lasiophylla	Woolly Cloak-fern	N	1				
	Chenopodium curvispicatum	Cottony Goosefoot	Y	1	Adult	>50	0	0
	Crinum flaccidum	Murray Lily	N	3				
	Digitaria brownii	Cotton Panic-grass	Y	4	Adult	0	0	>50
	Dodonaea lobulata	Lobed-leaf Hop-bush	Y	4	Mixed	>50	0	0
	Enchylaena tomentosa var. *tomentosa*	Ruby Saltbush	Y	4	Mixed	>50	<50	0
	Enteropogon acicularis	Umbrella Grass	N	2				
	Eremophila serrulata	Green Emubush	Y	1	Adult	>50	0	0
	Goodenia sp.	Goodenia	N	1				

RAM Site	Scientific Name	Common Name	Long-lived[1]	CSR[2]	Age Class[3]	Grazing Level % of Total Population		
						Intact	Modified	Over-utlised
	*Lysimachia arvensis**	Pimpernel	N	1				
	Maireana aphylla	Cotton-bush	Y	1	Adult	>50	<50	0
	Maireana integra	Entire-wing Bluebush	Y	1	Adult	>50	0	0
	Maireana spongiocarpa	Spongy-fruit Bluebush	Y	4	Mixed	<50	>50	<50
	Myoporum montanum	Native Myrtle	Y	2	Mixed	>50	0	0
	Portulaca oleracea	Common Purslane	N	1				
	Ptilotus obovatus	Silver Mulla Mulla	Y	4	Mixed	>50	<50	0
	Rhagodia spinescens	Spiny Saltbush	Y	2	Mixed	>50	<50	0
	Rostellularia adscendens ssp.	Pink Tongues	N	1				
	Santalum lanceolatum	Plumbush	Y	1	Adult	>50	0	0
	Sclerolaena intricata	Tangled Bindyi	N	1				
	Senecio glossanthus	Annual Groundsel	N	1				
	Senna artemisioides ssp. *helmsii*	Blunt-leaf Senna	Y	3	Mixed	>50	0	0
	Senna artemisioides ssp. *X artemisioides*	Silver Senna	Y	3	Adult	>50	0	0
	Sida corrugata var.	Corrugated Sida	N	2				
	Sida petrophila	Rock Sida	Y	2/4	Adult	>50	0	0
	*Sisymbrium erysimoides**	Smooth Mustard	N	1				
	*Sonchus oleraceus**	Common Sow-thistle	N	2				
	Sporobolus actinocladus	Ray Grass	N	3				
	Tetragonia sp.	False Spinach	N	1				
	Teucrium racemosum	Grey Germander	N	1	Adult	>50	<50	0
	Trianthema triquetrum	Red Spinach	N	1				
	Wurmbea sp.	Nancy	N	1				
	Site 18 Totals: 37 (long-lived = 18, short-lived = 19)							
Flora Site 19 / CAR019	*Abutilon otocarpum*	Desert Lantern-bush	Y	3	Mixed	>50	0	0
	Acacia papyrocarpa	Western Myall	Y	2/4	Mixed	>50	<50	0
	Acacia tetragonophylla	Dead Finish	Y	4/5	Adult	>50	0	0
	Atriplex vesicaria	Bladder Saltbush	Y	2	Mixed	>50	0	0
	Boerhavia dominii	Tar-vine	N	1				
	Crinum flaccidum	Murray Lily	N	3				
	Daucus glochidiatus	Native Carrot	N	3				
	Digitaria brownii	Cotton Panic-grass	Y	4	Adult	0	<50	>50
	Dodonaea lobulata	Lobed-leaf Hop-bush	Y	4/5	Mixed	>50	0	0
	Duma florulenta	Lignum	Y	2	Mixed	>50	0	0
	Einadia nutans ssp.	Climbing Saltbush	Y	2	Mixed	>50	0	0
	Eragrostis setifolia	Bristly Love-grass	Y	2	Adult	0	0	>50
	Eremophila latrobei ssp.	Crimson Emubush	Y	2	Adult	>50	0	0
	Eremophila oppositifolia ssp.	Opposite-leaved Emubush	Y	1	Adult	0	0	>50
	Eremophila serrulata	Green Emubush	Y	1	Adult	>50	0	0
	Eucalyptus camaldulensis ssp. *arida*	Northern River Red Gum	Y	4	Mixed	>50	0	0
	Exocarpos aphyllus	Leafless Cherry	Y	1	Adult	>50	0	0
	Lepidium phlebopetalum	Veined Peppercress	N	3				
	Maireana aphylla	Cotton-bush	Y	1	Adult	>50	0	0
	Malvastrum americanum var. *americanum*	Malvastrum	N	1				
	Myoporum montanum	Native Myrtle	Y	4	Mixed	>50	0	0
	Pluchea rubelliflora		N	2				
	Pterocaulon sphacelatum	Apple-bush	N	3				
	Ptilotus obovatus	Silver Mulla Mulla	Y	4	Mixed	>50	<50	0
	Rhagodia spinescens	Spiny Saltbush	Y	1	Adult	<50	>50	0
	Rostellularia adscendens ssp.	Pink Tongues	N	1				
	Santalum lanceolatum	Plumbush	Y	2/4	Mixed	>50	0	0
	Scaevola spinescens	Spiny Fanflower	Y	4	Mixed	>50	<50	0
	Senna artemisioides ssp. *helmsii*	Blunt-leaf Senna	Y	2/4	Adult	>50	0	0
	Senna artemisioides ssp. X *artemisioides*	Silver Senna	Y	2	Adult	>50	0	0
	Sida corrugata var.	Corrugated Sida	N	1				
	Sida petrophila	Rock Sida	Y	4	Mixed	>50	0	0
	Solanum lithophilum	Velvet Potato-bush	N	1				
	*Sonchus oleraceus**	Common Sow-thistle	N	2				
	Tetragonia sp.	False Spinach	N	2				
	Teucrium racemosum	Grey Germander	N	3	Adult	>50	0	0
	Site 19 Totals: 36 (long-lived =23, short-lived = 13)							
	Abutilon otocarpum	Desert Lantern-bush	Y	2	Mixed	>50	0	0

RAM Site	Scientific Name	Common Name	Long-lived[1]	CSR[2]	Age Class[3]	Grazing Level % of Total Population		
						Intact	Modified	Over-utlised
Flora Site 20 / CAR020	*Acacia aptaneura*	Slender Mulga	Y	1	Adult	>50	0	0
	Acacia papyrocarpa	Western Myall	Y	2	Adult	>50	<50	0
	Acacia tetragonophylla	Dead Finish	Y	4	Adult	>50	0	0
	Boerhavia dominii	Tar-vine	N	3				
	Convolvulus remotus	Grassy Bindweed	N	1				
	Crinum flaccidum	Murray Lily	N	1				
	Cymbopogon ambiguus	Lemon-grass	Y	2	Adult	0	>50	<50
	Daucus glochidiatus	Native Carrot	N	2				
	Digitaria brownii	Cotton Panic-grass	Y	4	Adult	0	<50	>50
	Dodonaea lobulata	Lobed-leaf Hop-bush	Y	4	Mixed	>50	0	0
	Enchylaena tomentosa var. *tomentosa*	Ruby Saltbush	Y	2	Mixed	>50	<50	0
	Eremophila serrulata	Green Emubush	Y	1	Mixed	>50	0	0
	Eucalyptus camaldulensis ssp. *arida*	Northern River Red Gum	Y	4	Mixed	>50	0	0
	Lepidium phlebopetalum	Veined Peppercress	N	3				
	Malvastrum americanum var. *americanum*	Malvastrum	N					
	Myoporum montanum	Native Myrtle	Y	4	Mixed	>50	0	0
	Pluchea rubelliflora	Winged Plais-bush	N	4				
	Ptilotus obovatus	Silver Mulla Mulla	Y	2/4	Mixed	>50	0	0
	Rhagodia spinescens	Spiny Saltbush	Y	1	Adult	>50	<50	0
	Santalum lanceolatum	Plumbush	Y	2	Mixed	>50	0	0
	Scaevola spinescens	Spiny Fanflower	Y	2	Adult	0	<50	>50
	Senna artemisioides ssp. *helmsii*	Blunt-leaf Senna	Y	2	Mixed	>50	0	0
	Senna artemisioides ssp. *X artemisioides*	Silver Senna	Y	2	Adult	>50	0	0
	Sida corrugata var.	Corrugated Sida	N	1				
	Sida petrophila	Rock Sida	Y	2	Mixed	>50	0	0
	Solanum lithophilum	Velvet Potato-bush	N	1				
	Solanum quadriloculatum	Plains Nightshade	N	1				
	*Sonchus oleraceus**	Common Sow-thistle	N	1				
	Teucrium racemosum	Grey Germander	N	1				
	Site 20 Totals: 30 (long-lived = 18, short-lived = 12)							
Flora Site 21 / CAR021	*Acacia ligulata*	Umbrella Bush	Y	4	Mixed	>50	0	0
	Acacia oswaldii	Umbrella Wattle	Y	1	Adult	0	>50	0
	Alectryon oleifolius ssp. *canescens*	Bullock Bush	Y	1	Adult	0	>50	0
	Aristida contorta	Curly Wire-grass	N	2				
	Aristida holathera var. *holathera*	Tall Kerosene Grass	N	2				
	Atriplex velutinella	Sandhill Saltbush	N	1				
	Dodonaea viscosa ssp. *angustissima*	Narrow-leaf Hop-bush	Y	1	Mixed	>50	<50	0
	Enchylaena tomentosa var. *tomentosa*	Ruby Saltbush	Y	2	Mixed	0	>50	0
	Hibiscus krichauffianus	Velvet-leaf Hibiscus	N	2/4				
	Lysiandra fuernrohrii	Sand Spurge	Y	3	Mixed	>50	0	0
	Maireana pyramidata	Black Bluebush	Y	1	Adult	0	>50	0
	Nicotiana velutina	Velvet Tobacco	N	3				
	Paractaenum novae-hollandiae ssp. *reversum*	Barbed-wire Grass	N	1				
	Pimelea microcephala ssp.	Shrubby Riceflower	Y	1	Adult	>50	0	0
	Polycalymma stuartii	Poached-egg Daisy	N	2				
	Roepera eremaea	Twinleaf	N	1				
	Sida ammophila	Sand Sida	N	2				
	*Sisymbrium erysimoides**	Smooth Mustard	N	4				
	Zygochloa paradoxa	Sandhill Cane-grass	Y	4	Adult	>50	0	0
	Site 21 Totals: 19 (long-lived = 9, short-lived = 10)							
Flora Site 22 / CAR022	*Acacia ligulata*	Umbrella Bush	Y	4	Mixed	>50	<50	0
	Acacia ramulosa var. *ramulosa*	Horse Mulga	Y	1	Adult	0	>50	0
	Aristida holathera var. *holathera*	Tall Kerosene Grass	N	2				
	Calandrinia eremaea	Dryland Purslane	N	1				
	Crotalaria eremaea ssp.	Loose-flowered Rattle-pod	N	4				
	Dodonaea viscosa ssp. *angustissima*	Narrow-leaf Hop-bush	Y	1	Adult	>50	<50	0
	Einadia nutans ssp.	Climbing Saltbush	Y	2	Mixed	>50	0	0
	Enchylaena tomentosa var. *tomentosa*	Ruby Saltbush	Y	2	Adult	<50	>50	0
	Euphorbia drummondii group	Spurge	N	1				

RAM Site	Scientific Name	Common Name	Long-lived[1]	CSR[2]	Age Class[3]	Grazing Level % of Total Population		
						Intact	Modified	Over-utlised
	Hibiscus krichauffianus	Velvet-leaf Hibiscus	N	2				
	Maireana pyramidata	Black Bluebush	Y	1	Adult	0	>50	0
	Nicotiana velutina	Velvet Tobacco	N	2				
	Paractaenum novae-hollandiae ssp. *reversum*	Barbed-wire Grass	N	1				
	Pimelea microcephala ssp.	Shrubby Riceflower	Y	1	Adult	>50	0	0
	Polycalymma stuartii	Poached-egg Daisy	N	3				
	Rhagodia spinescens	Spiny Saltbush	Y	1	Adult	0	>50	0
	Roepera eremaea	Twinleaf	N	1				
	Roepera howittii	Clasping Twinleaf	N	1				
	Salsola australis	Buckbush	N	1				
	Sida ammophila	Sand Sida	N	1				
	*Sisymbrium erysimoides**	Smooth Mustard	N	5				
	*Sonchus oleraceus**	Common Sow-thistle	N	1				
	Trichodesma zeylanicum var. *zeylanicum*	Camel Bush	N	3				
	Zygochloa paradoxa	Sandhill Cane-grass	Y	2/4	Adult	>50	<50	0
	Site 22 Totals: 24 (long-lived = 9, short-lived = 15)							

* Non-native

[1] Long-lived woody perennials – refer Appendix C; [2] CSR ratio (Source = DENR (2011); [3] Age Classes: Recorded for Long-lived perennials only; M = Adults and Juveniles present; A = Adults only present; J = Juveniles only present

CSR Ratio, Pastoral Lease Assessment Manual (DENR 2011)

CLASS	TERM	CSR	FIELD CRITERIA
1	Present	< 12 plants	< 12 plants within 200 m radius
2	Isolated Clumps	>20 spaces	Isolated clumps of 2 to 5 woody plants 200 m further apart
3	Isolated Plants	>20 spaces	Isolated plants
4	Very Sparse	6-20 spaces	Well spaced plants, crowns well separated
5	Sparse	1-5 spaces	Clearly spaced, crowns clearly separated
6	Mid dense	0-0.9 spaces	Crowns touching to slight separation
7	Closed or dense	0	Crowns touching to overlapping

Appendix C. Flora life span classification

Table C1: Long-lived Woody Species Perennial Classification

Family	Scientific Name	Common Name	Long-lived woody? Yes (Y) No (N)
MALVACEAE	*Abutilon halophilum*	Plains Lantern-bush	Y
MALVACEAE	*Abutilon leucopetalum*	Desert Lantern-bush	Y
MALVACEAE	*Abutilon otocarpum*	Desert Lantern	Y
MALVACEAE	*Abutilon* sp.	Lantern-bush	Y
FABACEAE	*Acacia aneura* var.	Mulga	Y
FABACEAE	*Acacia papyrocarpa*	Western Myall	Y
FABACEAE	*Acacia tetragonophylla*	Dead Finish	Y
FABACEAE	*Acacia victoriae* ssp.	Elegant Wattle	Y
SAPINDACEAE	*Alectryon oleifolius* ssp. *canescens*	Bullock Bush	Y
AMARANTHACEAE	*Alternanthera denticulata*	Lesser Joyweed	N
AMARANTHACEAE	*Alternanthera nodiflora*	Common Joyweed	N
LORANTHACEAE	*Amyema maidenii* ssp. *maidenii*	Pale-leaf Mistletoe	Y
LORANTHACEAE	*Amyema quandang* var. *quandang*	Grey Mistletoe	Y
ANACAMPSEROTACEAE	*Anacampseros australiana*	Australian Anacampseros	N
ASTERACEAE	*Anemocarpa podolepidium*	Rock Everlasting	N
ASTERACEAE	*Angianthus* sp.	Cup-flower	N
BRASSICACEAE	*Arabidella glaucescens*	Bluish Cress	N
BRASSICACEAE	*Arabidella nasturtium*	Yellow Cress	N
BRASSICACEAE	*Arabidella* sp.	Native Cress	N
POACEAE	*Aristida anthoxanthoides*	Yellow Three-awn	N
POACEAE	*Aristida contorta*	Curly Wire-grass	N
POACEAE	*Aristida holathera* var. *holathera*	Tall Kerosene Grass	N
POACEAE	*Aristida nitidula*	Brush Three-awn	N
POACEAE	*Aristida* sp.	Three-awn/Wire-grass	N
POACEAE	*Astrebla pectinata*	Barley Mitchell-grass	Y
POACEAE	*Astrebla* sp.	Mitchell-grass	Y
AMARANTHACEAE	*Atriplex fissivalvis*	Gibber Saltbush	N
AMARANTHACEAE	*Atriplex holocarpa*	Pop Saltbush	N
AMARANTHACEAE	*Atriplex lindleyi* ssp.	Baldoo	N
AMARANTHACEAE	*Atriplex lindleyi* ssp. *conduplicata*	Baldoo	N
AMARANTHACEAE	*Atriplex lindleyi* ssp. *inflata*	Corky Saltbush	N
AMARANTHACEAE	*Atriplex lindleyi* ssp. *lindleyi*	Baldoo	N
AMARANTHACEAE	*Atriplex* sp.	Saltbush	N
AMARANTHACEAE	*Atriplex spongiosa*	Pop Saltbush	N
AMARANTHACEAE	*Atriplex turbinata*	A Saltbush	N
AMARANTHACEAE	*Atriplex velutinella*	Sandhill Saltbush	N
AMARANTHACEAE	*Atriplex vesicaria*	Bladder Saltbush	Y
POACEAE	*Austrostipa nitida*	Balcarra Spear-grass	N
POACEAE	*Austrostipa scabra* ssp.	Rough Spear-grass	N
POACEAE	*Austrostipa* sp.	Spear-grass	N
POACEAE	*Austrostipa trichophylla*	Spear-grass	N
ASTERACEAE	*Bidens pilosa*	Cobblers Pegs	N
ASTERACEAE	*Blennospora drummondii*	Dwarf Button-flower	N
NYCTAGINACEAE	*Boerhavia dominii*	Tar-vine	N
NYCTAGINACEAE	*Boerhavia* sp.	Tar-vine	N
ASTERACEAE	*Brachyscome ciliaris* var.	Variable Daisy	N
ASTERACEAE	*Brachyscome ciliaris* var. *lanuginosa*	Woolly Variable Daisy	N
ASTERACEAE	*Brachyscome* sp.	Native Daisy	N
ASPHODELACEAE	*Bulbine semibarbata*	Small Leek-lily	N
ASPHODELACEAE	*Bulbine* sp.	Bulbine-lily	N
MONTIACEAE	*Calandrinia* sp.	Purslane/Parakeelya	N
MONTIACEAE	*Calandrinia volubilis*	Twining Purslane	N
ASTERACEAE	*Calotis hispidula*	Hairy Burr-daisy	N
ASTERACEAE	*Calotis* sp.	Burr-daisy	N
AIZOACEAE	*Carpobrotus rossii*	Native Pigface	Y
ASTERACEAE	*Centipeda cunninghamii*	Common Sneezeweed	N
ASTERACEAE	*Centipeda thespidioides*	Desert Sneezeweed	N

Family	Scientific Name	Common Name	Long-lived woody? Yes (Y) No (N)
AMARANTHACEAE	*Chenopodium curvispicatum*	Cottony Goosefoot	Y
AMARANTHACEAE	*Chenopodium desertorum* ssp.	Desert Goosefoot	Y
AMARANTHACEAE	*Chenopodium* sp.	Goosefoot	N
POACEAE	*Chloris pectinata*	Comb Windmill Grass	N
POACEAE	*Chloris* sp.	Windmill Grass/Chloris	N
ASTERACEAE	*Chrysocephalum pterochaetum*	Shrub Everlasting	N
ASTERACEAE	*Chrysocephalum* sp.	Everlasting	N
COMPOSITAE	*Compositae* sp.	Daisy Family	N
CONVOLVULACEAE	*Convolvulaceae* sp.	Bindweed Family	N
CONVOLVULACEAE	*Convolvulus angustissimus* ssp.	Narrow-leaf Bindweed	N
CONVOLVULACEAE	*Convolvulus erubescens complex*	Bindweed	N
CONVOLVULACEAE	*Convolvulus remotus*	Grassy Bindweed	N
CONVOLVULACEAE	*Convolvulus* sp.	Bindweed	N
ASTERACEAE	*Craspedia* sp.	Buttons	N
CRASSULACEAE	*Crassula* sp.	Crassula/Stonecrop	N
AMARYLLIDACEAE	*Crinum flaccidum*	Murray Lily	N
FABACEAE	*Crotalaria eremaea* ssp.	Loose-flowered Rattle-pod	N
FABACEAE	*Cullen australasicum*	Tall Scurf-pea	N
FABACEAE	*Cullen cinereum*	Annual Scurf-pea	N
FABACEAE	*Cullen graveolens*	Native Lucerne	N
FABACEAE	*Cullen pallidum*	Woolly Scurf-pea	N
FABACEAE	*Cullen* sp.	Scurf-pea	N
CONVOLVULACEAE	*Cuscuta* sp.	Dodder	N
POACEAE	*Cymbopogon ambiguus*	Lemon-grass	Y
APOCYNACEAE	*Cynanchum viminale* ssp. *australe*	Caustic Bush	Y
CYPERACEAE	*Cyperus rigidellus*	Dwarf Flat-sedge	N
CYPERACEAE	*Cyperus* sp.	Flat-sedge	N
POACEAE	*Dactyloctenium radulans*	Button-grass	N
APIACEAE	*Daucus glochidiatus*	Native Carrot	N
POACEAE	*Dichanthium sericeum* ssp.	Silky Blue-grass	Y
POACEAE	*Digitaria brownii*	Cotton Panic-grass	Y
POACEAE	*Digitaria divaricatissima* var. *divaricatissima*	Finger Panic-grass	Y
POACEAE	*Digitaria* sp.	Summer-grass	Y
AMARANTHACEAE	*Dissocarpus biflorus* var.	Two-horn Saltbush	N
AMARANTHACEAE	*Dissocarpus paradoxus*	Ball Bindii	N
SAPINDACEAE	*Dodonaea lobulata*	Lobed-leaf Hop-bush	Y
SAPINDACEAE	*Dodonaea viscosa* ssp. *angustissima*	Narrow-leaf Hop-bush	Y
POLYGONACEAE	*Duma florulenta*	Lignum	Y
AMARANTHACEAE	*Dysphania cristata*	Crested Goosefoot	N
AMARANTHACEAE	*Dysphania pumilio*	Clammy Goosefoot	N
POLYGONACEAE	*Duma florulenta*	Lignum	Y
AMARANTHACEAE	*Einadia nutans* ssp. *nutans*	Climbing Saltbush	Y
CYPERACEAE	*Eleocharis pallens*	Pale Spike-rush	N
AMARANTHACEAE	*Enchylaena tomentosa* var.	Ruby Saltbush	Y
POACEAE	*Enneapogon avenaceus*	Common Bottle-washers	N
POACEAE	*Enneapogon cylindricus*	Jointed Bottle-washers	N
POACEAE	*Enneapogon polyphyllus*	Leafy Bottle-washers	N
POACEAE	*Enneapogon* sp.	Bottle-washers / Nineawn	N
POACEAE	*Enteropogon acicularis*	Umbrella Grass	N
POACEAE	*Enteropogon ramosus*	Umbrella Grass	N
POACEAE	*Enteropogon* sp.	Umbrella Grass	N
POACEAE	*Eragrostis australasica*	Cane-grass	Y
POACEAE	*Eragrostis dielsii*	Mulka	N
POACEAE	*Eragrostis eriopoda*	Woollybutt	N
POACEAE	*Eragrostis parviflora*	Soft Love-grass	N
POACEAE	*Eragrostis setifolia*	Bristly Love-grass	Y
POACEAE	*Eragrostis* sp.	Love-grass	Y
POACEAE	*Eragrostis xerophila*	Knotty-butt Neverfail	Y
SCROPHULARIACEAE	*Eremophila duttonii*	Harlequin Emubush	Y
SCROPHULARIACEAE	*Eremophila glabra* ssp.	Tar Bush	Y
SCROPHULARIACEAE	*Eremophila latrobei* ssp.	Crimson Emubush	Y

Family	Scientific Name	Common Name	Long-lived woody? Yes (Y) No (N)
SCROPHULARIACEAE	*Eremophila maculata* ssp.	Spotted Emubush	Y
SCROPHULARIACEAE	*Eremophila oppositifolia* ssp.	Opposite-leaved Emubush	Y
SCROPHULARIACEAE	*Eremophila serrulata*	Green Emubush	Y
GERANIACEAE	*Erodium crinitum*	Blue Heron's-bill	N
GERANIACEAE	*Erodium* sp.	Heron's-bill/Crowfoot	N
MYRTACEAE	*Eucalyptus camaldulensis* ssp.	River Red Gum	Y
POACEAE	*Eulalia aurea*	Silky Brown-top	Y
EUPHORBIACEAE	*Euphorbia drummondii group*	Spurge	N
EUPHORBIACEAE	*Euphorbia* sp.	Spurge	N
EUPHORBIACEAE	*Euphorbia stevenii*	Bottletree Spurge	N
EUPHORBIACEAE	*Euphorbia tannensis* ssp. *eremophila*	Desert Spurge	N
SANTALACEAE	*Exocarpos aphyllus*	Leafless Cherry	Y
ASTERACEAE	*Flaveria trinervia*	Clustered Yellow-tops	N
FRANKENIACEAE	*Frankenia serpyllifolia*	Thyme Sea-heath	Y
FRANKENIACEAE	*Frankenia* sp.	Sea-heath	Y
FRANKENIACEAE	*Frankenia subteres*	Round Sea-heath	Y
MALVACEAE	*Gilesia biniflora*	Western Tar-vine	N
ASTERACEAE	*Glossocardia bidens*	Native Cobbler's-pegs	N
FABACEAE	*Glycine* sp.	Glycine	N
ASTERACEAE	*Gnephosis arachnoidea*	Spidery Button-flower	N
ASTERACEAE	*Gnephosis* sp.	Cup-flower	N
GOODENIACEAE	*Goodenia fascicularis*	Silky Goodenia	N
GOODENIACEAE	*Goodenia lunata*	Stiff Goodenia	N
GOODENIACEAE	*Goodenia pinnatifida*	Cut-leaf Goodenia	N
GOODENIACEAE	*Goodenia* sp.	Goodenia	N
GRAMINEAE	*Gramineae* sp.	Grass Family	N
AIZOACEAE	*Gunniopsis quadrifida*	Sturt's Pigface	Y
BORAGINACEAE	*Heliotropium* sp.	Heliotrope	N
MALVACEAE	*Hibiscus krichauffianus*	Velvet-leaf Hibiscus	N
POACEAE	*Iseilema membranaceum*	Small Flinders-grass	N
ASTERACEAE	*Ixiochlamys cuneifolia*	Silverton Daisy	N
ASTERACEAE	*Ixiochlamys nana*	Small Fuzzweed	N
ASTERACEAE	*Leiocarpa leptolepis*	Pale Plover-daisy	N
BRASSICACEAE	*Lepidium phlebopetalum*	Veined Peppercress	N
BRASSICACEAE	*Lepidium* sp.	Peppercress	N
LILIACEAE	*Liliaceae* sp.	Lily Family	N
ASPARAGACEAE	*Lomandra* sp.	Mat-rush	Y
FABACEAE	*Lotus cruentus*	Red-flower Lotus	N
SOLANACEAE	*Lycium australe*	Australian Boxthorn	Y
PHYLLANTHACEAE	*Lysiandra fuernrohrii*	Sand Spurge	Y
AMARANTHACEAE	*Maireana aphylla*	Cotton-bush	Y
AMARANTHACEAE	*Maireana appressa*	Pale-fruit Bluebush	Y
AMARANTHACEAE	*Maireana astrotricha*	Low Bluebush	Y
AMARANTHACEAE	*Maireana coronata*	Crown Fissure-plant	Y
AMARANTHACEAE	*Maireana eriantha*	Woolly Bluebush	Y
AMARANTHACEAE	*Maireana georgei*	Satiny Bluebush	Y
AMARANTHACEAE	*Maireana integra*	Entire-wing Bluebush	Y
AMARANTHACEAE	*Maireana pyramidata*	Black Bluebush	Y
AMARANTHACEAE	*Maireana sedifolia*	Bluebush	Y
AMARANTHACEAE	*Maireana* sp.	Bluebush/Fissure-plant	Y
AMARANTHACEAE	*Maireana spongiocarpa*	Spongy-fruit Bluebush	Y
AMARANTHACEAE	*Maireana turbinata*	Top-fruit Bluebush	Y
AMARANTHACEAE	*Malacocera tricornis*	Goat-head Soft-horns	N
MALVACEAE	*Malvastrum americanum* var.	Malvastrum	N
MARSILEACEAE	*Marsilea drummondii*	Common Nardoo	N
ASTERACEAE	*Minuria cunninghamii*	Bush Minuria	Y
ASTERACEAE	*Minuria denticulata*	Woolly Minuria	N
ASTERACEAE	*Minuria integerrima*	Smooth Minuria	N
ASTERACEAE	*Minuria leptophylla*	Minnie Daisy	N
LOGANIACEAE	*Mitrasacme* sp.	Mitrewort	N
SCROPHULARIACEAE	*Myoporum montanum*	Native Myrtle	Y

Family	Scientific Name	Common Name	Long-lived woody? Yes (Y) No (N)
AMARANTHACEAE	*Neobassia proceriflora*	Desert Glasswort	N
SOLANACEAE	*Nicotiana velutina*	Velvet Tobacco	N
AMARANTHACEAE	*Osteocarpum acropterum* var.	Bonefruit	N
AMARANTHACEAE	*Osteocarpum dipterocarpum*	Two-wing Bonefruit	N
AMARANTHACEAE	*Osteocarpum* sp.	Bonefruit	N
POACEAE	*Panicum decompositum* var.	Native Millet	N
POACEAE	*Panicum* sp.	Panic/Millet	N
POACEAE	*Paractaenum novae-hollandiae* ssp. *reversum*	Barbed-wire Grass	N
PHYLLANTHACEAE	*Lysiandra fuernrohrii*	Sand Spurge	N
THYMELAEACEAE	*Pimelea simplex* ssp. *simplex*	Desert Riceflower	N
PLANTAGINACEAE	*Plantago drummondii*	Dark Plantain	N
ASTERACEAE	*Pluchea rubelliflora*	Plains-bush	N
ASTERACEAE	*Podolepis capillaris*	Wiry Podolepis	N
ASTERACEAE	*Polycalymma stuartii*	Poached-egg Daisy	N
PORTULACACEAE	*Portulaca oleracea*	Common Purslane	N
PORTULACACEAE	*Portulaca* sp.	Purslane	N
ASTERACEAE	*Pterocaulon sphacelatum*	Apple-bush	N
AMARANTHACEAE	*Ptilotus incanus/obovatus*	Mulla	Y
AMARANTHACEAE	*Ptilotus nobilis* ssp.	Yellow-tails	N
AMARANTHACEAE	*Ptilotus obovatus*	Silver Mulla	Y
ASTERACEAE	*Pycnosorus pleiocephalus*	Soft Billy-buttons	N
ASTERACEAE	*Pycnosorus* sp.	Billy-buttons	N
AMARANTHACEAE	*Rhagodia* sp.	Saltbush	Y
AMARANTHACEAE	*Rhagodia spinescens*	Spiny Saltbush	Y
ASTERACEAE	*Rhodanthe corymbiflora*	Paper Everlasting	N
ASTERACEAE	*Rhodanthe floribunda*	White Everlasting	N
ASTERACEAE	*Rhodanthe microglossa*	Clustered Everlasting	N
ASTERACEAE	*Rhodanthe stricta*	Slender Everlasting	N
ASTERACEAE	*Rhodanthe uniflora*	Woolly Daisy	N
FABACEAE	*Rhynchosia australis*	Rhynchosia	N
ZYGOPHYLLACEAE	*Roepera ammophila*	Sand Twinleaf	N
ZYGOPHYLLACEAE	*Roepera aurantiaca* ssp. *aurantiaca*	Shrubby Twinleaf	Y
ZYGOPHYLLACEAE	*Roepera billardierei*	Coast Twinleaf	N
ZYGOPHYLLACEAE	*Roepera crenata*	Notched Twinleaf	N
ZYGOPHYLLACEAE	*Roepera eremaea*	Climbing Twinleaf	N
ZYGOPHYLLACEAE	*Roepera iodocarpa*	Violet Twinleaf	N
ZYGOPHYLLACEAE	*Roepera ovata*	Dwarf Twinleaf	N
ZYGOPHYLLACEAE	*Roepera prismatotheca*	Square-fruit Twinleaf	N
ZYGOPHYLLACEAE	*Roepera* sp.	Twinleaf	N
ACANTHACEAE	*Rostellularia adscendens* var. *pogonanthera*	Pink Tongues	N
POACEAE	*Rytidosperma caespitosum*	Common Wallaby-grass	Y
POACEAE	*Rytidosperma* sp.	Wallaby-grass	Y
AMARANTHACEAE	*Salsola australis*	Buckbush	N
SANTALACEAE	*Santalum lanceolatum*	Plumbush	Y
SANTALACEAE	*Santalum* sp.	Plumbush	Y
AIZOACEAE	*Sarcozona praecox*	Sarcozona	N
GOODENIACEAE	*Scaevola spinescens*	Spiny Fanflower	Y
AMARANTHACEAE	*Sclerolaena anisacanthoides*		N
AMARANTHACEAE	*Sclerolaena bicornis* var. *bicornis*	Goat-head Bindyi	N
AMARANTHACEAE	*Sclerolaena brachyptera*	Short-wing Bindyi	N
AMARANTHACEAE	*Sclerolaena cuneata*	Tangled Bindyi	N
AMARANTHACEAE	*Sclerolaena decurrens*	Green Bindyi	N
AMARANTHACEAE	*Sclerolaena diacantha*	Horned Bindyi	N
AMARANTHACEAE	*Sclerolaena divaricata*	Tangled Bindyi	N
AMARANTHACEAE	*Sclerolaena intricata*	Poverty Bush	N
AMARANTHACEAE	*Sclerolaena parallelicuspis*	Western Bindyi	N
AMARANTHACEAE	*Sclerolaena patenticuspis*	Spear-fruit Bindyi	N
AMARANTHACEAE	*Sclerolaena* sp.	Bindyi	N
#N/A	*Sclerolaena* sp. *Pernatty Station*		N
AMARANTHACEAE	*Sclerolaena tricuspis*	Three-spine Bindyi	N
AMARANTHACEAE	*Sclerolaena ventricosa*	Salt Bindyi	N

Family	Scientific Name	Common Name	Long-lived woody? Yes (Y) No (N)
ASTERACEAE	*Senecio magnificus*	Showy Groundsel	Y
FABACEAE	*Senna artemisioides* ssp.	Desert Senna	Y
FABACEAE	*Senna artemisioides* ssp. *alicia x ssp. coriacea*	Desert Senna	Y
FABACEAE	*Senna artemisioides* ssp. *artemisioides x* ssp. *coriacea*	Desert Senna	Y
FABACEAE	*Senna artemisioides* ssp. *helmsii*	Blunt-leaf Senna	Y
FABACEAE	*Senna artemisioides* ssp. *oligophylla*	Limestone Senna	Y
FABACEAE	*Senna artemisioides* ssp. *X artemisioides*	Silver Senna	Y
FABACEAE	*Senna artemisioides* ssp. *X coriacea*	Broad-leaf Desert Senna	Y
FABACEAE	*Senna artemisioides* ssp. *X sturtii*	Grey Senna	Y
POACEAE	*Setaria constricta*	Knotty-butt Paspalidium	Y
POACEAE	*Setaria* sp.	Pigeon-grass	Y
MALVACEAE	*Sida ammophila*	Sand Sida	N
MALVACEAE	*Sida corrugata* var.	Variable Sida	N
MALVACEAE	*Sida fibulifera*	Pin Sida	N
MALVACEAE	*Sida intricata*	Twiggy Sida	Y
MALVACEAE	*Sida petrophila*	Rock Sida	Y
MALVACEAE	*Sida trichopoda*	Narrow-leaf Sida	N
SOLANACEAE	*Solanum esuriale*	Potato-bush	N
SOLANACEAE	*Solanum quadriloculatum*	Tomato Bush	N
SOLANACEAE	*Solanum sturtianum*	Sturt's Nightshade	Y
POACEAE	*Sporobolus actinocladus*	Ray Grass	N
POACEAE	*Sporobolus caroli*	Yakka Grass	N
CELASTRACEAE	*Stackhousia muricata ssp. Perennial (W.R.Barker 3641)*		N
BRASSICACEAE	*Stenopetalum lineare*	Narrow Thread-petal	N
FABACEAE	*Swainsona* sp.	Swainson-pea	N
ASTERACEAE	*Taraxacum cygnorum*	Dandelion	N
AMARANTHACEAE	*Tecticornia indica* ssp.	Samphire	Y
AMARANTHACEAE	*Tecticornia medullosa*	Samphire	Y
AMARANTHACEAE	*Tecticornia pergranulata* ssp.	Black-seed Samphire	Y
AMARANTHACEAE	*Tecticornia* sp.	Samphire	Y
AMARANTHACEAE	*Tecticornia tenuis*	Slender Samphire	Y
AIZOACEAE	*Tetragonia eremaea*	Annual Spinach	N
AIZOACEAE	*Tetragonia tetragonoides*	Warragul cabbage	N
LAMIACEAE	*Teucrium racemosum*	Grey Germander	N
POACEAE	*Themeda triandra*	Kangaroo Grass	Y
ASPARAGACEAE	*Thysanotus baueri*	Mallee Fringe-lily	N
ASPARAGACEAE	*Thysanotus patersonii*	Twining Fringe-lily	N
ASPARAGACEAE	*Thysanotus* sp.	Fringe-lily	N
ARALIACEAE	*Trachymene glaucifolia*	Blue Parsnip	N
POACEAE	*Tragus australianus*	Red Spinach	N
AIZOACEAE	*Trianthema triquetrum*	Small Hogweed	N
BORAGINACEAE	*Trichodesma zeylanicum* var. *zeylanicum*	Camel Bush	N
POACEAE	*Tripogonella loliiformis*	Purple Plume Grass	N
POACEAE	*Triraphis mollis*	Purple Needle-grass	N
ASTERACEAE	*Vittadinia cuneata* var.	Fuzzy New Holland Daisy	N
ASTERACEAE	*Vittadinia* sp.	New Holland Daisy	N
CAMPANULACEAE	*Wahlenbergia communis*	Tufted Bluebell	N
CAMPANULACEAE	*Wahlenbergia luteola*	Yellow-wash Bluebell	N
CAMPANULACEAE	*Wahlenbergia* sp.	Native Bluebell	N
CAMPANULACEAE	*Wahlenbergia stricta* ssp. *stricta*	Tall Bluebell	N
COLCHICACEAE	*Wurmbea latifolia* ssp. *latifolia*	Early Nancy	N

Appendix D. Jessup Sites raw data

Appendix D1. Jessup raw data – total number of long-lived woody perennial adults and juveniles, spring 2025

Species	Life Stage	Flora Site																		
		1	2	3	4	5	6	7	9	10	11	12	13	15	16	17	18	19	20	Total
Abutilon halophilum	Adult	17	9	4		76					115			1	37					259
	Juvenile	5	3			57					12				43					120
Abutilon otocarpum	Adult									5										5
	Juvenile									3										3
Acacia papyrocarpa	Adult								1	2						18	18	10	2	51
	Juvenile															9	23	5		37
Acacia tetragonophylla	Adult									24								31	12	67
	Juvenile									2										2
Atriplex vesicaria	Adult	81	116	160	210	514	194	65	118	4	528	231	219	117	202	126	189	7		3081
	Juvenile	61	60	69	279	236	102	22	207		194	156	252	42	202	8				1890
Dodonaea lobulata	Adult									22						21	20	86	12	161
	Juvenile									4								3	2	9
Duma florulenta	Adult									4								5	21	30
	Juvenile																		3	3
Einadia nutans ssp.	Adult																	1		1
	Juvenile																	1	3	4
Enchylaena tomentosa	Adult									23						42	51	40	8	164
	Juvenile															17	10	1	6	34
Eremophila latrobei	Adult									2						1	2			5
	Juvenile									0										0
Eremophila oppositifolia	Adult								1											1
Eremophila serrulata	Adult									2						1				3
Eucalyptus camaldulensis ssp arida	Adult									6								4	5	15
	Juvenile									1									2	3
Exocarpus aphyllus	Adult									2										2
Frankenia serpyllifolia	Adult		1	30	2	70	1	2	13		3	4	13	6						145
	Juvenile			0	3	12			3			0								18
Maireana aphylla	Adult										2			19			1			22
Maireana appressa	Adult			4		3	1	16	1				3		2					30
	Juvenile			1				2												3

Maireana astrotricha	Adult							1												1
Maireana eriantha	Adult					2														2
Maireana georgeii/turbinata	Adult					5														5
Maireana spongiocarpa	Adult							7			91					16	26			140
	Juvenile										9					1				10
Minuria cunninghamii	Adult			6	4	5	27	1			32	1	1							77
	Juvenile			1		1	6				0				4					12
Myoporum montanum	Adult									5								12	12	29
	Juvenile									4								15	10	29
Ptilotus obovatus	Adult									84						49	32	15	2	182
	Juvenile									2						4	5	0		11
Rhagodia spinescens/ Chenopodium curvispicatum	Adult									3						5	9			17
	Juvenile															7				7
Santalum lanceolatum	Adult									1								3	2	6
	Juvenile																	2	2	4
Scaevola spinescens	Adult									27						2	1	16	7	53
	Juvenile															1				1
Senna artemisioides ssp. artemisioides	Adult									4						1	3	1		9
Senna artemisioides ssp. helmsii	Adult									3										3
	Juvenile																	1		1
Senna artemisioides ssp. sturtii	Adult																	1		1
	Adult															5				5
Sida calyxhymenia/petrophila	Adult							10												10
	Juvenile							2												2
Sida intricata	Adult	7		1	8	2														18
	Juvenile						1													1
Sida petrophila	Adult									54						2		3	2	61
	Juvenile									7										7
Tecticornia indica	Adult							6												6
Tecticornia medullosa	Adult	2	1	62	5	171	18				2	11	72	2	14					360
	Juvenile			4	3	2							0		4					13
Tecticornia pergranulata	Adult							31	43											74
Tecticornia tenuis	Adult								6											6
	Juvenile								5											5
Teucrium racemosum	Adult									1								1		2

Appendix D2. Eliza Creek species abundance trends

Acacia tetragonophylla	2018 Autumn	2018 Spring	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	2024 Spring	2025 Spring
Site 10	39	28	22	43	37	34	25	25	26
Site 17	0	0	0	0	0	0	0	0	0
Site 18	0	0	0	0	0	0	1	0	0
Site 19	31	27	26	19	26	32	26	27	31
Site 20	9	6	7	11	14	11	11	9	12
***A. tetragonophylla* Total**	**79**	**61**	**55**	**73**	**77**	**77**	**63**	**61**	**69**
Acacia papyrocarpa	2018 Autumn	2018 Spring	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	2024 Spring	2025 Spring
Site 10	0	1	0	2	3	0	0	1	2
Site 17	33	28	30	29	33	37	21	27	27
Site 18	42	53	15	49	45	63	56	54	41
Site 19	8	20	11	10	15	13	13	11	15
Site 20	2	1	1	0	1	1	1	1	2
***A. papyrocarpa* Total**	**85**	**103**	**57**	**90**	**97**	**114**	**91**	**94**	**87**
Dodonaea lobulata	2018 Autumn	2018 Spring	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	2024 Spring	2025 Spring
Site 10	25	37	25	31	33	25	38	30	26
Site 17	17	21	24	20	21	22	18	19	21
Site 18	11	11	13	15	15	14	13	15	20
Site 19	106	122	116	118	150	128	106	112	89
Site 20	13	6	12	16	12	20	11	13	14
***Dodonaea* Total**	**172**	**197**	**190**	**200**	**231**	**209**	**186**	**189**	**170**
Duma florulenta	2018 Autumn	2018 Spring	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	2024 Spring	2025 Spring
Site 10	6	6	8	7	5	8	7	7	4
Site 17	0	7	0	0	0	0	0	0	0
Site 18	0	7	0	0	0	0	0	0	0
Site 19	0	2	5	2	7	7	5	4	5
Site 20	27	31	24	26	26	24	24	27	24
***Duma florulenta* Total**	**33**	**53**	**37**	**35**	**38**	**39**	**36**	**38**	**33**
Eremophila latrobei	2018 Autumn	2018 Spring	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	2024 Spring	2025 Spring
Site 10	1	1	1	1	0	1	1	2	2
Site 17	0	0	1	1	1	2	0	1	1
Site 18	3	7	9	5	11	9	10	9	2
Site 20	0	0	1	0	1	1	1	1	0
***Eremophila latrobei* Total**	**4**	**8**	**12**	**7**	**13**	**13**	**12**	**13**	**5**
Eremophila serrulata	2018 Autumn	2018 Spring	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	2024 Spring	2025 Spring
Site 10	2	2	2	0	1	0	1	1	2
Site 17	1	1	0	1	1	3	2	2	1
Site 18	2	1	0	4	0	0	0	0	1
Site 19	1	2	1	2	0	1	0	0	0
Site 20	0	0	0	0	0	0	0	0	0
***Eremophila serrulata* Total**	**6**	**6**	**3**	**7**	**2**	**4**	**3**	**3**	**3**
Maireana spongiocarpa	2018 Autumn	2018 Spring	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	2024 Spring	2025 Spring
Site 17	nr	14	10	24	12	27	18	19	17
Site 18	nr	19	11	29	16	33	29	19	26
***Maireana* Total**		**33**	**21**	**53**	**28**	**60**	**47**	**38**	**43**
Myoporum montanum	2018 Autumn	2018 Spring	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	2024 Spring	2025 Spring
Site 10	23	7	19	23	10	27	5	14	9
Site 19	27	17	18	15	17	19	36	36	27
Site 20	16	14	19	16	16	27	20	24	22
***Myoporum* Total**	**66**	**38**	**56**	**54**	**43**	**73**	**61**	**75**	**56**
Ptilotus obovatus	2018 Autumn	2018 Spring	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	2024 Spring	2025 Spring
Site 10	25	66	31	65	71	105	115	133	86
Site 17	30	30	31	46	52	95	84	82	53
Site 18	100	73	48	46	23	97	80	104	37
Site 19	9	1	5	6	12	18	17	13	15
Site 20	0	0	3	1	1	2	3	5	2
***Ptilotus* Total**	**164**	**170**	**118**	**164**	**159**	**317**	**299**	**337**	**86**

Scaevola spinescens	2018 Autumn	2018 Spring	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	2024 Spring	2025 Spring
Site 10	12	21	6	11	22	13	23	28	27
Site 17	4	4	5	2	3	4	5	2	3
Site 18	4	3	3	2	1	2	2	2	1
Site 19	11	9	11	12	15	18	16	24	16
Site 20	2	1	9	10	6	5	5	9	7
***Scaevola* Total**	**33**	**38**	**34**	**37**	**47**	**42**	**51**	**65**	**54**
Senna (all species combined)	2018 Autumn	2018 Spring	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	2024 Spring	2025 Spring
Site 10	4	2	3	4	5	4	5	3	7
Site 17	7	4	4	3	6	7	6	6	6
Site 18	4	6	3	4	2	5	3	3	3
Site 19	1	3	1	2	0	2	2	3	3
Site 20	0	0	0	0	0	1	1	1	0
***Senna* Total**	**16**	**15**	**11**	**13**	**13**	**19**	**17**	**16**	**7**

Appendix E. Canopy cover visual estimates

Western Myall Transects

Species / Transect	Tree No.	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	2024 Spring	2025 Spring
Western Myall / 17A	1	98	100	100	100	100	90	80
	2	98	100	100	95	100	95	95
	2b				76	75	65	65
	2c						100	95
	3	100	100	100	100	100	100	95
	4	40	32	45	41	40	20	30
	5	95	90	98	95	100	80	80
	5b			95	90	100	90	75
	6	86	100	100	100	100	80	65
	7	86	86	100	98	100	100	80
	7b			100	100	100	100	95
	7c			100	100	100	100	90
	Mean	**86**	**87**	**94**	**90**	**92**	**85**	**79**
	SD	**21**	**25**	**17**	**18**	**19**	**23**	**23**
Western Myall / 17B	1	100	98	100	98	95	95	70
	2	95	95	95	90	100	80	60
	3	95	76	76	78	100	70	50
	4	76	95	90	86	90	90	70
	5	100	100	100	100	100	100	95
	5b			100	95	100	90	70
	6	72	86	86	77	90	70	65
	7	90	95	100	100	100	95	75
	Mean	**90**	**92**	**93**	**91**	**97**	**86**	**69**
	SD	**11.3**	**8.4**	**8.8**	**9.4**	**4.6**	**11.6**	**13**
Western Myall / 18A	1	86	nr	81	81	100	95	65
	1a*							70
	1b						95	80
	2	86	nr	81	90	90	80	70
	3	9	nr	1	5	5	5	5
	3b					100	100	95
	4	98	nr	81	100	100	90	85
	5	98	nr	85.5	100	100	80	70
	6	98	nr	98	100	100	80	85
	7	100	nr	85.5	86	100	90	80
	7a					100	90	60
	7b					100	90	70
	7c					100	90	80
	8	10	nr	0 (died)	0	0	0	0
	8a				90	100	90	90
	8c		nr	85.5	86	100	Not intercepted	90
	8d					100	Not intercepted	60
	9	95	nr	76.5	77	100	60	90
	10	95	nr	76.5	100	100	100	60
	11	100	nr	90.25	100	100	100	85
	11a							90
	11b							80
	12	100	nr	90.25	100	100	90	95
	Mean	**81**		**72**	**80**	**89**	**80**	**73**
	SD	**34**		**32**	**34**	**31**	**19**	**24**
Western Myall / 18B	1	57	nr	8	1	0	5	0
	1b						60	60
	2	56	nr	25	40	72	50	30
	3	29	nr	6	23	12	10	15
	3b							100
	4	67	nr	49	76	90	70	65
	5	2	nr	0 (died)	0	0	0	0

Species / Transect	Tree No.	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	2024 Spring	2025 Spring
	Mean	**42**	**nr**	**22**	**28**	**35**	**33**	**39**
	SD	**27**	**nr**	**20**	**32**	**43**	**31**	**80**
Western Myall / 19A	2	100	100	100	100	100	100	95
	4a						100	95
	4b			72	100	100	100	70
	4c			100	100	100	90	50
	6	100	100	100	100	100	90	70
	6b			100	100	100	90	90
	6c			100	90	100	90	70
	10b			100	100	100	100	90
	Mean	**100**	**100**	**96**	**99**	**100**	**95**	**79** **16**
	SD	**0**	**0**	**10**	**4**	**0**	**5**	
Western Myall / 19B	6A	100	100	100	nr	nr	nr	nr
	7	8	5	3	5	15	5	10
	7A						90	90
	7B			81	86	100	95	90
	8	100	98	93	95	100	90	70
	5AA				100	100	100	90
	5B			100	100	100	100	80
	Mean	**69**	**68**	**75**	**77**	**86**	**79**	**72**
	SD	**53**	**54**	**41**	**41**	**35**	**37**	**31**
Western Myall / 20A (one tree only)	9	100	90	77	100	100	70	70

*Shaded cells represent trees recorded for first time in 2025

River Red Gum

Species / Transect	Tree No.	2019 Spring	2020 Spring	2021 Spring	2022 Spring	2023 Autumn	2024 Spring	2025 Spring
River Red gum / 19A	1	88	90	86	81	90	85	85
	5	27	27	27	29	29	30	50
	7	77	90	75	80	100	70	60
	8	72	56	57	63	100	50	40
	9	68	45	63	75	100	70	35
	10	90	72	54	76	100	60	40
	Mean	**70**	**63**	**60**	**67**	**87**	**61**	**52**
	SD	**23**	**25**	**20**	**20**	**29**	**19**	**19**
River Red Gum / 19B	1	5	9	5	5	4	5	5
	2	86	81	90	96	100	80	15
	3b						70	35
	4	15	3	0	0	0	0	0
	5	81	56	43	81	100	35	60
	5A				10	100	20	20
	6	90	86	77	60	100	70	45
	Mean	**55**	**47**	**43**	**42**	**67**	**40**	**26**
	SD	**42**	**39**	**41**	**42**	**51**	**33**	**22**
River Red Gum / 20A	1	80	46	68	90	100	80	60
	2	3	2	23	90	90	10	20
	3	11	30	Not recorded	96	100	90	20
	4	72	53	60	63	80	40	40
	5	45	35	18	67	90	60	45
	6	48	53	64	90	100	70	35
	7	88	56	81	98	100	80	50
	8	42	33	18	38	70	35	30
	10	49	49	46	90	90	80	50
	Mean	**49**	**40**	**47**	**80**	**91**	**61**	**39**
	SD	**29**	**17**	**25**	**20**	**11**	**27**	**14**
River Red Gum 20B	1	45	35	28	48	70	70	45
	2	86	68	77	98	100	95	70
	3	36	33	23	67	90	65	35
	4	86	49	56	86	80	80	75
	Mean	**63**	**46**	**46**	**75**	**85**	**78**	**56**
	SD	**27**	**16**	**25**	**22**	**13**	**13**	**19**

Appendix F. Fauna

Table F1: Bird species detected at formal bird survey sites and opportunistic sites at Carrapateena during the spring 2025 survey

Family	*Species Name*	Common Name	Site																			Opportunistic[1]
			1	2	3	4	5	6	7	9	10	11	12	13	15	16	17	18	19	20	21	22	
Podicipedidae	*Tachybaptus novaehollandiae novaehollandiae*	Australasian Grebe																					SED
Artamidae	*Gymnorhina tibicen*	Australian Magpie	SM				1[2]	SM			SM					SM							
Motacillidae	*Anthus australis australis*	Australian Pipit	1[2],CT	1[2]	1[2],CT	1[2]	1[2]	SM	SM						1[2]	1[2]							LFA01
Corvidae	*Corvus coronoides*	Australian Raven	1[2]	1[2]	1[2]	SM	SM	SM	1		1[2]			1		1[2]				1	1	1	SED
Charadriidae	*Vanellus tricolor*	Banded Lapwing																					SED
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckooshrike	SM																				
Artamidae	*Artamus cinereus*	Black-faced Woodswallow	SM		SM				SM	1						SM	1			1	1	1	
Charadriidae	*Elseyornis melanops*	Black-fronted Dotterel							SM														SED
Falconidae	*Falco berigora berigora*	Brown Falcon				1		SM															SED
Accipitridae	*Accipiter fasciatus fasciatus*	Brown Goshawk																					CWM01
Psittacidae	*Melopsittacus undulatus*	Budgerigar									SM				SM								
Acanthizidae	*Acanthiza uropygialis*	Chestnut-rumped Thornbill	1,SM																	1			CWM05
Cinclosomatidae	*Cinclosoma cinnamomeum*	Cinnamon Quailthrush	SM	SM					SM												1		CWM02
Columbidae	*Phaps chalcoptera*	Common Bronzewing																			1		
Oreoicidae	*Oreoica gutturalis*	Crested Bellbird																		1			
Columbidae	*Ocyphaps lophotes*	Crested Pigeon	SM		SM				SM	1	SM									1	1		
Psittacidae	*Northiella haematogaster haematogaster*	Eastern Blue Bonnet																					CWM01
Casuariidae	*Dromaius novaehollandiae*	Emu																					CWM02, YH
Rallidae	*Fulica atra australis*	Eurasian Coot																					SED
Cacatudiae	*Eolophus roseicapillus*	Galah	SM				1[2]				SM					SM							YH
Artamidae	*Cracticus torquatus leucopterus*	Grey Butcherbird	SM				SM				SM								1				
Anatidae	*Anas gracilis gracilis*	Grey Teal																					SED

Family	*Species Name*	Common Name	Site																			Opportunistic[1]
			1	2	3	4	5	6	7	9	10	11	12	13	15	16	17	18	19	20	21	22	
Pachycephalidae	*Colluricincla harmonica*	Grey Shrike-thrush																					CWM01
Anatidae	*Aythya australis*	Hardhead																					SED
Podicipedidae	*Poliocephalus poliocephalus*	Hoary-headed Grebe																					SED
Cuculidae	*Chalcites basalis*	Horsefield's Bronze Cuckoo																					S21
Passeridae	*Passer domesticus*	House Sparrow																					EV, Admin, TJU Village
Cacatudiae	*Cacatua sanguinea gymnopis*	Little Corella	SM																				
Monarchidae	*Grallina cyanoleuca cyanoleuca*	Magpielark							1[2]														CWM01, SED
Charadriidae	*Vanellus miles*	Masked Lapwing																					SED
Artamidae	*Artamus personatus*	Masked Woodswallow							SM		SM					SM			1	1			SED
Psittacidae	*Psephotus varius*	Mulga Parrot	SM							1	1[2]						1	1	1	1			
Falconidae	*Falco cenchroides cenchroides*	Nankeen Kestrel		1[2]	SM	1	1		1		1[2]		1		1	1[2]							
Meliphagidae	*Epthianura aurifrons*	Orange Chat						SM															
Anatidae	*Malacorhynchus membranaceus*	Pink-eared Duck																					SED
Psittacidae	*Barnardius zonarius zonarius*	Port Lincoln Parrot	SM																				
Maluridae	*Malurus assimilis assimilis*	Purple-backed Fairywren	SM						1[2]		1[2]						1		1	1	1	1	
Meropidae	*Merops ornatus*	Rainbow Bee-eater							SM														
Alcedinidae	*Todiramphus pyrrhopygius*	Red-backed Kingfisher	SM				SM															1	
Acanthizidae	*Calamanthus campestris*	Rufous Fieldwren	1[2]	1[2]		SM		SM	SM				1		1[2],CT	SM							CF01
Pachycephalidae	*Pachycephala rufiventris rufiventris*	Rufous Whistler																			1	1	
Laridae	*Chroicocephalus novaehollandiae novaehollandiae*	Silver Gull			SM																		
Meliphagidae	*Gavicalis virescens*	Singing Honeyeater	SM		SM	SM	SM		1[2]		1[2]	1			SM	1[2]		1			1	1	
Acanthizidae	*Aphelocephala leucopsis leucopsis*	Southern Whiteface																					CWM05
Caprimulgidae	*Eurostopodus argus*	Spotted Nightjar							SM														
Meliphagidae	*Acanthogenys rufogularis*	Spiny-cheeked Honeyeater	SM								1,SM						1		1				
Pardalotidae	*Pardalotus striatus*	Striated Pardalote																					WAT17
Hirundinidae	*Petrochelidon nigricans*	Tree Martin		1		1					1[2]								1	1			

Family	*Species Name*	Common Name	Site																			Opportunistic[1]
			1	2	3	4	5	6	7	9	10	11	12	13	15	16	17	18	19	20	21	22	
Accipitridae	*Aquila audax audax*	Wedge-tailed Eagle									1												WAT17
Hirundinidae	*Hirundo neoxena neoxena*	Welcome Swallow	SM	1[2]		SM	1		SM		SM				SM	SM					1		EX, LFA01, SED, TJU, WAT17
Pomatostomidae	*Pomatostomus superciliosus*	White-browed Babbler							1							1	1		1	1	1	1	
Meliphagidae	*Ptilotula penicillata*	White-plumed honeyeater																					CWM01
Maluridae	*Malurus leucopterus leuconotus*	White-winged Fairywren	1[2]	1	1[2]		1[2]	1	1[2]	1	SM					1					1		
Campephagidae	*Lalage tricolor*	White-winged Triller																					SED
Rhipiduridae	*Rhipidura leucophrys leucophrys*	Willie Wagtail	SM				SM				1[2]						1		1				YH
Meliphagidae	*Manorina flavigula*	Yellow-throated Miner	SM						SM													1	
Estrildidae	*Taeniopygia guttata castanotis*	Zebra Finch	SM			SM		SM	1[2]		1[2]	1				SM				1	1		SWM05, SED
		Grand Total	23	8	8	9	11	8	19	4	18	2	2	1	6	13	6	2	8	11	12	8	

[1]Opportunistic observation locations: South Eliza Dam (SED), Exploration Village (EV), Western Access Road (WAR), Exploration Village (EV), CWM02/5 (weed monitoring sites), WAT17 / YC (Yeltacowie Creek), CF01 is a saline spray site within 500 m of processing plant (1.2 km from Site 3 and Site 15), [2]Observed plus Song Meter detection; Note '1' denotes present, not counts of individuals, SM = detected via Song Meter only, CT = detected via Camera Trap; Grey cells = EPBC Status. Limited bird surveys were undertaken at Site 11, 12 and 13 due to unsuitable conditions and limited time available.

Specialised Zoological

Acoustic analysis and bat call identification from Carrapateena, South Australia

Prepared for **Lathwida Environmental Pty Ltd**

Version **8 December 2025**

SZ project reference **SZ784**

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Version history

Date	Note
2025-12-08	Final version

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Summary

Bat identifications from bat detector sound files are provided from recordings made in the Carrapateena study area, c. 65 km east of Woomera, near the Carrapateena Arm of Lake Torrens, South Australia.

The dataset submitted for analysis included a total of 193 WAV format bat detector sound files from two recording sites made over a total of seven recording nights (nights of 19 – 23/09/2025).

Four species of bat were detected in the recordings (**Tables 1** and **2**; **Figure 1**). All species were identified unambiguously.

Methods

The ultrasonic recordings provided were recorded in WAV sound format from Wildlife Acoustics Song Meter Mini Bat bat detectors.

A multi-step acoustic analysis procedure developed to process large full spectrum echolocation recording datasets from insectivorous bats (Armstrong et al. 2021a,b) was applied to the passive site-based recordings made on the survey. Firstly, the WAV files were scanned for bat echolocation calls using several parameter sets in the software SCAN'R version 1.8.3 (Binary Acoustic Technology), which also provides measurements (SCAN'R parameters) from each putative bat pulse. The outputs were then used to determine if putative bat pulses measured in SCAN'R could be identified to species. This was done using a custom [R] language application that performed three tasks:

1. undertook a Discriminant Function Analysis on training data from representative calls from southern Australia;

2. from the measurements of each putative bat pulse from SCAN'R, calculated values for the first two Discriminant Functions that could separate the echolocation call types derived from the analysis of training data, and plotted these resulting coordinates over data ellipses representing one standard deviation of the variation for the defined call types; and

3. facilitated an inspection in a spectrogram of multiple examples of each call type for each recording night by opening the original WAV files containing pulses of interest in Adobe Audition version 25.0.

Species identifications were made based on measurements of characteristic frequency and observation of pulse shape, and with reference to information in Armstrong et al. (2021a). Nomenclature follows Jackson and Groves (2015). Distribution information for all bat species considered here was checked against the BatMap resource hosted by the Australasian Bat Society, Inc (https://www.ausbats.org.au/batmap.html) (Milne et al. 2023).

Limitations

The identifications presented in this report have been made within the following context:

1. The identifications made herein were based on the ultrasonic acoustic data recorded and provided by a 'third party' (the client named on the front of this report).
2. The scope of this report extended to providing information on the identification of bat species in bulk ultrasonic recordings. Further extended comment on these species and the possible impacts of a planned project on bat species were not part of the scope.
3. In the case of the present report, the recording equipment was not set up and supplied by Specialised Zoological. The equipment was operated by the third party during the survey.
4. Other than the general location of the study area, Specialised Zoological has not been provided with detailed information of the survey area, has not made a visit to observe the habitats available for bats, nor have we visited the specific project areas on a previous occasion.
5. Specialised Zoological has had no input into the overall design and timing of this bat survey, recording site placement, nor the degree of recording site replication.
6. While Specialised Zoological has made identifications to the best of our ability given the available materials, and reserves the right to re-examine the data and revise any identification following a query, it is the client's and / or proponent's responsibility to provide supporting evidence for any identification, which might require follow-up trapping effort or non-invasive methods such as video recordings. Specialised Zoological bears no liability for any follow-up work that may be required to support an identification based initially on the analysis of acoustic recordings undertaken and reported on here.
7. There are a variety of factors that affect the 'detectability' of each bat species, given the frequency, power and shape characteristics of their calls. Further information on the analysis and the various factors that can impinge on the reliability of identifications can be requested.
8. The analysis of ultrasonic recordings is one of several methods that can be used to survey for bats, and comprehensive surveys typically employ more than one method. If an identification in the present report is ambiguous or in question, a trapping programme would help to resolve the presence of the possibilities in the project area.
9. This version of the document supersedes any previous version. Previous drafts are not authorised by us for submission to the regulator or the public domain.

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Table 1. Species identified from all sites combined.

VESPERTILIONIDAE	
Gould's Wattled Bat	*Chalinolobus gouldii*
Lesser Long-eared Bat	*Nyctophilus geoffroyi*
Inland Forest Bat	*Vespadelus baverstocki*
MOLOSSIDAE	
White-striped Free-tailed Bat	*Austronomus australis*

Table 2. Species identifications summarised for all nights across each recording site (see *Table 1* for full species names).

			A. australis	***C. gouldii***	***N. geoffroyi***	***V. baverstocki***
Site	**Night**	**Coordinates**				
CAR007 SMU13599	19/09/2025	-31.173540, 137.442100	X	X	.	X
	20/09/2025	-31.173540, 137.442100	X	X	.	.
	21/09/2025	-31.173540, 137.442100	.	X	X	X
	22/09/2025	-31.173540, 137.442100	.	.	X	.
CAR010 SMU13725	21/09/2025	-31.231730, 137.525880	.	X	X	X
	22/09/2025	-31.231730, 137.525880	.	X	.	.
	23/09/2025	-31.231730, 137.525880	X	X	X	.

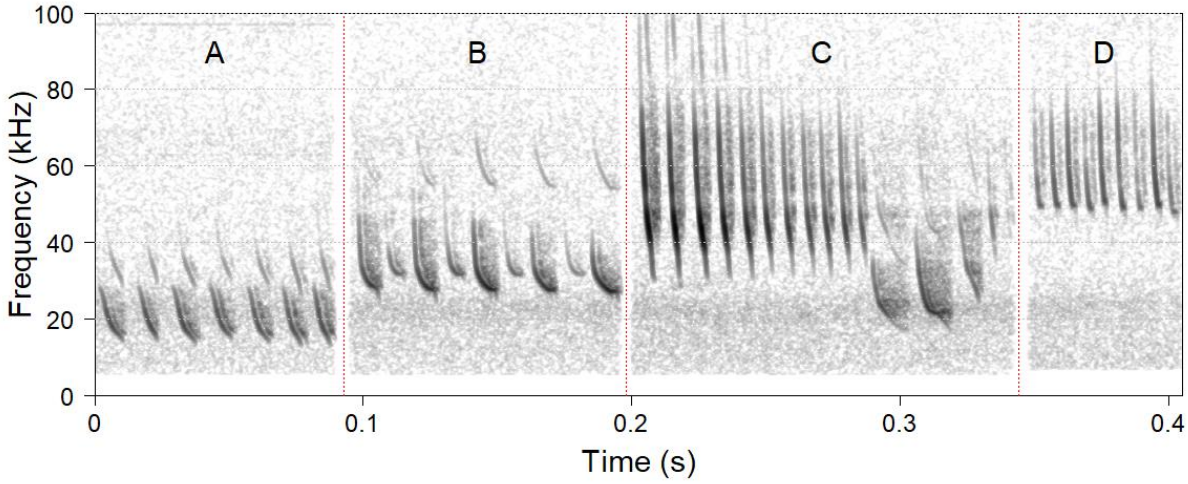


Figure 1. Representative echolocation call sequence portions of the species identified (**A**: *Austronomus australis*; **B**: *Chalinolobus gouldii*; **C**: *Nyctophilus geoffroyi*; **D**: *Vespadelus baverstocki*; time between pulses has been compressed).

Appendix G. Weeds

Appendix G1. Weed summary

Table G1: Weeds recorded at various locations across the Carrapateena Site during baseline (2012-2016) and compliance (autumn 2018 to spring 2024)

Scientific name	Common Name	Location	EBS 2012 – 2016	Years recorded between 2018 and 2024 and (CSR)[1]	Spring 2025 CSR*/ notes
Asphodelus fistulosus	Onion Weed	Dawson Dam	NR	2020 (2)	NR
Brassica tournefortii	Mustard	CWM01	Present	NR	NR
Carrichtera annua	Wards Weed	CWM01	NR	2021 (isolated CSR 4)	NR
		CWM05	NS	NR, 2024 (1)	NR
Carthamus lanatus	Saffron Thistle	CWM01	Present	2018, 2021, 2023 (1,2)	NR
		CAR007	Present	NR	NR
		South Eliza Dam	NS	2021 (2), 2024 (2)	NR
Centaurea calcitrapa	Star Thistle	CWM02	Present	NR	NR
Centaurea melitensis	Malta Thistle	CAR010	Present	2021 (1)	NR
		CAR018	NS	2021, 2023 (1)	NR
		CAR020	NS	2021, 2023 (2), 2024 (2/4)	NR
		CWM01	NS	2024 (1/5)	NR
		Dawson Dam	NS	2021, 2022 (2), 2024 (1/3)	NS
		South Eliza Dam	NS	NR	3 (localised)
Centarium erythraea / tenuiflorum	Centaury	CAR010	Present	NR	NR
		EV EIA	NS	2018 (1), 2023 (4)	1
		Dawson Dam	NS	2020 (4), 2023 (1)	NS
		Anzac Dam	NS	2022 (1)	NS
		South Eliza Dam	NS	2022 (2)	NR
		North Eliza Dam	NS	NR	NS
		Dawson	NS	2023 (2/4)	NS
Chenopodium album/murale	Goosefoot	Expo Village EIA	NS	2018, 2019, 2021, 2023 (2/4), 2024 (2/4)	2
		Anzac Dam	NS	2018, 2020 - 2023 (1/2/4)	NS
		Whittata Creek	NS	2021 (1)	NS
		Dawson Dam	NR	2020 - 2023 (2/3/4)	NS
Citrullus species, inc. *C. colocynthis*	Bitter Melon	Anzac Dam	NS	2019 – 2023 (2/3/4)	NS
		South Eliza Dam	NS	2019, 2020 (2/4)	NR
		Dawson Dam	NS	2018 – 2020, 2023 (1/2/4), 2024 (2)	NS
		CWM01	NR	2020, 2022 (1/3)	NR
		CWM02	NR	2022 (1)	NR
		CWM05	NS	2020, 2022, 2023, 2024 (2 or 3 or 4 or 5)	NR

Scientific name	Common Name	Location	EBS 2012 – 2016	Years recorded between 2018 and 2024 and (CSR)[1]	Spring 2025 CSR*/ notes
		CWM06	NR	2020, 2022, 2023 (1/2/3)	NR
		CWM021	NS	2020, 2022, 2023 (1/2)	NR
		CWM022	NS	2020, 2022, 2023 (1/2)	NR
		Tjungu EIA	NS	2023 (1/3)	NS
Cucumis myriocarpus	Paddy Melon	EV EIA	NS	2020, 2023 (3)	NS
		CWM01	NR	2020 (3)	NR
		Dawson Dam	NR	2020, 2023 (2/3/5)	NS
		South Eliza Dam	NR	2020, 2023 (2/3/5)	NR
Cynodon dactylon	Couch	Whittata Creek	NS	2021 (2), 2024 (2)	NS
Erodium sp. including E. cicutarium	Cut-leaf Heron's-bill	CAR004	NR	NR	1
		CAR005	NR	NR	1
		CAR009	NR	NR	1
		CWM02	NR	2020 (1)	NR
		Dawson Dam	NR	2020 (1)	NS
		Whittata Creek	NS	2021 (1)	NS
		Anzac Dam	NR	2020, 2021 (1/2)	NS
Heliotropium curassavicum	Smooth Heliotrope	North Eliza	NS	2018 – 2024 (2 or 3 or 4 or 5)	NS
		South Eliza	NS	2018 – 2024 (2 or 3 or 4 or 5)	4/5 (localised)
		Anzac Dam	NS	2018 – 2023 (2/4/5/6)	NS
		Dawson Dam	NS	2018 – 2024 (2/4/5/6)	NS
		CWM01	NR	2023 (1), 2024 (2)	2
		CWM02	Present	2019 – 2024 (1 or 2 or 3 or 4)	4 (near water)
		CWM06	NR	2023 (1)	2 (near water)
Heliotropium europeum and/or supinum	Spreading Heliotrope	CWM01	Present	2018, 2021 (1/2)	NR
		CWM02	NR	NR	2
		Anzac Dam	NS	2019 (1)	NS
		North Eliza Dam	NS	2019 – 2024 (2 or 3 or 4)	NS
		South Eliza Dam	NS	2021 – 2024 (1 or 2 or 4)	1
		Dawson Dam	NS	2018 – 2021 (2/3/4), 2024 (2)	NS
		Whittata Creek	NS	2021 (2)	NS
Lepidium africanum	Peppercress	CWM02	Present	NR	NR
Lysimachia arvensis	Scarlet Pimpernel	Expo Village EIA	NS	2018 – 2022 (2/4), 2024 (2/6)	Present
		CWM001	NR	2022 (1)	NR
		CWM006	NR	2020 (1)	NR
		CAR018	NS	NR	1
		North Eliza Dam	NS	2024 (1)	NS
Malva parviflora	Mallow	Anzac Dam	NS	2019 (1)	NS

Scientific name	Common Name	Location	EBS 2012 – 2016	Years recorded between 2018 and 2024 and (CSR)[1]	Spring 2025 CSR*/ notes
		North Eliza Dam	NS	2024 (1)	NS
		South Eliza Dam	NS	2023 (3)	2 (localised)
		CWM01	NR	2020, 2022 (1)	NR
		CWM02	NR	2020, 2023 (2/3)	3 (near water)
Medicago sp (including M. minima)	Medic	CWM01	NR	2022 (1)	1
		CWM02	NR	2022 (1), 2024 (3)	NR
		North Eliza Dam	NS	2024 (3)	NS
		South Eliza Dam	NS	2024 (3)	2
Mesembryanthemum crystallinum	Iceplant	CWM01	NR	2020 (3)	NR
		South Eliza Dam, EV	NR	2020 (1)	NR
Mesembryanthemum nodiflorum	Slender Iceplant	CAR001, CAR008, CAR009, CAR010	Present	NR	NR
Nicotiana glauca	Tree Tobacco	CAR013	Present	2022 (1)	NR
		Dawson Dam	NS	2023 (1)	NS
		South Eliza Dam	NS	2018 – 2024 (2 to 5)	2 to 5
Opuntia sp. [1]	Prickly Pear	Yeltacowie homestead	NS	2018 – 2024 (1)	1 (c. 10 m^2)
Polygonum aviculare	Wire Weed	Anzac Dam	NS	2019 (1)	NS
Rostraria pumila	Tiny Bristle Grass	CAR003-CAR005, CAR007, CAR008, CAR012-CAR015, CAR022	CAR003- CAR005, CAR007, CAR008, CAR012-CAR015	CAR004, CAR012 (1) Recorded in 2019 and 2020	NR
		South Eliza Dam	NS	2019 (3)	NR
		Expo Village	NS	2019 – 2022 (1/2/4), 2024 (2)	NR
Rumex vesicarius	Rosy Dock	CAR004, CAR013	Present	NR	NR
		CAR007	Present	2020 (1)	NR
Schinus molle	Pepper Tree	Whittata Creek	NS	2021 (1) Not surveyed other years	NS
Schismus barbatus	Arabian Grass	CAR003, CAR006, CAR012, CAR014	Present	NR	NR
Sisymbrium erysimoides	Smooth Mustard	Anzac Dam	NS	2019 (1)	NS
		Dawson Dam	NS	2019 (1), 2024 (2/4)	NS
		CAR001, CAR009, CAR011, CAR013, CAR014, CAR016	Present	NR	NR
		CAR010	NS	2021 (1)	NR
		CAR012	NS	2019 (1)	NR
		CAR017	NS	2019 (1)	1
		CAR020	NS	2024 (1)	NR
		CAR021	NS	2020, 2022, 2023, 2024 (1 or 2 or 3 or 4)	4
		CAR022	NS	2019 – 2023 (1/2/3/4), 2024 (4/5)	5
		CWM01	NR	2019, 2020, 2022, 2023 (1/2/3/4), 2024 (3)	1

Scientific name	Common Name	Location	EBS 2012 – 2016	Years recorded between 2018 and 2024 and (CSR)[1]	Spring 2025 CSR*/ notes
		CWM03	Present	NR	NR
		CWM05	NS	2020, 2021 (1/3), 2024 (1/4)	1 and3
		CWM06	NR	2019 – 2023 (1/3), 2024 (1/5)	1 to 5
		South Eliza Dam	NS	2019, 2020 (3), 2024 (3)	1
		North Eliza Dam	NS	2024 (1/3)	NS
		Expo Village	NS	2020 (2), 2024 (2/4)	2 and 4
Solanum nigrum	Black Nightshade	Anzac Dam	NS	2019 – 2023 (1)	NS
		Dawson Dam	NS	2019 – 2020, 2023 and 2024 (2)	NR
		South Eliza Dam	NS	2020, 2023 and 2024 (1)	1
		Expo Village	NS	2018 – 2021, 2023 and 2024 (1/2)	1
		Expo Village EIA	NS	2018 – 2021, 2023, 2024 (1 or 2 or 3 or 4)	1
		Whittata Creek	NS	2021 (1) Not surveyed other years	NS
		CWM01	Present	2021, 2022 (1), 2024 (1)	NR
		CWM02	Present	NR	NR
Sonchus oleraceus	Sow Thistle	Expo Village	NS	2018 (1), 2024 (2)	1
		Airport Laydown LFA (restoration)	NS	NR	1
		CWM01	NR	2021, 2022 (1), 2023 (1)	3 (largely near drainage)
		CWM02	NR	2024 (3)	NR
		CWM07	NR	NR	1
		NWM01	NS	NR	1
		Expo Village EIA	NS	2018, 2019, 2021, 2023 (1/3/4), 2024 (3/4)	3/4
		TV EIA	NS	2018 – 2023 (4)	NS
		CAR003		2019 (1)	1
		CAR004, CAR006	NR	NR	1
		CAR009	Present	NR	1
		CAR010	Present	NR	3
		CAR007, CAR014	Present	NR	NR
		CAR012	Present	2023 (1)	1
		CAR011, CAR015	Present	2019 (1)	NR
		CAR013	Present	2019, 2023 (1)	1
		CAR016	NR	2019 (1)	1
		CAR018	NR	2023 and 2024 (1)	2
		CAR019	NS	2020 (1), 2024 (1)	2
		CAR020, CAR022	NS	NR	1
Tamarix aphylla[1,2]	Athel Pine	Yeltacowie homestead	NS	2018, 2019, 2021 – 2023 (1), 2024 (1)	1 (c. 10 trees including suckers and regrowth of cut trees)
Tribulus terrestris	Caltrop	CAR002, CAR005, CAR008-CAR010, CAR013, CAR014	Present	NR	NR

Scientific name	Common Name	Location	EBS 2012 – 2016	Years recorded between 2018 and 2024 and (CSR)[1]	Spring 2025 CSR*/ notes
		CAR020	NS	2020 (1)	NR
Urtica urens	Stinging Nettle	Exploration Village EIA	NS	2023 (2)	NR
Verbena supina	Trailing Verbena	Anzac Dam	NS	2022 (2)	NS
		North Eliza Dam	NS	2024 (1)	NS
Xanthium spinosum[1]	Bathurst Burr	CWM01	NR	2018, 2019, 2021, 2023 (1/3), 2024 (2)	1 (7+ plants near culvert)
		CWM02	NR	2019. 2021, 2023 (2/3/4), 2024 (3)	1 (near water)
		CWM05	NS	NR	1 (c. 10) plants in localised area of cracking clay. No fruit observed
		Dawson Dam	NS	2019 – 2024 (4/5)	NS
		South Eliza Dam	NS	2019, 2021, 2023 (2/3/4/5), 2024 (3)	2 (localised)
		Whittata Creek	NS	2021 (2/5), 2024 (1) Not surveyed other years	NS

*CSR = Crown Separation Ratio: Abundance recorded using the CSR scale 1 = < 12 individuals; 2 = isolated clumps, 3 = isolated individuals, 4 = plants separated by 6-20 crown widths, 5 = plants separated by 1-5 crown widths

[1] Declared in SA under the Landscapes South Australia 2019 Act. Declared plant species are regulated as to their movement, sale, notification and/or control.

[2] WoNS - Weed of National Significance. Must be controlled within 100 m of a watercourse

[3] EV = Exploration Village, EV EIA = Exploration Village Effluent Irrigation Area. TV EIA = Tjungu Village Effluent Irrigation Area, NR = Not Recorded, site was surveyed, but weed species was not observed; NA = Not applicable, site was discontinued in spring 2018, NS = Not surveyed.

Appendix G2. Weed transect species (baseline and compliance)

Table G2: Weed species recorded along weed transects, baseline and compliance/operational monitoring

Transect	Species	2012-2016[1]	Years recorded between 2018 and 2024 and (CSR)[2]	Spring 2025 notes and/or CSR[2]
CWM01	*Brassica tournefortii* (Mustard)	Present	NR#	NR
CWM01	*Carrichtera annua* (Wards Weed)	NR	2021	NR
CWM01	*Carthamus lanatus* (Saffron Thistle)	Present	2018, 2023 (1)	NR
CWM01	*Centaurea melitensis* (Malta Thistle)	NR	NR, 2024(1)	NR
CWM01	*Cucumis* sp. (Paddy Melon)	NR	2020	NR
CWM01	*Cynodon dactylon* (Couch)	NR	2021 (2), 2024 (2)	NR
CWM01	*Heliotropium curassavicum* (Smooth Heliotrope)	NR	2022 (1), 2023 (1), 2024 (3)	2 (Localised at culvert)
CWM01	*Heliotropium supinum* (Spreading Heliotrope)	Present	2018, 2019, 2021	NR
CWM01	*Lysimachia arvensis* (Scarlet Pimpernel)	NR	2022 (1)	NR
CWM01	*Malva parviflora* (Mallow)	NR	2020 2022 (1)	NR
CWM01	*Medicago sp.* (Medic) including Medicago minima	NR	2022 (3)	1 (localised near drainage)
CWM01	*Mesembryanthemum crystallinum* (Iceplant)	NR	2020	NR
CWM01	*Sisymbrium erysimoides* (Smooth Mustard)	NR	2020, 2022 (1), 2023 (2/4)	1 (drainage line)
CWM01	*Sonchus oleraceus* (Sow Thistle)	Present	2021, 2022 (1), 2023 (1)	3 (largely near drainage)
CWM01	*Solanum nigrum* (Black Nightshade)	NR	2022 (1)	NR

Transect	Species	2012-2016[1]	Years recorded between 2018 and 2024 and (CSR)[2]	Spring 2025 notes and/or CSR[2]
CWM01	*Xanthium spinosum* (Bathurst Burr)	NR	2018, 2019, 2021, 2023 (3), 2024 (3) (2024 = 30+ plants)	Localised, 7+ at culvert
CWM02	*Centaurea calcitrapa* (Star Thistle)	Present	NR	NR
CWM02	*Citrullus Cucumis* (Bitter Melon)	NR	2022 (1)	NR
CWM02	*Erodium cicutarium* (Cut-leaf Heron's-bill)	NR	2020	NR
CWM02	*Heliotropium curassavicum* (Smooth Heliotrope)	Present	2019, 2020, 2021, 2022 (3), 2023 (2), 2024 (3)	4 (culvert and water's edge)
CWM02	*Heliotropium supinum* (Spreading Heliotrope)	NR	NR	2 (near water)
CWM02	*Lepidium africanum* (Peppercress)	Present	NR	NR
CWM02	*Malva parviflora* (Mallow)	NR	2020, 2023 (2)	3 (culvert and water's edge)
CWM02	*Medicago minima* (Medic)	NR	2022 (1), 2024 (4)	NR
CWM02	*Solanum nigrum* (Black Nightshade)	NR	2022 (1)	NR
CWM02	*Sonchus oleraceus* (Sow Thistle)	NR	2022 (1), 2024 (4)	1
CWM02	*Xanthium spinosum* (Bathurst Burr)	Present	2019, 2021, 2023 (2/4), 2024 (3)	1 (Culvert + water's edge but high fruit load)
CWM03	*Sisymbrium erysimoides* (Smooth Mustard)	Present	NR	NR
CWM04	*Sonchus oleraceus* (Sow Thistle)	Present	NR	NR
CWM05	*Carrichtera annua* (Wards Weed)	NR	NR, 2024 (1)	NR
CWM05	*Citrullus* sp. (Bitter Melon)	NS	2020, 2022 (4/5), 2023 (4/5), 2024 (3)	NR
CWM05	*Sisymbrium erysimoides* (Smooth Mustard)	NS##	2020, 2024 (1/4)	1/3 (Widespread but sparse on verge and dune)
CWM05	*Xanthium spinosum* (Bathurst Burr)	NR	NR	1 (c. 10) plants in localised area of cracking clay. No fruit observed
CWM06	*Citrullus* sp. (Bitter Melon)	NR	2020, 2022 (1), 2023 (2/3)	NR
CWM06	*Heliotropium curassavicum* (Smooth Heliotrope)	NR	NR	2 (drainage line)
CWM06	*Lysimachia arvensis* (Scarlet Pimpernel)	NR	2020	NR
CWM06	*Sisymbrium erysimoides* (Smooth Mustard)	NS	2018, 2019, 2020, 2022 (1), 2023 (1), 2024 (1 to 5)	1 to 5 (widespread)
CWM07	*Sonchus oleraceus* (Sow Thistle)	NR	NR	1 (two locations)
NWM01	*Sonchus oleraceus* (Sow Thistle)	NR	NR	1 (drainage line)
NWM01	*Tribulus terrestris* (Caltrop)	NS	2019	NR
NWM02	*Citrullus* sp. (Bitter Melon)	NS	2019	NR
NWM02	*Cucumis* sp. (Paddy Melon)	NS	2019	NR
NWM03	No weeds present	NS	Nil	Nil

Includes weeds recorded along weed transect, but outside of a designated recording quadrat.

[1]Data source: baseline surveys autumn 2012 – 2016 (EBS 2015a; EBS 2015b; EBS 2016); [2] Presence abundance uses CSR scale (1 = < 12 individuals; 2 = isolated clumps, 3 = isolated individuals, 4 = plants separated by 6-20 crown widths, 5 = plants separated by 1-5 crown widths

#NR = surveyed but not recorded; ##NS = Not surveyed (CWM05 first surveyed 2020. NWM01, NWN02 and NWM03 transects first surveyed 2019); Apple of Sodom (*Solanum linnaenum*) recorded during baseline surveys, but not included in above table as there are no Biological Databases of SA records for this species north of Port Augusta, Ceduna (NatureMaps 2024).



Appendix E
2025 Air Quality Monitoring Report

2025 Compliance Report

Carrapateena

Air Quality Monitoring Review

BHP

LATHWIDA ENVIRONMENTAL



March 2026

Final Report

Document status

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1 Introduction

1.1 Context

BHP operates the Carrapateena copper and gold mine (the Operation) in the far north of South Australia, approximately 160 km north of Port Augusta. The site operates in accordance with a Program for Environment Protection and Rehabilitation (PEPR), approved by the Government of South Australia's Department for Energy and Mining (DEM).

The current, approved PEPR is MPEPR2025/011, approved on 18 September 2025 (BHP 2025). The PEPR contains a suite of Outcomes, Outcome Measurement Criteria (OMC) and Leading Indicators (LI) designed to manage the environmental and social impacts and risks associated with the Operation. Noting that there are no changes to the air quality Outcomes, OMC or LI relative to the previously approved PEPR MPEPR2024/009, which was the regulatory PEPR in place during the 2025 compliance reporting period prior to the MPEPR2025/011.

BHP commissioned Lathwida Environmental Pty Ltd (Lathwida) to review the results of monitoring undertaken on site during 2025 in the context of those Outcomes, OMCs and LIs related to air quality, and specifically, those related to interpretation of air quality monitoring. This is presented across the following sections, with reference to the relevant PEPR requirement.

1.2 Data sources

BHP provided the following information in support of this review:

- Tailings storage facility (TSF) all weather data
- TSF weather data daily evaporation and rainfall
- soil data for samples (at environmental radiation monitoring location (ERML)16 to ERML19) analysed in March 2025 in the vicinity of the TSF
- High Volume Air Sampler (HVAS) field readings for PM_{10} dust measurements
- quarterly ERML deposited dust data
- metals in dust data.

All laboratory data has been undertaken by National Association of Testing Authorities (NATA) accredited facilities.

2 Air quality compliance review

The review of the above information was undertaken with reference to the relevant Outcome, OMCs and LIs described in MPEPR2025/011.

2.1 Public nuisance

2.1.1 Criteria

The compliance criteria for public nuisance impacts as a result of effects to air quality are described in Table 2.1.

Table 2.1: Air quality-related public nuisance compliance criteria

Public nuisance criteria	Details
Environmental Outcome	
The Tenement Holder must during construction and operation ensure that there are no public nuisance impacts from dust and noise generated by mining operations or mining-related traffic	
Outcome Measurement Criteria	
ID	**PN2**
Measurement method	Gravimetric analysis of continuous dust deposition
Location	Monitoring site adjacent to Pernatty Homestead (ERML09)
Achievement value	Dust deposition rates do not exceed 4 g/m^2/month (total) as per Table 7.1 of Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (DEC 2005; superseded by NSW EPA 2017)
Frequency	Quarterly collection and analysis during operation of the southern access road
Project phase	Construction and operations
Leading Indicator	
ID	**PN3**
Measurement method	Gravimetric analysis of continuous dust deposition
Location	Monitoring site adjacent to Pernatty Homestead (ERML09)
Achievement value	Exceedances of baseline levels of 1.6 g/m^2/month over three consecutive months
Frequency	Monthly collection and analysis
Project phase	Construction

2.1.2 Results

OMC PN2: Not applicable

Outcome Measurement Criteria PN2 applies only during the operation of the Southern Access Road. Following the commissioning of the Western Access Road, the Southern Access Road is no longer used by BHP and management of the road has been handed back to the Government of South Australia's Department for Infrastructure and Transport (DIT) and therefore compliance against this criterion was not monitored during the 2025 reporting period.

LI PN3: Not applicable

Leading Indicator PN3 applied only during the construction phase of the Southern Access Road. Following the commissioning of the Western Access Road, the Southern Access Road is no longer used by BHP and management of the road has been handed back to DIT and therefore compliance against this criterion was not monitored during the 2025 reporting period.

2.2 Air quality

2.2.1 Criteria

The compliance criteria for air quality impacts as a result of effects to air quality are described in Table 2.2. Note that these criteria do not address all air quality OMC or LIs, bring limited to only those related to ongoing air quality monitoring. Other (ecology and administrative) air quality criteria are address elsewhere in the overarching Carrapateena Annual Compliance Report.

Table 2.2: Air quality compliance criteria

Air quality criteria	Details
Environmental Outcome	
The Tenement Holder must during construction, operation and post Completion ensure no adverse change to the air quality environment as a result of particulate emissions and/or dust generated by mining operations or mining-related activities	
Outcome Measurement Criteria	
ID	**AQ1**
Measurement method	Gravimetric analysis of continuous dust deposition
Location	Monitoring sites adjacent to the TSF (ERML16 – ERML19)
Achievement value	Dust deposition rates do not exceed 4 g/m^2/month (total) as per Table 7.1 of Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (DEC 2005; superseded by NSW EPA 2017)
Frequency	Quarterly collection and analysis
Project phase	Construction and operations

Air quality criteria	Details
ID	**AQ11**
Measurement method	Gravimetric analysis of continuous dust deposition
Location	Monitoring sites adjacent to the TSF (ERML16 – ERML19)
Achievement value	Dust deposition rates do not exceed 4 g/m^2/month (total) as per Table 7.1 of Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (DEC 2005; superseded by NSW EPA 2017)
Frequency	Monthly collection post completion for a period of no less than one year (dry weather cycle of below average annual rainfall and tailings must be of a moisture content and crust thickness as per the air quality model inputs
Project phase	Closure
Leading Indicator	
ID	**AQ4**
Measurement method	Laboratory analysis of continuous metals in dust
Location	Monitoring sites adjacent to the TSF (ERML16 – ERML19)
Achievement value	Rising trend in metals concentrations over three consecutive years when compared to previous monitoring results (PEPR Table 9.11; ERML01 – ERML15)
Frequency	Annual
Project phase	Construction and operations
ID	**AQ7**
Measurement method	Soil sampling and laboratory analysis
Location	Monitoring sites adjacent to the TSF (ERML16 – ERML19)
Achievement value	Rising trend in metals concentrations over three consecutive years when compared to previous monitoring results (PEPR Table 9.11 – Summary of baseline metals in dust)
Frequency	Annual
Project phase	Construction and operations
ID	**AQ8**
Measurement method	Iso-kinetic sampling of the Flash Steam Heat Recovery Stack, Plant Extraction Scrubber Stack and Nonox Vent Scrubber Stack
Location	Concentrate Treatment Plant
Achievement value	Compliance with Schedule 1 of the Environment Protection (Air Quality) Policy 2016 (SA) (PEPR Table 9.10)
Frequency	Quarterly
Project phase	Construction and operations
ID	**AQ9**
Measurement method	Analysis of the Concentrate Treatment Plant scrubber efficiencies (continuous data logging)
Location	Concentrate Treatment Plant
Achievement value	Decrease in the performance of the scrubbing systems for three consecutive months when compared to previous months
Frequency	Monthly
Project phase	Construction and operations

2.2.2 Results

OMC AQ1: Compliant

The average rate of dust deposition at ERML16–ERML19 (inclusive) analysed across 2025 was approximately 1.3 g/m^2/month. This is significantly below the OMC achievement value of an annual average of 4 g/m^2/month in accordance with the requirements as outlined in the NSW EPA (2017) guidance.

Dust deposition rates increased during Q4 2024 and Q1 2025, however for the remainder of the reporting period, were found to be generally consistent with results from previous years as outlined in Figure 2.1. Q1 2025 data (collected in March) displays the highest readings of 3.66 g/m^2/month at ERML16, 2.91 g/m^2/month ERML17, and 1.99 g/m^2/month at ERML19. Unfortunately, Q1 2025 data could not be analysed for ERML18 as the bottle had broken in transit.

The spike in deposited dust may be as a result of earthworks associated with TSF wall raises and borrow pit operations undertaken during this time, resulting in increased dust generation surrounding nearby ERMLs, however there is also a strong seasonal trend observed in the long-term dust deposition results that suggests that the increase in Q1 2025 is likely contributed to, at least in part, by drier conditions during the summer months that are more conducive to natural dust generation.

In addition, Q1 2025 wind speeds have been analysed from the Carrapateena weather station as a marker for the potential for greater background wind erosion-related emissions. The average of 10-minute maximum wind speeds for January was 27.67 km/h, February 25.16 km/h, and March 24.98 km/h. These values are broadly consistent with ranges observed across the 2024 and 2023 datasets for January, February and March. Comparisons to the Bureau of Meteorology (BoM) Woomera Weather Station (ID 016001) and Port Augusta Aero (ID 018201) could not be made for wind speed as this specific dataset was only collected until 2010 for both locations.

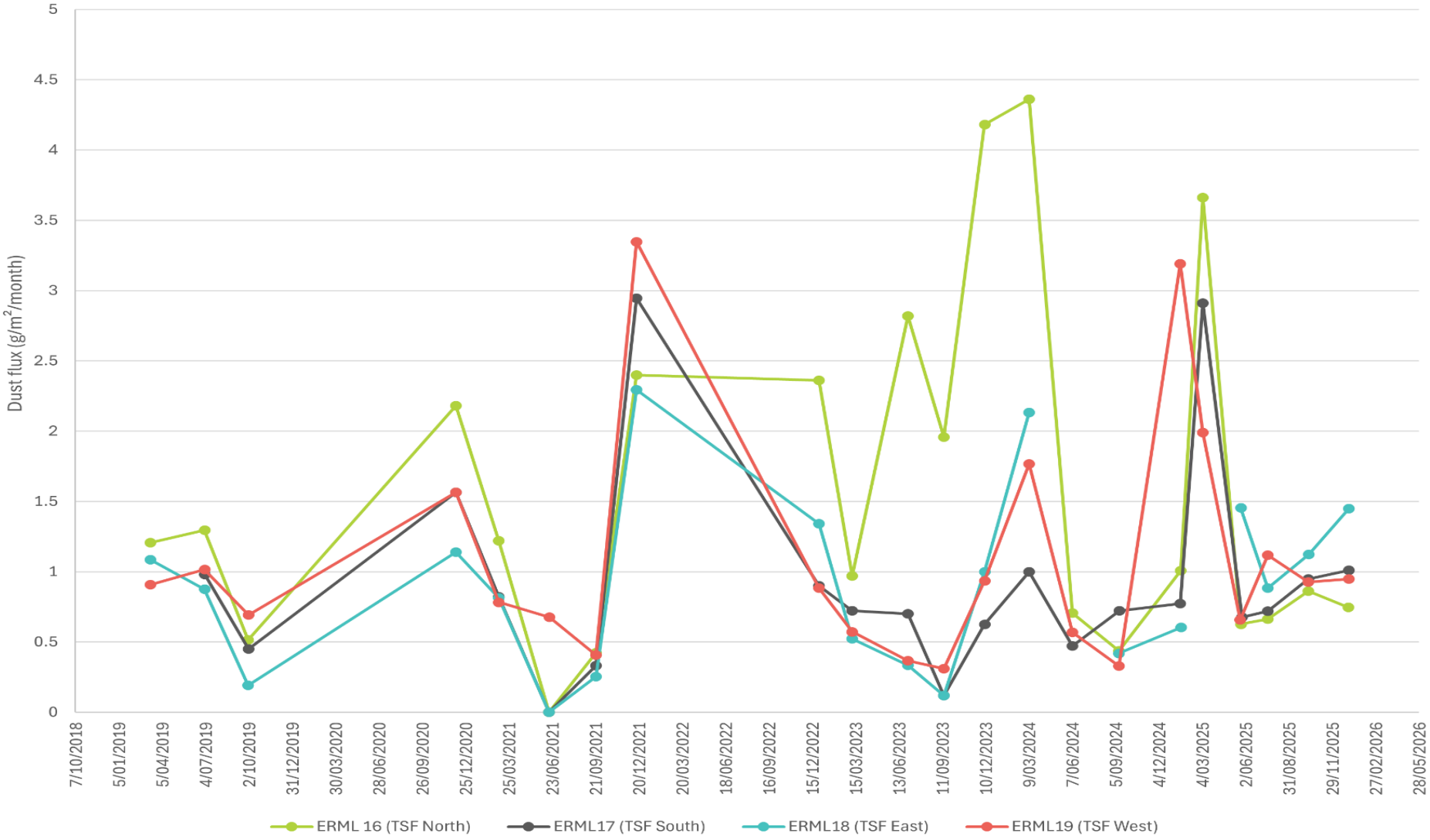


Figure 2.1: Measured deposited dust at the TSF (2019–2026)

OMC AQ11: Not applicable

This OMC applies following closure of the TSF.

LI AQ4: Not triggered

Metals in dust from ERML16 – ERML19 inclusive are compared to the average metal in dust concentrations and baseline concentrations from ERML02 – ERML15 as outlined in Figure 2.2. Metals in deposited dust concentrations for most analytes were generally similar, or on a downwards trajectory to that of previous reporting periods. Although several isolated outlier values (for lead, copper, uranium) were observed during the monitoring period, the broader dataset indicates a stable or downward trend suggesting emissions from the Operation aren't significantly affecting ambient air quality in the surrounding environment.

Metal concentrations in deposited dust at sites surrounding the TSF (ERML16 - ERML19) continue to be, in general, elevated when compared to the other monitoring locations across the Operation (ERML02 - ERML15) with the exception of:

- the cobalt concentration at ERML16 – ERML19 which is slightly lower (by 0.0003 mg/g) than the ERML02 – ERML15 concentration, and therefore not considered a material difference
- the titanium concentration at ERML16 – ERML19 which is slightly lower (by 0.0013 mg/g) than the ERML02 – ERML15 concentration, and therefore not considered a material difference
- the uranium concentration at ERML16 – ERML19 which is slightly lower (by 0.0002 mg/g) than the ERML02 – ERML15 concentration, and therefore not considered a material difference.

When looking at overall trends, only lead, copper, and uranium recorded increases in average metal in dust concentrations over the previous reporting period. While lead readings are still typically consistent with pre-operations baseline concentrations, the uranium reading is above its baseline value, and copper was found to be significantly higher when compared to the baseline value. Chromium is also above the baseline value, however measurements are consistent with more recent historical data.

The achievement value for this LI, as specified in Table 2.2, outlines rising trend in metals concentrations over three consecutive years when compared to previous monitoring results (ERML01 – ERML15). Considering the three elements which display increases for the reporting period, the following is inferred:

- lead displays a rise in metal concentrations only in the 2025 reporting period, with a downward trend observed in previous reporting years
- uranium has consistently displayed a rise in concentrations when comparing ERML02 – ERML15 against ERML02 – ERML15, and ERML16 – ERML19 against ERML16 – ERML19 data over three consecutive years. Uranium concentrations at ERML16 – ERML19 sites are comparable to ERML02 – ERML15 sites for consecutive reporting years, and dust emissions from the TSF are therefore unlikely to be the source for the observed increases
- copper has consistently displayed not only a rise in metal concentrations over three consecutive years when comparing ERML02 – ERML15 against ERML02 – ERML15 and ERML16 – ERML19 against

ERML16 – ERML19 (Table 2.3) but also reports consistently higher concentrations at ERML16 – ERML19 when compared to ERML02 – ERML15 for the same reporting year.

Baseline levels for uranium and copper are highlighted in Table 2.3 below, which demonstrate:

- uranium concentrations in deposited dust has increased over initial baseline observations at all ERML locations (both adjacent to and remote from the TSF) by approximately the same amount, indicating no significant additional contribution from the TSF
- copper concentrations in deposited dust have increased over initial baseline observations at all ERML locations (both adjacent to and remote from the TSF), however the increase at ERML locations close to the TSF has generally been greater than the increase at ERML locations more distant from the TSF. This indicates that dust generated from TSF operations, including wall raising and borrow pit operations, may be a contributor to the observed copper-in-dust concentrations.

Table 2.3: Uranium and copper concentrations for metals in dust (mg/g)

Year	Uranium		Copper	
	ERML02–ERML15	ERML16–ERML19	ERML02–ERML15	ERML16–ERML19
Baseline (PEPR Table 9.11)	0.00019-0.00158		2-98.0	
2022	0.0013	0.0008	66	74
2023	0.0020	0.0015	65	115
2024	0.0022	0.0016	83	141
2025	0.0026	0.0024	165	245

In order to provide further context to the deposited dust observations surrounding the Operation, a review of monitoring data from ERML14 was undertaken. ERML 14 is Carrapateena's regional monitoring location, sited near Woomera (approximately 60 km west of ML 6471) and thus indicative of regional changes in the airshed.

Dust mass at ERML 14 for the period July 2024 to May 2025 was sampled quarterly, with results as follows:

- July – September 2024: 0.0599 g
- September – January 2025: 0.2186 g
- January – March 2025: 0.1417 g
- March – May 2025: 0.0779 g.

The mass of dust collected during Q4 2024, and Q1 2025 are observed to be the greatest, in line with site measurements displaying increases (or spikes) of measured deposited dust as outlined in Figure 2.1.

A review of historical uranium and copper deposited dust concentrations at ERML 14 was undertaken (Table 2.4). These observations indicate:

- uranium concentrations in deposited dust at ERML 14 have generally been consistent since 2023

- copper concentrations in deposited dust at ERML 14 have increased in a similar proportion to the changes observed at other ERMLs since 2023.

Table 2.4: ERML14 uranium and copper concentrations (mg/g)

Element	2023	2024	2025
Uranium	0.0004	0.0005	0.0005
Copper	24	70	<90

In summary, it has been determined that LI AQ4 is not triggered on the basis that:

- all metals in deposited dust have decreased in concentration at ERML16 – ERML19 with the exception of lead, uranium and copper
- lead concentrations in deposited dust were observed to increase only in the current reporting year, following previous downward trends
- uranium concentrations in deposited dust have increased at ERML16 – ERML19 for the previous three reporting periods and are above baseline levels, however these trends are consistent with observations of deposited dust concentration increases for uranium at ERML02 – ERML15 locations, indicating that the source of the increase is unlikely to be the TSF
- copper concentrations in deposited dust have increased at ERML16 – ERML19 for the previous three reporting periods and are above baseline levels, however these trends are proportional to observations of deposited dust concentration increases for copper at ERML02 – ERML15 locations and those observed at the regional monitoring site (ERML14). The rate of increase for copper is slightly greater for ERML16 – ERML19 than other ERMLs, indicating that there may be some contribution from TSF activities.

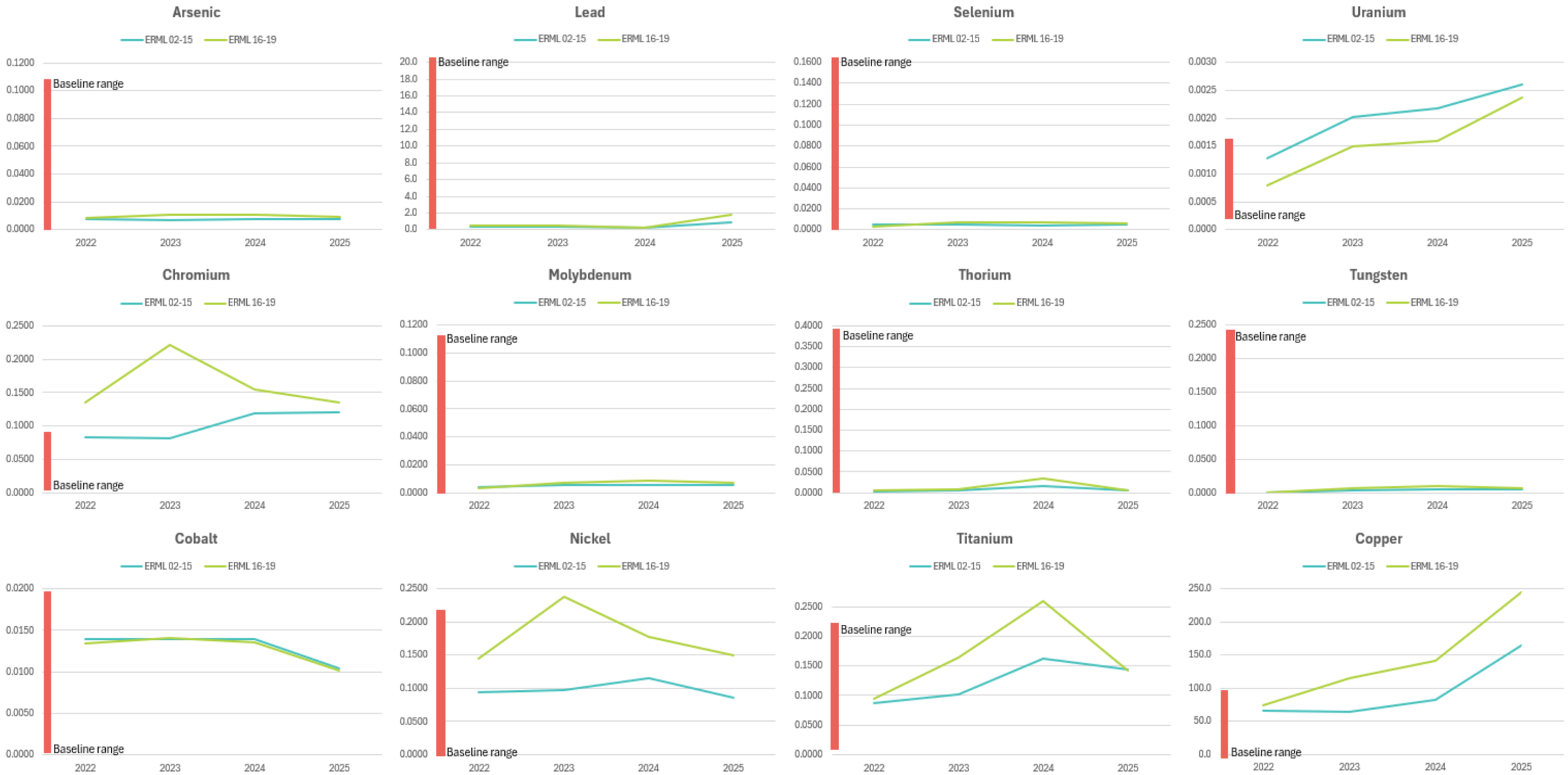


Figure 2.2: Metals in deposited dust (mg/g) at the TSF (ERML16–ERML19) versus areas remote from the TSF (ERML02–ERML15) and baseline ranges

LI AQ7: Not triggered

Comparison against monitoring undertaken in sequential years, and as a focus for this report, during the 2025 reporting period has been presented in Figure 2.3. Averages have been calculated based on raw data throughout the soil profiles including 0 to 2 cm depth and 15 to 20 cm depth across corresponding ERML16 – ERML19 sampling locations. This displays the chemical characteristics of soils throughout the upper soil profile.

The outcomes of the data trend demonstrates that measured concentrations at the ERML sites are generally consistent with previous reporting periods, outside of the 2019 and 2020 reporting periods for chromium. Further it is noted the 2017 to 2025 datasets for manganese displays the greatest fluctuation across the board. However, measured concentrations of all metals remain orders of magnitude less than the relevant National Environment Protection (Assessment of Site Contamination) Measure 1999 (Cth) guidelines for commercial/industrial environments, which have since been amended in 2013.

As per the LI requirements for AQ7, the achievement value specifies evaluation of a rising trend in metals concentrations over three consecutive years when compared to previous monitoring results (PEPR Table 9.11 – Summary of baseline metals in dust). The baseline of metals in dust as per the PEPR have been included in Table 2.5 below.

Table 2.5: Summary of baseline metals in dust

Metal	Baseline range (mg/g)[1]
Arsenic	0.001-0.1084
Chromium	0.009-0.092
Cobalt	0.0018-0.1893
Lead	0.024-20
Molybdenum	0.0012-0.1097
Nickel	0.009-0.21
Selenium	0.0018-0.1596
Thorium	0.0003-0.3806
Titanium	0.014-2.11
Uranium	0.00019-0.00158
Tungsten	0.0003-0.24
Lanthanum	0.002-0.035
Copper	2-98.0

[1] Baseline ranges taken from 2012 to 013 and 2015 to 2018 results for ERML01 – ERML 15

Laboratory analysis of the soil samples confirmed a rising trend in metal concentrations of chromium, lead, manganese, and zinc over the previous three reporting periods (Table 2.6). Similarly, a rising trend was observed for lanthanum, thorium, and titanium.

Baseline metals in dust have been used for comparison as stipulated in the achievement value wording for AQ7, however, it is noted that not all metals discussed within this section have a corresponding baseline value from Table 9.11 of the PEPR. When compared against baseline concentrations of metals in soil, all elements (aside from those which do not have a baseline listed) across the 2023 to 2025 reporting periods are observed to be lower than baseline concentrations with exception of uranium, which has been consistently slightly above baseline since monitoring commenced but does not have a rising concentration trend.

Table 2.6: Average ERML data over the last three years (mg/kg) for metals in soil

Element	Baseline (mg/kg)[2]	2023 ERML16–ERML19	2024 ERML16–ERML19	2025 ERML16–ERML19
Arsenic	1-108.4	5	5	5.5
Beryllium	NA	2	2	2
Cadmium	NA	0.2	0.2	0.2
Chromium	9-92	19	26	28.75
Cobalt	1.8-189.3	6	8	7
Copper	2,000-98,000	11	15	14.75
Lead	24-20,000	7	10	10.88
Manganese	NA	260	333	346.25
Nickel	9-210	10	14	13.75
Selenium	1.8-159.6	2	2	5
Uranium	0.19-1.58	2	2	2
Zinc	NA	32	42	43.5
Lanthanum	2-35	12	16	20.5
Molybdenum	1.2-109.7	2	2	5
Thorium	0.3-380.6	4.5	10.88	22.5
Titanium	14-2,110	106.5	138.63	328.75
Tungsten	3-240	2	2	2.13

A trend of rising copper and uranium in dust deposited around the TSF has been observed (see AQ LI4) however a similar trend is not observed in the soil metal concentrations. Similarly, the rising trend of metals in soil (albeit within baseline ranges) for some elements does not correspond to dust deposition trends, thus the source of these increases is unlikely to be associated with the Operation.

[2] Baseline ranges are as Table 9.11 in the PEPR which shows a summary of baseline metals in dust. Baseline ranges taken from 2012 to 2013 and 2015 to 2018 results from ERML01–ERML15

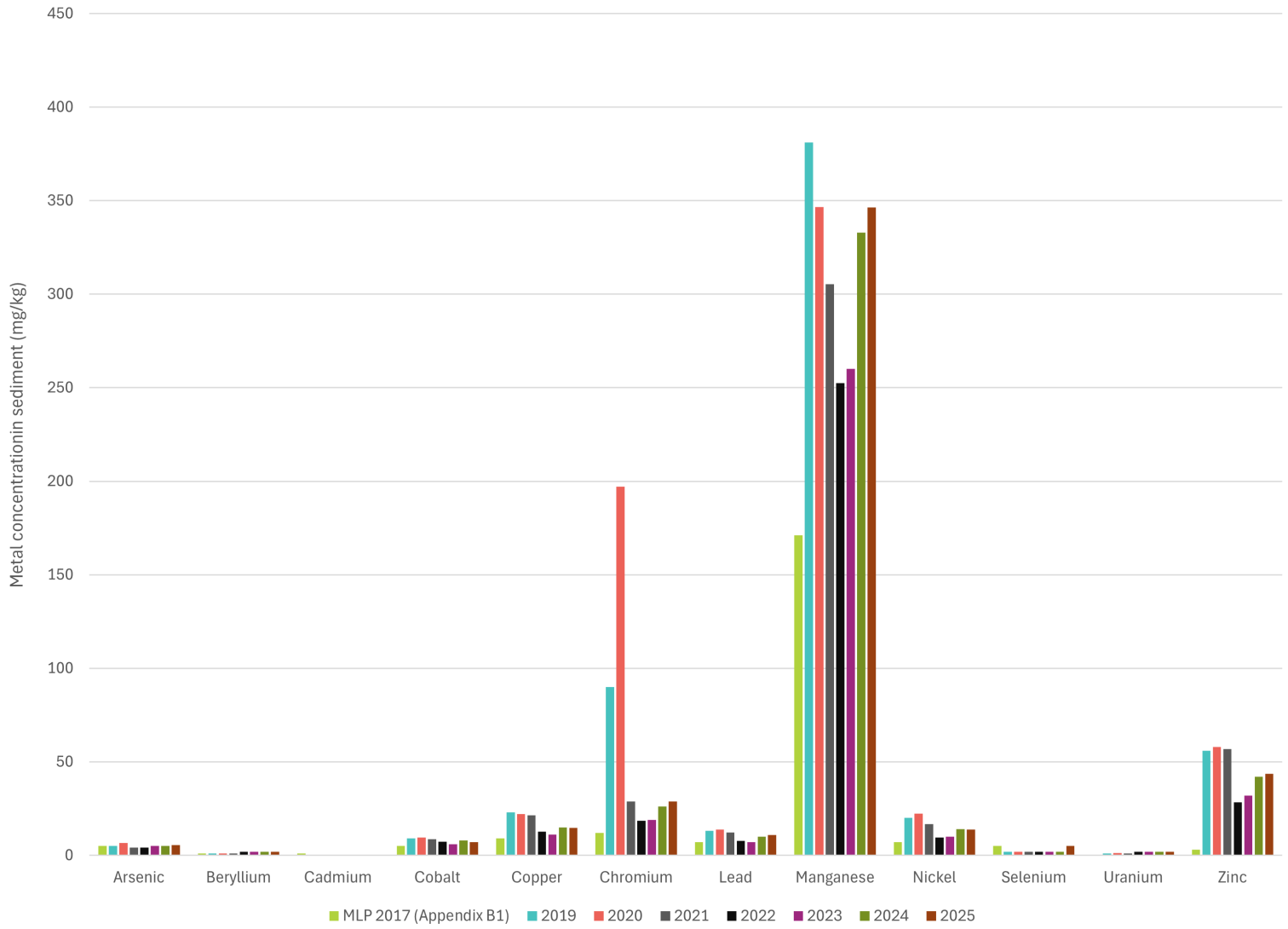


Figure 2.3: Selected metals in soil (ERML16–ERML19, all years)

LI AQ8: Not applicable

Construction and therefore operation of the Concentrate Treatment Plant (CTP) has not been progressed, and therefore related operational emissions monitoring has not been undertaken.

LI AQ 9: Not applicable

Construction and therefore operation of the CTP has not been progressed, and therefore related operational emissions monitoring has not been undertaken.

3 Conclusion

Review of relevant 2025 air quality and soil monitoring data were undertaken in order to establish the status of compliance against relevant Environmental Outcomes, OMCs and LIs as presented in the PEPR for Carrapateena (BHP 2025).

The compliance status determined from this review is:

- PN2: Not applicable
- PN3: Not applicable
- AQ1: Compliant
- AQ11: Not applicable
- AQ4: Not triggered
- AQ7: Not triggered
- AQ8: Not applicable
- AQ9: Not applicable

This review demonstrated that of the applicable OMCs and LIs for the reporting period, the air quality OMC relevant to the current phase of operations was found to be compliant with dust deposition rates recorded during the reporting period below the achievement value indicating that the relevant Environmental Outcome is being achieved.

Monitoring data indicated that two supporting LI criteria were not triggered. Rising trends of metals in dust (copper) and metals in soil (chromium, lead, manganese, zinc, lanthanum, thorium, and titanium) have been observed over three consecutive years when compared to previous monitoring results, however similar trends were observed for copper in dust at monitoring sites remote from the TSF and the Operation, indicating that the TSF is unlikely to be a significant driver of this trend. Metals in soil concentrations were found to all be within the baseline ranges established within the PEPR.

4 Abbreviated terms

4.1 Definition of acronyms

Table 4.1: Definition of acronyms

Abbreviation	Description
BoM	Bureau of Meteorology
DEM	Department for Energy and Mining
DIT	Department for Infrastructure and Transport
ERML	Environmental Radiation Monitoring Location
HIL	Health Investigation Level
HVAS	High Volume Air Sampler
LI	Leading Indicator
NATA	National Association of Testing Authorities
OMC	Outcome Measurement Criteria
PEPR	Program for Environment Protection and Rehabilitation
TSF	Tailings Storage Facility

4.2 Units of measure

Table 4.2: Units of measure

Unit	Description
cm	centimetre
g/m^2/month	grams per square metre per month
km	kilometre
mg/g	milligram per gram
mg/kg	milligram per kilogram
PM_{10}	particulate matter 10 microns or less

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BHP Public



Appendix F

2025 Environmental Radiation Impact Assessment

BHP

Carrapateena Environmental Radiation Impact Assessment 2025

Non-Human Biota and Member of Public Doses

19 March 2026

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1 Introduction

1.1 Purpose of this report

The purpose of this technical report is to:

- Provide an assessment of the radiation related impacts specific to non-human biota and members of the public for the existing Carrapateena operation.

The assessment of potential radiological impacts will be undertaken using the Environmental Risks from Ionising Contaminants: Assessment and Management (ERICA) Tool.

This report consists of the following:

- An outline of the relevant radiological characteristics of the operation
- A description of the methods for the assessment
- Assessment of the radiological impacts to representative and user-specific flora and fauna, referred to as non-human biota (NHB)
- Assessment of doses to members of the public.

1.2 Overview

BHP operates the Carrapateena mine in the mid-north of South Australia. The orebody predominantly contains copper but also includes uranium at an average concentration of approximately 3 Bq/g head of chain.

During mining and mineral processing activities, radiological impact to the environment may occur if not adequately controlled. As such, an environmental radiation monitoring program is established and executed to assess the potential dose pathways for members of the public and non-human biota.

When mining and processing is carried out with materials containing uranium, there is the potential for radiological impacts to the environment to occur. It is therefore important to measure and characterise the potential dose pathways for members of the public and non-human species present in the environment, to determine whether there are any radiological impacts, and what dose pathways may require further control.

2 Environmental Radiation Impact Assessment

This document assumes a basic understanding of radiation protection. An overview of key concepts is provided here for contextualization of the environmental radiation impact assessment.

The protection of the natural environment from emissions from nearby human activities has historically been based on the protection of humans. This approach was outlined by the International Commission on Radiation Protection (ICRP), which stated that “if man is protected then it can be assumed that the environment is protected” (ICRP, 1991). Under the Carrapateena PEPR, it is a requirement to demonstrate that non-human biota living in the local environment are protected against ionising radiation risks from radionuclides released to the environment by mining and processing activities. This is executed in accordance with the Carrapateena Radioactive Waste Environmental Management Plan (000792) and the Carrapateena Air Quality Environmental Management Plan (001374).

More recent publications (ICRP, 2014 and ARPANSA, 2015) have addressed this, and recommended that assessments be made on the impact of radiation on non-human biota. It is important to note that protection of non-human biota is demonstrated at the species level, rather than the individual level, as is the case for humans.

ARPANSA, 2015, suggests considering an as-simple-as-possible but as-complex-as-necessary approach to demonstrating protection, which assists in optimising the resources spent on the assessment and allows for a graded approach to protection. To facilitate this, a tiered approach may be used, which involves a first screening using simplified methodology and deliberately conservative (although not necessarily unrealistic) assumptions and parameter values, against a screening value of dose rate.

2.1 The ERICA Tool

The ERICA Tool was developed under the European Commission to provide a method of assessing the impact of radiological contaminants to the natural environment.

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) has noted that the ERICA Tool is applicable for use in Australia (ARPANSA, 2010). The software uses changes in radionuclide concentrations and concentration ratios in species, derived from monitoring and studies, to provide an estimated dose and measure of radiological impact to a number of Reference Animals and Plants (RAPs).

The database of the ERICA Tool has been built around a number of RAPs. Each RAP has a specified geometry, and default concentration ratio (CR) values. The geometry of an organism is represented as an ellipsoid – and by varying its axes – it can be used as a reasonable approximation for much of the existing wildlife on earth. Radiation damage arises due to ionisation along the path radiation takes as it passes through tissues, hence the dimensions of the organism have relevance to the degree of radiation damage that can occur. User specific organisms can be defined in ERICA, and the size and weight altered from that of RAPs.

Some simplifications introduced when using RAPs include:

- An assumption of homogenous radionuclide distribution in the tissues of the organism (for internal
- dosimetry),
- Generic biological data in terms of habitat, occupancy, life cycle, and reproduction among other factors.

Each assessment tier produces a dose rate which is comparable to a ‘screening dose rate’. The default ERICA screening dose rate is 10 µGy/h (ARPANSA, 2015), which is the level below which no effects would be observed for even the most sensitive species (predicted no-effect dose rate).
The two important inputs for an ERICA assessment are:

- Operationally derived changes in media concentration (the additional radionuclide concentration in soils or water attributable to the operation), in units of Bq/kg or Bq/L.
- The radionuclide concentration ratios, which is the ratio of radionuclide concentrations in the media to concentrations in flora and fauna.

These inputs allow external and internal doses to be estimated for reference (or user defined) animals and plants. User defined species with specific CR value data (where available) and user specified geometry allow the user to estimate doses to specific species more accurately.
The ERICA software used in the assessment was V2.0.230. A Tier 2 ERICA assessment was conducted because some additional concentration ratio data is available.

2.2 Initial (Pre-Mining) Conditions

The area surrounding the Carrapateena mine site was extensively surveyed in 2007 (Papari Radiation Services, 2008) to determine pre-mining baseline radiological conditions in the immediate area surrounding proposed mining activities. Gamma dose rates were measured in a grid pattern over the entire study area, as well as along transects of interest. The study area and measurement locations are shown in Figure 1.

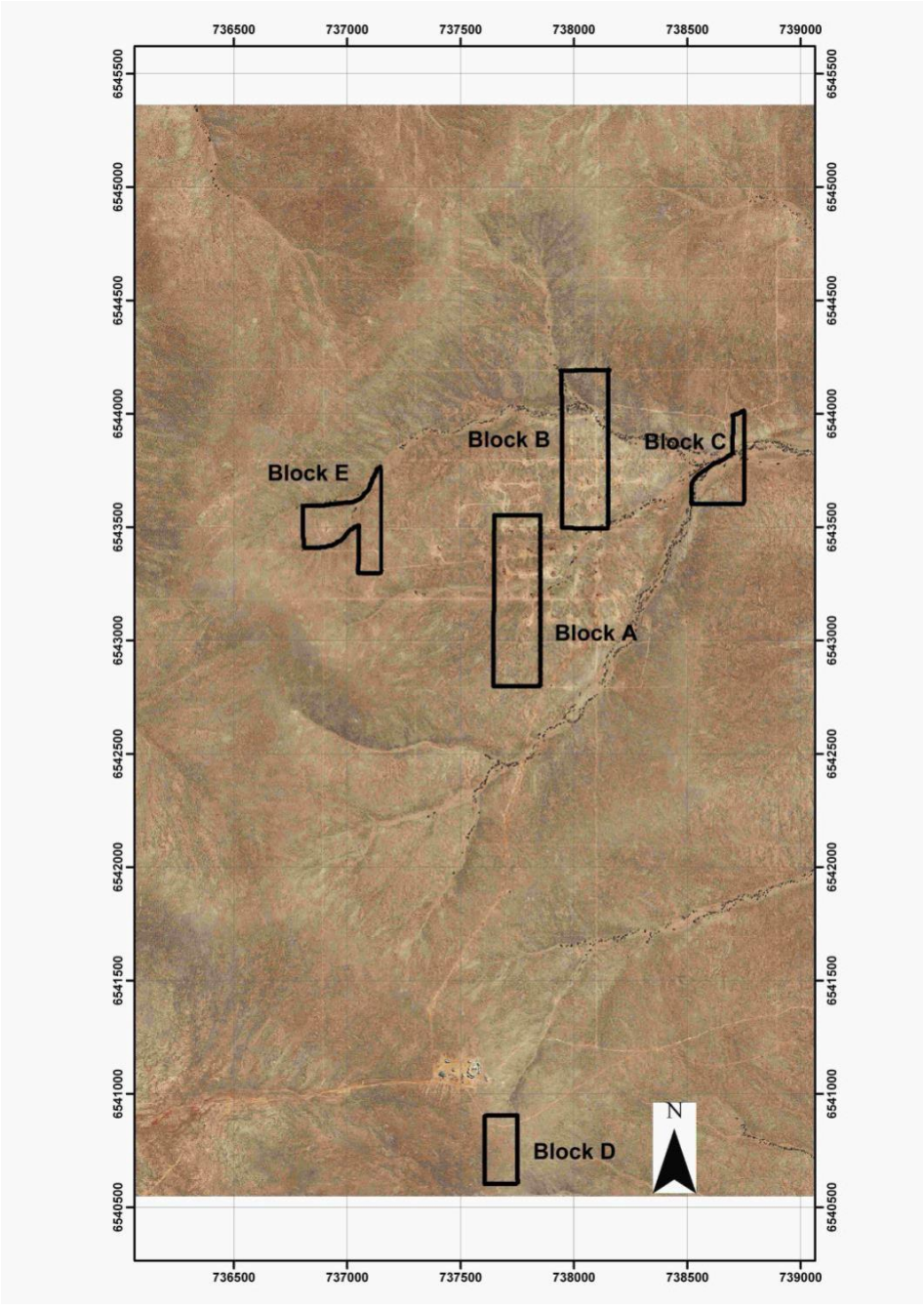


Figure 1: Carrapateena mine area showing monitoring locations from the 2007 survey

Gamma surveys were conducted in 2007, and the average contact dose rate was found to be 0.074 µGy/h over all measurements. This dose rate is again low compared to typical environmental levels, with the average in Australia being 0.09 µGy/h (UNSCEAR, 2000).

Measurements conducted in 2012 (JRHC, 2014) were similar. Several locations were monitored over a long-term period, with average dose rate estimated to be 0.06 µSv/h. The same locations were sampled to determine radionuclide concentrations in the soil, and the average concentration of uranium in soil was found to be 13 Bq/kg (0-2cm soil depth), equivalent to approximately 1ppm U. This concentration is low, but still typical of normal soil. For reference, the worldwide average uranium concentration is approximately 3 ppm (UNSCEAR, 2000).

The data collected from all locations showed that the radiological conditions are fairly consistent across the wider area. Uranium concentrations in soil are low compared to Australian averages, which are reflected in measured terrestrial dose rates.

Baseline data has been collected for dust over a number of years, and the most recent baseline report (JRHC, 2020) documents baseline radionuclide dust deposition data for U238, Ra226, Pb210 and Po210. The average deposition rates were 0.017 Bq/m^2/month U238, 0.027 Bq/m^2/month Ra226, 3.04 Bq/m^2/month Pb210 and 2.04 Bq/m^2/month Po210.

Radon monitoring was conducted as part of the same baseline study, and reported concentrations ranged from <15 to 37 Bq/m^3.

Groundwater radionuclide concentrations were measured in 2019 prior to TSF activities, with average concentrations of 0.31 Bq/L for gross alpha, 0.69 Bq/L for gross beta (excluding K40), 0.19 Bq/L for Ra226, and 0.69 Bq/L for Ra228.

2.3 Assessment Approach

Dust deposition has been monitored since the commencement of mining at a total of 18 sites surrounding the Carrapateena deposit, mine, processing facility, camp and access roads (Figure 2). Dust mass varies at each site, with some of the highest sites being away from any operation activities. Dust mass per square meter per month has been calculated for each location and ranged from 0.48 g/m^2/month to 16.1 g/m^2/month over the monitoring conducted in FY 2025. The average deposition of uranium was approximately 0.059 Bq/m^2/month, with maximum deposition of 0.59 Bq/m^2/month. Note that values below the Minimum Detection Limit (MDL) are taken as half the MDL. Radium-226, lead-210, and polonium-210 deposition rates averaged 0.34 Bq/m^2/month, 3.1 Bq/m^2/month, and 2.9 Bq/m^2/month respectively. The deposition rates for uranium-238 and radium-226 have risen since last year while polonium-210 and lead-210 are around the long-term average.

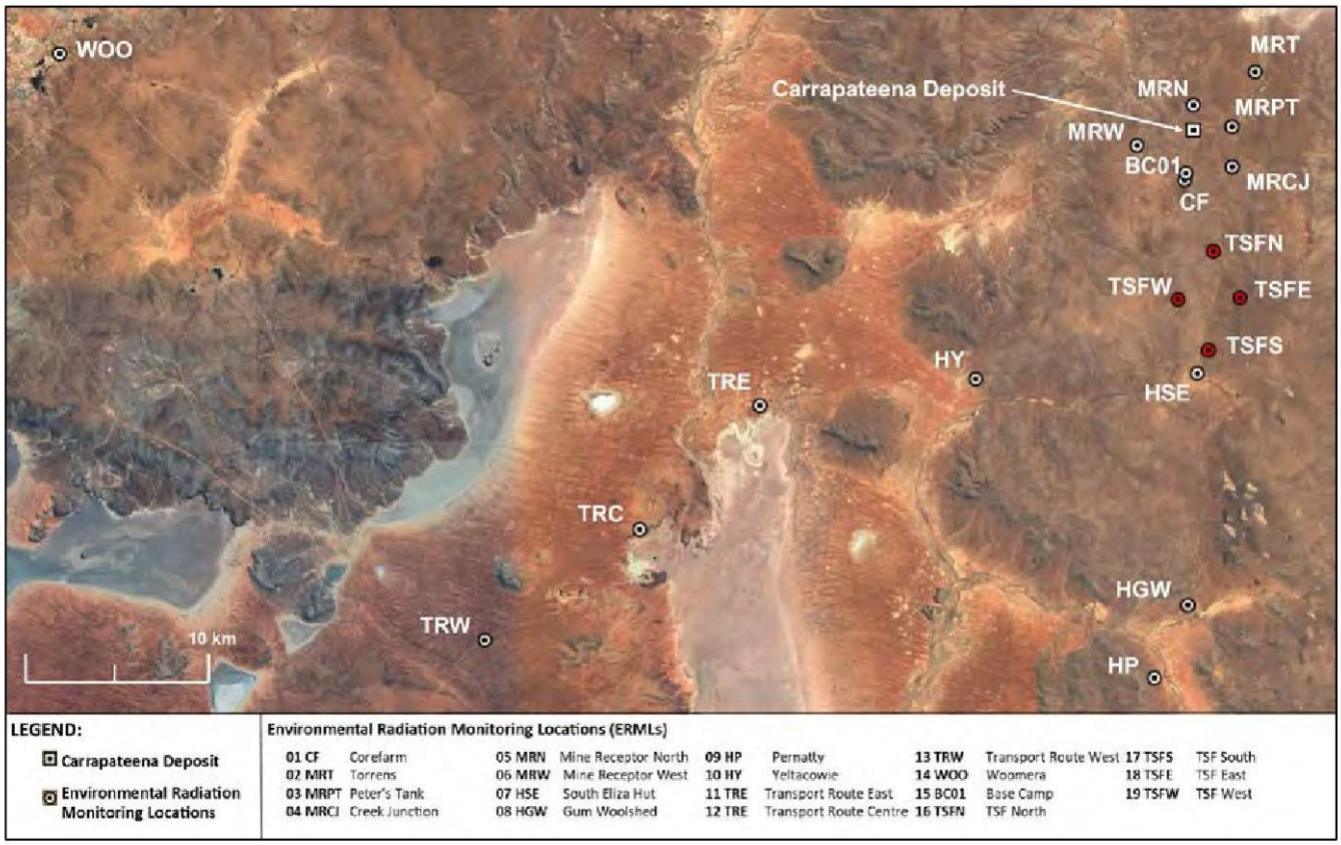


Figure 2: Dust deposition gauge locations Carrapateena

The difference between the approximate baseline dust and the dust measured at each location could be attributable to operational activities (dust generated by processing, mining and stockpiling activities, along with dust generated from use and maintenance of roads).

Groundwater activity concentrations have been analysed at four TSF monitoring bores since 2019 and an additional three have begun monitoring in 2024. Of the four initial sampling points, three have seen noticeable increases in gross alpha and gross beta radionuclide levels from baseline values determined in 2019, however all three are now below the highest concentration measured in 2022 or 2023 (see figure 3 and 4). Although the gross alpha and gross beta are beyond trigger values for drinking water for these bores (which also occurred in some samples during baseline monitoring), the water is not for human consumption – and even in the case that it was, calculated doses would be below 1 mSv/annum in all locations. These bores will continue to be monitored quarterly for seepage, with radionuclides and trace elements analysed annually.

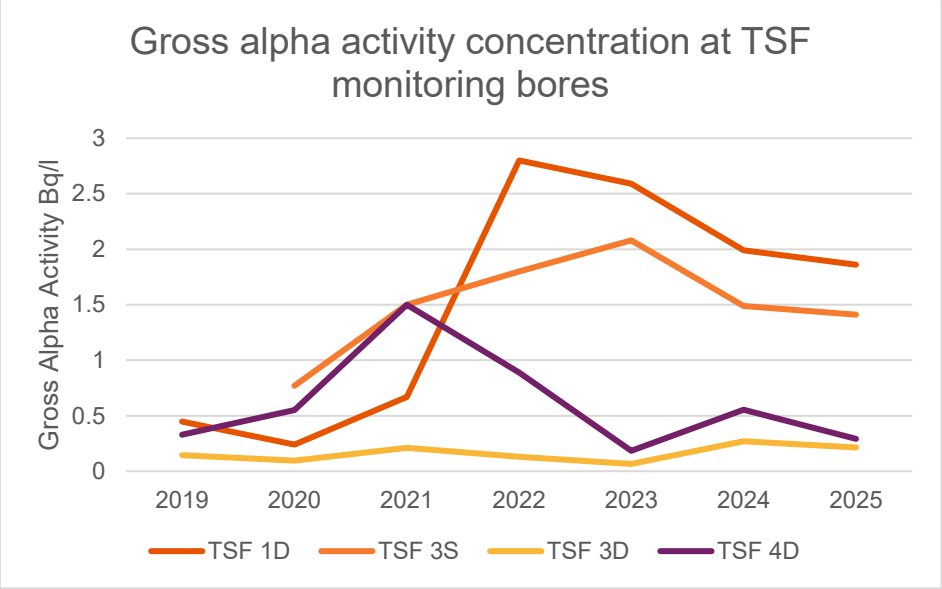


Figure 3: Gross alpha activity concentration in groundwater at TSF monitoring bores

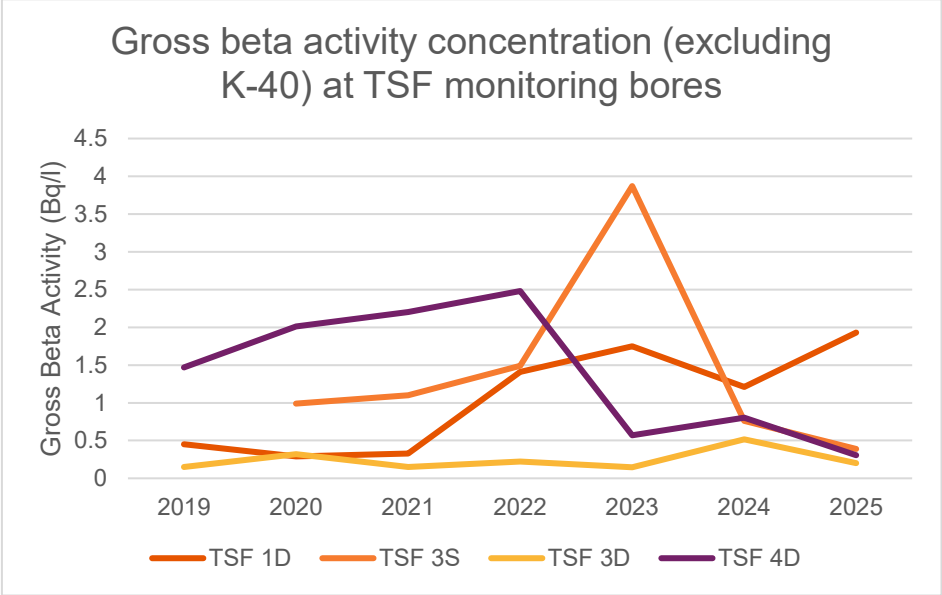


Figure 4: Gross beta activity concentration in groundwater at TSF monitoring bores

2.4 Radiological Impact of Operations

The dust deposition rates determined in section 2.3 were used to estimate the soil radionuclide content due to operations in FY2025. The deposited radionuclides are assumed to mix with the top 10 mm of soil evenly over time (consistent with measurements in SE Australia and in grasslands – Kaste, Heimsath and Bostick, 2007), and soil density is assumed to be 1500 kg/m^3.

This assessment does not include radionuclides from the Th-232 chain, due to the comparatively minimal concentrations of thorium within the ore and processing material handled during Carrapateena operations.

Where specific radionuclide progeny have not been analysed, they are assumed to be in equilibrium with their relevant parent for any operationally derived dust. The soil concentrations (additional to baseline concentrations)

used in the ERICA analysis are displayed in Table 1. It should be noted that radioactive progeny nuclides are included in the dose conversion coefficients of their parents if their half-lives are shorter than 10 days. Ac-227 and Ra-223 were excluded from analysis as the appropriate dose information is not available in ERICA, but due to the low activity concentration, the effect on total dose is negligible. Where appropriate baseline information is available for the radionuclide, the values have been corrected to account for the background. In some cases this has resulted in zero values for net operational contribution.

Radionuclide	Annual net average radionuclides in deposited dust (Bq/m^2)	Activity Concentration in Soil due to deposited dust in Bq/kg (with baseline subtracted)
U-238 Decay Chain		
U-238	0.504	0.0336
Th-234	0.504	0.0336
U-234	0.370	0.0246
Th-230	3.124	0.208
Ra-226	3.754	0.250
Pb-210	1.161	0.0774
Po-210	9.920	0.661
U-235 Decay Chain		
U-235	0.147	0.0098
Pa-231	0.147	0.0098
Th-227	0.288	0.0192

Table 1: Increased radionuclide concentrations in soil at reference location for 2025

Using the increased concentration in soils as inputs to ERICA, the output doses to RAPs can be determined (using generic CR values). All terrestrial RAPs available in ERICA were selected for assessment. Three additional Australian organisms were added into the default analysis, based on available data and their profiles as representatives of Australian fauna. Table 2 and 3 show the species specific data used for the ERICA assessment. No concentration ratio data is available for Emus so the default ERICA data for Bird is used.

Species	Body geometry and mass data				Occupancy Factor
	Organism mass (kg)	Height (m)	Width (m)	Length (m)	
Red kangaroo (Macropus rufus)	45.0	0.4	0.25	1	100% on soil
Emu (Dromaius novaehollandiae)	34.0	0.4	0.4	0.8	100% on soil
Sand Goanna (Varanus gouldii)	6.0	0.1	0.1	1.4	50% in soil, 50% on soil

Table 2: User specific geometry, mass and occupancy values

Species	Elemental Concentration Ratio (Bq/kg fw whole organism / Bq/kg dw soil)					Source
	U	Th	Ra	Pb	Po	
Red kangaroo (Macropus rufus)	0.0076	0.000111*	0.289	0.0222	0.598	ARPANSA, 2014
Sand Goanna (Varanus gouldii)	2.5	0.027	0.2*	1.2	11	ARPANSA, 2014
*Default ERICA values used where Australian data was unavailable. No protactinium values are available so ERICA default values have been used						

Table 3: User specific CR values derived from Australian data

The ERICA assessment dose rates for NHBs from radiation due to operations at Carrapateena in 2025 are displayed in table 4.

Organism	Total dose rate per organism (µGy/h)	No effect dose threshold (µGy/h)
Amphibian (reference)	0.0088	10
Annelid (reference)	0.0094	10
Arthropod – detritivorous (reference)	0.0099	10
Bird (reference)	0.0016	10
Emu (Custom)	0.0015	10
Flying insects (reference)	0.0033	10
Sand Goanna (Custom)	0.0464	10
Grasses & Herbs (reference)	0.0128	10
Red Kangaroo (Custom)	0.0204	10
Lichen and Bryophytes (reference)	0.0778	10
Mammal – large (reference)	0.0047	10
Mammal – small-burrowing (reference)	0.0049	10
Mollusc – gastropod (reference)	0.0025	10
Reptile (reference)	0.0090	10
Shrub (reference)	0.0195	10
Tree (reference)	0.0016	10

Table 4: Doses to reference animals and plants at the Carrapateena site in 2025

All doses to RAPs and user-defined species in ERICA are below the screening threshold of 10 µGy/h. The screening threshold is the threshold at which even the most sensitive NHB are unlikely to suffer any population effects as a result of chronic exposure to that dose.

3 Human Doses

3.1 Member of Public Dose Assessment

The potential exposure pathways for members of the public are:

- Irradiation by gamma radiation,
- Inhalation of radionuclides in dust,
- Inhalation of radon, thoron and associated decay products,
- Ingestion of animals or plants that have come in contact with radionuclides released into the environment as a result of operations.

Assessments assume that a member of the public resides at the location with the highest levels of inhalable and deposited dust that has been modelled or measured at the site for a full year. This is considered conservative, as members of public are unlikely to be able to access or reside in these areas (due to the site being located in a reserve). Dust levels at accessible locations will be considerably lower. It is likely that if public exposure does occur close to or at locations that have the highest levels of inhalable and deposited dust, that exposure will occur for only a relatively short period of time (e.g. hours or days, rather than an entire year).

Gamma radiation exposures to members of the public from sources within the Carrapateena Mining Lease (ML) are considered to be negligible due to the distance between the sources and the public. The sources of gamma radiation (for example ore stockpiles) are well within the mining lease boundary and inaccessible by the public. The gamma levels in addition to natural background at the closest accessible area are unlikely to be detectable. Gamma monitoring at each location, has not shown an increase in dose rate vs control dosimeters, nor baseline data, since operations began. For this year the net average radiation dose recorded by Optically Stimulated Luminescence Dosimeters (OSLDs) at the monitoring locations was 0.006 mSv and this has been taken as a conservative upper limit for dose by this pathway.

Doses due to inhalable dust have been calculated based on dust concentrations measured by hi-vol air sampling. The formula to determine dust dose, as given by ICRP Publication 119 (ICRP, 2012) is:

Inhalation dose (mSv/y) = Dust activity concentration (Bq/m^3) x Breathing rate (1.0 m^3/h for members of the public)

x hours per year (8,760 h/y) x Dose Conversion factor for each radionuclide (mSv/Bq)

The information relevant to the estimate of inhalation dose to members of the public is displayed in Table 5.

Radon, thoron and associated decay products are considered negligible for this assessment, as any radon and/or thoron will be quickly diluted in outdoor air. Monitoring conducted at all locations since commencement of mining have not detected sustained radon concentrations above typical background concentrations (<15 – 37 Bq/m3) measured during baseline data collection (with the overwhelming majority of results below detection limits).

Ingestion doses for members of the public have been calculated in previous years, with extremely conservative assumptions showing the dose is not significant. These calculations were based on food grown and sourced from the immediate area which is not a realistic assumption. As such, ingestion of food grown on the area of influence of the Carrapateena operation has not been included in the dose calculations.

Consequently, the estimated maximum dose for members of the public due to operations at Carrapateena is 0.046 mSv, which is well below the dose limit. Actual doses would be expected to be much lower due to actual occupancy times being less than assumed and considering the inhaled dust values do not have background levels subtracted.

Radionuclide	Inhalation coefficient (5 um particulates) (Sv/Bq) from ICRP 119 (Table G.1 – M type as default)	Average annual radionuclide concentration (Bq/m^3) (not baseline corrected)	Dose (1.0m3/h breathing rate, 8760 h/y occupancy) (mSv)
U-238 Decay Chain			
U-238	2.90E-06	1.18E-05	3.00E-04
Th-234	6.60E-09	2.12E-05	1.22E-06
Pa-234	3.80E-10	2.12E-05	7.05E-08
U-234	3.50E-06	1.18E-05	3.62E-04
Th-230	4.30E-05	1.13E-05	4.24E-03
Ra-226	3.50E-06	2.13E-05	6.52E-04
Pb-214	1.40E-08	2.13E-05	2.61E-06
Bi-214	1.10E-06	2.13E-05	2.05E-04
Pb-210	9.30E-08	6.07E-04	4.95E-04
Bi-210	3.30E-06	6.07E-04	1.76E-02
Po-210	2.90E-06	6.07E-04	1.54E-02
Total Dose			**3.92E-02 (39.2 µSv)**

Table 5: Doses to members of the public due to inhalation of suspended dust

4 Summary

No RAP or user defined animal or plant received a dose above the screening dose rate of 10 µGy/h, based on average exposure conditions in the Carrapateena operations area. This demonstrates that there are no radiological impacts at a species level from current operational activities.

Dose estimates for members of the public are below the member of public dose limit of 1 mSv/year. Public doses are considered conservative given the occupancy times of members of the public in the region will be lower than assumed in the calculations.

The assessment has shown that Carrapateena operations result in no radiological impacts to non-human biota, and to members of the public.

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Appendix G

2025 South Gap Offset Annual Report



South Gap EPBC Offset Annual Report 2025

23 February 2026

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Abbreviations

IBRA	Interim Biogeographic Regionalisation for Australia (Region, Sub-region, Association)
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)
EOMP	EPBC Offset Management Plan
MNES	Matters of National Environmental Significance

1. Introduction

1.1 Background

This report details work undertaken at the South Gap Station in central South Australia to offset the impacts of the Carrapateena mine (originally OZ Minerals, now BHP), as required by the EPBC Offset Management Plan (EOMP). The offset is now in the fifth year of management with a focus on protecting and restoring habitat for the EPBC listed Plains Mouse (*Pseudomys australis,* see more in 1.5), and improving overall ecosystem health. The EOMP has five specific goals:

Goal 1- Establish baseline conditions, including the distribution and condition of Plains Mouse habitat, the presence and distribution of target species, and the identification and prioritisation of local threats (refer to Jacobs 2020)
Goal 2- Refine the presence, distribution, and abundance of Plains Mouse within the offset
Goal 3- Manage total predation pressure (from Cats, Foxes and possibly Wild Dogs)
Goal 4- Maintain and/or enhance the condition of the habitat for the benefit of Plain Mouse through the management of total grazing pressure and invasive weeds
Goal 5- Improve knowledge of local target species populations, including how they respond to management locally.

The EOMP presents 14 individual objectives grouped under 11 management strategies to address EPBC Act offset liability and associated legislative and policy obligations for the first 10-year management period.

1.2 Location and site features

The South Gap EPBC offset program involves two distinct offset areas. Both are located on South Gap Station in central South Australia, approximately 100 km north of Port Augusta (Fig. 1). The site is adjacent to Lake Torrens. It is in the traditional country of the Kokatha people, who have strong connections to this land. The pastoral industry has utilised the landscape for the last 160 years, with sheep as the dominant stock for the area. The northern South Gap EPBC offset area is 1882 ha in size, and the southern is 1369 ha. The northern offset was fenced and managed directly by the Nature Foundation since 2021, while active management began on the southern offset in 2024.

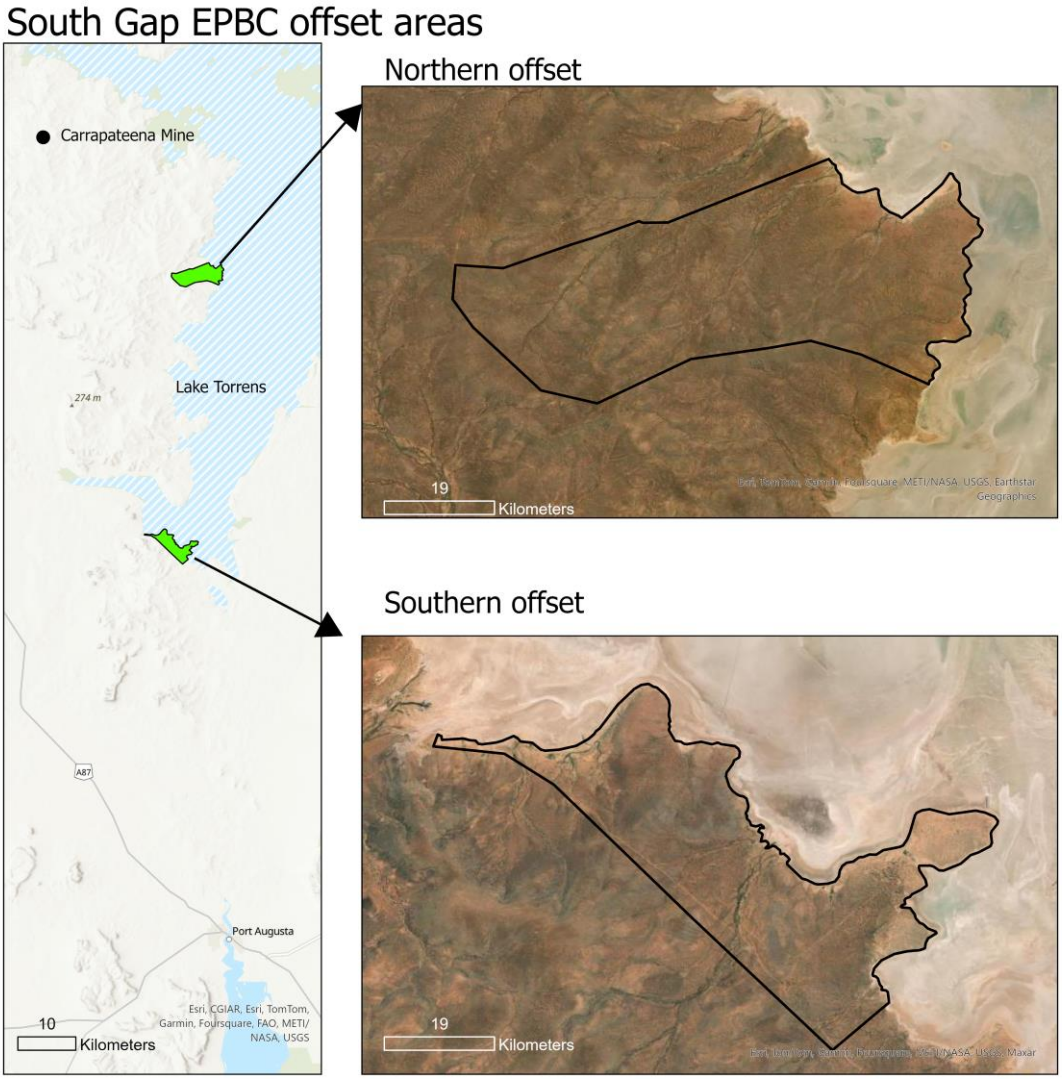


Figure 1. Location of the two South Gap EPBC offset areas within South Australia

1.3 Landscape

The habitats for both South Gap EPBC offset areas are similar, dominated by low plateau hills around 200m high. The prevalent habitat type is low open Chenopod shrublands, which is dominated by Bladder Saltbush (*Atriplex vesicaria*) and Samphire (*Tecticornia medullosa*). Also dissecting the landscape are ephemeral drainage lines with trees and shrubs such as Western Myall (*Acacia papyrocarpa*) and Black Oak (*Casuarina pauper*). Scattered through the landscape are patches of cracking clay (also known as Gilgai's), the most important habitat features for the Plains Mouse (*Pseudomys australis*). There are no waterpoints in the northern offset. There is a dam on the southern offset (Gum dam) that intermittently holds water after large rains.

1.4 Climate

The climate for both offsets is similar. Annual average rainfall is around 180 mm per year (nearest Bureau of Meteorology station, South Gap homestead station number 016043, complete records for 1884–November 2025), characteristic of a semi-arid climate. Annual rainfall varies greatly between years (Fig. 2). In the recent decade, there was a major drought in 2018 and 2019, and a return to ~average rainfall from 2020 to 2024.

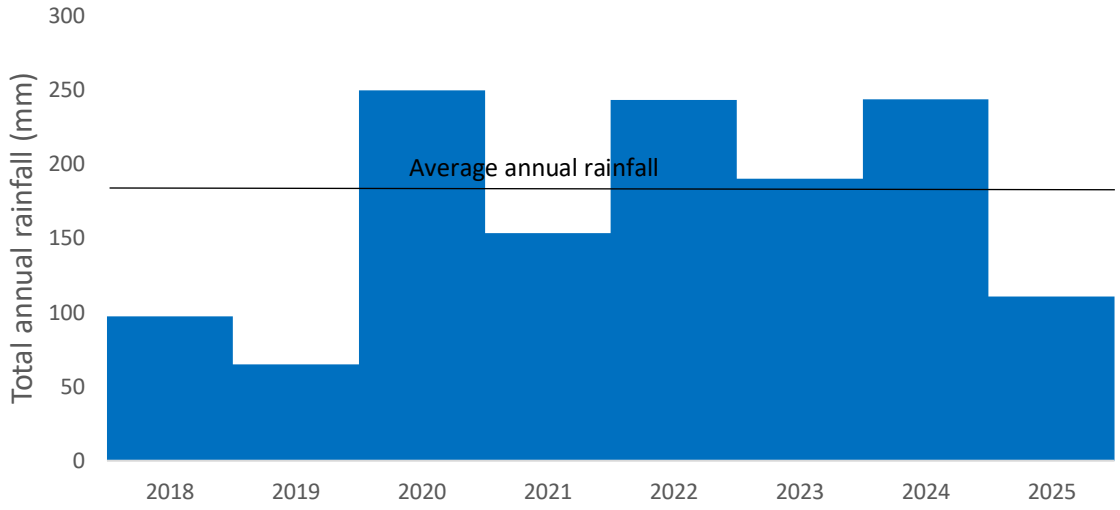


Figure 2. Total rainfall by year between 2018 and 2025, as measured by the South Gap weather station (Bureau of Meteorology # 016043)

Rainfall at South Gap homestead in 2025 was below the annual average, with a total of 110 mm. There was a particular dry start to the year, with scant rain falling between January and June (Fig. 3). There were however late winter rains and some spring rains. Rain gauges were deployed in both offsets in 2025 to obtain a more accurate understanding of the patchiness of rainfall at each site.

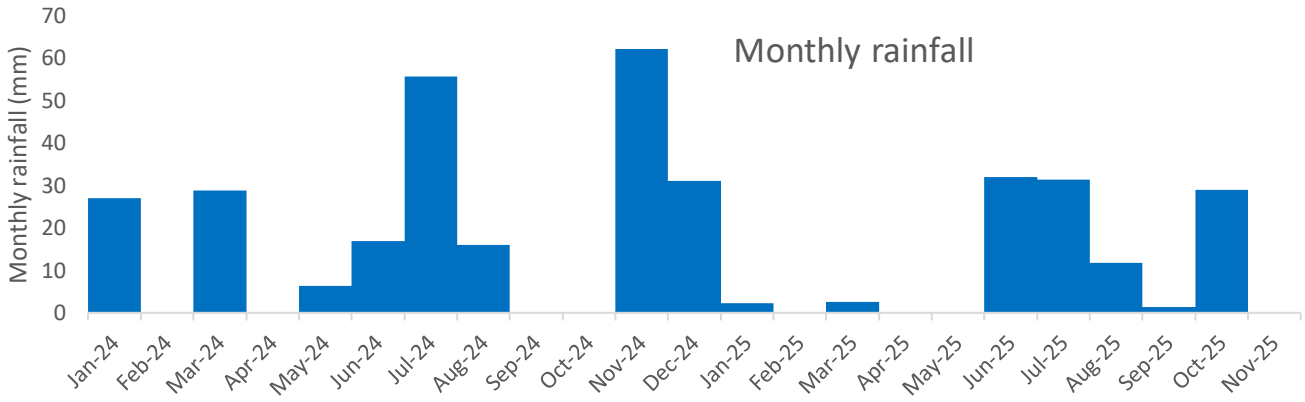


Figure 3. Rainfall for each month from January 2024 to November 2025, measured by the South Gap weather station (Bureau of Meteorology # 016043).

1.5 Conservation Values

The primary conservation value for the offset is the preservation of habitat for the Plains Mouse, a threatened native rodent (Fig. 4). This species weighs ~55 g and lives in the open dry shrubland, building small burrows. This size positions the species within the critical weight range of mammals likely to be threatened by feral Cats and Foxes (i.e. species with a body mass between 35 – 5500 g, Johnson and Isaac 2009, Woinarski, Burbidge et al. 2015). Plains Mice are listed under Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) as a Vulnerable Matter of National Environmental Significance, along with being listed in some form in every state in which it occurs (Moseby 2012).



Figure 4. Plains Mouse (*Pseudomys australis*). Photo by Jack Bilby.

Two other nationally threatened species may occur on the offset, although there are no known recent records from the surrounding area. These are the Thick-billed Grass-wren (*Amytornis modestus*) and night parrot (*Pezoporus occidentalis*). Other local species of note include the locally endemic Pernatty knob-tailed gecko (*Nephrurus deleani*), and small native mammals like Spinifex Hopping mouse (*Notomys alexis*) and Bolam's Mouse (*Pseudomys bolami*).

1.6 Threatening processes

Key threatening processes most likely impacting the offset areas and the Plains Mouse include:

- Predation by European Red Fox (*Vulpes vulpes*)
- Predation by Feral Cat (*Felis fus*)
- Predation by Wild Dog (*Canis* spp.)
- Competition and land degradation by European Rabbit (*Oryctolagus cuniculus*)
- Competition and land degradation by domestic stock (*Bos* spp. and *Ovis aries*)
- Competition and land degradation by Feral Goats (*Capra hircus*)

2. Legislative Framework

2.1 Environment Protection and Biodiversity Conservation Act (1999)

The Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) is the primary Commonwealth legislation established to protect and manage Matters of National Environmental Significance (MNES), including nationally and internationally important flora, fauna, ecological communities, and heritage places.

The EOMP guides the delivery of on-ground offset activities required to address the residual impact to Plains Mouse (Condition 3, 4 and 5) as per the EPBC Act Approval conditions (granted on 29 March 2018).

2.2 Other legislation

Other relevant legislation relating to the offset area includes the National Parks and Wildlife Act (1972), Native Title Act (1993), Aboriginal Heritage Act (1988), Landscape Act (2019) and the Pastoral Land Management and Conservation Act (1989). For more detail on these acts, refer to the EOMP.

3. Management Goals, Strategies and Objectives

Goals	**Strategies**	**Objectives** (under same acronym headings as EOMP)
Goal 1- Establish baseline conditions	Strategy 2: Improve knowledge of target species population dynamics and management	PM1: Quantify and monitor Plains Mouse habitat within the offset
Goal 2- Refine the presence, distribution, and abundance of Plains Mouse within the offset	Strategy 2: Improve knowledge of target species population dynamics and management	PM1: Quantify and monitor Plains Mouse habitat within the offset
Goal 3- Reduce predation pressure	Strategy 3: Cat control Strategy 4: Fox control Strategy 5: Wild dog control	CC1: Reduce Cat density to less than 4 Cats / 100 km within the offset area. FC1: Reduce Fox density to less than 1 Fox / 100 km within the offset area. DC1: Keep the offset area free of Wild Dogs.
Goal 4- Reduce total grazing pressure	Strategy 1: Stock management Strategy 6: Rabbit control Strategy 7: Weed control	SM1: Keep the offset area free of domestic livestock. RC1: By 2023, reduce Rabbit numbers and warrens by 80% within the offset area. RC2: Map and rip 5 km^2 of chenopod shrublands in priority areas each year for 4 yrs. WC1: By 2028, the distributions of invasive weeds (i.e. Declared and Weeds of National Significance) will be reduced.
Goal 5- Improve knowledge of local target species populations	Strategy 2: Improve knowledge of target species population dynamics and management	PM1: Quantify and monitor Plains Mouse habitat within the offset

4. Results

4.1 Goal 1 – Establish baseline conditions

The vegetation of the South Gap EPBC offset area is important to manage and understand. We monitor vegetation condition with annual Rangeland Assessment Method (RAM) floral surveys and Jessop transects (described in more detail below).

4.1.1 Vegetation mapping

Basic vegetation maps have now been established for both offsets. These were generated from field notes and observations, linked to observable landscape and vegetation patterns from satellite imagery. Maps were created manually by drawing polygons in ArcGIS PRO around known features, assigning a vegetation type, then conducting a site visit and taking a photo in each created polygon to check for accuracy (Fig. 5). The vegetation types were selected primarily based on the dominant perennial woody vegetation. The exception to this is the distinction between cracking clay and low Chenopod shrublands, where soil type was also a key defining factor.

4.1.2 RAM scores

Ecosphere Ecological Solutions were contracted in 2025 to assess vegetation condition (Blackall and Sinel 2025). The eight RAM sites and three Jessops sites in the Northern offset that had previously been surveyed in 2019, 2022 and 2023 were resampled. Six new sites were also established in the southern offset, with a baseline survey conducted. The RAM scores at the northern EPBC offset have remained stable through time (Fig. 6), but variation has decreased. This is likely due to the refinements in how the RAM scores are calculated (Blackall and Sinel 2025).

4.1.3 Weed assessments

To limit the spread of weeds to the South Gap EPBC offset area, vehicles are washed down before and after arrival. In the northern offset, no weeds of national significance were detected. However, some annual exotic forbs were found at cracking clay sites, including sow thistle (*Sonchus oleraceus*), malvastrum (*Malvastrum americanum*) and London rocket (*Sisymbrium irio*). These will be monitored through 2026 and controlled as required.

There is a substantially greater weed load in the southern offset area. Three declared weeds have been recorded, Prickly Pear (*Opuntia* spp.), Tree Tobacco (*Nicotiana glauca*) and Bathurst Burr (*Xanthium spinosum*). Every live Prickly Pear plant encountered during every field trip is controlled either manually by digging them up, or biologically by placing a chunk of Prickly Pear infected by Cochinel on top of it. We at present are mapping and recording details for each plant, however, this was not done consistently initially. On each trip we will also count the number of plants encountered, and recorded our lowest count yet of Prickly Pear in November 2025 (Fig. 7). Tree Tobacco is only known from a single dense patch. Manual control was attempted in 2024, but this was unsuccessful as plants resprouted from below-ground root stock. We cannot use herbicides to control this patch due to South Gap Pastoral's organic certification. In 2026 we aim to use an organic oil like

Orange Oil or Neem Oil to control this species. Bathurst Burr was detected at highly disturbed gilgais, and will be a focus of control efforts in 2026.

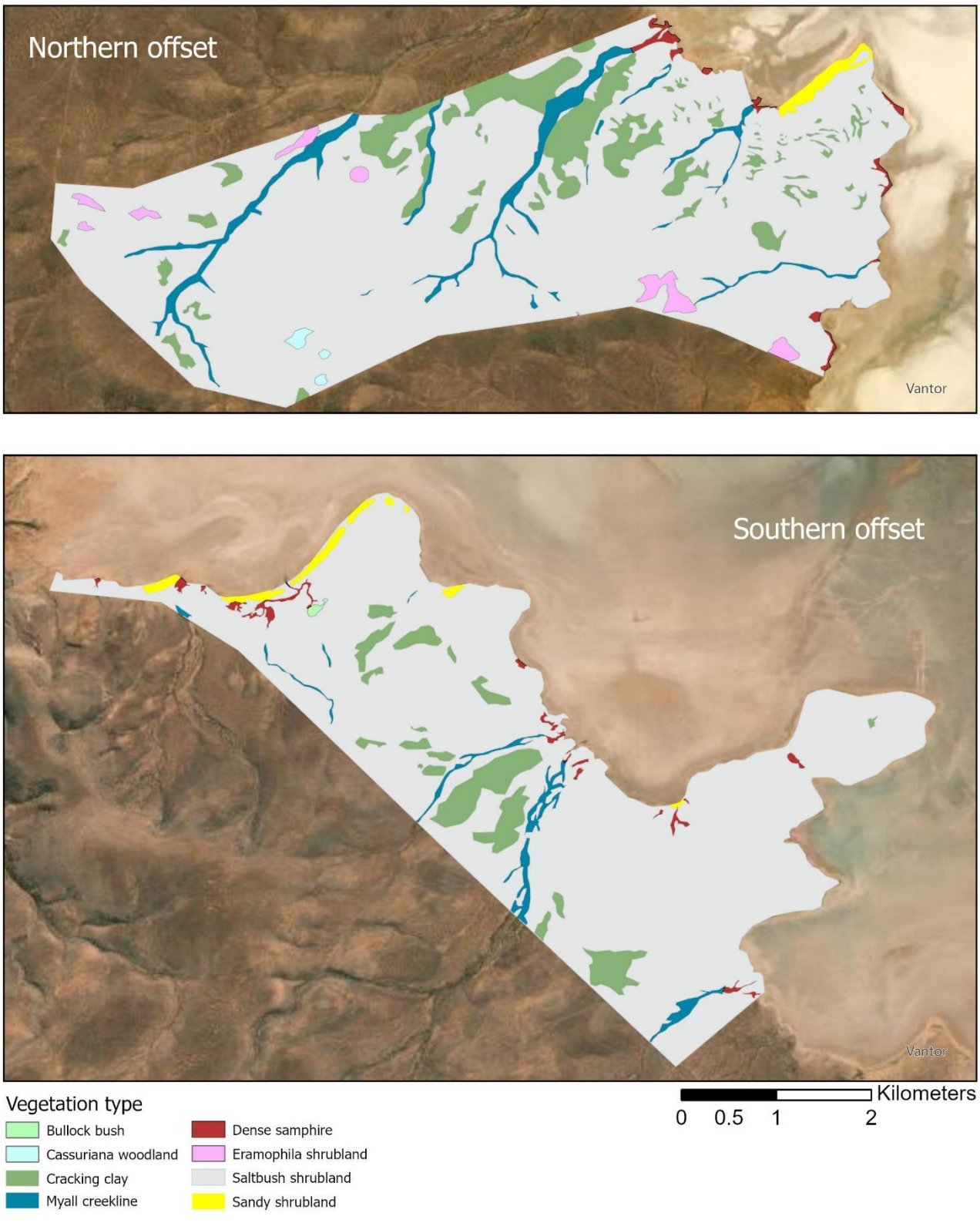


Figure 5. Vegetation map of the different habitat communities in the northern (top) and southern (bottom) offsets.

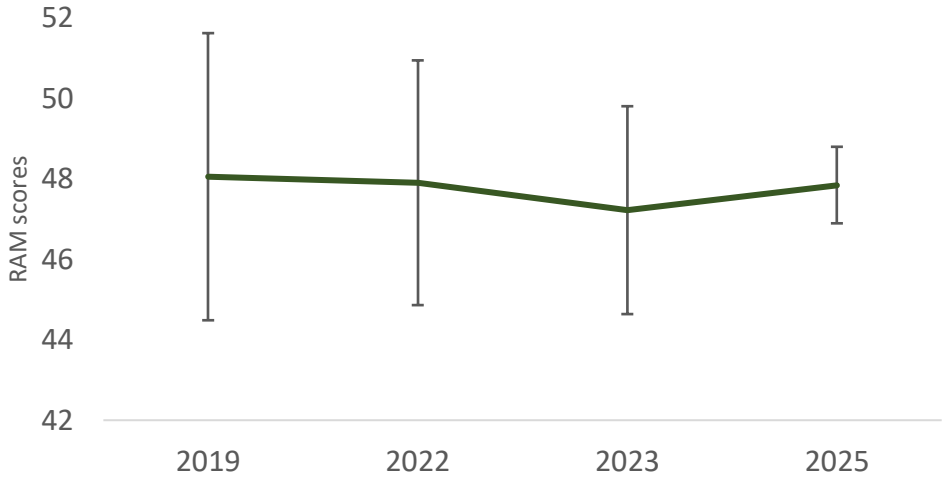


Figure 6. RAM scores at the northern offset.

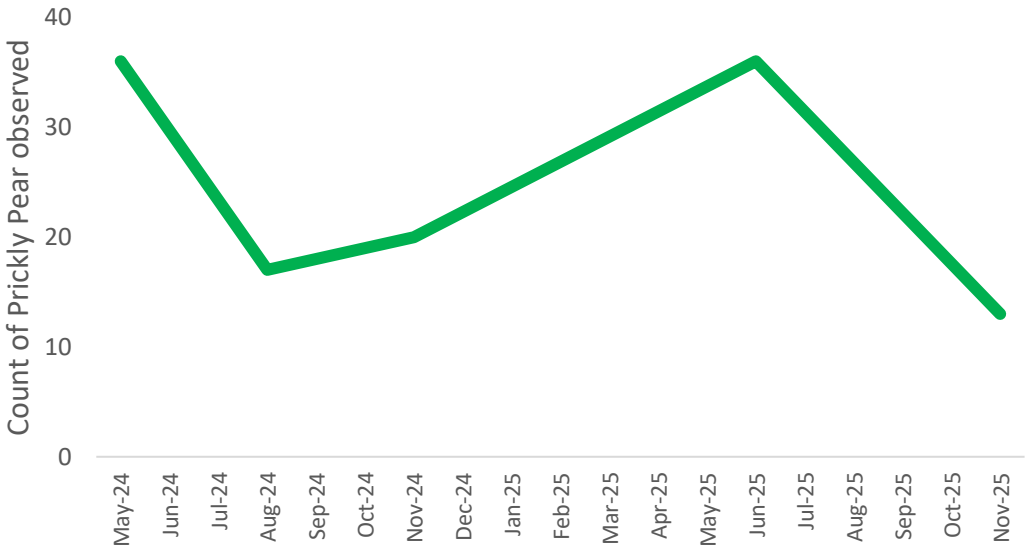


Figure 7. Detections of Prickly Pear (*Opuntia* spp.) at the southern offset on the 16 km central track.

4.2 Goal 2 – Presence, distribution, and abundance of Plains Mouse

Plains Mouse activity is monitored via 10 permanent remote camera sites in the northern offset, with 10 recently established in the southern offset. Each consists of a remote camera (Reconyx Hyperfire 2 Professional HP2X) with focus adjusted to 90 cm, set on a star-picket facing down at a lure (PVC tube with peanut butter). A 50 x 50 cm corkboard with 10 mm gridlines

was placed underneath the field of view to enable measurements of animal size. Cameras were last checked in November 2025. In the northern offset, seven were operational for the whole year. The other three either had too many false triggers or became waterlogged. In the southern offset, six were operational through the whole year.

Once images were downloaded, any small animals recorded were identified. Plains Mouse were confirmed from a head and body length of 90 to 145 mm and a tail shorter than 125 mm (Van Dyck, Gynther et al. 2013). Images of rodents with a head and body length of approximately 90 mm were only classed as 'likely' Plains Mouse. We could reliably identify to species level the Spinifex hopping-mouse (*Notomys alexis*), Narrow-nosed Planigale (*Planigale tenuirostris*), and Desert Short-tailed Mouse (*Leggadina forresti*). Some individuals of the other small mammal species could be identified to species level, though not all. For example, some Dunnart images could be differentiated between *Sminthopsis crassicaudata* or *S. macroura*. These species were therefore often clumped together, along with small rodents (*P. bolami*, *P. hermanbergiensis* or *M. domesticus*).

No Plains Mice were detected during 2025 at either offset (Fig. 8). Detection rates other small mammals such as Dunnarts and small rodents, remained low and stable (Fig. 9). It appears 2025 was not an ideal year for small mammals, and the Plains Mouse unlikely had favorable weather conditions to expand its range.

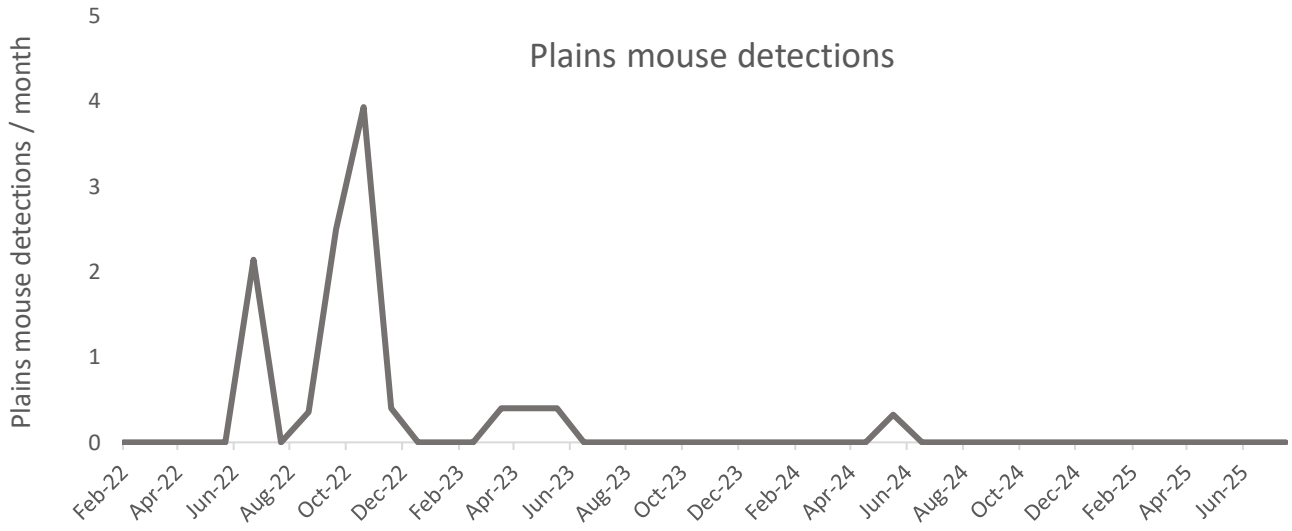


Figure 8. Plains Mouse detections on remote cameras at the northern South Gap EPBC offset.

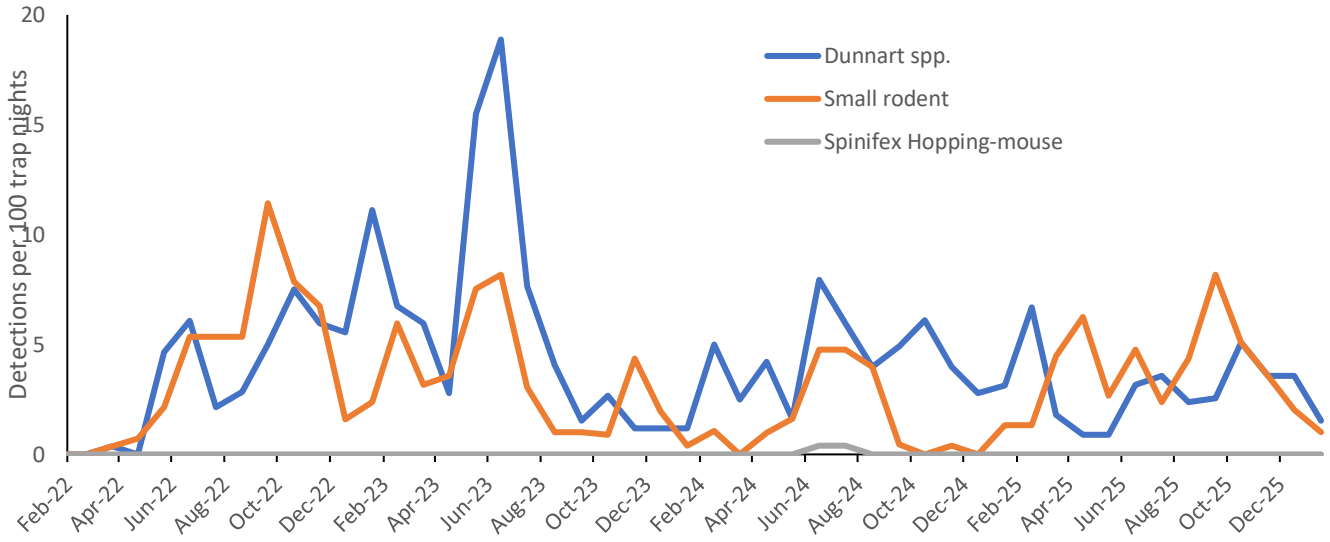


Figure 9. Detection rates of Dunnarts (*Sminthopsis* spp.), small rodents (<20g) and Spinifex Hopping-mice at the South Gap EPBC offset area.

4.3 Goal 3 – Reduce predation pressure

Feral control activities were conducted ~quarterly. To date, all shooting has been conducted on the northern offset. In 2025 there were three shooting events; two by Graham Miller and one by Phil Johns. The planned December shoot was cancelled due to extreme heat, and is now earmarked for late February. Feral control activities will start in the southern offset in 2026.

There are 15 remote cameras set up in the northern offset to monitor predator activity, with 9 also set in the southern offset. Each camera is placed facing into a likely pathway for feral predators, such as a road, dry creek or open area. These are checked 3-4 times per year.

Very few feral predators were detected or shot in 2025. These low numbers are likely due to extreme low activity of cats and foxes. Indeed, our remote cameras recorded historically low activity of both predators in the northern offset (Fig. 10). The activity rate of foxes was much greater in the southern offset especially around winter 2025. As mentioned above, feral control activities in this offset have not yet begun.

Table 1. Feral predators removed from South Gap EPBC northern offset area through EOMP activities.

Year	Cats	Foxes
2021	4	12
2022	2	8
2023	6	2
2024	3	1
2025	1	2
Total	15	23

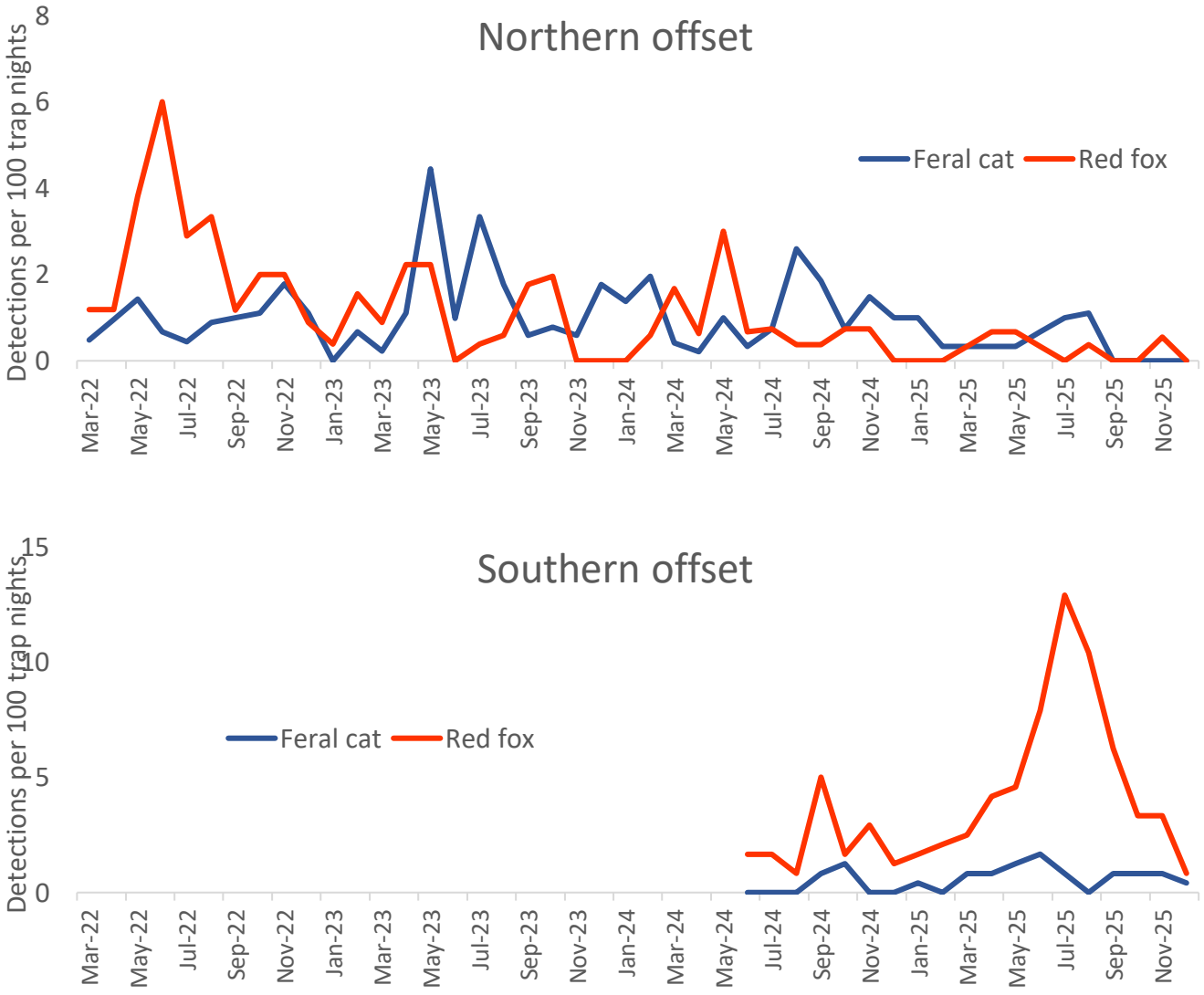


Figure 10. Detection rates of Feral Cats (blue) and Red Foxes (red) from remote cameras spread across both South Gap EPBC offset areas, with the northern offset above and southern offset below. Northern offset cameras were deployed from intial deployment in Feb 2022 to December 2025. Southern offset cameras were deployed from May 2024 to December 2025.

4.4 Goal 4 – Reduce total grazing pressure

Reduction of total grazing pressure in the offsets, to prevent negative impacts on vegetation and maintain and enhance habitat condition, is achieved through stock-proof perimeter fencing, the removal of sheep and goats, rabbit control activities, and the management of kangaroo numbers.

4.4.1 Fence condition

A stock-proof fence was erected around the northern offset in 2020. An older section of this fence was in disrepair in 2023, with a new fence built in 2024. The stock proof fence around the southern offset was erected in winter 2025. During each site visit, all fencelines are audited and any issues found are repaired, where possible. For example, in 2025 we found six small holes dug under the southern fence by Kangaroos, which were all patched up with small sections of mesh (Fig. 11). These holes did not appear large enough for sheep to easily get under.



Figure 11. Example of a hole dug underneath the stock exclusion fence by Kangaroos. These were patched up each time they were found with either large rocks or mesh wire.

4.4.2 Sheep activity

Sheep activity is monitored through the remote camera arrays. Although the fence in the northern offset was operational for all of 2025, a small number of sheep were able to get in over winter. Sheep activity has been low in the southern offset even prior to construction of the fence (Fig. 12).

4.4.3 Goat activity

Feral goats were a major issue in the southern offset in 2025. During 2025, there was a massive influx early in the year. During the April field trip a herd of at least 200 were observed, with damage evident on shrubs indicative of goat browsing. Remote camera data revealed a spike in detections from spring 2024 to autumn 2025, that tapered off after South Gap pastoral conducted large-scale removal across the entire property (Fig. 13). Goat numbers are reported to South Gap Station managers to inform ongoing mustering and harvesting activities to manage the population. Approximately 2000 were removed from South Gap in 2025.

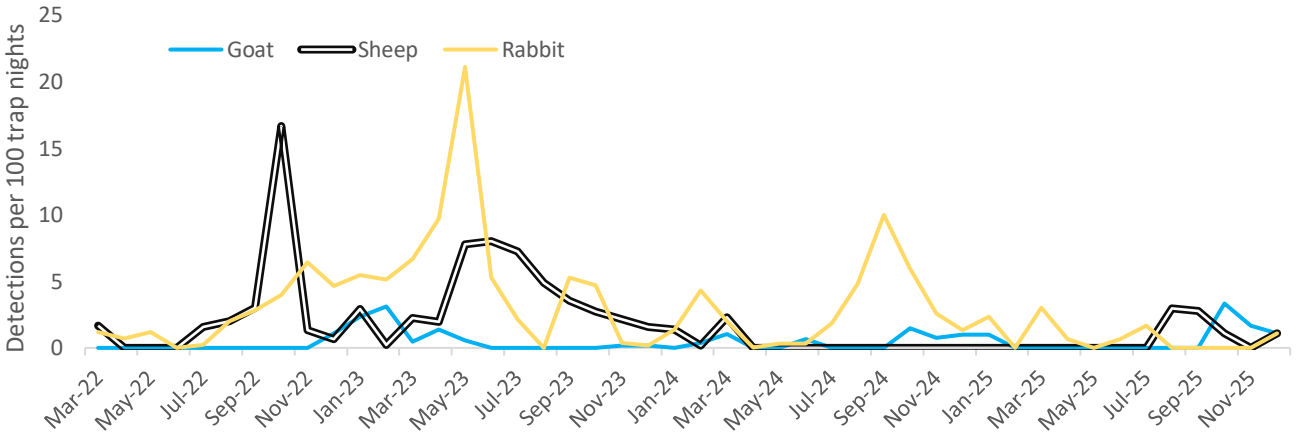


Figure 12. Detection rates of Goats, Sheep and Rabbits on remote cameras in the northern offset.

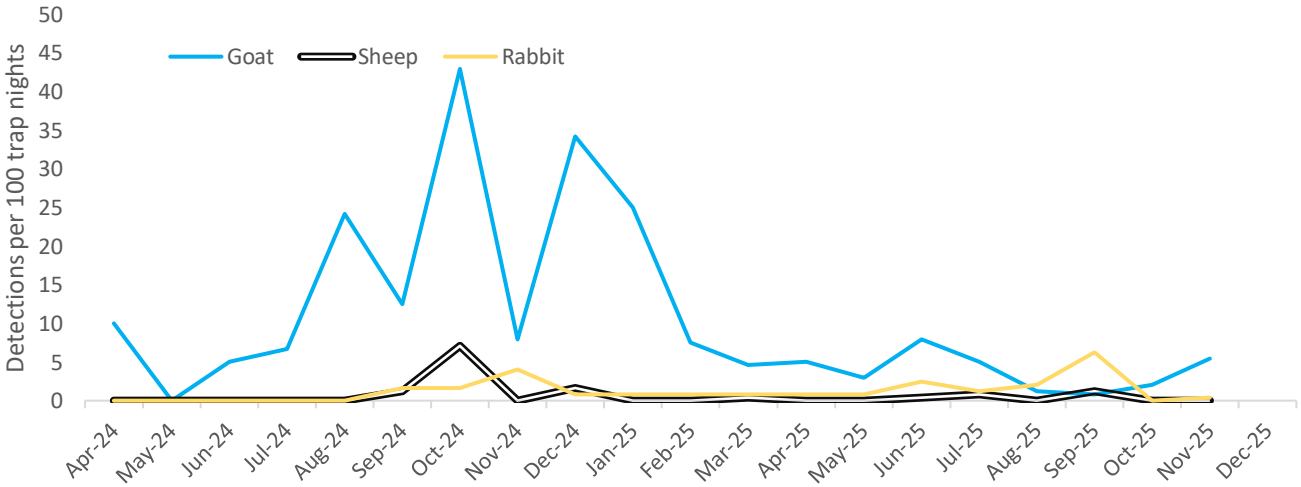


Figure 13. Detection rates of Goats, Sheep and Rabbits on remote cameras within the southern offset.

4.4.4 Rabbit activity

There were few rabbits detected in 2025 in either offset (Figs. 12, 13). To reduce potential breeding rates, we conducted small-scale, localized control in the northern offset in June 2025. The aim of this was to reduce rabbit breeding potential, not necessarily reduce overall population numbers. The entire 3 km stretch of sandy habitat on the banks of Lake Torrens was scanned for rabbit warrens. Eleven different warrens were found. Four of these were trapped with soft-jaw leghold traps for two nights then collapsed, and the rest were simply collapsed (see Fig. 14). Two rabbits were captured. Twenty old warrens in other habitats were also checked. Only one active warren was found, located near the main camp site on the side of a clay cliff. None of the other old warrens were active, and all warrens were collapsed.

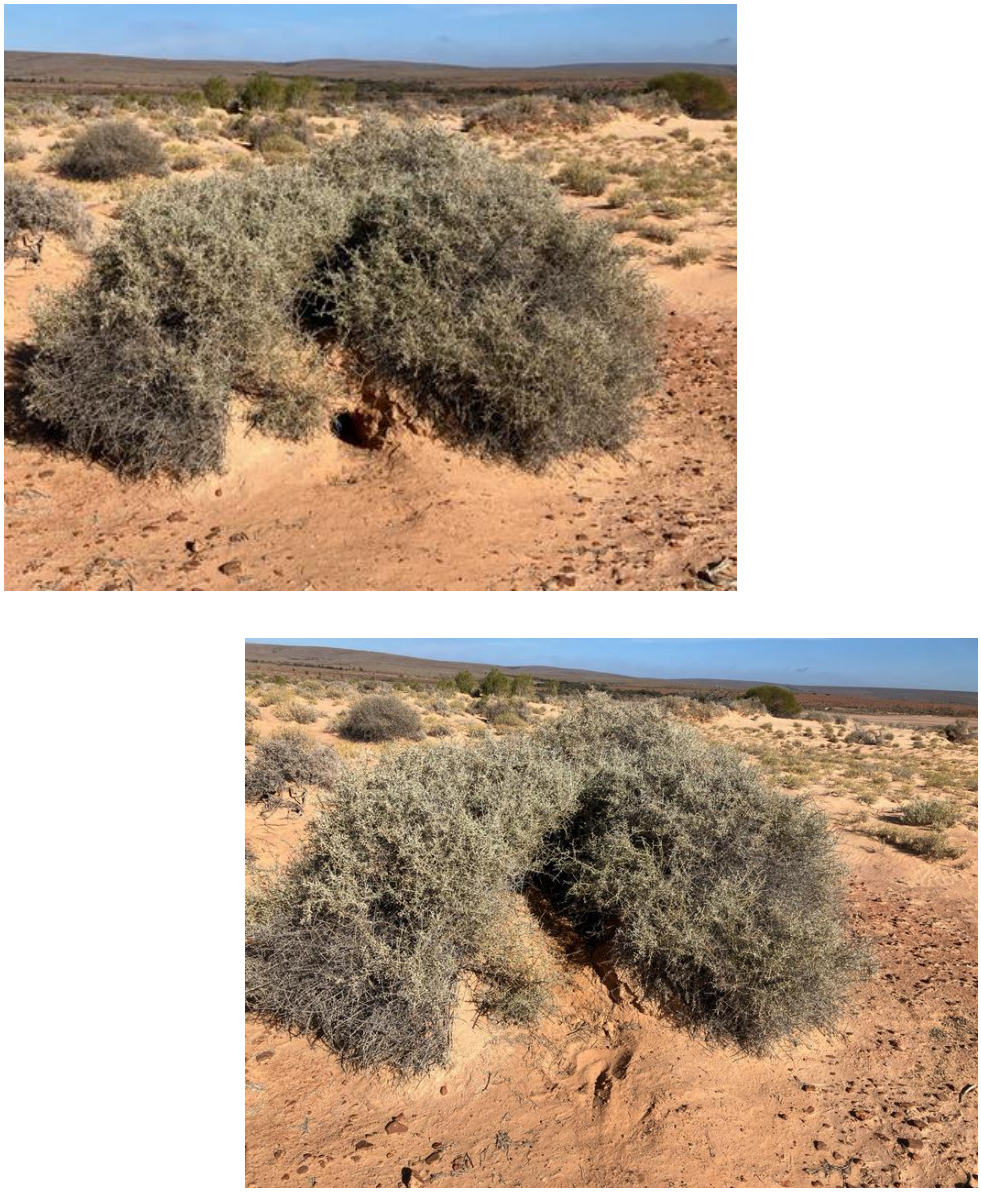


Figure 14. Before and after photos of collapsing of a rabbit warren at the northern offset.

4.4.5 Kangaroo activity

Kangaroo activity was high in both offsets in 2025 (Fig. 15). Kangaroo control was conducted in the northern offset under South Gap Pastoral harvest quota and will continue in 2026.

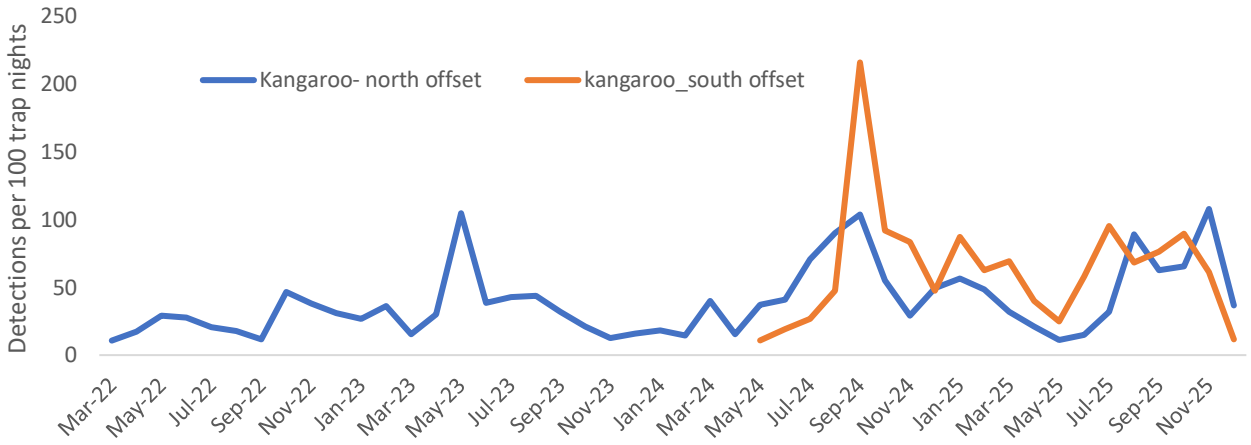


Figure 15. Activity rates of Kangaroos (both Red Kangaroos and Euros) from remote cameras in the northern (blue) and southern (orange) offset areas.

To investigate the impact of kangaroo grazing on cracking clay habitat, we set up two small temporary exclusion areas in the northern offset. These are around 6.5m x 6.5m in area, surrounded by fences that are around 1.2m high and constructed with 4 - 5 star pickets, with wire attached to the ground with pegs (Fig. 16). While probably not completely impervious to kangaroos, these exclosures should reduce grazing impacts. A remote camera was placed in each exclosure has been deployed to test effectiveness. We aim to create more and potentially improve their design in 2026.

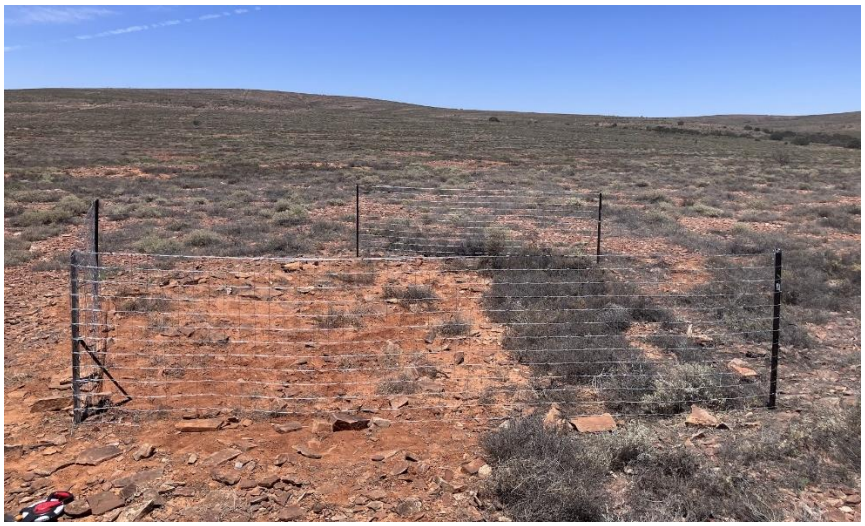


Figure 16. Small temporary kangaroo grazing exclosure created to measure the impact of grazing on cracking clay habitats.

4.5 Goal 5 – Improve knowledge of local target species populations, including how they respond locally to management.

While the key focus of the EOMP is on Plains Mouse, birdlife is also monitored on the offset to improve knowledge of other local target species. Birds were surveyed at three sites during each trip in both offsets. At each site, we scan for birds for 20 minutes, with a count taken of each species seen or heard. All incidental sightings of note were also recorded. Each site was surveyed twice in 2025 (June-July and November). Habitat varied at each site, from creek woodland near Gum dam, open saltbush plains, and dense saltbush on the banks of Lake Torrens.

A total of 72 birds have been detected thus far (Table 2). Two species detected are listed as Vulnerable under the EBPC act, the Blue-winged Parrot and Southern Whiteface. Two new bird species have been detected in 2025; the White-winged Triller (*Lalage tricolor*) and Buff-banded Rail (*Gallirallus philippensis*,).

We have now begun a monitoring and conservation program for the vulnerable Sandalwood plant (*Santalum spicatum*), which is currently found on the southern offset. Each year the length of Gum creek will be walked, with records taken for all Sandalwood and Quandong plants observed, including height, size, and leaf density at different heights (to measure browse effects). Five adult sandalwood trees have been found to date, with no saplings. Adult trees had no leaves below 1.5m height (roughly goat-browsing height, see Fig. 17). This suggests browsing pressures of goats have been high and inhibited recruitment. One sandalwood had a small, basic grazing-exclosure put around it. In 2026 we aim to create another grazing exclosure around a sandalwood plant, and conduct some replanting if rainfall conditions are ideal.

All confirmed records of animals detected during works on this project are cleaned and submitted to the **Biological Databases of South Australia (**https://linkeddata.tern.org.au/prez/bdbsa-cv/v/**),** managed by the SA Department for Environment. This is generally loaded by June each year.



Figure 17. An adult Sandalwood (*Santalum spicatum*) at the southern offset with a distinct goat browse line with no herbage present under 1.5m high.

Table 2. South Gap offset bird list from 2021 to 2025. Species listing under EPBC act in brackets. New species are listed in bold.

Bird List	
Australian Boobook	Mulga Parrot
Australian Magpie	Nankeen Kestrel
Australian Owlet-nightjar	Orange Chat
Australian Pipit	Pacific Black Duck
Australian Raven	Pied Butcherbird
Banded Stilt	Pink-eared Duck
Barn owl	Purple-backed Fairywren
Black-faced Woodswallow	Red-capped Robin
Black-shouldered Kite	Red-necked Avocet
Black-tailed Native-hen	Rufous Field-wren
Blue-winged Parrot (Vulnerable)	Rufous Songlark
Brown Falcon	Rufous Whistler
Brown Goshawk	Singing Honeyeater
Budgerigar	Slender-billed Thornbill
Buff-banded Rail	Southern Whiteface (Vulnerable)
Chirruping Wedgebill	Spiny-cheeked Honeyeater
Cinnamon Quail-thrush	Spotted Harrier
Common Bronzewing	Spotted Nightjar
Crested Bellbird	Striated Pardalote
Crested Pigeon	Stubble Quail
Crimson Chat	Tawny Frogmouth
Eastern Bluebonnet	Wedge-tailed Eagle
Elegant Parrot	Weebill
Emu	Welcome Swallow
Galah	White-backed Swallow
Grey Fantail	White-browed Babbler
Grey Shrike thrush	White-faced Heron
Grey Teal	White-fronted Honeyeater
Grey-crowned Babbler	White-winged Fairywren
Hooded Robin	**White-winged triller**
Inland Dotterel	Willie Wagtail
Inland Thornbill	Yellow Chat
Little Buttonquail	Yellow-throated Miner
Little Crow	Zebra Finch
Mallee Ringneck	Silver Gull

5. Future Priorities

In 2026 we will continue all ongoing monitoring and management actions as directed by the EOMP. Additional priorities will include:

- Exploring the possibility of deploying weather stations that provide data in near real-time
- The promotion of sandalwood regeneration in the southern offset, via herbivore exclusion and possible replanting
- The continuation of Gilgai research to improve understanding of Plains Mouse habitat use, including the set up of more kangaroo grazing exclosures
- Expansion of feral animal control to the southern offset
- Vehicle-track improvement to ensure safe access to and through the offsets
- A review of the need to establish merino fence upgrade on southern offset to prevent stock from entering the southern paddock from across Lake Torrens

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Appendix H TSF Closure Strategy Verification Report



TSF CLOSURE STRATEGY VERIFICATION REPORT: CARRAPATEENA OPERATION

March 2026

Prepared for BHP Carrapateena

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Client: BHP Carrapateena

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1 INTRODUCTION

1.1 Background

The Carrapateena operation (Carrapateena) is operated by OZM Carrapateena Pty Ltd and OZ Minerals Carrapateena Pty Ltd, wholly owned by OZ Minerals Limited. BHP Group Limited is the ultimate parent company of OZ Minerals Limited. Carrapateena is a copper-gold-silver mine located near Pernatty South Australia, approximately 160 km north of Port Augusta (Figure 1).

A Program for Environmental Protection and Rehabilitation (PEPR) was submitted by BHP in June 2025 which consolidates the approved activities for the Mineral Lease (ML) and Miscellaneous Purposes Licences (MPL) for Carrapateena (BHP 2025b).

BHP submitted a PEPR compliance report (BHP 2025a) for the period January 2024 to December 2024 associated with Carrapateena's ML (ML 6471) and MPLs (MPL 149, MPL 152, MPL 153, MPL 154 and MPL 156).

1.2 PEPR compliance

A number of non-compliances were reported in Carrapateena's 2024 PEPR compliance report. One non-compliance for ML 6471 was the non-achievement of Outcome Measurement Criteria (OMC) AQ3/TSF7. It relates specifically to the Tailings Storage Facility (TSF). Information with respect to this specific non-compliance is given in Table 1 (from Table 8.1 of BHP (2025b)).

The non-compliance refers to two OMC, AQ3 and TSF7. These two OMCs are identical and this report addresses OMC AQ3 and TSF7 together, the details of which are given in Table 2 (BHP 2025b).

Table 1: Non-compliance information.

Licence permit tenement	Type of non-compliance	Brief description
ML 6471	Non-achievement of OMC (AQ3/TSF7) Audit (TSF Closure Strategy Verification) undertaken by an independent suitably qualified expert approved by the Direct of Mines (or other authorised officer) and provided to the Mining Regulator at 6, 8 and 10 years after the lease grant. The audit demonstrates that data has been collected as per Leading Indicators AQ5, AQ6, TSF8 and TSF9 and recommends any changes to existing TSF closure strategies to meet the relevant Environmental Outcomes.	The TSF Closure Strategy Verification report has not been provided to the Mining Regulator due to the uncertainty around Stage 2 of the TSF being the final downstream embankment raise and the subsequent time required to collect meaningful erosion data through field trials. It was agreed with the regulator that the report would subsequently be completed in 2025.

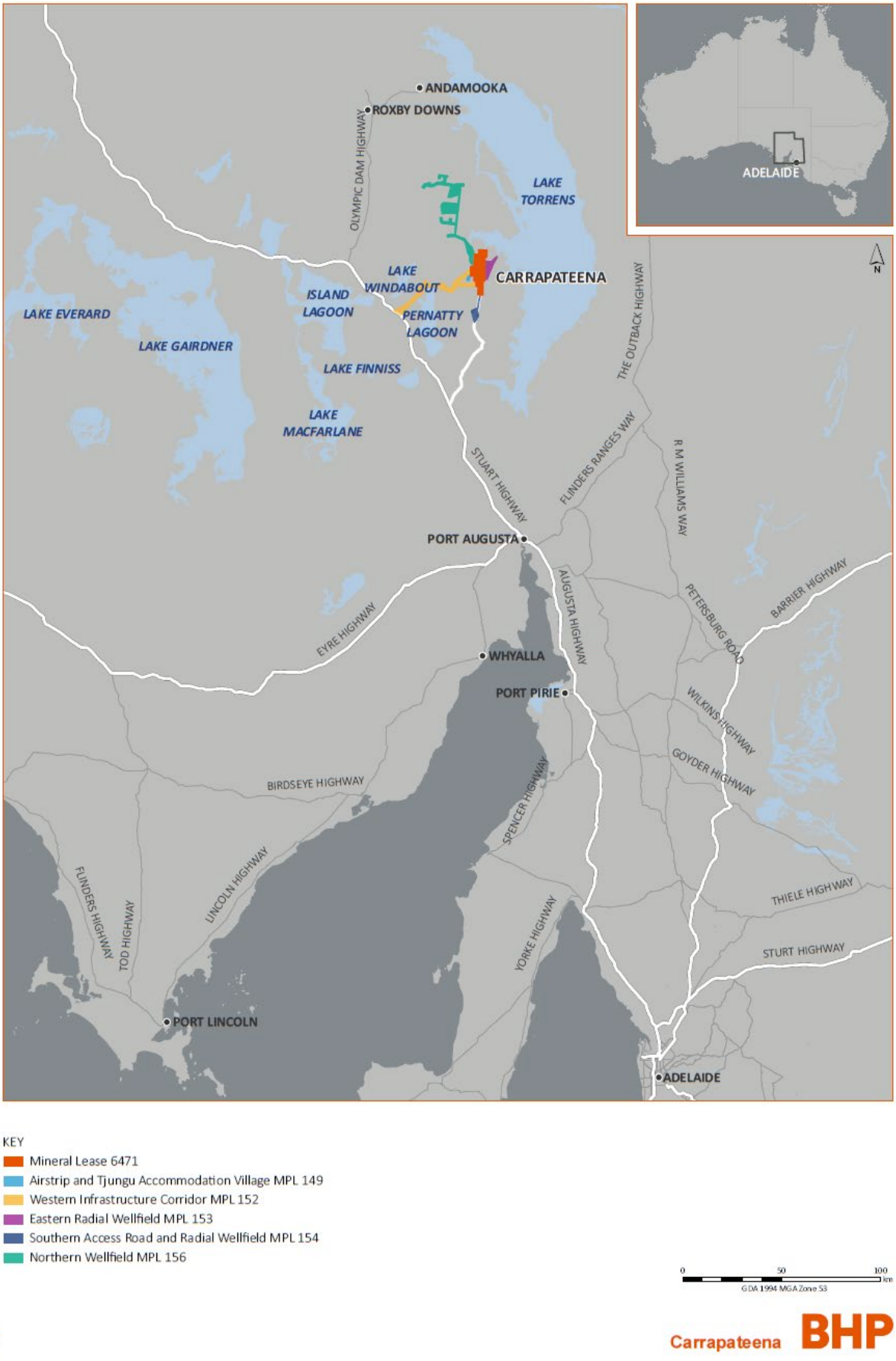


Figure 1: Project location (Source: BHP 2025).

Table 2: Details of Outcome Measurement Criteria – TSF7

Outcome Measurement Criteria
Audit (TSF Closure Strategy Verification Report) undertaken by an independent suitably qualified expert approved by the Director of Mines (or other authorised officer) demonstrates that#: • Data has been collected for the calibration of the Air Quality Model and Landform Evolution Model as per Leading Indicators AQ5, AQ6, TSF8 and TSF9. • Data collected as per Leading Indicators AQ5, AQ6, TSF8 and TSF9 (and any other relevant data) demonstrates that the TSF closure strategies set out in the PEPR (Section 4.17.3), specifically the requirement for no TSF cover system, would be effective in achieving the relevant environmental outcomes. The audit must also include the following information in each TSF closure strategy verification report: • Recommendations for any changes to existing TSF closure strategies to ensure achievement of the relevant environmental outcomes; and • Recommendations for any new TSF closure strategies to ensure achievement of the relevant environmental outcomes. The audit will be provided to the Mining Regulator at the following frequencies: • An initial report at 6 years after lease grant (allowing for 2 years to reach first tailings deposition, and 4 years to conduct the relevant scientific investigations); and • 8 years after lease grant; and • 10 years after lease grant; or • Any other timeframe as agreed between the Tenement Holder and Director of Mines (or other authorised officer) Demonstration of achievement of the outcome will be met through the independent and suitably qualified expert verifying the requirement for no TSF cover system at any of the time intervals stated above. If the independent and suitably qualified expert cannot verify the requirement for no TSF cover system, demonstration of achievement of the outcome will be met through: • PEPR review which details the changed and/or new TSF closure strategies; and • Payment of a Bond (or top up to the existing Bond) to reflect the rehabilitation liability of the changed and/or new TSF closure strategies. # The scope of the audit will be agreed by the Tenement Holder and the Director of Mines (or other authorised officer) at an appropriate time ahead of delivery of the initial report.

1.3 Audit purpose and objective

The purpose of this audit is to review the current TSF closure strategy, with a particular focus on the current closure plan to not cap the top surface of the TSF at closure. OMC TSF7 provides the basis for the audit (Table 2). The audit deliverable (this report) is intended to be the *TSF Closure Strategy Verification Report*, as required by OCM TSF7.

The review is to demonstrate that:

- Data has been collected for the calibration of the Air Quality Model and Landform Evolution Model as per Leading Indicators AQ5, AQ6, TSF8 and TSF9.
- Data collected as per Leading Indicators AQ5, AQ6, TSF8 and TSF9 (and any other relevant data) demonstrates that the TSF closure strategies set out in the PEPR (Section 4.17.3), specifically the requirement for no TSF cover system, would be effective in achieving the relevant environmental outcomes.

The Leading Indicators AQ5, AQ6, TSF8 and TSF9 are detailed in Table 3.

Achievement of AQ5 requires that monitoring data collected during operations be used to validate the air quality modelling outputs presented in Table 9.10 of the PEPR (BHP 2025a). These relate to dust concentrations (PM_{10}, $PM_{2.5}$) and contaminant concentrations. A key consideration is the validation of the dust threshold lift speed, set at 5.4 m/s in the Air Quality Model originally developed by Jacobs (2016).

Achievement of AQ6 requires an independent review of the dust threshold lift data from tailings beach trials and a review of potential deviations from the modelled outputs should the dust threshold lift speed be found to be less than 5.4 m/s.

Achievement of TSF8 requires calibration of the Landform Evolution Model with erosion data collected in the field.

Achievement of TSF9 requires an independent review of the Landform Evolution Model, with the field data aimed to validate the model assumptions found in Table 9.9 of the PEPR (BHP 2925a). These assumptions relate to the particle size of the tailings and embankment material, and hydrological parameters of the model (rainfall intensity, in-channel lateral erosion channel, 'm' value and Mannings roughness coefficient).

Table 3: Summary of relevant Leading Indicators.

ID	Measurement method	Achievement value
AQ5	Calibration of the air quality model (OZ Minerals 2017a; Appendix C1 Air Quality Modelling and Assessment of Effects) with operational monitoring data and dust threshold lift data established in the tailings beach trials.	Validates modelling outputs (Table 9.10)
AQ6	Audit by an independent and suitably qualified expert of dust threshold lift data from the tailings beach trials	Should the threshold lift speed be determined to be below the Air Quality Model dust threshold lift speed of 5.4 m/s, an assessment will be undertaken by an independent and suitably qualified expert to determine if there is a material deviation expected on modelling outputs that triggers a model calibration
TSF8	Calibration of the Landform Evolution Model with erosion field study data	Validates modelling outputs (MLP Appendix A7 Closure Strategy (Erosion Modelling) (OZ Minerals 2017a)).
TSF9	Audit by an independent and suitably qualified expert of laboratory and field data including rainfall intensity, tailings particle sizes, in-channel lateral erosion parameters, 'm' from the tailings beach trials at the TSF against the Landform Evolution Model (MLP Appendix A7 Closure Strategy (Erosion Modelling) (OZ Minerals 2017a)) input assumptions	Should values deviate outside of the sensitivities in (Table 9.9) an assessment will be undertaken by an independent and suitably qualified expert to determine if there is a material deviation expected on modelling outputs that [triggers a] model calibration.

1.4 Reviewer

Evan Howard (Certified Professional Soil Scientist) of Landloch Pty Ltd completed the review. An outline of his experience is provided in Appendix A.

2 REVIEW METHOD

The review was completed through a desktop review of relevant documents. No site visit was undertaken. Documents and records that were reviewed included:

- Carrapateena Operation Program for Environment Protection and Rehabilitation (BHP 2025a)
- Carrapateena Operation Program for Environmental Protection and Rehabilitation, Volumes 1 and 2 (BHP 2025b)
- Carrapateena TSF Landform Evolution Modelling Update (SRK 2023)
- Carrapateena Mine Tailings Storage Facility – Dust Emissions Study (WSP 2024)
- Memo: Carra TSF Stage 3 Bridging Word – Mine Waste Assessment and Borrow Pit 3 Extension (WSP 2025)
- Carrapateena Project Air Quality and Meteorology Baseline Assessment (Jacobs 2016)
- National Pollutant Inventory, Emission Technique Manual for Mining (AG 2012).
- Daily rainfall record from the TSF Automatic Weather Station, January 2020 to November 2025.
- Daily rainfall records for Woomera Aerodrome (station 16001) and Andamooka (station 16065) sourced from the Bureau of Meteorology (BoM 2026a, 2026b).

3 TSF DESIGN

3.1 Construction type

The approved TSF design comprises a cross-valley embankment at the head of the Eliza Creek valley. The initial starter embankment has been constructed using compacted silt, clay, gravel, and weathered rock obtained from colluvium collected within the TSF impoundment area (prior to deposition of tailings). Mined waste rock has been used as armouring for erosion protection of the downstream (outer) face of the embankment, and crushed waste rock has been used as a wearing course for the embankment crest.

The starter embankment was completed in August 2019 and provided an initial storage capacity of 3 years, with a nominal maximum embankment height of approximately 16 m. To provide additional storage capacity, the TSF embankment was raised via the construction of Stage 2A and Stage 2B, with further raises planned until the approved storage volume is achieved. The initial raises (Stage 2A and Stage 2B) have been constructed with a downstream raise methodology using similar construction materials to that of the starter embankment.

The approved TSF design proposes that subsequent raises (Stage 3 to Stage 6) be constructed with an upstream raise methodology using consolidated tailings with rock armouring on the downstream faces of the embankment. BHP are proposing an

alternative TSF design (BHP 2025b) in which the Stage 3 TSF embankment would be constructed with a downstream raise methodology and that subsequent raises (Stage 4A, Stage 4B, and Stage 5A) would be constructed with an upstream construction methodology, by which time the rate of rise would be sufficiently low to support upstream raises (Figure 2, BHP (2025b)). The construction of the upstream raises is contingent on achieving a suitable tailings beach strength, confirmed via geotechnical investigation prior to construction.

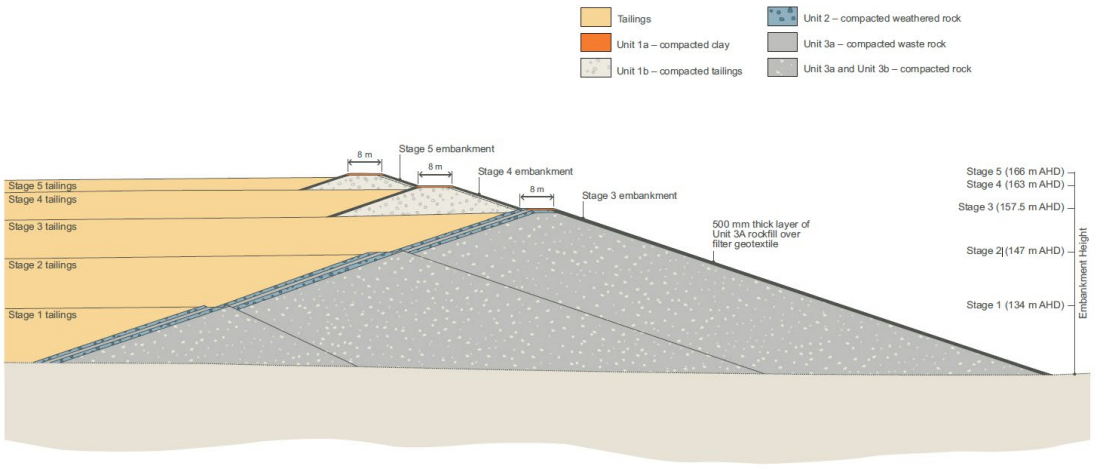


Figure 2: Proposed Stage 3 to Stage 5 TSF raise configurations (Source: BHP (2025b)).

3.2 Embankment outer face

The embankment outer face is sheeted with a rock armour layer that is approximately 3 m thick[1]. An assessment of the rock armour materials used on the existing outer face of the Stage 2A and Stage 2B embankment was undertaken in March 2025 (WSP 2025). It noted that degradation of the rock armour had been observed at the toe of the Stage 2 embankment where it came into contact with hypersaline seepage water. Test slots were excavated at the toe of the Stage 2 embankment in areas were rock degradation was observed. Testing showed that rocks impacted by the precipitation of salts, caused by evaporation of the seepage water, had low strength but that rock not exposed to salt precipitation had high strength. WSP concluded that the breakdown of rocks was due to near-surface atmospheric processes (i.e. evaporation) and that rock positioned deeper in the embankment had a low risk of breakdown. It was concluded that the observed degradation of the surface rock had no meaningful impact on the embankment's integrity as a whole.

The section of embankment on which the degradation of the rock was observed will be covered over as part of construction of the proposed alternative (downstream) Stage 3 raise. The horizontal thickness of the Stage 3 downstream raise from the current Stage 2 embankment toe is in the order of 150 m. This will greatly limit the ability for seepage to interact with the near-surface Stage 3 embankment material. The existing erosion protection layer on the Stage 2 embankment has performed well (no observed erosion)

[1] Thickness of this layer is measured horizontally. The layer is made from material that has been classified as 'Unit 3E – Coarse Mine Rockfill'.

in areas not impacted by seepage and can be used again on the outer face of the Stage 3 embankment outer face (WSP 2025). Landloch notes that this observation of good performance was made by WSP, but would add that the rainfall on site since 2020 has not contained some of the larger daily rainfall events that would be significant contributors to the erosion potential of the landform in the longer-term. See Appendix B for further discussion on the rainfall that has occurred at Carrapateena between the period 2020-2025.

Landloch anticipates that rock armour material of a suitable rock type, durability, and particle size distribution will be used in future upstream raises of the embankment such that the final outer surface of the embankment (at completion of Stage 6) will comprise a thick, rock armour layer similar in characteristics to the current Stage 2 embankment outer face.

The current plan is to use Unit 3A material as rock armour, which is the rocky component of a weathered quartzite. WSP (2025) undertook an assessment of this material from Borrow Pit 3 and recommended the use of 'moderately weathered or better' quartzite; this excludes the use of the 'extremely weathered' quartzite noted to exist by WSP that overlies the moderately weathered quartzite. The moderately weathered quartzite is located under the topsoil and colluvium layers in the borrow area.

WSP (2025) also recommended the durability of the quartzite rock be assessed. Landloch supports that recommendation. That said, the weathered quartzite has been present on the decant dam outer wall since 2019 (~6 years) and is not observably eroding (Figure 3). It is noted that the quartzite on the decant dam wall has a low fines content, and it is likely that the quartzite rock from the borrow area will need to be screened and separated from the fines in order for it be used as an erosion resistant rock armour.



Figure 3: Decant dam embankment covered in quartzite rock (within minimal observable fines) (Source: BHP).

3.3 Top surface

The top surface of the tailings is constructed by spigotting tailings from the head of the valley reaches, crest of the TSF embankment, and valley sides (i.e. from essentially all sides of the TSF). The intent is to create a surface that is relatively flat (0.7–1.5% gradient), with the position of the supernatant pond kept away from the crest of the outer embankment.

The current closure strategy is that the TSF will not be capped following cessation of operations. A key requirement of this strategy is that the tailings are not prone to liberation of dust in the long term.

4 AIR QUALITY MODEL

4.1 Air quality assessment

Jacobs undertook an air quality assessment in 2016 (Jacobs 2016) that was updated in 2024 (Jacobs 2024) to cover the Carrapateena Expansion Project and the associated increased production rate and mine life, and the transition from the use of thickened tailings to the use of dry stacked tailings. Dry staking was assumed as the worst case for dust generation (higher risk than thickened tailings) given it is placed at lower moisture content and can more readily dry via evaporation; wind erosion is of most concern for dry materials and of little to no concern for materials that are moist.

The updated assessment considered the Ground-Level Concentrations (GLCs) for air pollutants established by the South Australian Government's *Environment Protection (Air Quality) Policy 2016*:

- Maximum 24-hour average PM_{10} GLC, 50 µg/m^3 (includes background PM_{10}).
- Maximum 24-hour average $PM_{2.5}$ GLC, 25 µg/m^3 (includes background $PM_{2.5}$).
- Annual average $PM_{2.5}$ GLC, 8 µg/m^3 (includes background $PM_{2.5}$).

The updated assessment also included incorporation of additional monitoring data including meteorology, particulate matter, and dust deposition, obtained since the submission of the Carrapateena Project Mining Lease Proposal. No sustained trend in increased airborne metal concentrations was measured in the period 2015 to 2022.

A key parameter considered was wind speed. For Carrapateena, wind data for 2014, 2017, 2018, and 2019 showed an average wind speed of 3.8–4.0 m/s measured at 1.5–1.8m above ground. This compared well with average wind speed data from Woomera (5.4 m/s) measured at 8 m above ground level. When corrected for the height difference, the wind speed for site (if measured at 8 m) would be in the order of 4.6–5.6 m/s. The air quality model assumed dust emission only occurred when the hourly average wind speed was greater than 5.4 m/s.

For the closure design, the updated assessment (Jacobs 2024) found that there was no exceedances for:

- PM_{10}, maximum 24-hour average GLCs – project wind erosion contributions ranged from 0.2–44 µg/m$_3$ depending on location. For the TSF, values in the order of 20 µg/m^3 were common.
- $PM_{2.5}$, maximum 24-hour average GLCs – project wind erosion contributions ranged from 0.04–6.7 µg/m^3, depending on location. For the TSF, values in the order of 3–5 µg/m^3 were common.
- $PM_{2.5}$, annual average GLCs ranged from 0.0–1.1 µg/m^3. For the TSF, values in the order of 0.5 µg/m^3 were common.

4.2 Threshold wind speed

An assessment of the wind speed threshold for dust emissions was first reported by Jacobs (2016). The assessment considered data for Carrapateena from April 2012 to March 2016 and for Woomera Aerodrome for January 2012 to March 2016. Seasonal wind speed frequency distributions (using 10-minute wind records) for 2012–2016 showed that wind speed at Carrapateena is rarely greater than 10 m/s. A wind speed threshold for dust emissions in the range of 8–12 m/s was suggested, noting that a threshold wind speed in the order of 5 m/s is typical for emission assessments. The updated air quality assessment (Jacobs 2024) adopted a threshold value of 5.4 m/s, noting the higher values reported in 2016 was from 10-minute data and not hourly data; 10-minute data would yield higher wind speeds than hourly data for the same measurement period. A value of 5.4 m/s is consistent with the Australian Government's *National Pollutant Inventory Emission Estimate Technique Manual for Mining* (AG 2012).

WSP were engaged to assess the dust emission threshold wind speed via direct measurement of the tailings surface of the Carrapateena TSF (WSP 2024). Dust emissions were measured using a Dust-Quant Portable In-Situ Wind Erosion Laboratory. Measurements were made at 185 locations across the tailings surface. Areas assessed appeared to have dried surfaces. In some locations the surface had a salt crust below which the tailings were moist. The salt crust will inhibit wind erosion. Other areas were observed to be scoured by surface water erosion with a disturbed salt crust surface. In-situ moisture contents of these areas were in the order of 15%, and the tailings were found to have a moisture content of 65-69%. This indicates that the surfaces are dry, but that moisture is considerably higher at shallow depths. The WSP study confirmed that the local wind speed threshold for undisturbed tailings (based on an increase in PM_{10} values) ranged from 9–23 m/s. Given this threshold is higher than the common average wind speeds measured for site, and that moisture rapidly increases with depth, the risk of detachment of tailings was considered low.

5 LANDFORM EVOLUTION MODEL

5.1 Inputs

5.1.1 Topography

The landform evolution model for the TSF was updated to include the Stage 6 layout of the TSF (SRK 2023). The topographic data was sourced from 2 m digital elevation data for the catchment and Computer Aided Design (CAD) files for the TSF embankment.

The area modelled included the entire upstream catchment area. As such, the model captures all the surface areas that can contribute runoff and eroded sediment to the TSF. The grid size of this elevation model was 20 m.

Separate more detailed (3 m grid size) elevation models were also prepared for the TSF embankment area to enable modelling of this zone in more detail. This is important because use of the larger grid size for the embankment would produce coarser predictions of landform evolution and may lead to avoidable errors in predictions of erosion and deposition.

The selection of grid sizes is appropriate for the model runs to which they were applied.

A spillway was included in the closure design of the TSF, but was not incorporated in the modelled topography. This omission has the potential to lead to significant differences between the modelled erosion reports in the landform evolution model report. However, it was reported that the capacity of the TSF impoundment area at the end of the model period was sufficient to store runoff from a 72-hour Probable Maximum Precipitation (PMP) rainfall event. Therefore, it can be concluded that the spillway would not have functioned (i.e. no discharge of runoff) if it had been included in the modelled topography. Therefore, this omission will not have a material impact on the predicted erosional performance of the TSF downstream of the TSF embankment.

5.1.2 Rainfall

Modelling considered erosion of the entire TSF shape for a long-term rainfall sequence (133.5 years) and a longer-term synthetic rainfall sequence (1,000 years).

The long-term (133.5 years) rainfall sequence was sourced from the SILO climate service[2]. SILO is a database of Australia climate data that contains data from 1889 to the present day. It provides datasets with values for missing data that are infilled using interpolations of data from nearby stations. The datasets are constructed from observed data obtained from the Australian Bureau of Meteorology. In the case of Carrapateena, the SILO data sourced was based on rainfall from Woomera Aerodrome (BoM station 16001). This is the closest station to Carrapateena and has similar characteristics to other nearby stations such as Andamooka (see Appendix B). Given that rainfall patterns (mean annual, mean monthly, and daily) are relatively consistent across a wide area in the vicinity of Carrapateena, the SILO data can be reasonably used to represent the rainfall at Carrapateena.

The longer-term (1,000 years) rainfall sequence was generated using the Hyetos climate generation model. The model seeks to maintain key statistics (mean, variance, maximum rainfalls and proportion dry days (SRK 2023). The sequence contains larger rainfall events (>250 mm) than found in the SILO dataset (largest event in ~140 mm). This rainfall sequence produced slightly lower rainfall depths for the frequent events, but larger depths for the rare events. SRK (2023) considered is outcome conservative, as the periods of higher intensity (rarer events) are likely to control the results of the LEM. Landloch agrees with this assessment, as cumulative runoff and erosion in the long-term are dominated by the larger events that generate considerably more runoff and erosion than the smaller events. In many cases, the smaller events result in little to no runoff and similarly produce little to no erosion as a result.

The daily rainfall data was disaggregated into hourly data for input to the CAESAR-Lisflood landform evolution model. Use of hourly rainfall data (rather than shorter periods) has the potential to underestimate event based erosion. This is because runoff (i.e. rainfall excess) is sensitive to the intensity of rainfall from which it is produced. Maximum rainfall intensity values calculated from hourly data are always lower than

[2] https://www.longpaddock.qld.gov.au/silo/

those calculated from rainfall from shorter periods and hence erosion predictions based on hourly data are lower than those calculated from shorter time periods.

5.1.3 Hydrological parameters

A Manning's n value of 0.031 was applied to the model. Landloch agrees that this value is reasonable for use for natural channels with clean, regular cross sections, flood plains with short grass pasture, and excavated channels with gravel/ small rocks.

An 'm' value of 0.005 was adopted for the landform evolution modelling. This parameter controls the peak and duration of the runoff hydrograph generated by a rain event. No justification of the 'm' value was provided in the report. Adoption of an m value of 0.005 will produce higher peak runoff values, from which it could be assumed that higher runoff rates would be derived. This would lead to higher erosion than would be predicted if a larger m value were adopted.

The in-channel lateral erosion parameter controls the width of the channel that can be formed in the CAESAR-Lisflood model. A value of 20 was adopted, which is in the range suggested in the model documentation. However, there is limited information regarding the suitability of this value or the sensitivity of the model output to this parameter.

5.1.4 Evaporation

Evaporation was used to estimate the evaporation losses from the pond. An average evaporation rate of 8.6 mm/day was adopted from the BoM climate data for Woomera Aerodrome. Landloch has confirmed this value, though notes that values will change throughout the year, and that evaporation measured from a Class A evaporation pan commonly overestimates actual evaporation from larger water bodies. Reported values of actual evaporation from large water bodies range from 20–85% of pan evaporation. For arid areas, values of 60–70% could be expected (Howard 2008). This difference can be significant.

That said, the use of this single value for the purposes of modelling evaporation losses from the pond is reasonable for Carrapateena because of its very low rainfall, meaning that even if evaporation occurs slower than anticipated, there remains considerable time over which evaporation can still occur. It is also unclear whether water loss from the pond via percolation was considered. If it was then the situation outlined above remains the case. If it were not, this would mean that the rate of water loss from the pond would be higher than the evaporation rate suggests, and that pond water storage capacity levels would return to their maximum values more quickly than the model may suggests. This would make the model predictions of storage requirements conservative.

5.1.5 Soil properties

The landform evolution model was set up using particle size distribution (PSD) data of the colluvium for the in-situ catchment materials, tailings for the beach area, and coarse mine rockfill for the TSF outer embankment. The PSD data was sourced from testing of

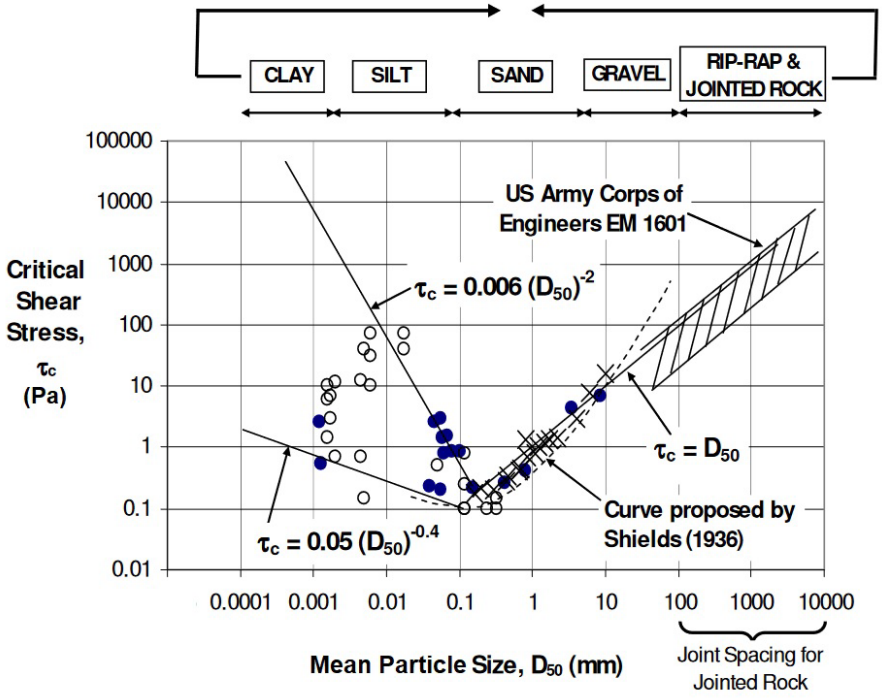
site materials, except for the rockfill whose PSD was based on the PSD of the rock specified in the Stage 2 wall raise report.

The CAESAR-Lisflood landform evolution model uses PSD as the criteria by which the erodibility of a material is defined, with materials that contain larger particles producing less erosion. Although this is generally true, the use of PSD to define a material's erodibility is simplistic and can lead to error. Examples of this simplistic view leading to possible error include:

- Two particles of the same size may have different particle densities, with the lower density particle more prone to detachment to the higher density particle. In another circumstance, two particles of different size and densities could conceivably erode at the same rate.
- PSD data is generally derived via laboratory testing in which the samples are fully dispersed prior to assessment of their PSD. In reality, materials do not erode as fully dispersed particles. Rather they erode as aggregated particles which will have a different size and density.
- A wide range of factors not captured by PSD govern detachment potential, such as shear strength, void ratio, soil swell potential, clay mineralogy, dispersion potential, exchangeable cations, and salinity.

The relationship between particle size and detachment potential is weak for fine-grained material, but stronger for larger particles. Figure 4, adapted from Briaud (2008), shows predictions of critical shear stress (the surface shear at which detachment initiates) using Shields equation are relatively accurate for larger particles (sand-sized particles and larger), and that critical shear for smaller particles is highly variable. Errors up to 3 orders of magnitude are reported as possible. Briaud et al. (2001) reported that, "*soil properties influence the erodibility of a soil. Therefore, it appears logical to think that a correlation exists between erodibility and soil properties*". However, they also noted that, "*for fine grained soils, researchers have looked for such a correlation, starting in the early 1960s… Today, no widely accepted correlation could be found after extensive literature reviews*". They recommended that for soils, "*considering all the problems associated with correlations, a direct measurement* [of critical shear stress] *is favored*".

Both the colluvium and tailings are dominated by fine-grained particles. Hence it could be expected that the CAESAR-Lisflood landform evolution model may predict erosion with less accuracy for these materials than it would for the coarse mine rockfill which is dominated by coarse particles. The prediction of erosion of the colluvium and tailings could be an overestimate or underestimate, or it could be accurate. It is not possible to be certain of its accuracy.



LEGEND	
● data points	Briaud *et. al.* (2001)
O data points	Briaud (2008)
X data points	Vanoni (1975)
Dotted line	Shields (1936)
Hatched area	US Army Corps of Engineers (1991)

Figure 4: Comparison of various estimates of critical shear stress as affected by grain size (adapted from Briaud 2008).

5.2 Results

The results of the landform evolution model showed that capping the tailings surface with coarse mine rockfill would significantly reduce its erosion potential compared to leaving it uncovered. Similarly, erosion potential of the embankment was also predicted to be very low when covered in coarse mine rockfill. These results are deemed reasonable and are likely to indicate low erosion risk given that the CAESAR-Lisflood model would be likely more accurately predict erosion of the areas covered by coarse-dominated wastes.

Modelling of the TSF using the 133.5 year climate sequence indicated that when uncovered, no tailings were released to the environment. That is, the TSF embankment was not eroded through or overtopped. Tailings would remain at the surface and not be covered by the eroding colluvium from upslope of the tailings surface. In all scenarios, the TSF was modelled to have a remaining available storage capacity sufficient to store the runoff from the 72-hour PMP storm.

Modelling of the catchment using the 1,000 year sequence predicted the development of gullies in the tailings surface. Erosion in the upstream catchment area is consistent with published values of natural erosion. Minor erosion of the embankment was predicted.

These results indicate that the prediction of gully erosion on the uncovered tailings surface will not lead to release of tailings to the environment or the failure of the TSF structure. Therefore, available data indicates a cover system is not required to meet the Environmental Outcome and there is no apparent benefit in covering the tailings in order to reduce the risk posed by erosion to the surrounding environment. Given that the approved TSF closure surface for the tailings is not covered, other closure objectives such as vegetation growth are not relevant for this structure.

5.3 Calibration to field data

Achievement of Leading Indicator TSF8 requires calibration of the landform evolution model with erosion data collected in the field. No erosion data collected in the field was reported.

Field-based erosion measurements would be useful in confirming model predictions of erosion, given that the TSF will store eroded sediment generated from upslope undisturbed areas, and that the CAESAR-Lisflood model is likely least accurate when predicting erosion of finer-grained materials (i.e. tailings, and the fines-dominated colluvium).

That said, given that after completion of the Stage 6 wall raise there will exist a large storage capacity within the TSF impoundment area in which eroded sediment and runoff from the upstream colluvium area could be deposited and managed, it is not a critical failing that this data does not exist.

Establishment of a simple erosion trial to demonstrate that the erosion rates of the upslope areas are low as currently estimated would be sufficient calibration, and validation of surface hydrology parameters (e.g. runoff rates, hydrographs, m values etc.) would not be necessary. Further detail is given in Section 7.2.

If the TSF design changes (e.g. not all planned wall raises occur or the volume of tailings to be stored changes), this field calibration data may become important to establish with greater certainty the accuracy of the predicted erosion from the finer-grained materials.

6 FINDINGS

6.1 Air quality model

The air quality model has modelled dust emissions and reported dust concentrations (PM_{10}, $PM_{2.5}$) and airborne contaminant concentrations. These were supported by measured values from site. In this way, AQ5 can be considered as being achieved.

A review of the dust threshold lift wind speed from the tailings surface has found that the values are 9–23 m/s, higher than the previously adopted 5.4 m/s. This wind speed was directly measured from the tailings surface that was dry. Given the measured threshold lift wind speed from the tailings surface is higher than the 5.4 m/s adopted in the original and updated, it was concluded that the risk of dust emissions from the tailings surface at closure is low.

Landloch agree with this assessment, noting that the increased erosion resistance is likely due to the presence of the salt crust that is acting to inhibit the detachment of surface particles. Landloch considers the AQ6 has been achieved.

The air quality model supports the current plan for closure of the TSF to not apply a cover and to leave tailings at the final surface. Based on the existing evidence, the current plan will adequately protect air quality by limiting the instances of dust generation.

Recommendations to further support the plan are given in Section 7.1.

6.2 Landform evolution model

The landform evolution model used appropriate topographical input. It is noted that the closure spillway was excluded from the model, but it was concluded that the spillway would not have functioned during the model period because the TSF was modelled to not overtop and the remaining storage capacity within the impoundment area was sufficient to store runoff from a 72-hour Probable Maximum Precipitation (PMP) rainfall event. This is essentially the largest rainfall event (by depth) that is considered in landform stability studies.

The rainfall data used were appropriate and allowed consideration of runoff and erosion potential for a wide range of rainfall and runoff events, including extreme events.

The soil evaporation data were also appropriate, noting that the use of pan evaporation can overpredict the actual evaporative losses that occur from large surface areas of water. Carrapateena has very low rainfall, meaning that even if evaporation occurs slower than anticipated, there remains considerable time over which evaporation can still occur before the next rainfall event occurs.

The CAESAR-Lisflood model relies on particle size distribution to describe the erodibility of a material. This is a simplistic approach as it does not account for issues related to particle density, aggregation, and other physical and chemical properties of the material.

The hydrological parameters used have not been validated. Landloch note that the 'm' and 'in-channel lateral erosion' parameter values have been set based on what appear to be guidance given in the model literature. The Manning's n value is set based on widely accepted published values. Additionally, the model-predicted erosion has not been calibrated to field data. In these ways the requirements of TSF8 and TSF9 have not strictly been met.

However, given the low rainfall for the site, and the finding that the TSF impoundment has a large storage capacity that is able to retain all sediment and runoff within the impoundment area even for the 72-hour PMP event, more exact calibration of the landform evolution model may not be necessary. To support this finding, a sensitivity analysis of the hydrological parameters on the resultant erosion and runoff that is generated could be conducted to demonstrate that the storage capacity is sufficient to manage runoff predicted using a wide range of model input parameter values. A simple field trial could also be conducted to demonstrate that erosion rates are indeed low.

The landform evolution model supports the current plan for closure of the TSF to not apply a cover and to leave tailings at the final surface. Based on the existing evidence, the

current plan will adequately protect water quality because the TSF impoundment completely stores the eroded sediment and runoff generated from the contributing catchment in the long-term, and that erosion rates from the rock armoured embankment are low.

Based on these findings, the following key recommendations will support ongoing confidence in the existing closure strategy. These are provided below in Section 7.2.

7 RECOMMENDATIONS

7.1 Air quality

The conclusions of the existing air quality study could be supported by:

- Assessment of the potential for the salt crust to weaken or disappear in the long term (i.e. through leaching of salt by rainfall), thus reducing the wind speed threshold for dust emission and increasing the potential for dusting in the long term.
- Consideration of the potential impact of the moist tailings just below (<50 mm) the dry tailings surface. This is because the underlying moist tailings could be maintaining a higher moisture content at the surface (due to capillary rise of moisture) than would exist in the longer term as the tailings continue to dry. It is also feasible that gully erosion of the tailings, where it occurs would increase the potential and rate of drying of the tailings. As tailings dry, the risk of wind erosion may increase. This could be assessed by:
    - Excising undisturbed samples (e.g. cores or similar) of tailings from the surface,
    - Tracking the change in moisture in the excised sample, allowing it to dry thoroughly to a steady air dry moisture,
    - Repeating the wind erosion test on the dried sample.

WSP (2024) also note that the dust measured in their study may actually be sourced not from the tailings surface but from local dust derived from adjacent natural surfaces. Determination of the composition of the dust (e.g. local soil or tailings) would support the study and assist in apportioning the dust present to the correct source.

7.2 Landform evolution model

The conclusions of the existing landform evolution model could be supported by:

- Sensitivity analysis of the hydrological parameters, with the aim to demonstrate that the impoundment area of the closure TSF topography is able to store all the required sediment and runoff for a wide range of parameter values.
- Targeted field-based erosion measurements of the colluvium, a non-active tailings surface, and the rock-armoured embankment. The aim of this is to support the findings that the:

- Erosion rate of the colluvium is consistent with (not necessarily exactly the same) the modelled values.
- Erosion of the tailings will result in only minor gully erosion.
- Erosion rates of the rock-armoured embankment is very low (possibly so low as to be not practically measurable).

The targeted field-based erosion measurements could be made by the establishment of trial areas from which erosion rates are periodically measured. Such a trial would need to operate for a 3-5 year period with an assessment of erosion occurring every year. Shorter trials in arid environments are at risk of not yielding useful data due to a lack of rainfall and runoff events.

The trial areas would need to be sufficiently large to ensure the range of erosion processes (sheet, rill, gully erosion) are captured. An area that is at least 30 m long (longer is better) and 20 m wide is suggested. Triplicate areas of this size are ideal. For the colluvium, an area just upslope of the tailings surface could be considered, for the tailings, an area towards the bottom of the beach may be accessible. For the TSF embankment, a section positioned at the longest slope length could be considered.

Erosion measurements could be made by comparing sequential high resolution Lidar or drone digital elevation data pickups of the trial areas. This would provide an estimate of the eroded volume (noting that some accretion of sediment may occur via in-blown dust) that can be converted to a rate (t/ha) using a measure of bulk density.

The trial would need to be coupled with a rainfall record that records rainfall on a 1-minute or 5-minute time scale. This is to allow for calculation of rainfall depths and rainfall erosivity values during the trial period. This can be used to scale the erosion results to be representative of long-term erosion rates. Without this, a trial period with low rainfall/erosivity would underestimate long-term erosion rates, and a period with high rainfall/erosivity would overestimate long-term erosion rates.

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APPENDIX A: REVIEWER EXPERIENCE

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Curriculum Vitae of Evan Howard



Qualifications

Bachelor of Engineering (Environmental)
University of Southern Queensland

Certified Professional Soil Scientist (CPSS)
Soil Science Australia

Position

Principal Environmental Consultant, Managing Director

Summary of Experience

Evan is an Environmental Engineer and Certified Professional Soil Scientist with over 25 years' experience in land management related issues. He specialises in soil and mineral waste characterisation, land rehabilitation planning, erosion and landform evolution modelling, mining landform design, rehabilitation auditing and assessment, irrigation water use efficiency assessments, and mining landform cover modelling.

Evan has contributed to minesite rehabilitation on numerous sites across Australia (WA, QLD, NSW, SA, VIC, and NT), west and southern Africa, North America and South America. He has completed many soil and land projects for the mining, agriculture, and urban development sectors, and is involved in land use planning activities for many mining companies.

Evan has assessed erosion potential and designed and assisted in designing stable waste landforms on numerous sites across Australia and internationally. He has performed and managed several broadscale soil surveys for the mining and urban development sectors for sites across Australia, and has been involved in mine planning and closure activities for several large and mid-sized mining companies in Western Australia. Evan is also able to model solute and water movement through constructed soil profiles, and has assisted several sites in assessing risks associated with capillary rise of salts from saline wastes, percolation of water to depth through waste landforms, and vegetation water use requirements from constructed soil profiles.

Relevant Experience

- Technical land rehabilitation advice for many sites, including BHP and Anglo American coal mines in QLD, Yancoal coal mines in WA, BHP, Fortescue, Rio Tinto, and Roy Hill Pilbara iron ore mines, Min Res sites in WA, and Anglo American diamond and metalliferous mines Africa and South America.
- Development of landform rehabilitation designs for numerous sites. Locations include central QLD, the Pilbara, south-west WA, arid lands of WA, NT, western NSW, and South Australia. Commodities include coal, iron ore, gold, copper, nickel, diamond, and mineral sands.
- Planning and participation in numerous land surveys for large mining developments including Gudai-Darri, Solomon, and Christmas Creek.

- Co-author of a book chapter titled *Material characterisation: avoiding unnecessary costs and failure*, in the Australasian Institute of Mining and Metallurgy's 'From start to finish: a life-of-mine perspective'.

Selected Publications

- Howard, E.J. and Loch, R.J. (2019) Acceptable erosion rates for mine waste landform rehabilitation modelling in the Pilbara, Western Australia, Proceedings of the 13th International Conference on Mine Closure, Australian Centre for Geomechanics, Perth.
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Professional history

Landloch Pty Ltd, January 2005 - present
Evan has been a Principal Consultant and Director of Landloch since 2008.

University of Southern Queensland, 2000 - 2005
Evan undertook applied research in the field of irrigation science and soil physics on behalf of the National Centre for Engineering in Agriculture. His main project focused on water use efficiency improvements for the Queensland horticultural industry.

APPENDIX B: CARRAPATEENA RAINFALL

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Rainfall (and the runoff that it produces) is a key driver of surface water erosion. Therefore, observations of surface water erosion made at the Carrapateena TSF must be made in the context of the rainfall that has occurred during the period during which the TSF has existed.

Daily rainfall data for the period 1 January 2020 to 17 November 2025 from the TSF Automatic Weather Station were compared against measured data from nearby weather stations controlled by the Bureau of Meteorology (BoM). The nearest BoM sites to Carrapateena are located at:

- Woomera Aerodrome (station 16001), ~68 km west of site, with data from 1965-2026 (2026a), and
- Andamooka (station 16065), ~96 km west-north-west of site, with data from 1949-2026 (BoM 2026b)[3].

Mean annual rainfall for Carrapateena for the period 2020-2025 was 181 mm. This is similar to the mean annual rainfall for Woomera Aerodrome (184 mm) and Andamooka (188 mm).

Mean monthly rainfall for Woomera Aerodrome and Andamooka are relatively consistent throughout the year, ranging from 12.6–18.4 mm (average 15.3 mm) for Woomera Aerodrome and ranging from 11.1–21.4 mm (average 15.7 mm) for Andamooka. Mean monthly rainfall for Carrapateena is more variable, ranging from 3.1–34.4 mm (average 15.2 mm). The greater variability is explained by the shorter period of measurement (6 years) at Carrapateena. Rainfall records greater than ~20 years are commonly needed in order for the variability in calculated averages to stabilise.

The 90th percentile daily rainfall ranges from 28.5–52.8 mm for Woomera Aerodrome and 30.8–65.4 mm for Andamooka. The 90th percentile daily rainfall for Carrapateena ranges from 3.9–30.0 mm, indicating that the largest daily rainfall events that have occurred at site are smaller than the longer observed records at nearby stations.

It was concluded that although average annual and monthly rainfall at Carrapateena for the period 2020-2025 is consistent with long-term average values for nearby observations (allowing for variability due to the short length of record), the observed daily rainfall events have been generally smaller. Smaller daily rainfall events are likely to have lower rainfall erosivity values (erosive energy of rainfall). Therefore, the observed erosion that has occurred to date may be an underestimate of the erosion that may occur in the long-term when a greater number of larger rainfall events have occurred.

That said, it is important to note that the landform evolution modelling work undertaken for the TSF did not utilise the shorter rainfall record for Carrapateena discussed here. Rather, it used a long record (133.5 year) of processed (gap filled) data based on observed data supplied by the BoM.

[3] Woomera Aerodrome: https://reg.bom.gov.au/climate/averages/tables/cw_016001.shtml; Andamooka: https://reg.bom.gov.au/climate/averages/tables/cw_016065.shtml

BHP