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APPENDIX 1

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Year	Updated Monitoring Locations 2024	Assessment Goal LA10 Q1 & Q2 2024	Assessment Goal LeAQ 15min Q3 & Q4 2024	Estimated contribution Q1 (LA10)	Estimated contribution Q2 (LA10)	Estimated contribution Q3 (LeAQ 15min)	Estimated contribution Q4 (LeAQ 15min)	Description	Residential Property
2014	P1		53	46/7	47	<60	47	Remembrance Driveway (School Entrance Road)	No
2015				<53	<54	<47	55/6		
2016				<50	<50	<50	<46		
2017				53/4	55/7	56/7	53/3		
2018				48/9	50/1	<45	<46		
2019				<53	<56	<56	<48		
2020				<48	<46	<48	<45		
2021				<49	<56	<48	<60***		
2022				<52***	<53***	<50***	<50***		
2023				<50***	<52***	<57***	52/3***		
2024				53/4***	52/3***	51**	53**		
2014	P2	45	N/A^	<44	<47	<45	<42	Olive Lane (End of Cul-de-sac)	Yes
2015				<48**	<47	<42	44/5		
2016				44/5	<40	<45	<45*		
2017				<45**	<47**	<47	<45*		
2018				<47***	<47**	<44	<47***		
2019				<46***	<47***	<42**	<44		
2020				<46***	<44**	<46**	<45**		
2021				<45**	<45**	<45**	<51***		
2022				<47***	<50***	<45***	<44***		
2023				<44**	<44**	<52**	43/4**		
2024				46/7***	50/1***	49**	45*		
2014	P3	45	N/A^	<40	<40	<47	<40	Remembrance Driveway (Service Station)	Yes
2015				<40	<46	<42	<42		
2016				<40	<40	<45	<45*		
2017				<45**	<45**	<45	<40		
2018				<35	<35	<45	<40		
2019				<43**	<45**	<40**	<40		
2020				<44**	<45**	<35	<40		
2021				<45**	<45**	<42**	<48***		
2022				<45**	<45**	<44**	<40**		
2023				<42**	<44**	<50**(<35)	46/7**(<37)		
2024				46/7**(<35)	46/7**(<35)	47*	43*		
2014	P4	45 (37)	38	<35 (<35)	<43 (<35)	<38 (<35)	<30	Stratford Road	Yes
2015				<30	40/1 (-)	40/1 (-)	39/40 (-)		
2016				<35 (<35)	<50	<55	<45		
2017				<40** (<35)	<40** (<35)	<40 (<35)	<40 (<35)		
2018				<35	<37	<40	<40**		
2019				<35**	<37**	<39**	<39		
2020				<35	<39	<35	<40		
2021				<44**(<35)	<42(<35)	<40 (<35)	<42** (<35)		
2022				<40**(<35)	<43**(<35)	<44***	<40 (<35)		
2023				<44***(<35)	<44(<35)	<44***(<35)	44/5** (<37)		
2024				34/5 (<35)	42/3* (<35)	34	34*		
2014	P5	45 (37)	N/A^	<35	<35	<35	<32	Rockford Road	Yes
2015				<33	32/3(-)	<34	<35 (-)		
2016				<33 (-)	<30 (-)	<30 (-)	<40* (<35)		
2017				<35**(<35)	<35**(<35)	<37**(<35)	<37**(<35)		
2018				<35	<35	<35	<40		
2019				<35	<35	<35	<35		
2020				<35	<35	<35	<37**		
2021				<37 (<35)	<35 (<35)	<35 (<35)	<42 (<35)		
2022				<40**(<35)	<40**(<35)	<40**	<42** (<35)		
2023				<38**(<35)	<42**(<35)	<36**(<35)	<38**(<35)		
2024				<37/8** (<35)	<44/8* (<35)	N/A	35*		
2023	P6		35	<35	<35	<40 (<35)	<35 (<35)	Charles Point Rd Driveway Entrance	Yes
2024				<35 (<35)	<35 (<35)	35	34		
2023	P7		41	<44***	<40	<50***	<35	Remembrance Driveway (Garden Centre)	Yes
2024				<34/5	<45/6*	32	40*		

NOTES: # Ambient noise controlled by insects (2-5kHz)
 * Includes DECC INP +2dB(A) allowance (INP Section 11.1.3)
 ** Includes +2dB correction for low frequency noise (NPfI Table C.1)
 *** Includes +5dB correction for low frequency noise (NPfI Table C.1)
 () Noise Assessment Goal for REA
 ^Noise Agreement in place



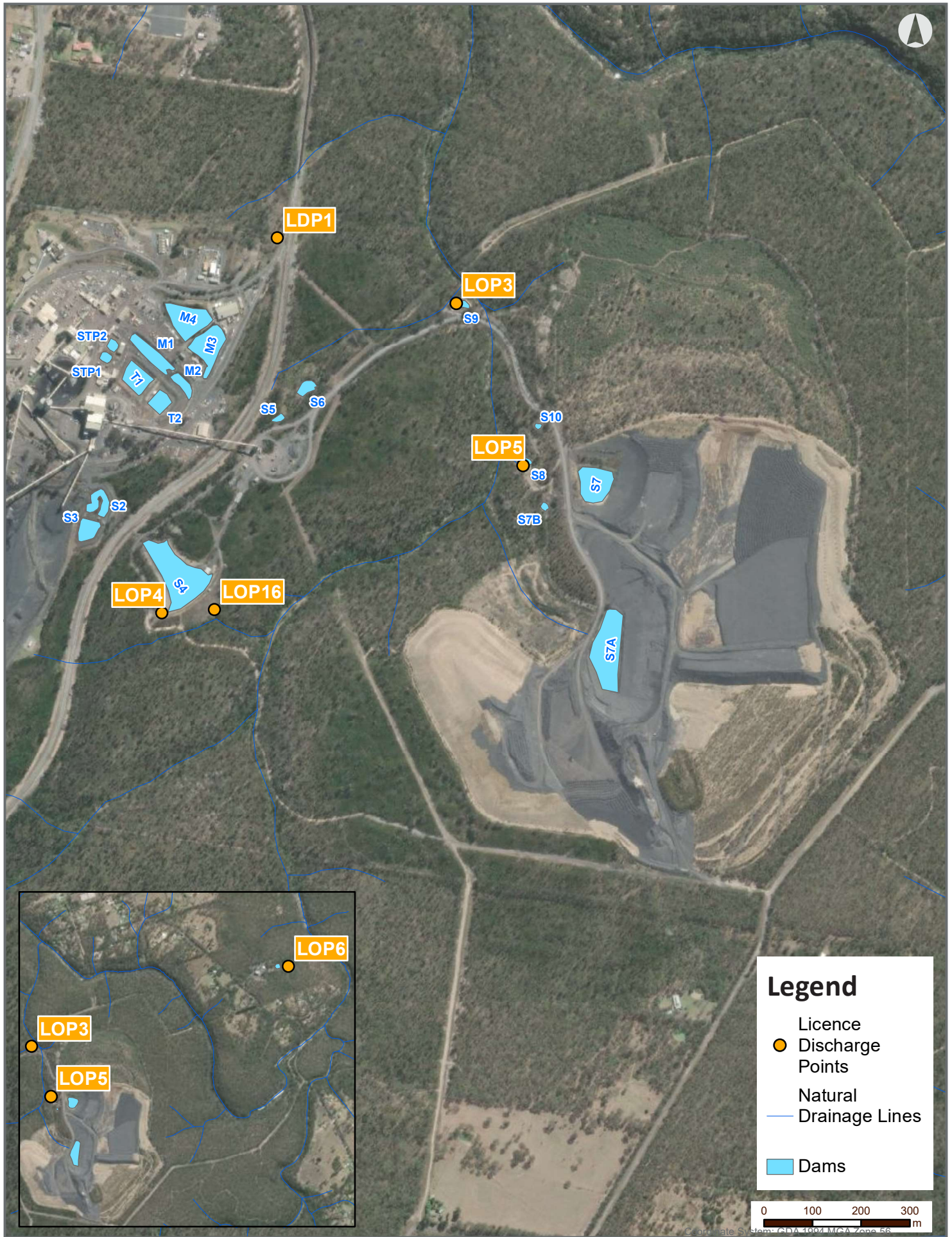
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Tahmoor Coal EPL Discharge and Overflow Points

Date: 17/01/2025

Data Sources:
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Estimated Water Volume				
Water Storage Name	Beginning 2024	End 2024	Capacity	Comments
M1	1.8ML	1.8ML	1.8ML	M series Dams act together to treat mine water pumped from Underground and stormwater, discharged via LDP1
M2	0.5ML	0.5ML	0.5ML	
M3	9.0ML	9.0ML	9.0ML	
M4	8.0ML	8.0ML	8.0ML	
M5	0.5ML	2.0ML	3.0ML	First settling Dam for No.2 Shaft Site area (stormwater)
M6	2.0ML	4.5ML	4.5ML	Second settling Dam for No.2 Shaft Site area (stormwater)
S2/S3	8.0ML	8.3ML	8.3ML	
S4	7ML	23ML	36.9ML	The Dam is designed to act as a retention basin with a controlled outlet. Discharges via overflow Point 4.
S5	0.3ML	0.5ML	0.5ML	Silt Trap only. Discharges to S6
S6	1ML	1.5ML	1.5ML	This Dam is designed to act as a retention basin with a controlled outlet.
S7	10ML	20ML	41.5ML	This is the main catchment for runoff from the REA. The dam is a retention basin during peak rainfall events. All water is pumped into Dam S4 via S9.
S7A	10ML	12ML	12.0ML	These Dams are designed to act as retention basins with a controlled outlet to S7 Dam.
S7B	0.2ML	1.0ML	1.0ML	
S8	1.5ML	1.8ML	4.5ML	Dam retains overflow from S7b. Pumps to Dam S9. Discharges via LOP5.
S9	0.15ML	0.16ML	0.4ML	Silt trap only for sealed Haul road. Wet well pumps to Dam S4. Discharges via LOP3.
STP1	590KL	590KL	590KL	Treated effluent overflows to M1 Dam.
STP2	590KL	590KL	590KL	
Tank No.1	250KL	250KL	250KL	Underground potable water supply
Tank No.2	250KL	250KL	250KL	Underground potable water supply



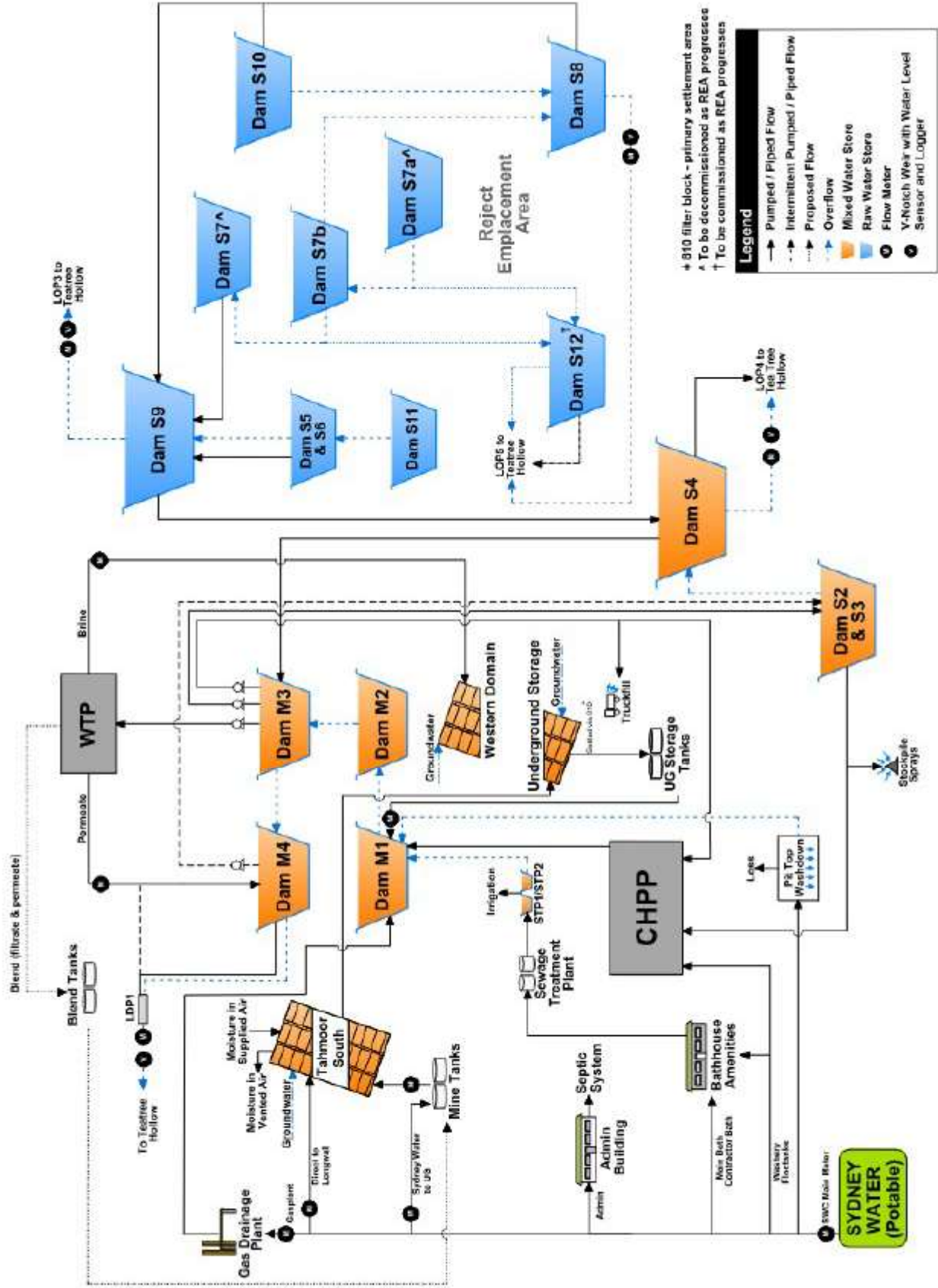
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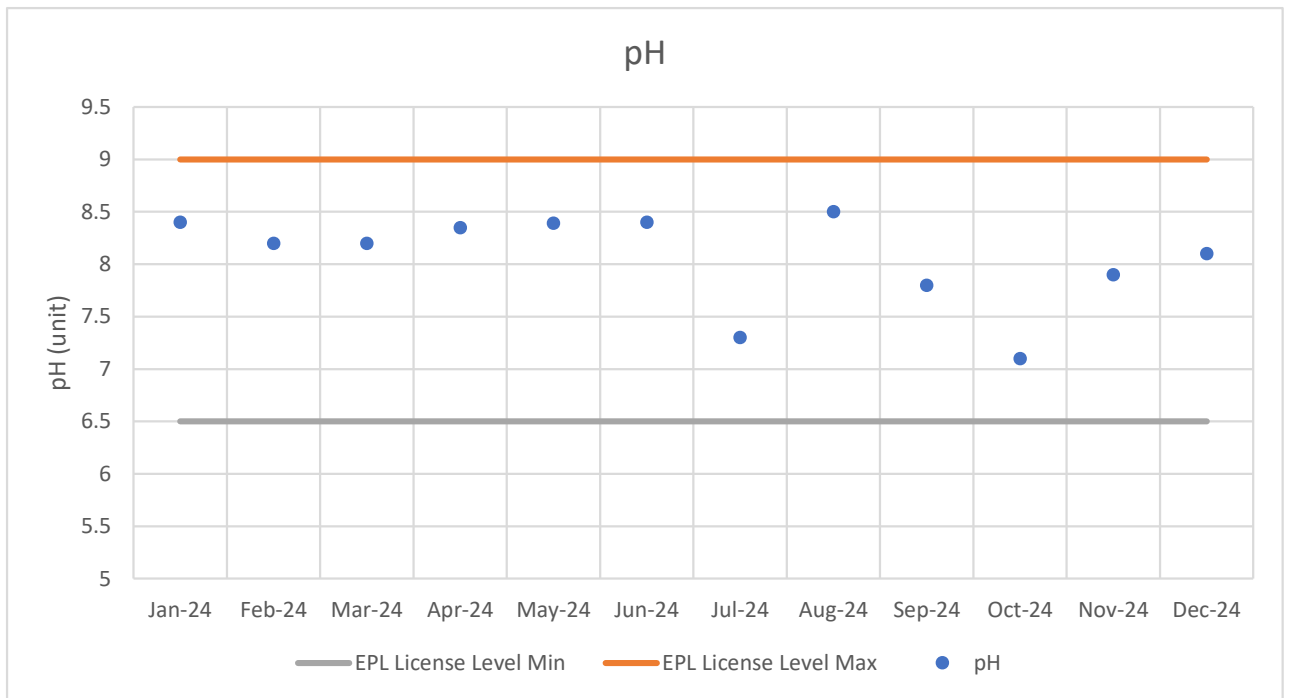


Figure 1 Monthly Compliance Monitoring of pH at LDP1 for the reporting period.

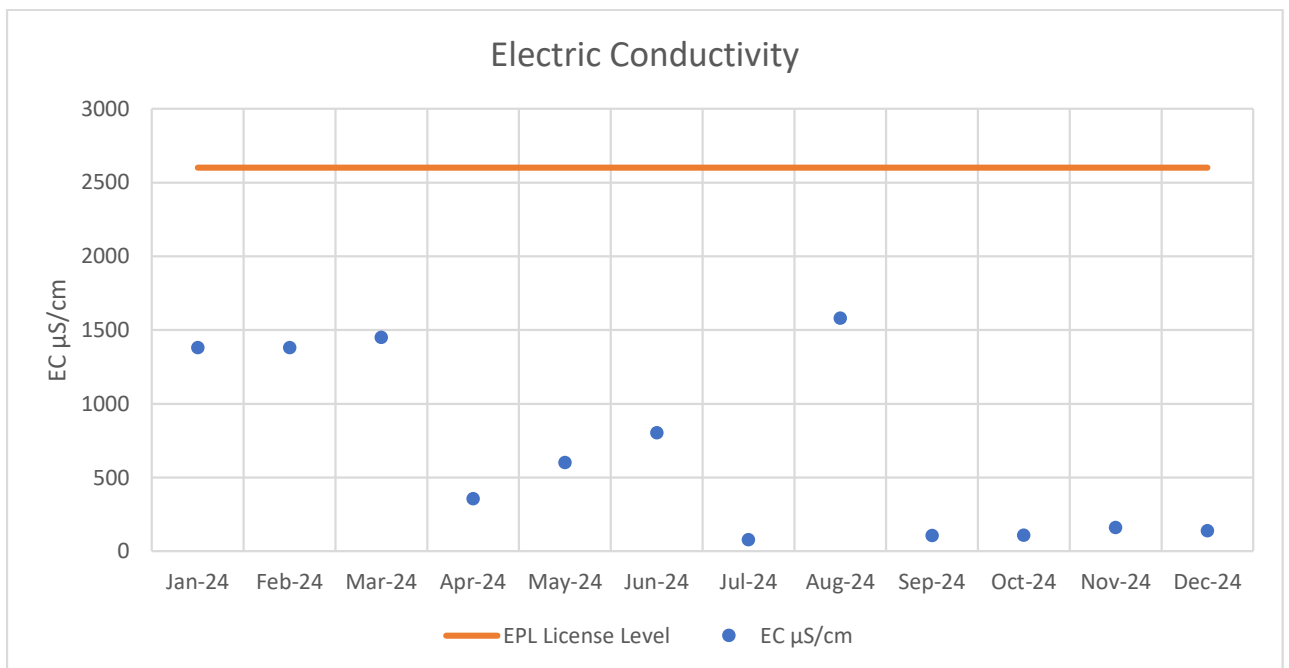


Figure 2 Monthly Compliance Monitoring of EC at LDP1 for the reporting period.

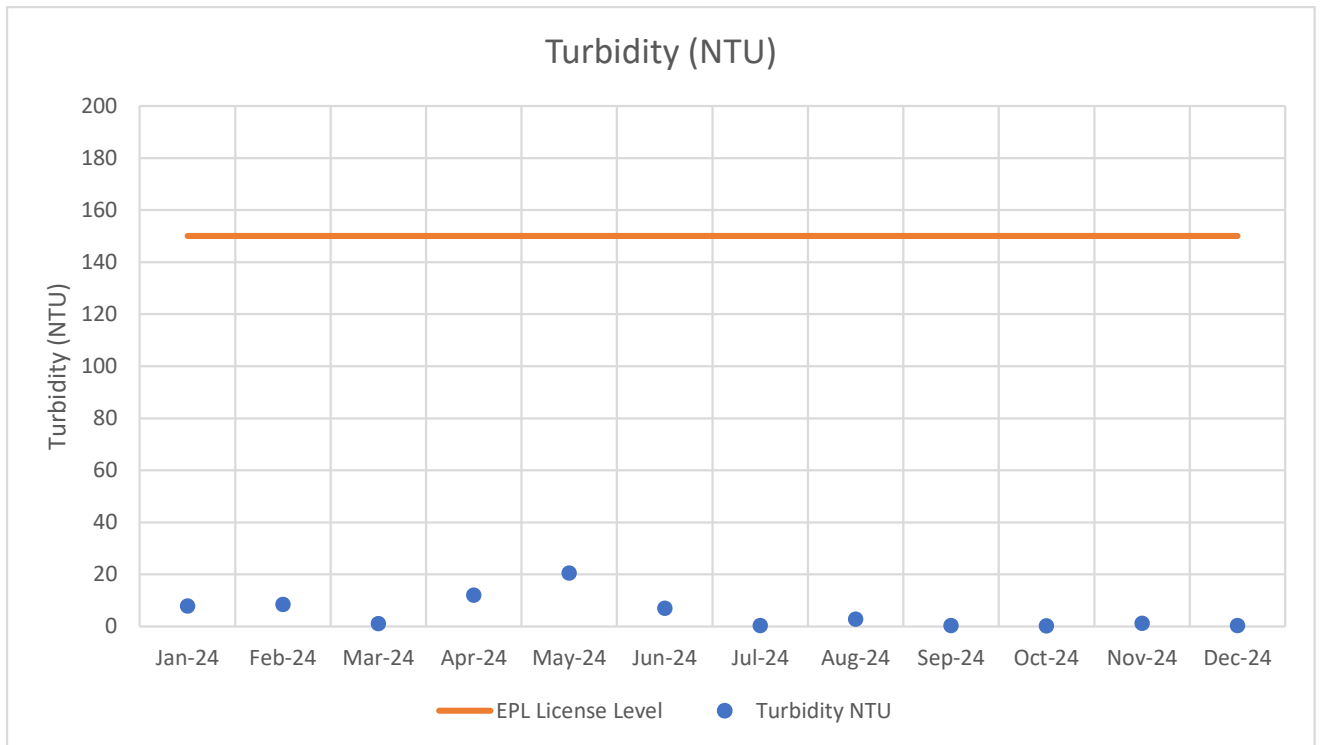


Figure 3 Monthly Compliance Monitoring of Turbidity at LDP1 for the reporting period.

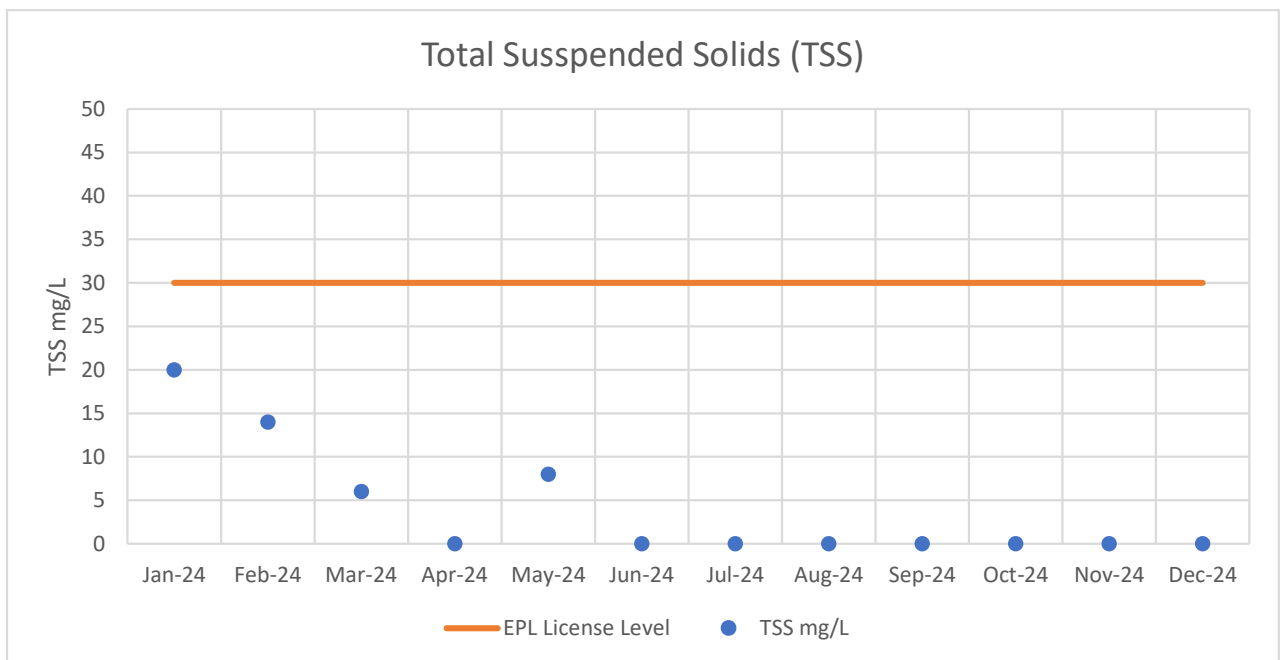


Figure 4 Monthly Compliance Monitoring of Total Suspended Solids at LDP1 for the reporting period.

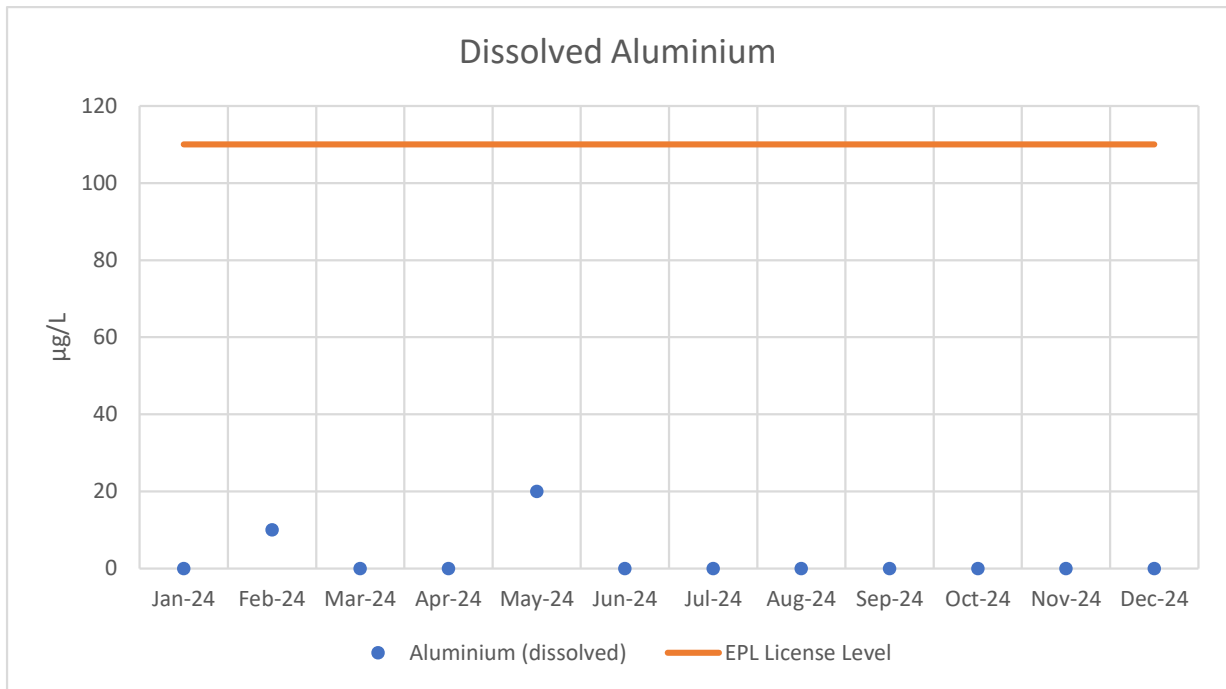


Figure 5 Monthly Compliance Monitoring of Dissolved Aluminium at LDP1 for the reporting period.

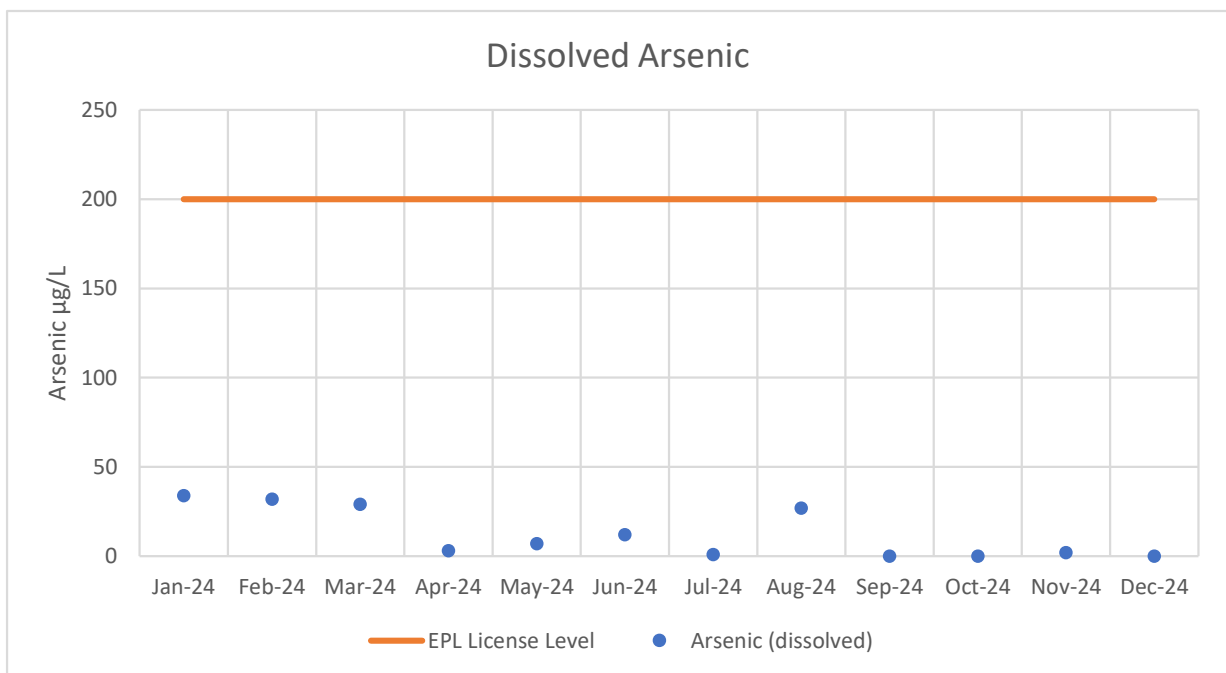


Figure 6 Monthly Compliance Monitoring of Arsenic at LDP1 for the reporting period.

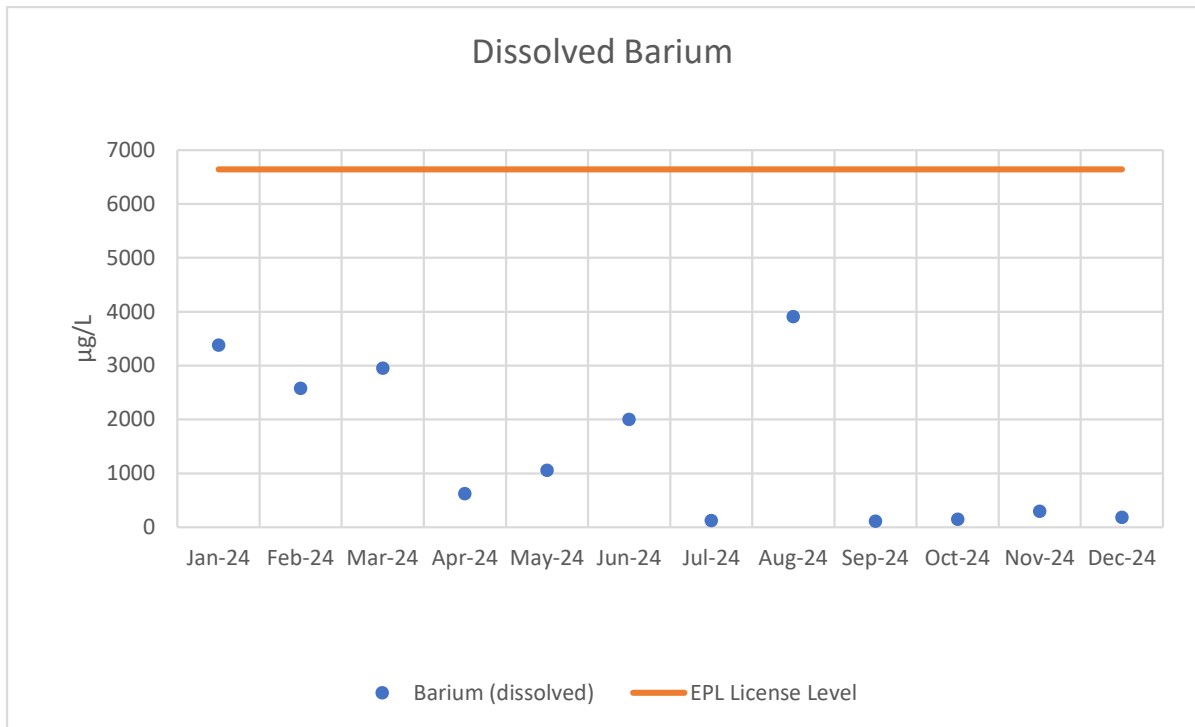


Figure 7 Monthly Compliance Monitoring of Dissolved Barium at LDP1 for the reporting period.

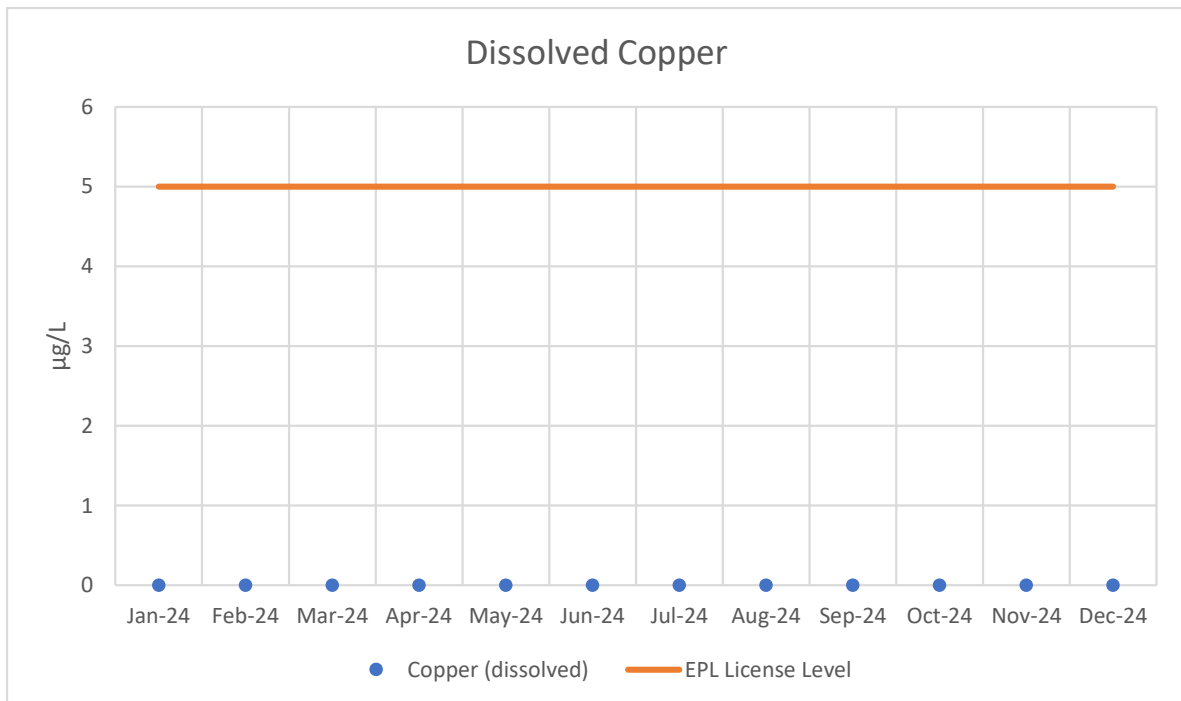


Figure 8 Monthly Compliance Monitoring of Dissolved Copper at LDP1 for the reporting period.

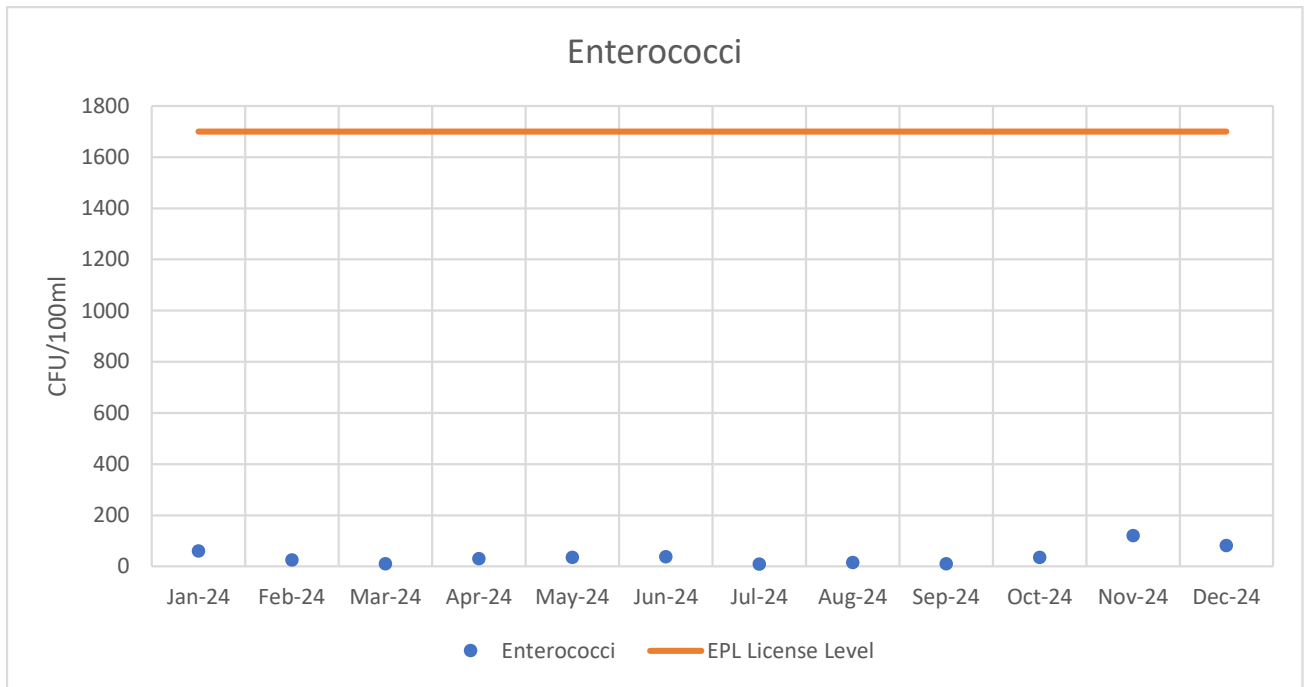


Figure 9 Monthly Compliance Monitoring of Enterococci at LDP1 for the reporting period.

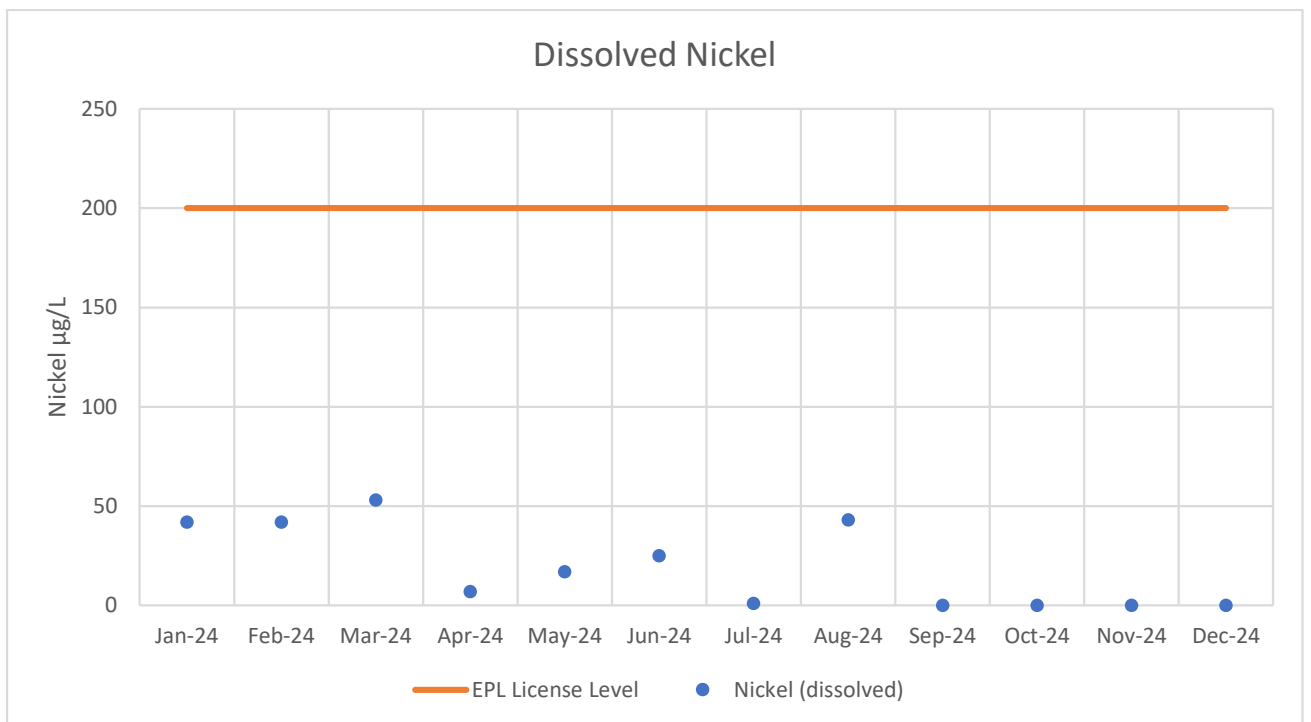


Figure 10 Monthly Compliance Monitoring of Nickel at LDP1 for the reporting period.

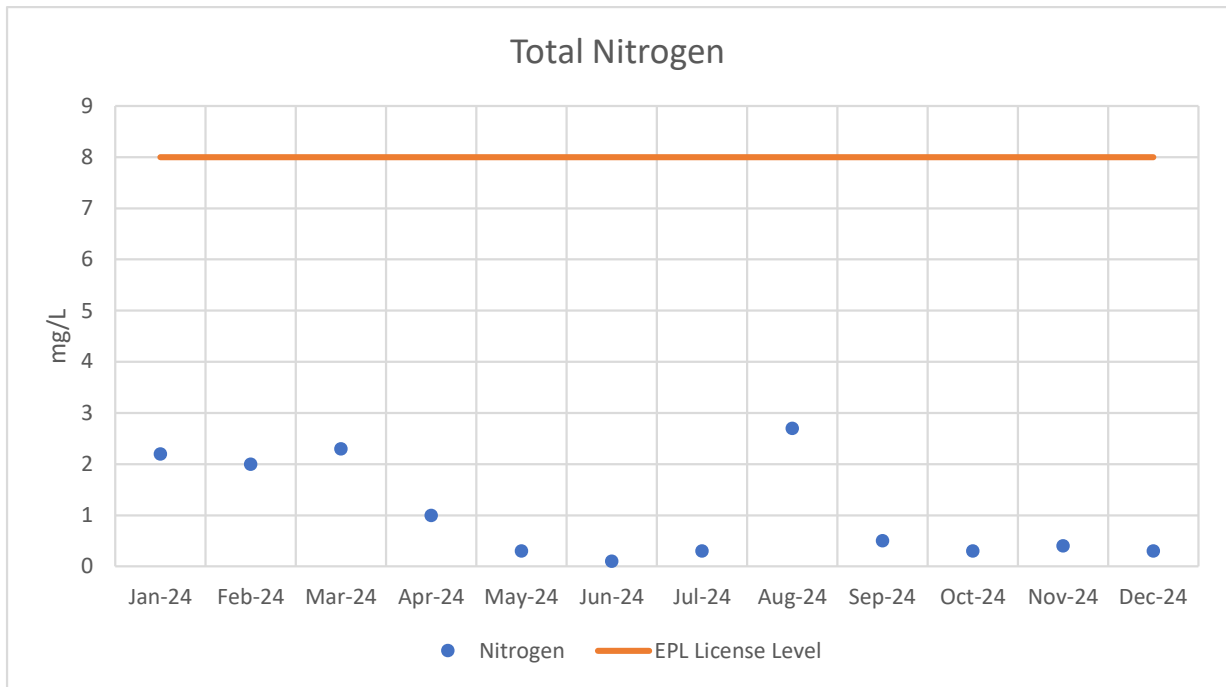


Figure 11 Monthly Compliance Monitoring of Nitrogen at LDP1 for the reporting period.

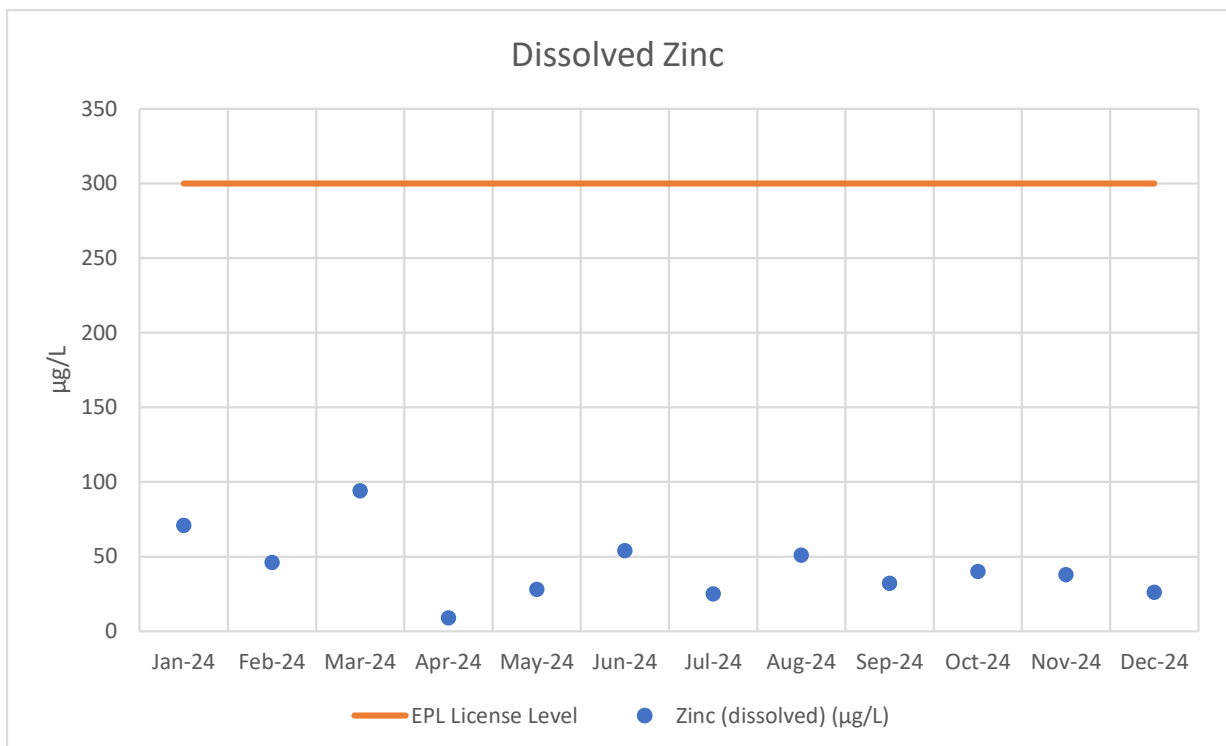


Figure 12 Monthly Compliance Monitoring of Dissolved Zinc at LDP1 for the reporting period.



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		Well Name Sample Name	Pit Top											Pit Top 4										REAI				REA2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
			Pit Top 1					Pit Top 2						Pit Top 4					REAI				REA2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
			8/02/2024	5/06/2024	2/09/2024	5/12/2024	8/02/2024	5/06/2024	2/09/2024	5/12/2024	8/02/2024	5/06/2024		2/09/2024	5/12/2024	8/02/2024	5/06/2024	2/09/2024	5/12/2024	8/02/2024	5/06/2024	2/09/2024	5/12/2024																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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REA																																
REA3														REA4				REA5				REA6				REA7						
REA3				REA4				REA5				REA6				REA7																
3/12/2024	8/02/2024	5/06/2024	2/09/2024	3/12/2024	8/02/2024	6/03/2024	6/06/2024	2/09/2024	3/12/2024	7/02/2024	5/06/2024	2/09/2024	3/12/2024	8/02/2024	5/06/2024	2/09/2024	3/12/2024	8/02/2024	5/06/2024	2/09/2024	3/12/2024	8/02/2024	5/06/2024	2/09/2024	3/12/2024	8/02/2024	5/06/2024	2/09/2024	3/12/2024			
31.32	35.78	35.36	34.22	36.03	36.1	35.92	35.28	34.77	35.74	1.82	1.74	1.85	1.52	38.57	38.26	38	38.41	25.85	23.46	25.6	23.46	25.6	23.46	25.6	23.46	25.6	23.46	25.6	23.46	25.6		
-	35.78	35.36	-	-	36.1	35.92	35.28	-	-	1.82	1.74	-	-	38.57	38.26	-	-	25.85	23.46	-	25.85	23.46	-	25.85	23.46	-	25.85	23.46	-	25.85		
55.01	39.56	39.83	39.95	39.75	53.53	53.71	54.55	53.91	54.00	7.10	7.41	7.34	7.45	40.50	40.36	41.26	40.62	38.31	38.28	38.37	38.32	38.31	38.28	38.37	38.32	38.31	38.28	38.37	38.32	38.31		
-	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve	Hydrasleeve		
1	1	2	1	1	1	1	2	1	1	1	2	1	1	1	2	1	1	1	1	2	1	1	2	1	1	1	2	1	1	1		
187.8	325	167	474	585	186	197	396	396	448.5	270	193	230	162	890	845	962	915	225	212.55	247	215.8	247	215.8	247	215.8	247	215.8	247	215.8	247	215.8	
1.07	1.64	3.89	8.11	0.74	1.36	1.86	1.86	1.86	2.63	2.16	5.57	9.91	2.67	1.22	2.91	1.45	1.45	2.74	4.45	10.37	1.15	4.45	10.37	1.15	4.45	10.37	1.15	4.45	10.37	1.15	4.45	
288	499	256	724	818	287	304	487	605	620	414.00	297	354	250	1373	1298	1483	1414	347	326	381	331	347	326	381	331	347	326	381	331	347	326	
6.84	6.05	6.83	5.67	6.51	6.44	6.74	6.3	5.84	6.19	6	6.05	5.37	3.99*	5.67	5.9	5.77	6.32	7.58	7.03	6.7	7.58	7.03	6.7	7.58	7.03	6.7	7.58	7.03	6.7	7.58	7.03	
291.1	185	56	184	104.1	285	12	105	182	34.1	212	251	211.0	211.0	199	3	94	22.8	267	4	89	23.2	4	89	23.2	4	89	23.2	4	89	23.2	4	
19.2	17.3	16.6	16.4	20.4	17.90	18.80	16.40	17.3	19.6	17.60	16.70	15.50	18.90	17.90	17.10	17.20	19.30	19.5	17.8	17.7	20.8	17.7	20.8	17.7	20.8	17.7	20.8	17.7	20.8	17.7	20.8	
35	23	26	26	23	29	34	29	29	25	4	3	4	2	20	11	16	18	5.6	3	10	11	3	10	11	5.6	3	10	11	3	10	11	
4	5	5.6	7.8	5	14	15	15	14	14	3	3	3	3	11	4	5	6.3	30	33	28	16	33	28	16	30	33	28	16	33	28	16	
12	11	17	23	15	14	14	54	35	45	41	39	40	31	210	220	200	260	39	45	36	21	45	36	21	39	45	36	21	45	36	21	
2	3	4	5.1	3	2	2	6.7	5	5.5	6.7	6.3	6.5	4	15	17	19	18	1	0.6	2	1	1	0.6	2	1	1	0.6	2	1	1	0.6	
97	68	81	85	71	80	94	100	91	86	38	33	35	22	110	97	120	120	18	10	32	32	18	10	32	18	10	32	18	10	32	18	
<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		
120	65	82	74	74	120	120	92	100	87	18	14	15	9	140	140	130	110	120	130	130	95	120	130	130	120	130	130	130	120	130	130	
120	65	82	74	74	120	120	92	100	87	18	14	15	9	140	140	130	110	120	130	130	95	120	130	130	120	130	130	130	120	130	130	
8	6	4	7	6	5	5	7	10	11	10	11	10	10	41	44	45	46	27	31	34	28	41	44	45	27	31	34	28	41	44	45	
8	87	38	80	66	12	13	68	78	100	99	77	78	48	310	310	320	320	6	6	7	4	310	320	320	6	6	7	4	310	320	320	
-5	-33	-5	-14	-23	-4	-1	10	-9	-10	-12	-4	-1	3	-1	-3	-6	6	-4	-7	-8	-14	-4	-7	-8	-14	-4	-7	-8	-14	-4	-7	
0.7	0.5	0.4	0.5	0.6	0.8	0.7	0.3	0.3	0.2	0.4	0.4	0.7	0.8	0.3	0.1	0.7	0.1	0.8	0.7	0.5	0.7	0.1	0.8	0.7	0.5	0.7	0.1	0.8	0.7	0.5		
0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1	0.1	0.1	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.4	0.3	0.2	0.2	0.1	0.4	0.3	0.2	0.2	0.1	0.4	
10	11	5	3	6	7	11	3	1	3	6	2	5	4	5	2	<1	6	3	3	2	6	3	3	2	6	3	3	2	6	3	3	
0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	0.06	0.07	0.07	0.06	0.06	<0.05	0.07	0.05	<0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
2300	310	490	640	680	410	490	260	490	1000	1200	1200	1200	1200	520	820	500	1400	530	1100	850	340	530	1100	850	340	530	1100	850	340	530	1100	
3	2	3	3	2	<1	<1	1	<1	2	1	2	2	2	<1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
39	48	64	66	78	51	58	70	78	89	100	100	83	69	88	93	83	89	25	35	35	34	89	25	35	35	34	89	25	35	35	34	
2	5	6	10	7	2	2	8	10	13	17	16	12	8	33	34	42	38	<1	2	2	<1	2	2	2	<1	2	2	2	2	<1	2	
6	5	4	4	8	4	4	3	3	5	5	2	4	5	3	1	2	2	4	5	6	4	3	2	4	5	6	4	3	2	4	5	
3200	3	2	7600	5900	11	2000	2	9900	14000	6	6	18000	7900	29	2	25000	23000	70	2	1500	730	70	2	1500	730	70	2	1500	730	70	2	1500
2	360	4	5	4	75	11	11	13	14	1000	6	6	4	2100	28	29	29	27	75	45	45	27	75	45	45	27	75	45	45	27	75	
330	6	430	660	470	5	64	570	820	1200	18	1200	710	460	26	2000	2100	2300	4	74	83	29	4	74	83	29	4	74	83	29	4	74	
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APPENDIX 7

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2024 Annual Rehabilitation Walkover

Refuse Emplacement Area



Document tracking

Project Name	Tahmoor Coal Pty Ltd Rehabilitation Monitoring 2024
Prepared by	Natalie Brumby
Version Number	1.0
Status	Final

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Abbreviations

Abbreviation	Description
REA	Refuse Emplacement Area

1.0 Introduction

Tahmoor Coal has undertaken the Annual Rehabilitation Walkover for 2024 of the 9 rehabilitated areas located within the Refuse Emplacement Area (REA) of Tahmoor Coking Coal Operations in Tahmoor.

Ecological Australia Pty Ltd has completed the work for the permanent monitoring plots in Appendix B.

The rehabilitation monitoring was undertaken in accordance with the Tahmoor Coal Rehabilitation Management Plan (TAH-HSEC-00402), Rehabilitation Strategy (TAH-HSEC-00401) and Rehabilitation Monitoring procedure (TAH-HSEC-00012). This report and its Appendices document the results for 2024. This is completed by the following:

- An annual walkover inspection of all areas within the Refuse Emplacement Area (REA) where rehabilitation activities have been completed including newly established revegetation (Appendix A); and
- Monitoring of permanent monitoring sites within mine closure Domain 3 within the REA (see **Figure 1**) that have been established in each development stage to assess revegetation progress (Appendix B).
- Monitoring of Grass Trials established with in older sections of revegetation to consider the efficacy of planting and/or seeding with native grasses to increase native vegetation cover and increase organic matter in the soil profile, in patches with limited vegetation (Appendix A).

These guidelines state:

“The objective of this monitoring is to evaluate progress of rehabilitation towards fulfilling long term land use objectives, such as the development towards a self-sustaining ecosystem.”

1.1 Background

Rehabilitation of vegetation within the REA has been carried out since 1993, as each stage of the refuse emplacement was constructed. The permanent monitoring sites program began in 2010 with the establishment of two permanent plots within each existing section of the REA and two reference site plots within relatively undisturbed native vegetation nearby of the same Plant Community Type. As each stage of the REA was completed permanent plots have been established following revegetation. In addition, further plots were established in areas greater than four hectares to address the recommendations for native vegetation monitoring provided in the Rehabilitation Strategy. In future, in

accordance with monitoring guidelines, additional permanent plots will be installed as each area of revegetation within the REA reaches an age of 5 years from planting.

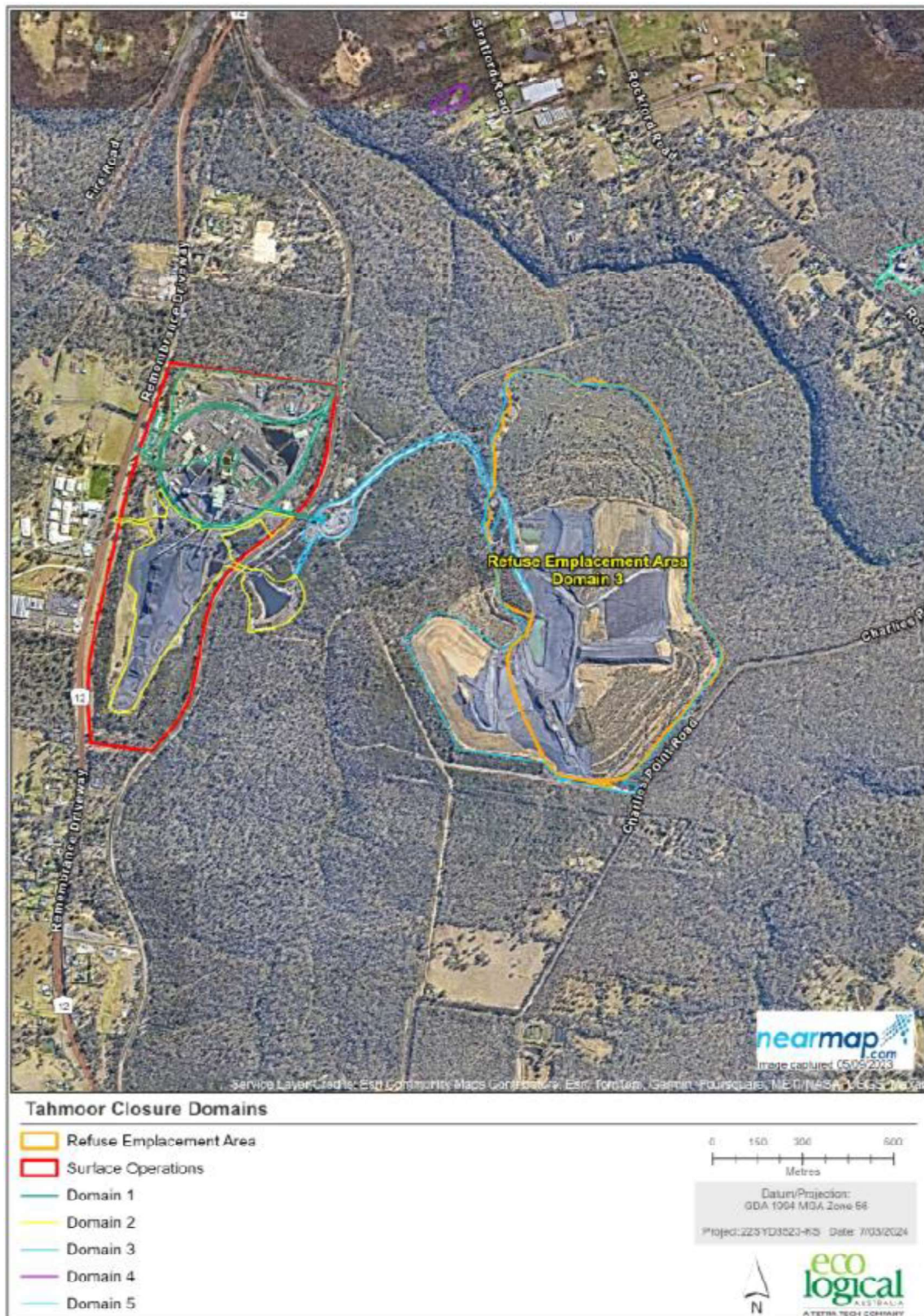


Figure 1 – Tahmoor Coal surface operations and refuse emplacement area.

2.0 Methodology

Monitoring of permanent sites in the rehabilitation areas provides information regarding changes in both vegetation growth, senescence, colonisation and species diversity. In addition, indication of the success of the rehabilitation is gained through comparison of both vegetation structure and species composition with the reference sites monitored in nearby bushland. Methods for measuring these values include:

- Detailed species counts and cover within 2 m x 2 m nested quadrats;
- Species diversity within 2 m x 2 m nested quadrants;
- Canopy cover;
- Growth rates of trees via Diameter at Breast Height (DBH) measurement;
- Reproductive potential, progress within a 20 m x 10 m plot; and
- Photographic monitoring of plots is also implemented.

The walkover inspection records details across each stage and includes information on the following factors:

- evidence of soil profile development and visual assessment of surface materials;
- evidence of erosion and stability, and function of erosion and sediment control structures
- growth rates and evidence of plant mortality or dieback
- species diversity including identification of target species
- presence of over-storey, midstorey and understorey species
- evidence of reproductive potential
- evidence of biological nutrient cycling
- occurrence of potholing or slumping and evidence of spontaneous combustion
- evidence of contamination or other limitations to vegetative establishment.

Native grass species have been trialed via direct seeding, in areas where the existing vegetation within established revegetation areas was sparse. These grass planting trials were monitored to review the survival and growth of planted species.

More detailed presentation of the monitoring results is included in the appendices:

- Appendix A - Monitoring 2024 – Mine Closure Domains 1 – 5 Permanent Sites; and
- Appendix B - Monitoring 2024 - Annual Walkover – Refuse Emplacement Area and No. 2 Shaft Power Corridor.

These appendices include collated details of the recorded monitoring results, the collected field data sheets, and monitoring photographs.

3.0 Results

3.1 Previous Monitoring Results

Revegetation across the REA was highly variable with some sections approximately 31 years old and others newly established with seeding carried out 24 months prior to monitoring. The native species included in the revegetation mix also varies, in both diversity and structural representation, between those areas revegetated prior to 2006 and those revegetated more recently.

Characteristics of sections revegetated prior to 2006 include (Stages 1-5, 6 & 9):

- Canopy species including Eucalyptus species, Angophora species and Allocasuarina littoralis (Black She-oak) providing canopy cover ranging from good to limited, heights up to 10 m and exhibiting good growth. Second generation A. littoralis were common near mature plants, with other canopy species second generation plants beginning to appear.
- Smaller tree species including Acacia decurrens (Black Wattle) and Acacia binervia (Coast Myall) were also regenerating with second generation individuals present.
- A midstorey that varied from dense stands of Kunzea ambigua (Tick Bush) or the non-local species Leptospermum laevigatum (Coast Teatree) to scattered Acacia species interspersed with other less abundant native species.
- Highly effective weed control actions reduced weed cover where extensive stands of the weed Andropogon virginicus (Whiskey Grass) and smaller populations of Eragrostis curvula (African Lovegrass) were present and excluded all other species. Weed cover was generally low with weed control providing good on-going results.
- Increasing colonisation by native grasses with cover increasing annually in most areas, including where exotic grasses have been controlled.
- Vegetation was dominated by Acacia species, many of which are senescent or in some sections mixed native vegetation that is not representative of the local native plant communities. Senescent Acacias becoming less common.
- Good species diversity including target species of nearby remnant vegetation; however, many species had a low abundance.

- All species exhibited signs of good reproduction potential including the threatened species, *Persoonia bargoensis* and *Grevillea parviflora* subsp. *parviflora* (Small-flower Grevillea).

Characteristics of sections revegetated in 2007 (Stage 8):

- originally planted with pasture species as a stabiliser, and was still dominated by exotic grasses in 2016;
- trial of reseeded using the soil amelioration product OGM proved not suitable for the REA;
- very limited cover by native species, both target and non-target;
- scattered patches of native grasses with good cover prior to 2017;
- revegetation and rehabilitation measures were ceased in 2023 with area stripped and re-emplaced;
- Stage was re-capped with topsoil and seeded in September 2023.

Characteristics of sections revegetated post 2010 (Stages 12a, 14 & 16 and No.2 Shaft 11KV Power corridor) are:

- generally good germination rates on level areas with species from all strata represented;
- germination more variable on slopes but still adequate;
- growth rates moderate to very good; and
- limited weed populations.

3.2 Monitoring Results in 2024

Erosion Controls

Erosion control structures, which were implemented in 2019, remain in good condition and no major erosion was recorded along the slopes of the REA. An area in Stage 1, where seepage affected vegetation growth, was rehabilitated with the ripping of the soil surface and mulching in 2018. This area continues to be in a good condition with no seepage evident in 2024. Nearby the seepage area, minor erosion has been recorded, this is shown on the boundary of Stage 1 in **Figure 2** below. Erosion has also been identified in Stage 9 on an access road from the Haul Road and in two (2) areas in Stage 17 (see **Figure 2**).

This should continue to be monitored and minor works required to rectify the erosion if required.

Grass Trials

Monitoring of grass trials was undertaken as part of the 2024 works. The fencing around most of the grass trials has been damaged by wildlife and will need to be remediated.

During 2024, weed coverage has decreased in Trial H and still remains the highest in grass cover when compared with all the other Trials. Trial E and F had the least grass coverage however good diversity in emerging seedling species. Trials A, B and C had good grass coverage with less species diversity. Low weed presence was noted for all trails during 2024 inspections.

There was an overall pattern of reduced cover and abundance of exotic species. This decrease in overall vegetative cover and species diversity may be a result of slightly drier and warmer than average temperatures.

Reference and Permanent Plot Monitoring

The reference plots and permanent monitoring plots which were burnt by fire in 2019 have recovered well and have a diversity and abundance of species similar to those species within the REA. There is continued evidence of nutrient recycling with termite mounds, ants and scats noted in those burnt plots. Litter cover has stabilised in these plots with grass, leaf litter and twigs recorded in all plots. Plot monitoring data is available in Appendix A.

Most reference and permanent monitoring plots recorded no major changes in vegetation quality and structure overall since 2023.

Overall, weed cover was low overall but has slightly increased or remained at closure criteria levels in some areas of the REA.

Additional characteristics and changes that were noted within the required monitoring plots include:

- overall good health recorded in canopy species, especially *Allocasuarina littoralis* (Black She-oak) which had many healthy juveniles;
- native species richness has increased across the REA and within the reference plots since 2023;
- structural complexity of the monitoring plots is continuing to develop, though does yet not meet closure criteria with many areas still lacking adequate canopy and ground cover;
- threatened flora species *Persoonia bargoensis* (Bargo geebung) was noted in all Stages of the REA and *Grevillea parviflora* subsp. *parviflora* (Small-flower Grevillea) was noted in Stage 6;

- biological nutrient cycling was recorded across the REA, including the presence of decomposing vegetation, lichens, termites, ants, cicadas, spiders, macropod scats and an *Pseudonaja Textilis* (Eastern Brown Snake);
- rabbit herbivory impact low, but evident in some areas; herbivory by native macropods was also present, particularly in Stages 3, 4 and 5;
- remnants of plastic tree guard waste was noted in Stages 3, 4 and 5;
- overall erosion control adequate.

Table 1 provides further details of the monitoring results from 2024 in comparison with results from earlier years and recommendations.

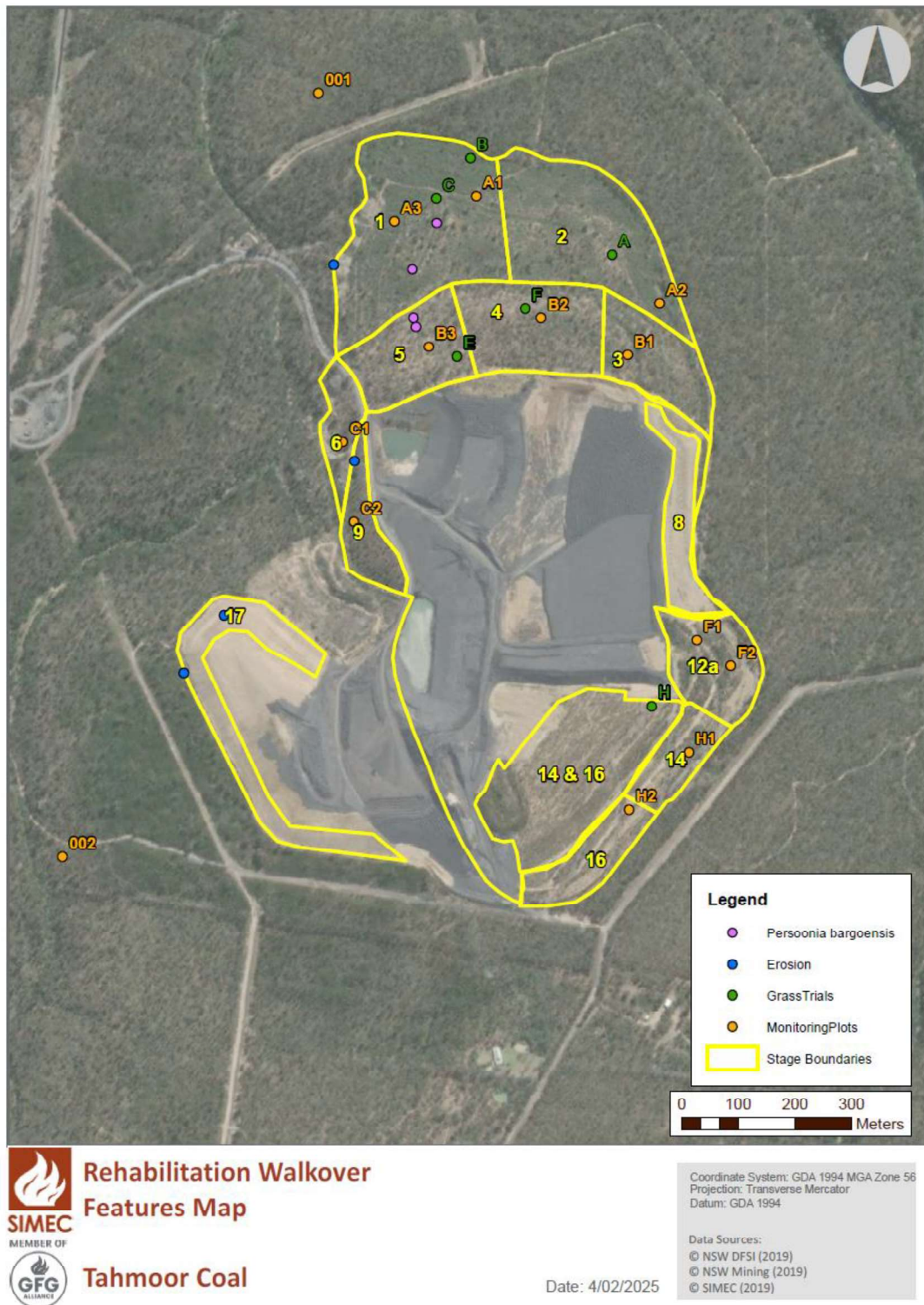


Figure 2 Rehabilitation Walkover Features Identified

Table 1: Key Monitoring Results

Key Characteristics	2023 Results – Permanent Plot Surveys and Walkover Surveys	2024 Results	Recommendations
Soil Profile development	Soil profile continues to develop across all areas of the REA and litter cover has generally improved or remained consistent across all monitoring plots in 2023.	Soil profile continues to develop across the REA. Biological nutrient cycling was recorded across the REA, including the presence of decomposing vegetation, lichens, termites, ants, cicadas, spiders, macropod scats and an Pseudonaja Textilis (Eastern Brown Snake).	Continue to monitor soil profile.
Evidence of Erosion	Evidence of erosion is present within the lower stages of 12a and 14 between the edge of the REA and the existing fence line to the east.	Minor erosion noted in drainage way in lower stages of 12a and 14. Has been infilled with ballast and branches.	Continue to monitor for minor gully erosion and repair with minor works such as infilling with logs and branches.
Native plant species diversity	Native species diversity of canopy, shrubs and grasses is generally consistent across the REA and many of the target species within the adjacent bushland have also colonised within the REA.	Structural complexity of the monitoring plots is continuing to develop, though does yet not meet closure criteria with many areas still lacking adequate canopy and ground cover	Maintain weed control program with attention to avoiding off-target damage to native species.
Native plant cover (overstorey,	Native vegetation cover is stable within Stages 1 to 5 within the REA. Native cover has increased within	Native species richness has increased across the REA	Consider undertaking more native grass trials within the upper stages of 14 and 16.

Rehabilitation Monitoring
2024

midstorey, groundcover)	Stage 12a and the lower sections of Stage 14 and 16. Whilst there is cover of scramblers and shrubs continuing to develop within the upper stages of 14 and 16, the overall cover of native grasses is generally low.	and within the reference plots since 2023.	
Native plant growth rates and regeneration	The growth rate in canopy species remains consistent and small increases recorded in all plots across the REA in 2023.	Overall good health recorded in canopy species, especially <i>Allocasuarina littoralis</i> (Black She-oak) which had many healthy juveniles. Second generation <i>Eucalyptus</i> spp. and <i>Acacia</i> spp. seedlings were observed in in most areas, although often in low abundance.	Nil
Threatened Flora	Stable populations of <i>Grevillea parviflora</i> subsp. <i>parviflora</i> and <i>Persoonia bargoensis</i> in Stages 6 and 9. Stable populations of <i>Persoonia bargoensis</i> where it has not been recorded previously across Stage 3 and 4.	Threatened flora species <i>Persoonia bargoensis</i> (Bargo geebung) was noted in all Stages of the REA and <i>Grevillea parviflora</i> subsp. <i>parviflora</i> (Small-flower <i>Grevillea</i>) was noted in Stage 6.	Continue to monitor threatened species populations. Weed control in the vicinity of these species to be carried out by hand.
Weed occurrences and cover	<i>Gomphocarpus fruticosus</i> not recorded across REA. <i>Cenchrus setaceus</i> not recorded across REA. New exotic population of	Weed cover is low overall but has increased slightly or remained at closure criteria threshold levels in some areas of the REA; primarily due to <i>Eragrostis curvula</i>	Increase weed monitoring and weed control program overall, targeting key areas of new weed infestations.

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	Cenchrus longisetus (Fox-tail Grass) noted in isolated areas within the REA within Stage 2, Stage 3 and Stage 5.	(African lovegrass) cover in Stage 12a and Stages 14 and 16.	Take care to avoid off-target species during weed control works.
Non-local native species	It was noted that significant control works have been undertaken within the REA for Acacia saligna. In particular many areas where this species was present within Stages 2 and 3 have been treated.	Exotic grasses, herbaceous weeds and woody weed, Acacia saligna (Golden wattle), still require ongoing monitoring and treatment in some areas	Continue to control the spread of Leptospermum laevigatum by controlling seedlings outside stages 1 and 2. Maintain monitoring for Acacia saligna and control opportunistically during weed control activities.
Feral fauna	No rabbits noted during field survey, however it is likely that a population remains in the area.	Rabbit herbivory impact low, but evident in some areas; herbivory by native macropods was also present, particularly in Stages 3, 4 and 5	Rabbit monitoring to continue and conduct a control programme in conjunction with neighbouring properties if required. Consultation by Tahmoor Coal with Local Land Services advisable.

Appendix A

Mine Closure Domain 3 - Permanent Monitoring Sites



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Abbreviations

Abbreviation	Description
CD	Closure Domain
DBH	Diameter at breast height
ELA	Eco Logical Australia Pty Ltd
MOP	Tahmoor Colliery Mine Operations Plan 2012 - 2019 (XCN 2012)
PCT	Plant Community Type
REA	Refuse Emplacement Area
sp.	species
spp.	species (plural)
SVTM	State Vegetation Type Mapping

1. Introduction

Eco Logical Australia Pty Ltd (ELA) was commissioned by Tahmoor Coal Pty Ltd. (Tahmoor Coal) to assess permanent monitoring sites in rehabilitated areas of Mine Closure Domain 3 within Tahmoor Coal. The location of all mine closure domains at Tahmoor Coal are shown in Figure 1.

Development of the Tahmoor Coal site began in 1975. The Refuse Emplacement Area (REA) was established during the 1980s with long wall mining beginning in 1986. Sections of the REA have been progressively rehabilitated with native vegetation over the past 20 years, with additional sections rehabilitated as each stage of the REA has been constructed. The majority of the permanent monitoring sites are located within Domain 3 across Stages 1 – 16 of the REA. Permanent monitoring sites within the current active areas of the mine (Domains 1, 2, 4 and 5) have not been assessed in this report.

Figure 2 provides the location of both the rehabilitation stages within the REA and the permanent monitoring sites within each stage. Annual monitoring of permanent sites in the rehabilitation areas of the REA provides information regarding improvement and other changes in both vegetation growth and colonisation. In addition, indication of the success of the rehabilitation is gained through comparison of both vegetation structure and composition within the reference sites and surrounding vegetation communities.

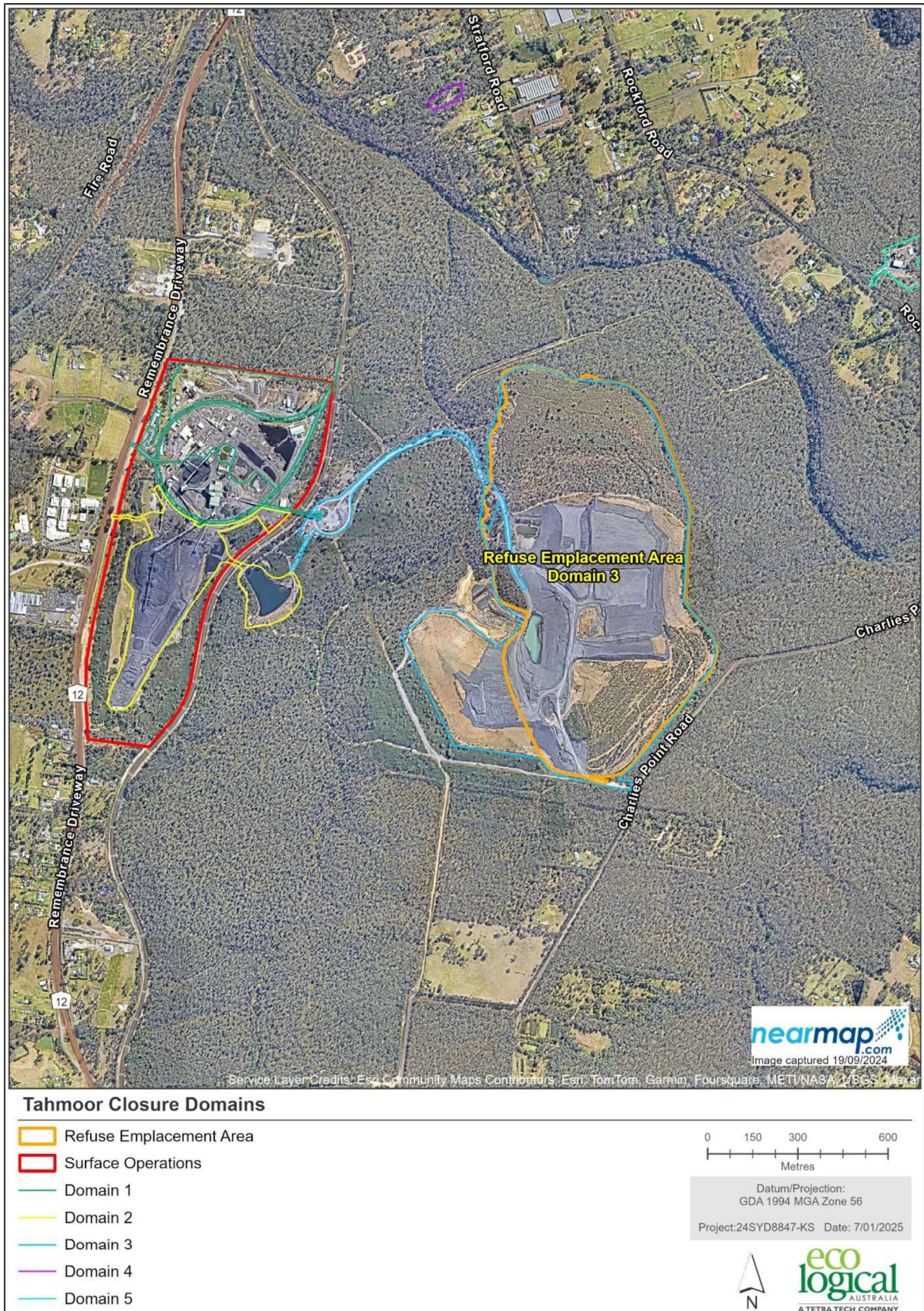


Figure 1: Mine closure domains 1-5

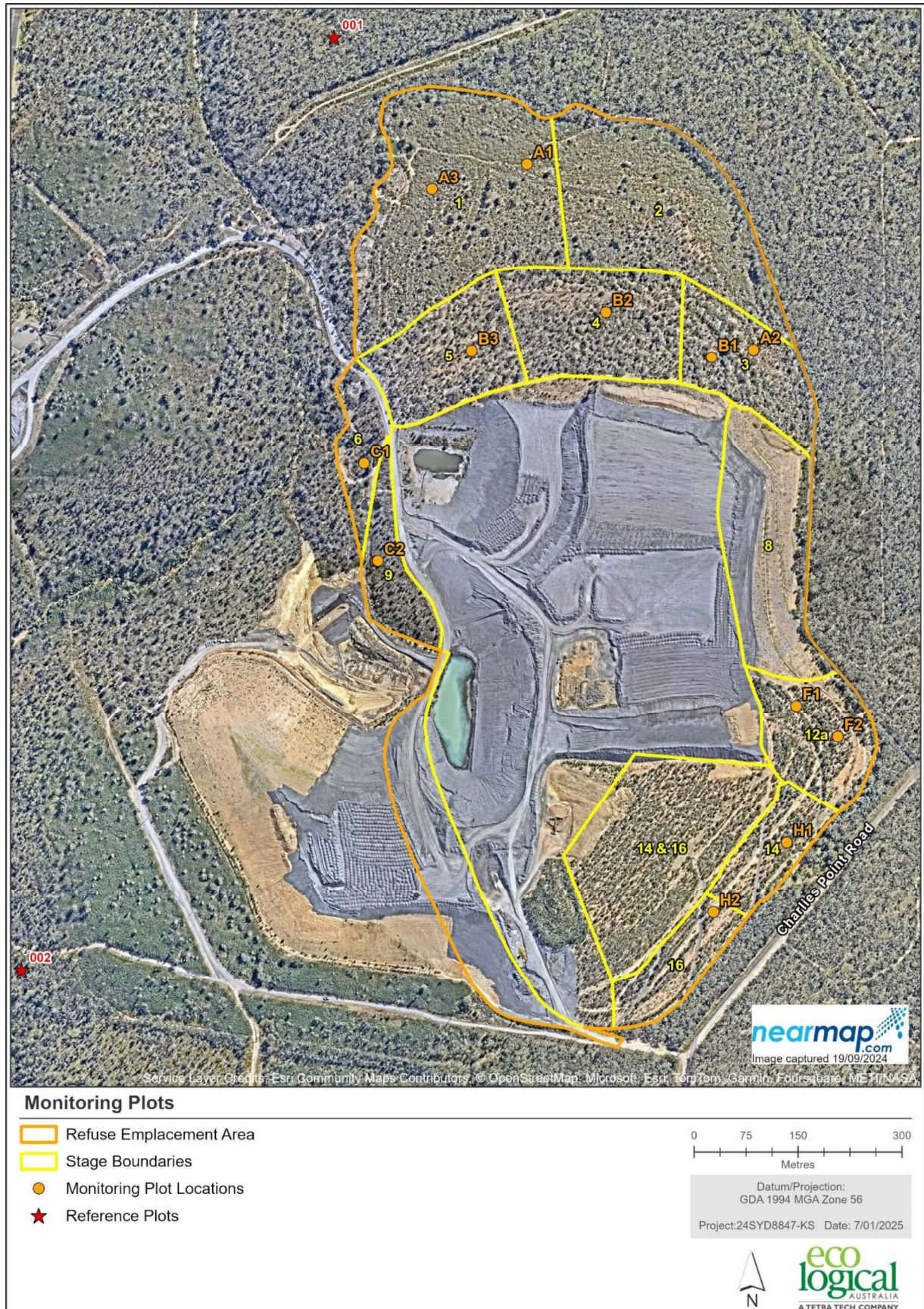


Figure 2: Stage boundaries within the REA and monitoring plots

2. Domain 3 – Refuse Emplacement Area

2.1 Monitoring methodology

Permanent plot monitoring was undertaken in accordance with Tahmoor Coal's Rehabilitation Management Plan - TAH-HSEC-402 and Rehabilitation Strategy TAH-HSEC-401. Monitoring methodology is based on the 'plot-based sampling of vegetation' as described in *Rehabilitation Management Plan (TAH-HSEC-402)*.

Two monitoring plots, within each of the following REA stages or areas were established prior to 2014, with an additional plot established within Stages 1 and 2, and one within Stages 3, 4 and 5 in 2015 to conform to the new guidelines for monitoring at that time. Plot identifiers are as below.

- Reference sites within undisturbed native vegetation – plots 001 and 002
- Stages 1 and 2 – plots A1, A2 and A3
- Stages 3, 4 and 5 – plots B1, B2 and B3
- Stages 6 and 9 – plots C1 and C2
- Stage 12 (lower benches) (12A) – plots F1 and F2
- Stages 14 and 16 (lower benches) – plots H1 and H2.

Stage 8 does not have permanent monitoring plots located within it yet, due to the more recent timing of revegetation installation. Stage 7, Stage 10 and Stage 12B monitoring plots have been removed due to earthworks in these areas.

The locations of all permanent monitoring plots are shown in Figure 2.

Assessment of the permanent monitoring plots within the REA was carried out over four days on 11-12 November, 21 November and 16 December 2024 by ELA ecologists, Claire Plunkett, Cornelia Ersson and Tim Finter.

The procedures and measurements undertaken at each of the permanent monitoring sites are outlined in Table 1.

Further to the plot-based sampling, additional elements which include soil stability, biological nutrient cycling, refuse material on the surface and fauna habitat, were assessed within the plots.

Field data was collected using a standardised field template and later converted to a digital format. Plants were identified using field guides (Fairley and Moore 1995; Robinson 2003) and the PlantNet database (Royal Botanic Gardens Trust 2013).

To identify target species, native species recorded in the monitoring plots were cross-referenced against species that have been identified in the reference plots, as well as species which are predicted to occur in the surrounding Plant Community Types (PCT) as mapped in the State Vegetation Type Mapping (DPE 2024).

Table 1: Monitoring procedures and measurements

Plot descriptor	Procedure and/or measurement
General description	- Global Positioning System (GPS) location. - Describe the vegetation in general terms.
Reproductive potential	Assessment of reproductive potential of the existing vegetation and soil disturbance.
2 m x 2 m quadrats	- Stem count the number of plants of all native and exotic species, excluding grass. - Measure live vegetation cover for understorey and grasses (separately) using a line intercept method. - Record presence of ground cover (litter, logs, rocks etc.).
20 m x 10 m plots	- Stem count, by species, all trees >1.6 m tall. - Tag and measure Diameter Breast Height (DBH) of trees >1.6 m tall, to a maximum of 10 for any one species. - Record canopy cover over 20 m centreline of the 20x 10 m plots where trees are tall enough. - Subjectively describe tree health, by species if relevant, noting signs of drought stress, nutrient deficiencies, disease and severe insect attack. Where health problems are noted, record the percentage of unhealthy trees. - Record any new plant species which are not present in the smaller plots, including all weeds.
50 m erosion transect	Record the location, number and dimension of all gullies >30 cm wide and/or 30 cm deep. Record rill and slope-wash features.
Rehabilitation in general	When traversing between monitoring plots, note the presence of species of interest not previously recorded (e.g., key functional or structural species, protected species, noxious/priority weeds), as well as obvious problems including any extensive bare areas (e.g., those greater than 0.1 hectare).
Photographic record	- For each plot, a photograph was taken at each end of the plot, along the centreline looking in. - A star picket with identifier is installed as a permanent photo monitoring point.

2.2 Monitoring results

Tabulated summaries of the results collected for each monitoring plot and collated for each rehabilitation stage are provided within **Appendix A1**, along with photographs of each monitoring plot. Collated species lists for each stage are listed in **Appendix A2**.

Other than expected growth, there were no major changes in vegetation quality and structure overall since 2023. The following provides a broad overview of the characteristics and variations that were recorded:

- overall good health recorded in canopy species, especially *Allocasuarina littoralis* (Black She-oak) which had many healthy juveniles
 - some dieback noted in *Eucalyptus* spp. in Stage 2 and Stages 3, 4 and 5
 - poor health noted in *Acacia* spp. in Stage 12a and Stages 14 and 16, in part due to boring insect damage
 - generally, there was a small but consistent increase in the diameter of living canopy species
 - many young canopy trees have grown to more than 1.6 m; these have been tagged for ongoing growth and health monitoring

- second generation *Eucalyptus* spp. and *Acacia* spp. seedlings were observed in in most areas, although often in low abundance
- native species richness has increased across the REA and within the reference plots since 2023
 - colonisation by second generation local native shrubs, forbs, grasses and sedges was noted across the REA and most species are consistent with those in the control monitoring plots or with those predicted to occur in adjacent PCTs, based on SVTM (DPE 2024).
- structural complexity of the monitoring plots is continuing to develop, though does yet not meet closure criteria with many areas still lacking adequate canopy and ground cover
 - native grass cover experienced a moderate decrease across the REA and the reference plots; particularly evident in the reference plots, Stages 1 and 2, Stages 6 and 9 and Stage 12a.
 - understorey cover experienced a moderate decrease overall across the REA, though not significantly in the reference plots
- weed cover is low overall but has increased slightly or remained at closure criteria threshold levels in some areas of the REA; primarily due to *Eragrostis curvula* (African lovegrass) cover in Stage 12a and Stages 14 and 16
 - weed cover in Stages 3, 4 and 5 decreased to below 10% (closure criteria threshold)
 - exotic grasses, herbaceous weeds and woody weed, *Acacia saligna* (Golden wattle), still require ongoing monitoring and treatment in some areas
- threatened flora species *Persoonia bargoensis* (Bargo geebung) was noted in all Stages of the REA and *Grevillea parviflora* subsp. *parviflora* (Small-flower Grevillea) was noted in Stage 6
- biological nutrient cycling was recorded across the REA, including the presence of decomposing vegetation, lichens, termites, ants, cicadas, spiders, macropod scats and an *Pseudonaja Textilis* (Eastern Brown Snake)
- rabbit herbivory impact low, but evident in some areas; herbivory by native macropods was also present, particularly in Stages 3, 4 and 5
- remnants of plastic tree guard waste was noted in Stages 3, 4 and 5
- overall erosion control adequate.

A series of rehabilitation closure criteria have been developed in line with Tahmoor Coal Pty Ltd.'s rehabilitation indicators and completion criteria, contained within Section 6 of the Rehabilitation Strategy TAH-HSEC-401. Rehabilitation progress within each of the monitored sections of the REA has been evaluated in line with these criteria, and these evaluations are summarised in **Appendix A3**. These evaluations include assessment of the progress of revegetation within each development stage towards a self-sustaining native vegetation community.

The recorded field data sheets from monitoring in 2024 are provided in **Appendix A4**.

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A1 Domain 3 – Summary tables of plot monitoring results

The following tables and figures provide a summary of the monitoring results in 2024 for the permanent monitoring plots in the REA.

Table 2: Characteristics of the reference monitoring plots

Characteristic	Plot number		Comment (including comparison with 2023 results)
	001	002	
Over-storey cover (%)	10	3	001 – small increase (5%) 002 – small increase (1%)
Understorey live cover (%) ^	80	61	001 – small increase (4%) 002 – small decrease (0.25%)
No. of native species	55		
Native species no. change since 2023	+10		
No. of target species	N/A		
Native grass cover (%) ^	22	16.4	001 – decrease (18%) 002 – decrease (13%)
Exotic grass cover (%) ^	0	0	None in 2 x 2m plots
Weed density (%)	<0.1	0	001 – one exotic plant observed 002 – none (no change)
Reproductive potential**	b, f	b, f	buds and flowers noted in shrubs and grasses, limited in canopy species
2 nd generation natives	√	√	New seedlings of canopy spp. observed
Tree DBH increase (cm)***	1.6 - 2.2	1 – 1.2	Small but stable increase since 2023 001 – average increase 1.9cm 002 – average increase 1.1cm (many new trees tagged in 2024)
Tree health	Good	Good	Abundant epicormic growth and tree recovery
Litter cover (%) ^	32	52	001 – increase (8%) 002 – large increase (34%)
Litter	sandy soils, leaf litter, twigs, fallen branches	sandy soils, leaf litter, twigs, fallen branches	Results are consistent with 2023
Substrate material	0	0	
Nutrient recycling	√	√	Ants, spiders, herbivore scats, leaf litter
Erosion	no erosion	no erosion	

^ Mean of five quadrats

** reproductive potential – b=buds/flowers, f=fruit, fg= grasses only

*** range of increase since 2023 monitoring

2023		
2024		

Figure 3: Reference plot 001 in 2023 and 2024

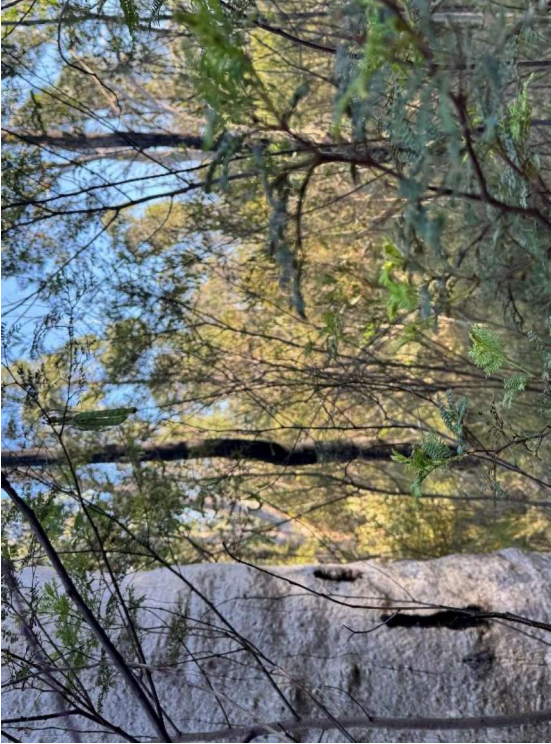
2023		
2024		

Figure 4: Reference plot 002 in 2023 and 2024

Table 3: Characteristics of monitoring plots A1, A2 and A3 in Stages 1 and 2

Establishment – 1993 and 1996	Plot number			Comment (including comparison with 2023 results)
Characteristic	A1	A2	A3	
Over-storey cover (%)	0	1	0	A1 and A3 - no canopy trees A2 – small increase (1%)
Understorey live cover (%) ^	50	49	31	A1 – decrease (8%) A2 – increase (10%) A3 – decrease (25%)
No. of native species		43		
Native species no. change since 2023		+7		
No. of target species*		42		
Native grass cover (%) ^	4	0.6	3.6	A1 – decrease (15%) A2 – decrease (0.2%) A3 – decrease (2%)
Exotic grass cover (%) ^	20	11.2	0.2	A1 – increase (5%) A2 – decrease (1.6%) A3 – increase (0.2%)
Weed density (%)	12	1	<1	A1 and A2 – small decrease (1-3%) A3 – very small increase (<1%)
Reproductive potential **	b, f	b, f	b, f	buds and flowers noted in shrubs and grasses, limited in canopy species
2 nd generation natives	√	√	√	
Tree DBH increase (cm) ***	1 – 1.6	2 – 4.9	1	Small increase in tree DBH overall A1 – average increase 1.2cm A2 – average increase 3.1cm A3 – average increase 1cm Many new trees were tagged in all plots in 2024.
Tree health	Good	Moderate-Good	Good	A1 and A3 - no <i>Eucalyptus</i> spp. A2 – one <i>Eucalyptus globoidea</i> died since 2023
Litter cover (%) ^	19	19	50	A1 – small increase (3%) A2 – no change A3 – large increase (26%)
Litter	Twigs and grass litter	Twig and grass litter, stones	Twig and leaf litter	Results are consistent with 2023.
Substrate material size (cm)	≤ 20	≤ 20	none observed	
Nutrient recycling	√	√	√	Ants, termites, cicadas, leaf litter, herbivore scats, lichens
Soil crusting	no	no	no	
Erosion	very little evidence of rill lines, no erosion	no erosion	rill lines slightly evident, no erosion	No change since 2023

^ Mean of five quadrats

* target species identified within reference plots in 2022-24; species known to occur in reference plots before fire; and species in bushland surrounding REA emplacement stages

** reproductive potential – b=buds/flowers, f=fruit, fg= grasses only

*** range of increase since 2023 monitoring

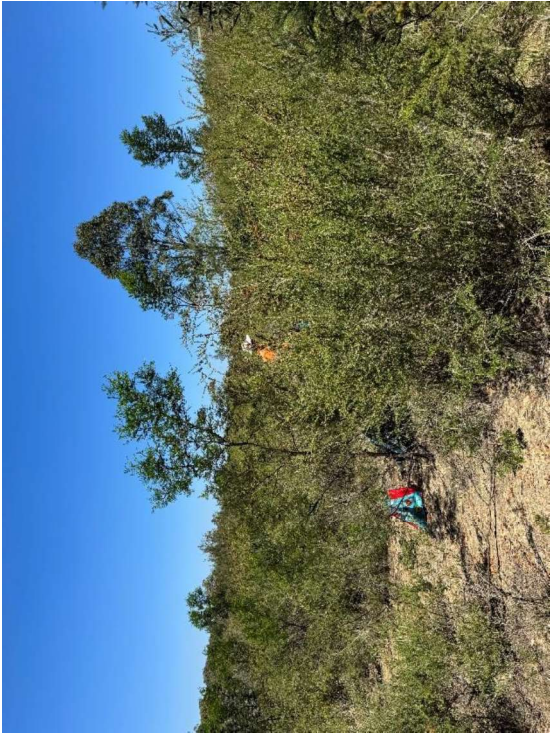
2023		
2024		

Figure 5: Stages 1 and 2 plot A1 in 2023 and 2024

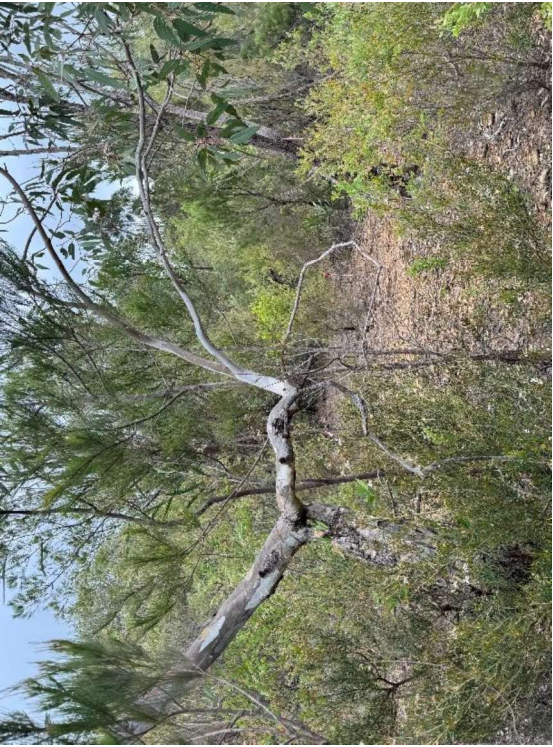
2023		
2024		

Figure 6: Stages 1 and 2 Plot A2 in 2023 and 2024

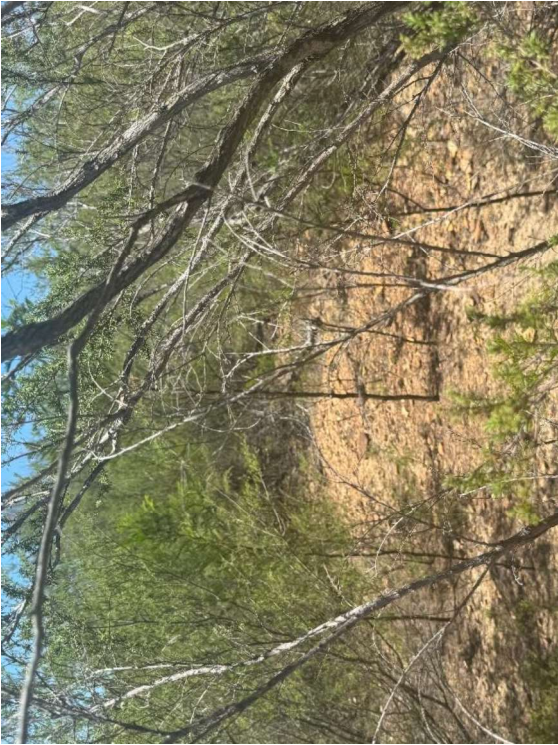
2023		
2024		

Figure 7: Stages 1 and 2 Plot A3 in 2023 and 2024

Table 4: Characteristics of plots B1, B2 and B3 in Stages 3, 4 and 5

Characteristic	Plot number			Comment (including comparison with 2023 results)
	B1	B2	B3	
Over-storey cover (%)	25	12	2	B1, B2, B3 – small increase (2-5%)
Understorey live cover (%) ^	29	37.6	24	B1 – increase (5%) B2 – increase (28.6%) B3 – decrease (6%)
No. of native species	51			
Native species change since 2023	+13			
No. of target species*	48			
Native grass cover (%) ^	20	0.8	1	B1 – small decrease (1%) B2 – decrease (1.8%) B3 – decrease (6.4%)
Exotic grass cover (%) ^	0.6	0.6	0.4	B1 – small decrease (0.6%) B2 – small increase (0.5%) B3 – small increase (0.4%)
Weed density (%)	0	1	3	B1, B2, B3 – small decrease (0.6-9%)
Reproductive potential **	b, f	b, f	b, f	
2nd generation natives	√	√	√	buds and flowers noted in shrubs and grasses, limited in canopy species
Tree DBH increase (cm)***	1.2 – 3.3	0.6 - 6	0.6 – 2.4	Small increase in tree DBH overall B1 – average increase 2.1cm B2 – average increase 2.3cm B3 – average increase 1.3cm
Tree health	moderate	poor-moderate	good	B1 and B2 – many <i>Eucalyptus</i> spp. poor, but other spp. healthy B3 – no change
Litter cover (%) ^	86	96.8	17.4	B1, B2, B3 – small increase (8-3.8%)
Litter	twig and leaf litter, sandstone rocks	twig and leaf litter	twig and leaf litter, termite mound, rocks	Results are consistent with 2023
Substrate material size (cm)	≤ 20	≤ 20	≤ 20	No change
Nutrient recycling	√	√	√	Ants, termites, cicadas, leaf litter, herbivore scats
Soil crusting	no	no	no	
Erosion	no erosion	no erosion	no erosion	No change since 2023

^ Mean of five quadrats

* target species identified within reference plots in 2022-24; species known to occur in reference plots before fire; and species in bushland surrounding REA emplacement stages

** reproductive potential – b=buds/flowers, f=fruit, fg= grasses only

*** range of increase since 2023 monitoring

2023		
2024		

Figure 8: Stages 3, 4 and 5 plot B1 in 2023 and 2024

2023	 A photograph of a tree in 2023. The tree has a thick, dark trunk and dense green foliage. The ground is covered in dry, brownish vegetation and some fallen leaves. The background shows more trees and a clear sky.	 A photograph of a tree in 2023. The tree has a thick, dark trunk and dense green foliage. The ground is covered in dry, brownish vegetation and some fallen leaves. The background shows more trees and a clear sky.
2024	 A photograph of a tree in 2024. The tree has a thick, dark trunk and dense green foliage. The ground is covered in dry, brownish vegetation and some fallen leaves. The background shows more trees and a clear sky.	 A photograph of a tree in 2024. The tree has a thick, dark trunk and dense green foliage. The ground is covered in dry, brownish vegetation and some fallen leaves. The background shows more trees and a clear sky.

Figure 9: Stages 3, 4 and 5 plot B2 2023 and 2024

2023		
2024		

Figure 10: plot B3 in 2023 and 2024

Table 5: Characteristics of plots C1 and C2 in Stages 6 and 9

Characteristic	Plot number		Comment (including comparison with 2023 results)
	C1	C2	
Over-storey cover (%)	0	50	C1 – decrease (5%) only tree over centreline has fallen since 2023 C2 – large increase (40%)
Understorey live cover (%) ^	41	42.2	C1 – moderate decrease (26%) C2 – increase (14.4%)
No. of native species	40		
Native species change since 2023	+8		
No. of target species*	39		
Native grasses cover (%) ^	14.4	1.4	C1 – large decrease (36.6%) C2 – moderate decrease (18%)
Exotic grass cover (%) ^	0.2	0	C1 – small increase (0.2%) C2 – no change
Weed density (%)	1	0	C1, C2 – no change
Reproductive potential**	b, f	b, f	buds and flowers noted in shrubs and grasses, limited in canopy species
2nd generation natives	√	√	
Tree DBH increase (cm)***	0.6 - 0.9	0.7 – 4.8	Small increase in DBH overall C1 – average increase 0.8cm C2 – average increase 2.8cm Many new trees were tagged in 2024.
Tree health	Good	Good	C1 and C2 - regenerating understorey of <i>Acacia</i> sp. and <i>Allocasuarina</i> sp.
Litter cover (%) ^	68	84	C1, C2 – large increase (33-39%)
Litter	twig and leaf litter, woody debris, rocks	twig and leaf litter, woody debris, rocks	Results are consistent with 2023
Substrate material size (cm)	≤ 20	none	
Nutrient recycling	√	√	Ants, termites, cicadas, leaf litter, lichens herbivore scats
Soil crusting	no	no	
Erosion	no erosion	no erosion	No change since 2023

^ Mean of five quadrats

* target species identified within reference plots in 2022-24; species known to occur in reference plots before fire; and species in bushland surrounding REA emplacement stages

** reproductive potential – b=buds/flowers, f=fruit, fg= grasses only

*** range of increase since 2023 monitoring

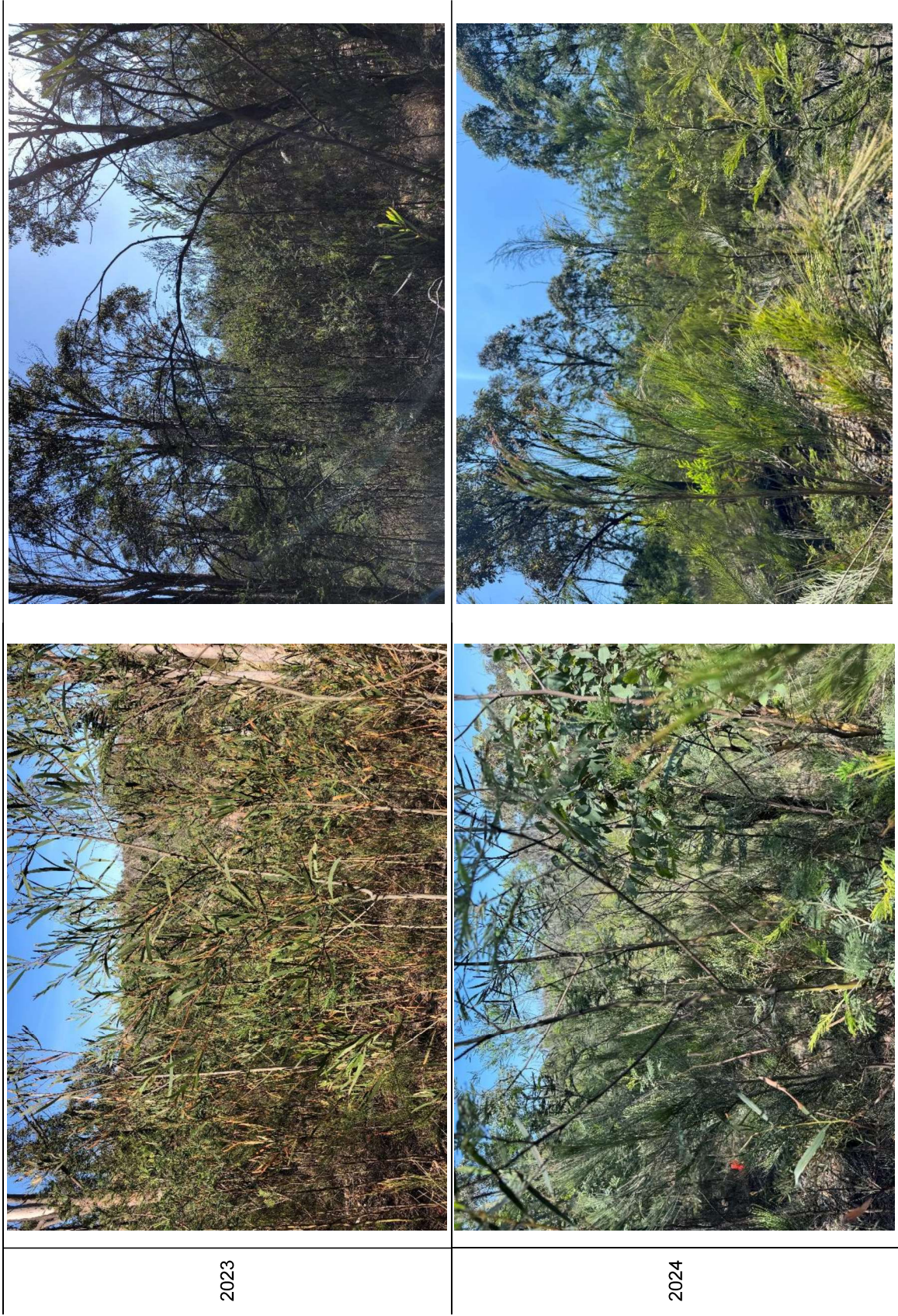


Figure 11: Stages 6 and 9 plot C1 in 2023 and 2024

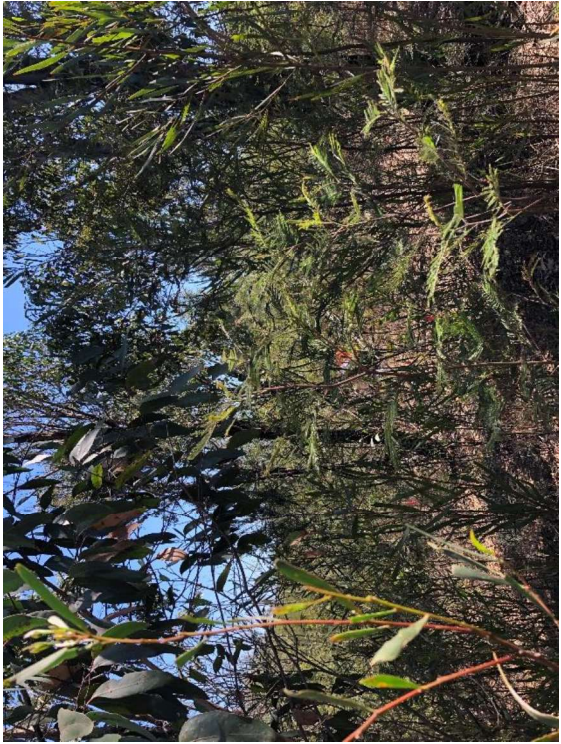
2023	 A photograph showing a dense stand of trees with green foliage and some bare branches, likely in a rehabilitation area. The ground is covered with dry, brownish vegetation.	 A photograph showing a dense stand of trees with green foliage and some bare branches, likely in a rehabilitation area. The ground is covered with dry, brownish vegetation.
2024	 A photograph showing a dense stand of trees with green foliage and some bare branches, likely in a rehabilitation area. The ground is covered with dry, brownish vegetation.	 A photograph showing a dense stand of trees with green foliage and some bare branches, likely in a rehabilitation area. The ground is covered with dry, brownish vegetation.

Figure 12: Stages 6 and 9 plot C2 in 2023 and 2024

Table 6: Characteristics of plots F1 and F2 in stage 12a lower slopes

Characteristic	Plot number		Comment (including comparison with 2023 results)
	F1	F2	
Over-storey cover (%)	35	5	F1 – small increase (5%) F2 – small increase (2%)
Understorey live cover (%) ^	65	44	F1 – moderate increase (23%) F2 – small increase (9%)
No. of native species	48		
Native species change since 2023	+8		
No. of target species*	45		
Native grasses cover (%) ^	14	13	F1 – decrease (8.4%) F2 – decrease (13.6%)
Exotic grass cover (%) ^	9	0.4	F1 and F2 – small decrease (0.6-6%)
Weed density (%)	10	5	F1 – small increase (8%) F2 – no change
Reproductive potential**	b, f	b, f	buds and flowers noted in shrubs and grasses, limited in canopy species
2 nd generation natives	√	√	
Tree DBH increase (cm)***	0 – 2.6	0 – 1.8	Small increase in tree DBH overall F1 – average increase 1.3cm F2 – average increase 1.4cm Many new trees were tagged in 2024.
Tree health	Good	Moderate-Good	Overall good condition across both plots, aside from a few poor <i>Acacia decurrens</i> and <i>Acacia</i> sp. in both plots. <i>Eucalyptus</i> spp. in good condition across both plots, especially <i>Eucalyptus punctata</i> in F2.
Litter cover (%) ^	73	43	F1 – increase (13%) F2 – small increase (1%)
Litter	leaf litter, mulch, sandstone pebbles, twigs	leaf litter, mulch, sandstone pebbles, twigs	Results are consistent with 2023
Substrate material size (cm)	≤ 20	≤ 20	F1 and F2 – (1-2%)
Nutrient recycling	√	√	Ants, woody debris, leaf litter, herbivore scats F1 - Eastern brown snake observed
Soil crusting	no	no	
Erosion	minor erosion	no erosion	No change since 2023

^ Mean of five quadrats

* target species identified within reference plots in 2022-24; species known to occur in reference plots before fire; and species in bushland surrounding REA emplacement stages

** reproductive potential – b=buds/flowers, f=fruit, fg= grasses only

*** range of increase since 2023 monitoring

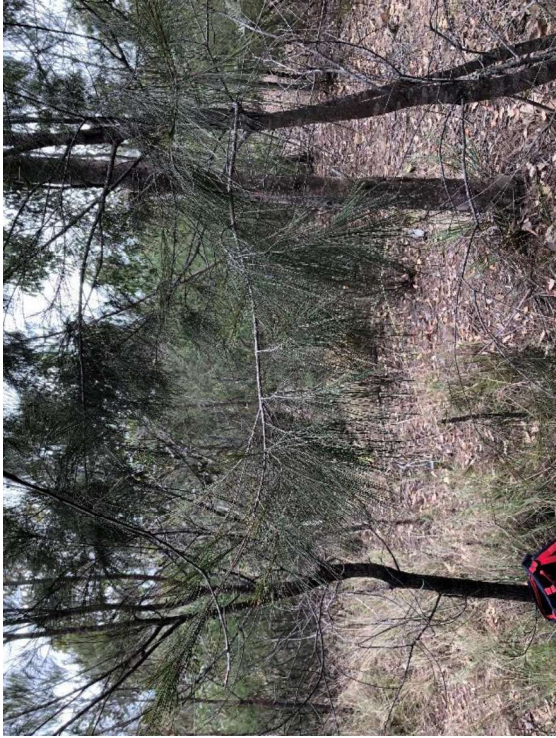
2023		
2024		

Figure 13: Stage 12A plot F1 in 2023 and 2024

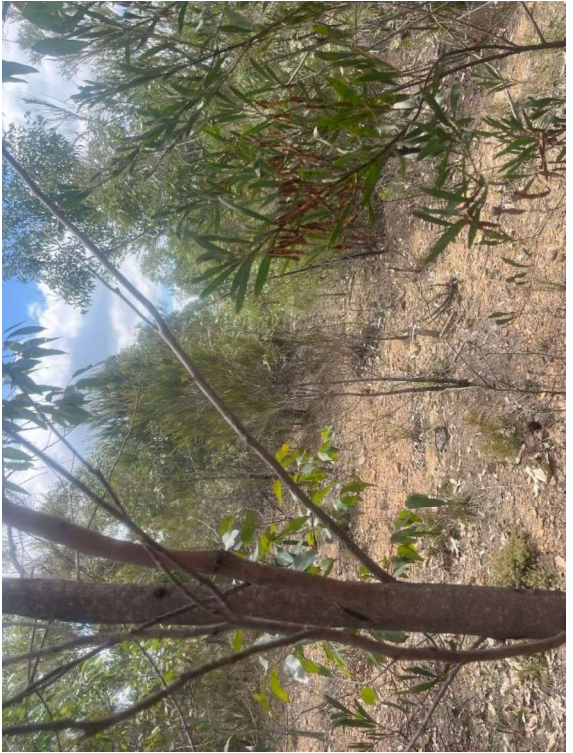
2023		
2024		

Figure 14: Stage 12A plot F2 in 2023 and 2024

Table 7: Characteristics of plots H1 and H2 in stages 14 and 16 lower benches

Established in 2012	Plot number		Comment (including comparison with 2023 results)
Characteristic	H1	H2	
Over-storey cover (%)	7	15	H1 – small increase (2%) H2 – no change
Understorey live cover (%) ^	32	16	H1 – increase (20%) H2 – small decrease (4%)
No. of native species	33		
Native species change since 2023	+9		
No. of target species*	31		
Native grasses cover (%) ^	4.2	4.2	H1 – small decrease (0.6%) H2 – small decrease (3%)
Exotic grass cover (%) ^	0.2	7	H1, H2 – small decrease (0.2-3%)
Weed density (%)	10	10	No change
Reproductive potential**	b, f	b, f	buds and flowers noted in shrubs and grasses, limited in canopy species
2 nd generation natives	v	v	
Tree DBH increase***	0.5 – 3.6	0.5 – 3.6	Small increase in tree DBH overall H1 – average increase 1.4cm H2 – average increase 1.7cm Several new trees were tagged in 2024.
Tree health	Good	Moderate -Good	F1 - Some dieback of <i>Acacia</i> spp. due to boring insects, but otherwise healthy F2 – Good overall with one prone, but living, <i>Acacia decurrens</i>
Litter cover (%) ^	55	30	H1 – decrease (11%) H2 – small increase (4%)
Litter	leaf litter, sandstone pebbles, mulch	twigs, grass litter, sandstone pebbles	
Substrate material size (cm)	≤ 20	≤ 20	1% coverage, scattered
Nutrient recycling	v	v	Ants, cicadas, leaf litter, herbivore scats
soil crusting	no	no	
Erosion	no gully erosion evident, rill lines evident	minor gully erosion, deep rill lines evident	No change

^ Mean of five quadrats

* target species identified within reference plots in 2022-24; species known to occur in reference plots before fire; and species in bushland surrounding REA emplacement stages

** reproductive potential – b=buds/flowers, f=fruit, fg= grasses only

*** range of increase since 2023 monitoring

2023	 
2024	 

Figure 15: Stages 14 and 16 plot H1 in 2023 and 2024

2023		
2024		

Figure 16: Stages 14 and 16 plot H2 in 2023 and 2024

A2 Species lists

Species recorded within reference sites	
<i>Acacia linifolia</i>	<i>Laxmannia gracilis</i>
<i>Acacia longifolia</i>	<i>Leptospermum juniperinum</i>
<i>Acacia parramattensis</i>	<i>Leptospermum trinervium</i>
<i>Acacia</i> sp. seedling	<i>Lindsea microphylla</i>
<i>Acacia terminalis</i>	<i>Lomandra multiflora</i>
<i>Allocasuarina littoralis</i>	<i>Lomandra obliqua</i>
<i>Anisopogon avenaceus</i>	<i>Microlaena stipoides</i> var. <i>stipoides</i>
<i>Aristida</i> sp.	<i>Mirbelia rubiifolia</i>
<i>Austrostipa scabra</i>	<i>Patersonia sericea</i>
<i>Austrostipa</i> sp.	<i>Persoonia bargoensis</i> [±]
<i>Billardiera scandens</i>	<i>Persoonia linearis</i>
<i>Brachyloma daphnoides</i>	<i>Phyllanthus hirtellus</i>
<i>Cassytha glabella</i>	<i>Pimelea linifolia</i>
<i>Cassytha pubescens</i>	<i>Platysace linearifolia</i>
<i>Cyathochaeta diandra</i>	<i>Poa</i> sp.
<i>Dianella revoluta</i>	<i>Ptilothrix deusta</i>
<i>Dillwynia</i> sp.	<i>Pultenaea</i> sp.
<i>Entolasia stricta</i>	<i>Scaevola ramosissima</i>
<i>Eriostemon australasius</i>	<i>Schoenus ericetorum</i>
<i>Eucalyptus globoidea</i>	<i>Schoenus</i> sp.
<i>Eucalyptus piperita</i>	<i>Senecio madagascariensis</i> [^]
<i>Eucalyptus punctata</i>	<i>Stypandra glauca</i>
<i>Eucalyptus</i> sp. seedling	<i>Tricoryne eliator</i>
<i>Gompholobium glabratum</i>	
<i>Gonocarpus tetragynus</i>	
<i>Goodenia hederacea</i> subsp. <i>hederacea</i>	
<i>Grevillea sphacelata</i>	
<i>Hakea dactyloides</i>	
<i>Hibbertia diffusa</i>	
<i>Hibbertia riparia</i>	
<i>Kunzea ambigua</i>	
<i>Lambertia formosa</i>	
<i>Lasiopetalum ferrugineum</i>	

Species recorded within Stages 1 and 2

<i>Acacia decurrens</i> *	<i>Microtis unifolia</i> *
<i>Acacia falcata</i> *	<i>Mirbelia rubiifolia</i> *
<i>Acacia longifolia</i> *	<i>Opercularia diphylla</i> *
<i>Acacia mearnsii</i> *	<i>Patersonia sericea</i> *
<i>Acacia parramattensis</i> *	<i>Persoonia bargoensis</i> ±*
<i>Acacia saligna</i> ^	<i>Persoonia levis</i> *
<i>Acacia suaveolens</i> *	<i>Persoonia linearis</i> *
<i>Acacia terminalis</i> *	<i>Pimelea linifolia</i> *
<i>Allocasuarina littoralis</i> *	<i>Pomax umbellata</i> *
<i>Aristida ramosa</i> *	<i>Stypandra glauca</i> *
<i>Astroloma humifusum</i> *	<i>Themeda triandra</i> *
<i>Austrostipa scabra</i> *	
<i>Banksia spinulosa</i> *	
<i>Billardiera scandens</i> *	
<i>Cheilanthes sieberi</i> *	
<i>Coronidium oxylepis</i> *	
<i>Cymbopogon refractus</i> *	
<i>Daviesia acicularis</i> *	
<i>Dianella revoluta</i> *	
<i>Dillwynia</i> sp.*	
<i>Dodenaia triquetra</i> *	
<i>Entolasia stricta</i> *	
<i>Eragrostis brownii</i> *	
<i>Eragrostis curvula</i> ^	
<i>Eucalyptus globoidea</i> *	
<i>Grevillea sphacelata</i> *	
<i>Hakea sericea</i> *	
<i>Hypochaeris radicata</i> ^	
<i>Kennedia rubicunda</i> *	
<i>Kunzea ambigua</i> *	
<i>Laxmannia gracilis</i> *	
<i>Lepidosperma laterale</i> *	
<i>Leptomeria acida</i> *	
<i>Leptospermum laevigatum</i>	
<i>Lomandra multiflora</i> *	

*identified within reference plots in 2022-24; species known to occur in reference plots before fire; and species in bushland surrounding REA emplacement stages

± denotes threatened species

^ denotes exotic species

Stages 3, 4 and 5

<i>Acacia binervata</i> *	<i>Kennedia rubicunda</i> *
<i>Acacia binervia</i> *	<i>Kunzea ambigua</i> *
<i>Acacia decurrens</i> *	<i>Lagenophora stipitata</i> *
<i>Acacia falcata</i> *	<i>Laxmannia gracilis</i> *
<i>Acacia longifolia</i> *	<i>Lepidosperma laterale</i> *
<i>Acacia mearnsii</i> *	<i>Linum trigynum</i> ^
<i>Acacia myrtifolia</i> *	<i>Lomandra multiflora</i> *
<i>Acacia parramattensis</i> *	<i>Micrantheum ericoides</i> *
<i>Acacia suaveolens</i> *	<i>Mirbelia rubiifolia</i> *
<i>Acacia terminalis</i> *	<i>Opercularia diphylla</i> *
<i>Allocasuarina littoralis</i> *	<i>Panicum effusum</i> *
<i>Anisopogon avenaceus</i> *	<i>Paspalum dilatatum</i> ^
<i>Aristida ramosa</i> *	<i>Persoonia bargoensis</i> ±*
<i>Astroloma humifusum</i> *	<i>Persoonia levis</i> *
<i>Austrostipa scabra</i> *	<i>Persoonia linearis</i> *
<i>Banksia integrifolia</i>	<i>Persoonia pinifolia</i> *
<i>Billardiera scandens</i> *	<i>Phyllanthus hirtellus</i> *
<i>Brachyloma daphnoides</i> *	<i>Pimelea linifolia</i> *
<i>Cenchrus clandestinus</i> ^	<i>Poa</i> sp.
<i>Cenchrus setaceus</i> ^	<i>Pomax umbellata</i> *
<i>Centaurium erythraea</i> ^	<i>Sisymbrium officinale</i> ^
<i>Coronidium oxylepis</i> *	<i>Stypandra glauca</i> *
<i>Cynodon dactylon</i> ^	<i>Themeda triandra</i> *
<i>Dillwynia</i> sp.*	
<i>Dillwynia</i> sp. 2	
<i>Dodonaea triquetra</i> *	
<i>Entolasia stricta</i> *	
<i>Eragrostis brownii</i> *	
<i>Eucalyptus globoidea</i> *	
<i>Eucalyptus punctata</i> *	
<i>Eucalyptus racemosa</i> *	
<i>Eucalyptus</i> sp. seedling	
<i>Hakea dactyloides</i> *	
<i>Hakea sericea</i> *	

*identified within reference plots in 2022-24; species known to occur in reference plots before fire; and species in bushland surrounding REA emplacement stages

± denotes threatened species

^ denotes exotic species

Stages 6 and 9

<i>Acacia decurrens</i> *	<i>Lomandra obliqua</i> *
<i>Acacia falcata</i> *	<i>Mirbelia rubiifolia</i> *
<i>Acacia longifolia</i> *	<i>Monotoca scoparia</i> *
<i>Acacia mearnsii</i> *	<i>Opercularia diphylla</i> *
<i>Acacia suaveolens</i> *	<i>Patersonia glabrata</i> *
<i>Allocasuarina littoralis</i> *	<i>Persoonia bargoensis</i> [±] *
<i>Aristida ramosa</i> *	<i>Persoonia linearis</i> *
<i>Astroloma humifusum</i> *	<i>Phyllanthus hirtellus</i> *
<i>Austrostipa scabra</i> *	<i>Richardia stellaris</i> [^]
<i>Billardiera scandens</i> *	<i>Sisymbrium officinale</i> [^]
<i>Callistemon linearis</i> *	<i>Themeda triandra</i> *
<i>Cenchrus clandestinus</i> [^]	<i>Verbena bonariensis</i> [^]
<i>Coronidium oxylepis</i> *	
<i>Cyathochaeta diandra</i> *	
<i>Daviesia genistifolia</i> *	
<i>Dianella revoluta</i> *	
<i>Dillwynia</i> sp.*	
<i>Entolasia stricta</i> *	
<i>Eragrostis brownii</i> *	
<i>Eucalyptus globoidea</i> *	
<i>Eucalyptus punctata</i> *	
<i>Eucalyptus</i> sp. seedling	
<i>Gamochaeta</i> sp. [^]	
<i>Grevillea parviflora</i> subsp. <i>parviflora</i> [±] *	
<i>Grevillea sphacelata</i> *	
<i>Hakea sericea</i> *	
<i>Hovea linearis</i> *	
<i>Hypochaeris radicata</i> [^]	
<i>Kunzea ambigua</i> *	
<i>Laxmannia gracilis</i> *	
<i>Lepidosperma laterale</i> *	
<i>Leptospermum polygalifolium</i> *	
<i>Lomandra filiformis</i> *	

*identified within reference plots in 2022-24; species known to occur in reference plots before fire; and species in bushland surrounding REA emplacement stages

[±]denotes threatened species

[^] denotes exotic species

Stage 12a (lower benches)

<i>Acacia decurrens</i> *	<i>Kunzea ambigua</i> *
<i>Acacia longifolia</i> *	<i>Laxmannia gracilis</i> *
<i>Acacia myrtifolia</i> *	<i>Lepidosperma laterale</i> *
<i>Acacia rubida</i> *	<i>Leptospermum juniperinum</i> *
<i>Acacia terminalis</i> *	<i>Lobelia purpurascens</i> *
<i>Allocasuarina littoralis</i> *	<i>Lomandra longifolia</i> *
<i>Angophora floribunda</i> *	<i>Lomandra multiflora</i> *
<i>Astroloma humifusum</i> *	<i>Lomandra obliqua</i> *
<i>Austrostipa scabra</i> *	<i>Lysimachia arvensis</i> ^
<i>Billardiera scandens</i> *	<i>Melaleuca thymifolia</i> *
<i>Bossiaea heterophylla</i> *	<i>Mirbelia rubiifolia</i> *
<i>Bossiaea prostrata</i> *	<i>Panicum effusum</i> *
<i>Centella asiatica</i> *	<i>Persoonia bargoensis</i> [±] *
<i>Cheilanthes sieberi</i> *	<i>Persoonia linearis</i> *
<i>Daviesia</i> sp.	<i>Phyllanthus hirtellus</i> *
<i>Daviesia ulicifolia</i> *	<i>Plantago lanceolata</i> ^
<i>Dianella revoluta</i> *	<i>Pomax umbellata</i> *
<i>Dichelachne</i> sp.	<i>Pultenaea villosa</i> *
<i>Dodonaea viscosa</i> *	<i>Richardia stellaris</i> ^
<i>Entolasia stricta</i> *	<i>Senecio madagascariensis</i> ^
<i>Eragrostis brownii</i> *	<i>Themeda triandra</i> *
<i>Eragrostis curvula</i> ^	<i>Wahlenbergia gracilis</i> *
<i>Eucalyptus fibrosa</i> *	
<i>Eucalyptus punctata</i> *	
<i>Eucalyptus</i> sp. seedling	
<i>Euchiton japonicus</i> *	
<i>Facelis retus</i> ^	
<i>Glycine clandestina</i> *	
<i>Gonocarpus tetragynus</i> *	
<i>Hardenbergia violacea</i> *	
<i>Hibbertia aspera</i> *	
<i>Hydrocotyle laxiflora</i> *	
<i>Hypochaeris radicata</i> ^	

*identified within reference plots in 2022-24; species known to occur in reference plots before fire; and species in bushland surrounding REA emplacement stages

[±]denotes threatened species

^ denotes exotic species

Stages 14 and 16 (lower benches)

<i>Acacia decurrens</i> *	<i>Persoonia linearis</i> *
<i>Acacia falcata</i> *	<i>Pomax umbellata</i> *
<i>Acacia longifolia</i> *	<i>Richardia stellaris</i> ^
<i>Acacia parramattensis</i> *	<i>Themeda triandra</i> *
<i>Acacia</i> sp. seedling	
<i>Acacia suaveolens</i> *	
<i>Acacia terminalis</i> *	
<i>Allocasuarina littoralis</i> *	
<i>Astroloma humifusum</i> *	
<i>Centaurium erythra</i> ^	
<i>Conyza bonariensis</i> ^	
<i>Cynodon dactylon</i> ^	
<i>Daviesia ulicifolia</i> *	
<i>Dianella revoluta</i> *	
<i>Dodonaea viscosa</i> *	
<i>Entolasia stricta</i> *	
<i>Eragrostis brownii</i> *	
<i>Eragrostis curvula</i> ^	
<i>Eucalyptus fibrosa</i> *	
<i>Eucalyptus punctata</i> *	
<i>Eucalyptus</i> sp. seedling	
<i>Euchiton sphaericus</i> *	
<i>Euphorbia</i> sp.	
<i>Glycine clandestina</i> *	
<i>Gonocarpus tetragynus</i> *	
<i>Hardenbergia violacea</i> *	
<i>Hibbertia aspera</i> *	
<i>Hypochaeris radicata</i> ^	
<i>Kunzea ambigua</i> *	
<i>Laxmannia gracilis</i> *	
<i>Lepidosperma laterale</i> *	
<i>Lobelia purpurascens</i> *	
<i>Lomandra multiflora</i> *	
<i>Mirbelia rubiifolia</i> *	
<i>Persoonia bargoensis</i> [±] *	

*identified within reference plots in 2022-24; species known to occur in reference plots before fire; and species in bushland surrounding REA emplacement stages

[±]denotes threatened species

^ denotes exotic species

A3 Summary of rehabilitation progress

The following tables provide a summary of rehabilitation progress within each development stage of Domain 3 (REA) with reference to closure criteria contained in the Rehabilitation Strategy.

Table 8: Rehabilitation progress in Stages 1 and 2 of CD 3 with reference to closure criteria contained in the Rehabilitation Strategy

Rehabilitation phase	Domain objective	Indicator	Completion Criteria	Complete (yes/no)	Comment (including comparison with 2023 results)
Decommissioning	Infrastructure and services will be removed from the REA site	All services related to refuse emplacement activities to be removed from the REA	Yes	Yes	From this Stage of Domain 3
		REA site offices and any other infrastructure to be removed	Yes	Yes	From this Stage of Domain 3
Growth medium development	Apply topsoil for rehabilitation Reduce erosion on slopes, and provide furrows for seed beds	Topsoil placement depth	>200 cm	Yes	
		All final landform slopes to be contour ploughed	Yes	Yes	
Ecosystem establishment	Establish native bushland rehabilitation	Conduct seeding and/or planting	Yes	Yes – seeding and planting completed	Seeding 1993 Tubestock planting 1996
Ecosystem development	Self-sustaining native bushland rehabilitation (REA Rehabilitation and Water Management Plan)	Presence of weeds in monitoring transects (%)	< 10%	No	Weed control and monitoring should continue to ensure cover does not increase across these stages. Continued treatment of <i>Acacia saligna</i> is required.
		Evidence of second-generation flora germination in monitoring transects	Yes	Yes	Good second generation of forbs, grasses and shrubs. Second generation <i>Eucalyptus</i> spp. and <i>Allocasuarina littoralis</i> are also present in low abundance.
		Rehabilitation monitoring transects contain flora species and structural	Yes	No	Stage 2 revegetation includes non-indigenous species

Rehabilitation phase	Domain objective	Indicator	Completion Criteria	Complete (yes/no)	Comment (including comparison with 2023 results)
		characteristics similar to the desired vegetation communities at the reference sites			<i>(Leptospermum laevigatum)</i> providing high % of cover. Colonisation by target species in both stages continues to increase, however structural characteristics require further progress.

Table 9: Rehabilitation progress in Stages 3, 4 and 5 of CD 3 with reference to closure criteria contained in the Rehabilitation Strategy.

Rehabilitation phase	Domain objective	Indicator	Completion Criteria	Complete (yes/no)	Comment (including comparison with 2023 results)
Decommissioning	Infrastructure and services will be removed from the REA site	All services related to refuse emplacement activities to be removed from the REA	Yes	Yes	From this Stage of Domain 3
		REA site offices and any other infrastructure to be removed	Yes	Yes	From this Stage of Domain 3
Growth medium development	Apply topsoil for rehabilitation	Topsoil placement depth	>200 cm	Yes	
	Reduce erosion on slopes, and provide furrows for seed beds	All final landform slopes to be contour ploughed	Yes	Yes	No erosion evident
Ecosystem establishment	Establish native bushland rehabilitation	Conduct seeding and/or planting	Yes	Yes - seeding / planting completed	In 1998
Ecosystem development	Self-sustaining native bushland rehabilitation (REA Rehabilitation and Water Management Plan)	Presence of weeds in monitoring transects (%)	< 10%	Yes	Weed density decreased to <10% within monitoring transects from 2023 to 2024. Weed control and monitoring should continue to ensure cover does not increase across Stages 3, 4 and 5.
		Evidence of second-generation flora germination in monitoring transects	Yes	No	Evidence of reproductive potential, and second generation in some areas.

Rehabilitation phase	Domain objective	Indicator	Completion Criteria	Complete (yes/no)	Comment (including comparison with 2023 results)
					Second generation canopy species were lacking in monitoring plot B1.
		Rehabilitation monitoring transects contain flora species and structural characteristics similar to the desired vegetation communities at the reference sites	Yes	No	Colonisation by target species in these stages has increased since 2023. Structural characteristics require further progress.

Table 10: Rehabilitation progress in Stages 6 and 9 of CD 3 with reference to closure criteria contained in the Rehabilitation Strategy

Rehabilitation phase	Domain objective	Indicator	Completion Criteria	Complete (yes/no)	Comment (including comparison with 2023 results)
Decommissioning	Infrastructure and services will be removed from the REA site	All services related to refuse emplacement activities to be removed from the REA	Yes	Yes	From this stage of Domain 3
		REA site offices and any other infrastructure to be removed	Yes	Yes	From this stage of Domain 3
Growth medium development	Apply topsoil for rehabilitation	Topsoil placement depth	>200 cm	Yes	
	Reduce erosion on slopes, and provide furrows for seed beds	All final landform slopes to be contour ploughed	Yes	Yes	
Ecosystem establishment	Establish native bushland rehabilitation	Conduct seeding and/or planting	Yes	Yes – seeding and planting completed	In autumn 2000
Ecosystem development	Self-sustaining native bushland rehabilitation (REA Rehabilitation and Water Management Plan)	Presence of weeds in monitoring transects (%)	< 10%	Yes	Weed coverage is minimal and has remained stable from 2023-2024. Weed control and monitoring should continue to ensure cover does not increase across Stage 6 and 9
		Evidence of second-generation flora germination in monitoring transects	Yes	No	Evidence of reproductive potential, and second generation in some areas, but particularly lacking in monitoring plot C2.

Rehabilitation phase	Domain objective	Indicator	Completion Criteria	Complete (yes/no)	Comment (including comparison with 2023 results)
					Continue to monitor establishment and growth of second-generation canopy species.
		Rehabilitation monitoring transects contain flora species and structural characteristics similar to the desired vegetation communities at the reference sites	Yes	No	Colonisation by target species in these stages has increased since 2023. Structural characteristics require further progress, in particular, re-development of the canopy in monitoring plot C1. The limited structural characteristics within Stages 6 and 9 are in part due to previous fire in 2019.

Table 11: Rehabilitation progress in Stage 12A of CD 3 with reference to closure criteria contained in the Rehabilitation Strategy

Rehabilitation phase	Domain objective	Indicator	Completion Criteria	Complete (yes/no)	Comment (including comparison with 2023 results)
Decommissioning	Infrastructure and services will be removed from the REA site	All services related to refuse emplacement activities to be removed from the REA	Yes	Yes	From this stage of Domain 3
		REA site offices and any other infrastructure to be removed	Yes	Yes	From this stage of Domain 3
Growth medium development	Apply topsoil for rehabilitation	Topsoil placement depth	>200 cm	Yes	
	Reduce erosion on slopes, and provide furrows for seed beds	All final landform slopes to be contour ploughed	Yes	Yes	Erosion evident at lower stage of the eastern boundary of this domain. No change noted since 2023.
Ecosystem establishment	Establish native bushland rehabilitation	Conduct seeding and/or planting	Yes	Yes – seeding and planting completed	Seeded in November 2011 and 2014
Ecosystem development	Self-sustaining native bushland rehabilitation (REA Rehabilitation and Water Management Plan)	Presence of weeds in monitoring transects (%)	< 10%	No	Weed density increased in monitoring plot F1 between 2023 and 2024. Weed density in this monitoring plot is now 10% and therefore no longer meets the completion criteria threshold. Weed control and monitoring should continue to ensure weed cover does

Rehabilitation phase	Domain objective	Indicator	Completion Criteria	Complete (yes/no)	Comment (including comparison with 2023 results)
		Evidence of second-generation flora germination in monitoring transects	Yes	Yes	not increase across this Stage. Second generation forbs, grasses, shrubs and canopy species are present in low abundance.
					Continue to monitor health and development of second generation flora.
		Rehabilitation monitoring transects contain flora species and structural characteristics similar to the desired vegetation communities at the reference sites	Yes	No	Colonisation by target species in these stages has increased since 2023.
					Structural characteristics require further progress, in particular, canopy development in monitoring plot C1.

Table 12: Rehabilitation progress in Stages 14 and 16 of CD 3 with reference to closure criteria contained in the Rehabilitation Strategy

Rehabilitation phase	Domain objective	Indicator	Completion Criteria	Complete (yes/no)	Comment (including comparison with 2023 results)
Decommissioning	Infrastructure and services will be removed from the REA site	All services related to refuse emplacement activities to be removed from the REA	Yes	Yes	From this stage of Domain 3
		REA site offices and any other infrastructure to be removed	Yes	Yes	From this stage of Domain 3
Growth medium development	Apply topsoil for rehabilitation	Topsoil placement depth	>200 cm	Yes	
	Reduce erosion on slopes, and provide furrows for seed beds	All final landform slopes to be contour ploughed	Yes	Yes	Gully erosion present at lower slopes but appears unchanged since 2023.
Ecosystem establishment	Establish native bushland rehabilitation	Conduct seeding and/or planting	Yes	Yes – seeding and planting completed	Lower slopes - direct seeding in December 2012, reseeded of patches in 2014. Upper slopes - direct seeding in October 2015
Ecosystem development	Self-sustaining native bushland rehabilitation (REA Rehabilitation and Water Management Plan)	Presence of weeds in monitoring transects (%)	< 10%	No	Weed density is 10% in both monitoring plots. Weed control and monitoring should continue to ensure weed cover does not increase across this Stage.

Rehabilitation phase	Domain objective	Indicator	Completion Criteria	Complete (yes/no)	Comment (including comparison with 2023 results)
		Evidence of second-generation flora germination in monitoring transects	Yes	Yes	Second generation forbs, grasses, shrubs and canopy species are present in low abundance. Continue to monitor health and development of second generation flora.
		Rehabilitation monitoring transects contain flora species and structural characteristics similar to the desired vegetation communities at the reference sites	Yes	No	Colonisation by target species in these stages has increased since 2023. Structural characteristics require further progress.

A4 Field data sheets

REA Permanent Monitoring Site Field Sheet 2023			Site Number: Reference Site 001	
20m x 10m quadrat		Site Number: 001		
Species (Trees >1.6m)	No.	Tag / DBH (Diameter Breast Height)		
<i>Eucalyptus racemosa</i>	4	2/dead	4/dead	5/25
Health: Good (epicormic growth evident, no new saplings to tag) Unhealthy: 50%		8/dead		
<i>Eucalyptus globoidea</i>	2	6/5.2	1~/45.3	
Health: Moderate Unhealthy: 30% (some defoliation)				
Health: Unhealthy: %				
Health: Unhealthy: %				
Canopy cover % (over 20m centreline): 10%				
Estimated topsoil depth (closure criteria >200mm): >200mm				
Weed Density (closure criteria < 10%): <0.1%				
Reject material on surface: None				
Biological nutrient recycling: Ants, termites, leaf litter, fallen timber, sedge tussocks, fallen branches				
Fauna habitat: Leaf litter, fallen timber, sedge tussocks, fallen branches, mature trees				
Comments: One prone <i>Acacia longifolia</i> . One new tree tagged in 2024.				
50 m erosion transect: No erosion evident				
----- -----				
Additional species in quadrat: <i>Grevillea sphacelata</i> , <i>Kunzea ambigua</i> , <i>Acacia linifolia</i> , <i>Persoonia linearis</i> , <i>Acacia longifolia</i> , <i>Senecio madagascariensis</i> [^]				

~ Tree tagged in 2024

[^]denotes exotic species

REA Permanent Monitoring Site Field Sheet 2023		Stage:			Reference Site 002	
20m x 10m quadrat		Site Number: 002				
Species (Trees >1.6m)	No.	Tag / DBH (Diameter Breast Height)				
<i>Eucalyptus racemosa</i>	2	3/27	2~/57			
Health: Good. Abundant epicormic growth. Unhealthy: 10%						
<i>Eucalyptus globoidea</i>	1	4/20.7				
Health: Good. Abundant epicormic growth. Unhealthy: 5%						
<i>Acacia longifolia</i>	9	5~/5.1	6~/3	7~/3.3		
Health: Excellent and actively fruiting. Unhealthy: 0%		8~/4	9~/3.5	15~/3		
		16~/3	17~/3.6	24~/2		
<i>Acacia terminalis</i>	10	10~/3.3	11~/3.5	12~/3.6		
Health: Excellent and actively fruiting. Unhealthy: 0%		13~/3.2	14~/3.2	18~/3.1		
		19~/3	20~/3.1	21~/3	22~/3.9	
<i>Acacia linifolia</i>	1	23~/3.2				
Health: Excellent Unhealthy: 0%						
Canopy cover % (over 20m centreline): 3%						
Estimated topsoil depth (closure criteria >200mm): >200mm						
Weed Density (closure criteria < 10%): 0%						
Reject material on surface: None						
Biological nutrient recycling: Ants, termites, leaf litter, fallen timber, cryptogam, wombat scats, cicada shells, spiders						
Fauna habitat: leaf litter, woody debris exposed rocks and sandy soils serving as basking habitat for reptiles. Hollows are also present.						
Comments: <i>Acacia</i> spp. showing continued growth, dominating the midstorey. All stages of reproduction present, including new eucalypt seedlings on the ground layer. High diversity of forbs and grasses. 19 trees tagged in 2024.						
50 m erosion transect: No erosion evident						
----- -----						
Additional species in quadrat: <i>Scaevola ramosissima</i> , <i>Persoonia bargoensis</i> ±, <i>Persoonia linearis</i> , <i>Eucalyptus piperita</i> , <i>Dianella revoluta</i>						

~ Tree tagged in 2024

±denotes threatened species

REA Permanent Monitoring Site Field Sheet 2024			Stage: Stage 1 and 2		
20m x 10m quadrat		Site Number: A1			
Species (Trees >1.6m)	No.	Tag / DBH (Diameter Breast Height)			
Acacia decurrens	7	1/3	2/3.1	6~/2.9	
Health: Good Unhealthy: 0%		4/2.6	3/3.8	7~/2.5	
		8~/3.7			
Allocasuarina littoralis	1	5/3.4			
Health: Good Unhealthy: 0%					
Health: Unhealthy: 0%					
Health: Unhealthy: 0%					
Canopy cover % (over 20m centreline): 0% No live canopy					
Estimated topsoil depth (closure criteria >200mm): >200mm					
Weed Density (closure criteria < 10%): 12% (Eragrostis curvula^)					
Reject material on surface: <1% small scattered					
Biological nutrient recycling: Ants, termite mound in the vicinity, leaf litter (limited), cryptogam (limited), kangaroo scats (limited). Three trees tagged in 2024.					
Fauna habitat: limited leaf litter, woody debris, grass tussocks, small rocks.					
Comments: Kunzea ambigua and Acacia spp. continue to dominate the midstorey. Small decrease in exotic cover from previous.					
50 m erosion transect: No evidence of rill lines, no erosion issues					
----- -----					
Additional species in quadrat: Persoonia linearis, Persoonia bargoensis±, Coronidium oxylepis					

~ Tree tagged in 2024

^denotes exotic species

±denotes threatened species

REA Permanent Monitoring Site Field Sheet 2024		Stage: Stage 1 and 2		
20m x 10m quadrat			Site Number: A2	
Species (Trees >1.6m)	No.	Tag / DBH (Diameter Breast Height)		
<i>Allocasuarina littoralis</i>	7	7*N/A	4/14.1	10/5.1
Health: Good Unhealthy: 0%		1/3	3/3.6	5/3.7
Note* tree no. 7 is slightly outside the plot		11~/3.5		
<i>Eucalyptus punctata</i>	1	6/15		
Health: Good Unhealthy: 0%				
<i>Eucalyptus globoidea</i>	2	2/dead	8/9.2	
Health: One tree is dead, the other is in good condition. Unhealthy: 50%				
<i>Persoonia linearis</i>	1	12~/4		
Health: Good Unhealthy: 0%				
<i>Acacia parramattensis</i>	2	13~/3.5	14~/5	
Health: Good Unhealthy: 0%				
Canopy cover % (over 20m centreline): 1 %				
Estimated topsoil depth (closure criteria >200mm): approx. 200mm				
Weed Density (closure criteria < 10%): 1% (<i>Eragrostis curvula</i> ^)				
Reject material on surface: Yes, small to medium sized pieces with low coverage				
Biological nutrient recycling: Ants, termite mound in the vicinity, leaf litter (moderate), cryptogam, kangaroo scats, significant cicada emergence occurring during surveys.				
Fauna habitat: leaf litter, woody debris, grass tussocks.				
Comments: A few new <i>Acacia</i> spp. and <i>Allocasuarina littoralis</i> seedlings emerging within plot. Four trees tagged in 2024.				
50 m erosion transect: No erosion evident, no erosion issues				
----- -----				
Additional species in quadrat: <i>Hakea sericea</i> , <i>Acacia longifolia</i> , <i>Acacia saligna</i> ^, <i>Dodonea triquetra</i> , <i>Stypandra glauca</i> , <i>Billardiera scandens</i> , <i>Leptomeria acida</i> , <i>Kunzea ambigua</i> , <i>Microtis unifolia</i>				

~ Tree tagged in 2024

±denotes threatened species

^denotes exotic species

REA Permanent Monitoring Site Field Sheet 2024			Stage: Stage 1 and 2		
20m x 10m quadrat		Site Number: A3			
Species (Trees >1.6m)	No.	Tag / DBH (Diameter Breast Height)			
Acacia decurrens	3	1/2.3	2~/2	3~/1.5	
Health: Good					
Unhealthy:					
Acacia longifolia	3	4~/1	5~/1	6~/1	
Health: Good					
Unhealthy: 0%					
Health:					
Unhealthy:					
Canopy cover % (over 20m centreline): 0%					
Estimated topsoil depth: (closure criteria >200mm) approx. 200mm					
Weed Density: (closure criteria < 10%) < 1% (Eragrostis curvula^)					
Reject material on surface: None evident					
Biological nutrient recycling: Ants, spiders and cicadas all present. Moderate leaf litter and cryptogram cover.					
Fauna habitat: Shrubs, fallen timber, rocks for basking/sheltering, large termite mound, litter, and logs provide habitat for birds, reptiles, small mammals and invertebrates.					
Comments: Limited seedlings and saplings of canopy species in plot and surrounds. Abundant new growth on Kunzea ambigua and Acacia spp. throughout. Five trees tagged in 2024.					
50 m erosion transect: Rill lines slightly evident, no erosion issues					
----- -----					
Additional species in quadrat: Laxmannia gracilis, Persoonia levis, Coronidium oxylepis, Persoonia linearis, Cheilanthes sieberi					

~ Tree tagged in 2024
^indicates exotic species

REA Permanent Monitoring Site Field Sheet 2024		Stage: Stages 3, 4 and 5			
20m x 10m quadrat		Site Number: B1			
Species (Trees >1.6m)	No.	Tag / DBH (Diameter Breast Height)			
<i>Eucalyptus punctata</i>	1	6/16.6			
Health: Good					
Unhealthy: 10% (one large dead branch)					
<i>Eucalyptus globoidea</i>	4	4/28.2	3/26	5/8.4	
Health: Poor		12/24.3			
Unhealthy: 80% (dieback is common)					
<i>Allocasuarina littoralis</i>	2	4/10.8	5~/2		
Health: Good					
Unhealthy: 0%					
<i>Acacia binervia</i>	2	8/19	9~/10.3		
Health: Good					
Unhealthy: 0%					
<i>Eucalyptus racemosa</i>	2	1/27.2	2/23.2		
Health: Good					
Unhealthy: 2%					
<i>Acacia falcata</i>	1	1~/2.9			
Health: Good					
Unhealthy: 0%					
Canopy cover % (over 20m centreline): 25%					
Estimated topsoil depth: (closure criteria >200mm): > 200mm					
Weed Density (closure criteria < 10%): 0%					
Reject material on surface: Less than 1% (small pieces, occasionally scattered)					
Biological nutrient recycling: ants, termites, cicadas, kangaroo scats, cryptogam, leaf litter, medium sized fallen branches and debris					
Fauna habitat: Abundant leaf litter, woody debris, termite mounds, grass tussocks and dense midstorey. Suitable for birds and small mammals.					
Comments: Ground layer is relatively sparse, comprising mostly grasses. Midstorey density has increased in some areas. Plastic tree guard material scattered around the quadrat. Three trees tagged in 2024.					
50 m erosion transect: No erosion evident					
----- -----					
Additional species in quadrat: <i>Acacia terminalis</i> , <i>Persoonia linearis</i> , <i>Kennedia rubicunda</i> , <i>Persoonia bargoensis</i> ±, <i>Pimelea linearis</i> , <i>Acacia suaveolens</i> , <i>Acacia falcata</i> , <i>Micrantheum ericoides</i> , <i>Anisopogon avenaceus</i> , <i>Coronidium oxylepis</i> , <i>Laxmannia gracilis</i>					

~ Tree tagged in 2024

±denotes threatened species

REA Permanent Monitoring Site Field Sheet 2024		Stage: Stages 3, 4 and 5			
20m x 10m quadrat		Site Number: B2			
Species (Trees >1.6m)	No.	Tag / DBH (Diameter Breast Height)			
<i>Eucalyptus punctata</i>	4	1/12	3/23.1	6/15.5	
Health: Moderate		20*N/A			
Unhealthy: 20% (tree 6 has several dead branches)					
<i>Eucalyptus globoidea</i>	1	9/7.5			
Health: Poor					
Unhealthy: 95% (most branches dead)					
<i>Allocasuarina littoralis</i>	11	4/26.5	12/6.6	17/4.8	
Health: Good		18**N/A	19/4	21/3.8	27~/3.5
Unhealthy: 0%		22/4	23/5.3	24/0.5	26~/3.5
<i>Eucalyptus crebra</i>	2	16/14	25**N/A		
Health: Poor					
Unhealthy: (most branches dead)					
<i>Acacia binervata</i>	4	7/11.1	10~/8	11~/7	12~/14
Health: Good					
Unhealthy: 0%					
Canopy cover % (over 20m centreline): 12%					
Estimated topsoil depth (closure criteria >200mm): > 200mm					
Weed Density (closure criteria < 10%): 1%					
Reject material on surface: <1% scattered					
Biological nutrient recycling: Ants, termites, cicadas, leaf litter, kangaroo scats					
Fauna habitat: logs, leaf litter, woody debris					
Comments: Increased midstorey density in some areas and minor increase in canopy cover over centreline.					
50 m erosion transect: Rill lines evident, no erosion					
----- -----					
Additional species in quadrat: <i>Hakea dactyloides</i> , <i>Laxmannia gracilis</i> , <i>Sisymbrium officinale</i> ^, <i>Lomandra multiflora</i> , <i>Coronidium oxylepis</i>					

* Tree not found in 2023-24

** Tree not found in 2024

~ Tree tagged in 2024

REA Permanent Monitoring Site Field Sheet 2024			Stage: Stages 3, 4 and 5		
20m x 10m quadrat		Site Number: B3			
Species (Trees >1.6m)	No.	Tag / DBH (Diameter Breast Height)			
<i>Eucalyptus racemosa</i>	2	1/16.5	5~/16.2		
Health: Good					
Unhealthy: 0%					
<i>Allocasuarina littoralis</i>	2	3/12.6	9/6.8		
Health: Good					
Unhealthy: 0%					
<i>Acacia decurrens</i>	1	2/1.6			
Health: Good					
Unhealthy: 0%					
<i>Acacia binervata</i>	1	4~/3.5			
Health: Good					
Unhealthy: 0%					
<i>Acacia longifolia</i>	2	6~/4	7~/3.3		
Health: Good					
Unhealthy: 0%					
Canopy cover % (over 20m centreline): 2 %					
Estimated topsoil depth (closure criteria >200mm): >200mm					
Weed Density (closure criteria < 10%): 3%					
Reject material on surface: approx. 5% (small, scattered)					
Biological nutrient recycling: ants, scats, leaf litter and woody debris					
Fauna habitat: fallen timber, grass tussocks, exposed rocks-sheltering/basking habitat, termite mound					
Comments: High native regeneration in understorey and midstorey although ground cover is sparse. Slight increase in canopy cover over centreline. Very minor decrease in weed cover. Four trees tagged in 2024.					
50 m erosion transect: No erosion evident					
----- -----					
Additional species in quadrat: <i>Centaurium erythraea</i> [^] , <i>Cenchrus setaceus</i> [^] , <i>Hypochaeris radicata</i> [^] , <i>Linum trigynum</i> [^] , <i>Persoonia levis</i> , <i>Acacia binervia</i> , <i>Banksia integrifolia</i> , <i>Dodonaea triquetra</i>					

~ Tree tagged in 2024

[^]indicates exotic species

REA Permanent Monitoring Site Field Sheet 2023			Stage: Stages 6 and 9		
20m x 10m quadrat		Site Number: C1			
Species (Trees >1.6m)	No.	Tag / DBH (Diameter Breast Height)			
<i>Eucalyptus punctata</i>	3	1** N/A	14/6.3	21/22	
Health: Good					
Unhealthy: 0%					
<i>Eucalyptus globoidea</i>	3	12* N/A	19/10	2~/2.8	
Health: Good					
Unhealthy: 0%					
<i>Eucalyptus crebra</i>	1	11/18.8			
Health: Good					
Unhealthy: 0%					
<i>Allocasuarina littoralis</i>	1	13/dead			
Health: Poor					
Unhealthy: 100% (dead and collapsed in 2024)					
<i>Acacia mearnsii</i>	6	3~/2.5	4~/2.9	5~/2.3	6~/3.1
		7~/2.8	8~/2.6		
Canopy cover % (over 20m centreline): 0%					
Estimated topsoil depth (closure criteria >200mm): >200mm					
Weed Density (closure criteria < 10%): 1%					
Reject material on surface: <5% (small to large sized pieces of reject material)					
Biological nutrient recycling: ants, scats, termites					
Fauna habitat: leaf litter, twigs, grass litter small rocks/pebbles and woody debris					
Comments: Healthy understorey of emerging <i>Acacia</i> spp. Canopy cover decrease due to fallen <i>Allocasuarina littoralis</i> . Seven trees tagged in 2024.					
50 m erosion transect: No erosion evident					
0m ----- ----- 50m					
Additional species in quadrat: <i>Monotoca scoparia</i> , <i>Persoonia linearis</i> , <i>Sisymbrium officinale</i> ^, <i>Daviesia genistifolia</i> , <i>Patersonia glabella</i> , <i>Coronidium oxylepis</i> , <i>Callistemon linearis</i> , <i>Verbena bonariensis</i> ^, <i>Cenchrus clandestinus</i> ^, <i>Gamochaeta</i> sp. ^					

* Tree not found in 2023-24

** Tree not found in 2024

~ Tree tagged in 2024

^indicates exotic species

REA Permanent Monitoring Site Field Sheet 2024		Stage: Stage 6 and 9		
20m x 10m quadrat		Site Number: C2		
Species (Trees >1.6m)	No.	Tag / DBH (Diameter Breast Height)		
<i>Acacia parramattensis</i>	4	9* N/A	11* N/A	5~/2.7
Health: Good		8~/3.4		
Unhealthy: 0%				
<i>Eucalyptus punctata</i>	2	1/30	6/25.3	
Health: Good				
Unhealthy: 0%				
<i>Eucalyptus globoides</i>	4	4/17	2/22	10~/8
Health: Good		13~/17		
Unhealthy: 0%				
<i>Allocasuarina littoralis</i>	3	7* N/A	3~/3	12~/2.5
Health: Good				
Unhealthy: % 0				
Canopy cover % (over 20m centreline): 50%				
Estimated topsoil depth (closure criteria >200mm): >200mm				
Weed Density (closure criteria < 10%): 0%				
Reject material on surface: None				
Biological nutrient recycling: ants, scats				
Fauna habitat: fallen branches, twigs, leaf litter, grass litter, rocks/pebbles				
Comments: Eucalyptus saplings present. <i>Acacia</i> spp. and <i>Allocasuarina littoralis</i> are dominant in the midstorey, to approximately 2m tall. Significant increase in canopy cover over centreline.				
50 m erosion transect: No erosion evident				
----- -----				
Additional species in quadrat: <i>Grevillea sphacelata</i> , <i>Lepidosperma laterale</i> , <i>Hakea sericea</i> , <i>Mirbelia rubiifolia</i> , <i>Leptospermum polygalifolium</i> , <i>Persoonia linearis</i>				

* Tree not found in 2023-24

~ Tree tagged in 2024

REA Permanent Monitoring Site Field Sheet 2024		Stage: Stage 12a		
20m x 10m quadrat		Site Number: F1		
Species (Trees >1.6m)	No.	Tag / DBH (Diameter Breast Height)		
<i>Acacia parramattensis</i>	0			
Health: N/A – no new Acacias				
Unhealthy:				
<i>Allocasuarina littoralis</i>	12	9/7.4	10/5.9	19* N/A
Health: Good		21* N/A	25/3	26/6.4
Unhealthy: 0%		27/7.3	34/7.3	35/3.5
		36/7.2	37~/5.4	38~/5.3
<i>Eucalyptus punctata</i>	13	11/16	12**N/A	13/10.6
Health: Good – growth evident across most tagged trees		16/5.4	17/4.8	18/7.8
Unhealthy: 0%		20/14.5	22/8.1	23/11
		24/13.5	14**N/A	40~/6.8
		41~/3.9		
<i>Acacia</i> sp.	1	2/dead		
Health: N/A – Acacia die off noted.				
Unhealthy: 100%				
Canopy cover % (over 20m centreline): 35% (increased)				
Estimated topsoil depth (closure criteria >200mm): > 200mm				
Weed Density (closure criteria < 10%): 10% (increased)				
Reject material on surface: Less than 1%, (small, scattered).				
Biological nutrient recycling: Ants, spiders, fallen timber, mulch, leaf litter and macropod scats				
Fauna habitat: Rocks, leaf litter, pebbles, woody mulch, sandstone rock, grass tussocks, exposed soil, fallen timber.				
Comments: Midstorey is dense. Canopy has increased. Exotic cover has also increased. Four trees tagged in 2024. <i>Pseudonaja textilis</i> (Eastern brown snake) observed in plot.				
50 m erosion transect: Minor erosion				
0m ----- ----- 50m				
Additional species in quadrat: <i>Acacia myrtifolia</i> , <i>Dichelachne</i> sp., <i>Laxmannia gracilis</i> , <i>Lysimachia arvensis</i> ^, <i>Wahlenbergia gracilis</i> , <i>Plantago lanceolata</i> ^, <i>Persoonia linearis</i> , <i>Hibbertia aspera</i> , <i>Persoonia bargoensis</i> ±, <i>Euchiton japonicus</i> , <i>Senecio madagascariensis</i> ^, <i>Lepidosperma laterale</i> , <i>Leptospermum juniperinum</i> , <i>Richardia stellaris</i> ^, <i>Acacia rubida</i> , <i>Centella asiatica</i> , <i>Bossiaea heterophylla</i>				

* Tree not found in 2023-24

** Tree not found in 2024

~ Tree tagged in 2024

^indicates exotic species

±denotes threatened species

REA Permanent Monitoring Site Field Sheet 2024		Stage: Stage 12a		
20m x 10m quadrat		Site Number: F2		
Species (Trees >1.6m)	No.	Tag / DBH (Diameter Breast Height)		
<i>Acacia decurrens</i>	5	3/3.7	10/dead	11/3.6
Health: Low		28/dead	40~/4.3	
Unhealthy: 60% (two trees dead)				
<i>Eucalyptus punctata</i>	12	12**N/A	13/4.2	15/9.2
Health: Good		18**N/A	19/6	20/4
Unhealthy: 9% (plant no. 26 unhealthy)		26/3.3	29/7.1	8/11.5
		35~/3.5	36~/3.8	37~/5.8
<i>Allocasuarina littoralis</i>	11	16/4.2	17**N/A	21/4.8
Health: Good		25/4.1	30/4.8	31~/3.1
Unhealthy: 0%		33~/6.8	32~/3	34~/4.7
		39~/4.7	38~/5	
<i>Eucalyptus oblonga</i>	3	12/8.8	18/5	41~/4.2
Health: Good				
Unhealthy: 0%				
<i>Eucalyptus</i> sp.	1	24/3.5		
Health: Good				
Unhealthy: 0%				
<i>Acacia</i> sp.	1	28/dead		
Health: Good				
Unhealthy: 0%				
Canopy cover % (over 20m centreline): 5%				
Estimated topsoil depth (closure criteria >200mm): approx. 200mm				
Weed Density (closure criteria < 10%): <5% <i>Eragrostis curvula</i> [^]				
Reject material on surface: 2% (large, scattered pieces >2cm in size in some places)				
Biological nutrient recycling: Ants, kangaroo and rabbit scats, spiders, fallen timber, mulch, leaf litter				
Fauna habitat: rocks, leaf litter, pebbles, woody mulch, sandstone rock, grass tussocks, exposed soil, fallen timber				
Comments: Several missing tree tags and incorrectly tagged trees. <i>Eucalyptus punctata</i> in very good health. Eleven trees tagged in 2024.				
50 m erosion transect: No erosion evident				
0m ----- ----- 50m				
Additional species in quadrat: <i>Dianella revoluta</i> , <i>Hardenbergia violacea</i> , <i>Bossiaea prostrata</i> , <i>Lomandra longifolia</i> , <i>Cheilanthes sieberi</i> , <i>Lysimachia arvensis</i> [^] , <i>Hydrocotyle laxiflora</i> , <i>Gonocarpus tetragynus</i> , <i>Facelis retus</i> [^] , <i>Panicum effusum</i> , <i>Acacia longifolia</i>				

** Tree not found in 2024

~ Tree tagged in 2024

[^]indicates exotic species

REA Permanent Monitoring Site Field Sheet 2024			Stage: Stages 14 and 16	
20m x 10m quadrat		Site Number: H1		
Species (Trees >1.6m)	No.	Tag / DBH (Diameter Breast Height)		
<i>Allocasuarina littoralis</i>	10	2/8.8	6/6.7	7/4.2
Health: Good Unhealthy: 0%		8/6	9/4.1	10/dead
		12/7	14/3.8	20~/1
		21~/4.2		
<i>Acacia parramattensis</i>	2	4/5.1	5/13.1	
Health: Good-Moderate Unhealthy: 10% (wood-boring insect damage)				
<i>Acacia decurrens</i>	4	11/6.7	13/6.4	18~/4.1
Health: Good-Moderate Unhealthy: 5% (wood-boring insect damage)		22/2.5		
<i>Eucalyptus fibrosa</i>	1	1/8.7		
Health: Good Unhealthy: 0%				
<i>Eucalyptus punctata</i>	5	15/4.6	16~/4.7	17~/7.6
Health: Good Unhealthy: 0%		23~/6	19~/4.6	
Canopy cover % (over 20m centreline): 7%				
Estimated topsoil depth (closure criteria >200mm): > 200mm				
Weed Density (closure criteria < 10%): 10% scattered <i>Eragrostis curvula</i> ^, <i>Richardia stellaris</i> ^, <i>Centaureum erythra</i> ^				
Reject material on surface: <1% (small, scattered)				
Biological nutrient recycling: ants, spiders, cicadas, kangaroo scats, grass litter and leaf litter				
Fauna habitat: Grass tussocks, midstory shrubs, rocks (basking habitat), sandstone pebbles (basking habitat)				
Comments: Dieback observed in <i>Acacia</i> spp. due to boring insect damage. Few trees missing tags. Seven trees tagged in 2024.				
50 m erosion transect: No gully erosion evident, however rill lines slightly evident				
S 0m ----- ----- ----- 50m N				
Additional species in quadrat: <i>Lomandra multiflora</i> , <i>Hibbertia aspera</i> , <i>Dianella revoluta</i> , <i>Lobelia purpurascens</i> , <i>Laxmannia gracilis</i> , <i>Euchiton sphaericus</i> , <i>Pomax umbellata</i> , <i>Daviesia ulicifolia</i> , <i>Persoonia linearis</i>				

~ Tree tagged in 2024
^indicates exotic species

REA Permanent Monitoring Site Field Sheet 2024		Stage: Stages 14 and 16		
20m x 10m quadrat		Site Number: H2		
Species (Trees >1.6m)	No.	Tag / DBH (Diameter Breast Height)		
<i>Allocasuarina littoralis</i>	9	1/6.2	2/8.1	9/8.9
Health: Good		10/5.8	12/7.4	17/4.3
Unhealthy: 5%		20/2	27/2.8	33~/2.7
<i>Eucalyptus punctata</i>	12	3/4	4/6.8	15/7.8
Health: Good		18/15.1	21/5	22/6.7
Unhealthy: 2%		23/3.5	24*N/A	25/8
		28/6.6	26/9.3	35~/3.5
		34~/6/7		
<i>Eucalyptus</i> sp.	4	14*N/A	30/4	31/4.5
Health: Good		22*N/A		
Unhealthy: 0%				
<i>Acacia decurrens</i>	1	32/6.8		
Health: Moderate				
Unhealthy: 50% (prone with roots exposed, but still alive and appears healthy)				
Canopy cover % (over 20m centreline): 15%				
Estimated topsoil depth (closure criteria >200mm): >200mm				
Weed Density (closure criteria < 10%): 10%				
Reject material on surface: 1% (small and large pieces, scattered)				
Biological nutrient recycling: Ants, scats, spiders, leaf litter and grass litter				
Fauna habitat: Mulch, grass/leaf litter, rocks, sandstone pebbles, shrubs and twigs				
Comments: No change in canopy cover over centreline or weed cover. Few trees not found. Three trees tagged in 2024.				
50 m erosion transect: No erosion, deep rill lines evident.				
N 0m ----- ----- 50m S				
Additional species in quadrat: <i>Allocasuarina littoralis</i> , <i>Acacia suaveolens</i> , <i>Astroloma humifusum</i> , <i>Persoonia bargoensis</i> ±, <i>Persoonia linearis</i> , <i>Gonocarpus tetragynus</i> , <i>Lomandra multiflora</i> , <i>Davesia ulicifolia</i> , <i>Mirbelia rubiflora</i>				

* Tree not found in 2023-24

~ Tree tagged in 2024

±denotes threatened species



2024 Appendix B – Annual Walkover

Refuse Emplacement Area



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Abbreviations

Abbreviation	Description
REA	Refuse Emplacement Area
TARP	Trigger Action Response Plan

1.0 Introduction

Tahmoor Coal has undertaken the Annual Rehabilitation Walkover for 2024 of the 12 stages rehabilitated to date located within the Refuse Emplacement Area (REA) of Tahmoor Coking Coal Operations in Tahmoor. The REA is located in Mining closure Domain 3 shown in **Figure 1**.

The Walkover included the following areas for assessment:

- Six (6) rehabilitated and revegetated areas established over historic refuse emplacement areas. These areas include Stages 1-2, Stages 3, 4 and 5, Stage 8, Stages 6 & 9, Stage 12a, 14 & 16 (Higher & Lower benches) and 17; and
- No. 2 Shaft 11KV Power Line Corridor

The above stages assessed during the rehabilitation walkover are shown in **Figure 2**.

The rehabilitation monitoring was undertaken in accordance with the Tahmoor Coal Rehabilitation Management Plan (TAH-HSEC-00402) and Rehabilitation Monitoring procedure (TAH-HSEC-00012) which states:

The purpose of the annual inspection is to provide a “rapid” style assessment (via a walkover or flyover) of all existing (including recently completed rehabilitation areas) across the operation.

The primary focus is to identify rehabilitation failures or maintenance issues that if left unchecked could hinder succession of rehabilitation or result in expensive remediation. The inspection includes but is not limited to identification of:

a) erosion (rill, gully and tunnel);

b) stability and functioning of erosion and sediment control and water management structures;

c) visual assessment of vegetation cover, species diversity, vegetation health and growth rates; and

d) presence of weeds and pests.

Trials have been established within the older sections of revegetation to consider the efficacy of planting and/or seeding with native grasses to increase native vegetation cover and increase organic matter in the soil profile, in patches with limited vegetation. Photo monitoring was carried out at these trial sites and a visual assessment recorded.

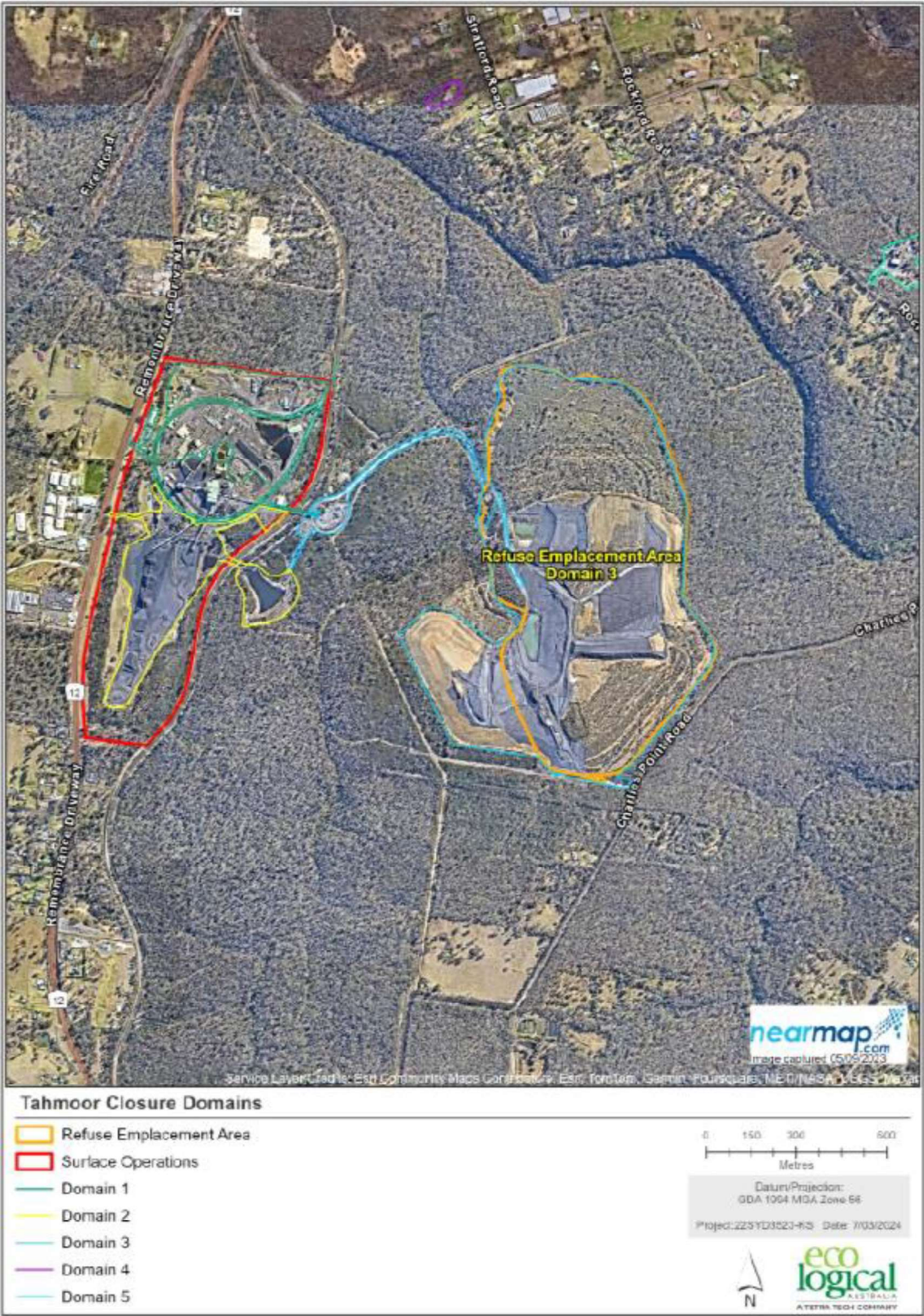


Figure 1 – Tahmoor Coal surface operations and refuse emplacement area.

2.0 Methodology

The REA and No. 2 Shaft 11kV power corridor were traversed by foot on the 11 November 2024 by Tahmoor Coal Environmental Specialists Natalie Brumby and Thomas O'Brien.

The rehabilitation monitoring was recorded on Tahmoor Coal Annual Rehabilitation Inspection (Walkover Form) to collect the following information:

- visual assessment of surface materials
- evidence of erosion
- occurrence of potholing or slumping
- evidence of spontaneous combustion
- evidence of contamination or other limitations to vegetative establishment
- stability and function of erosion and sediment control structures
- integrity of water management structures
- evidence of soil profile development
- evidence of poor growth rates
- evidence of plant mortality or dieback
- native species diversity including evidence of target species in each stratum
- exotic species and density
- evidence of regeneration and seeding
- evidence of biological nutrient cycling
- additional factors which will impact on revegetation.

Sites and features were recorded and photographed and are presented within this report. Additional photos were captured at permanent monitoring sites during monitoring (**Appendix A**).

3.0 Trigger Action Response Plan

A Trigger Action Response Plan has been developed to classify the status of rehabilitation progress and to provide a response to this progress and adequacy. These classifications are given in **Table 1** and the Stages classified in **Table 2** below.

Table 1 Rehabilitation Status Trigger Action Response Plan

Annual Rehabilitation Status	Description	Action
VC	Generally, exceeds the good practice standards and regulatory requirements by a significant margin.	No further action. Continue to maintenance activities as scheduled.
C	Generally good practice standards and regulatory requirements subject to normal variance	No further action. Continue to maintenance activities as scheduled.
NC1	Not complying with some regulatory requirements and improvement needed to meet required good practice standards. Required works minor in nature and generally within budgeted site program	Undertake minor works to improve rehabilitation to minimum standard prior to next annual inspection
NC2	Not complying with significant risk to this inspection item, urgent corrective action needed. Requirements generally substantial in nature and beyond a budgeted site program	Undertake major works required to improve rehabilitation to minimum standard prior to the next annual inspection.

3.1 Trigger Action Response Plan Classification

Table 2 Rehabilitation Stages Classification Status for 2024

Area	Status Rating	Comments
1-2	C	Minor gully erosion to be improved, continued weed control
3, 4 & 5	C	Continued weed control
6 & 9	C	Continued weed control
8	No Status	Rehabilitation still establishing
12a	C	Opportunity for additional plantings in bare patches
14 & 16	C	Continued weed control
17	No Status	Rehabilitation still establishing

4.0 Results

Trigger Action Response Plan classifications for each stage are provided in **Appendix A**.

The field survey record sheets (using Tahmoor Coal Annual Rehabilitation Inspection (Walkover Form)) for the rehabilitation monitoring are provided in **Appendix B**.

Overall, native vegetation cover has remained stable over the past 12 months, with an increase noted in seedling varieties in native understorey cover and diversity observed across the REA during the walkover. However, continued improvement in additional grass species and canopy vegetation is recommended in some stages and a focus on vegetating bare patches noted during the walkover.

Over the past year (1st November 2023 to 31 October 2024) there has been approximately 922.6 mm of precipitation (Camden weather station). This is above the average annual rainfall for the area (~749.8mm) and above the rainfall received in the previous year, which was below average at 677.5mm of rainfall (BOM 2024).

The moderate rainfall received has supported the growth of seedlings and saplings of second-generation Eucalyptus species, and Allocasuarina littoralis across the REA. During the walkover, an abundance of diversity among understorey seedling species including shrubs, grasses, sedges and forbs was noted. However, some bare areas remain with sparse vegetation.

As of 13 November 2024, El Niño Southern Oscillation (ENSO) remains neutral, with sea surface temperatures (SSTs) in the central equatorial Pacific Ocean at ENSO-neutral levels (BOM 2024). The Bureau's model suggests SST's are likely to remain within the ENSO-neutral thresholds throughout the forecast period to February 2025. It is unlikely that the vegetation within the REA will be negatively affected by any shift in La Niña or El Niño conditions as forecasts predict neutral conditions. Therefore, the impacts of La Niña and El Niño events are considered unlikely to affect the stability of species diversity and cover across the REA over the next 12 months.

There was little change observed in erosion points throughout the REA with drainage lines in good condition. It is recommended that areas previously identified with minor erosion are monitored throughout the year. Some remediation had been undertaken during 2024 on erosion points in Stages 12a and developing Stage 8 with the addition of coir logs.

Stages 6 and 9 within the REA show good coverage of native grass cover and continued growth of Allocasuarina and Eucalyptus seedlings. The mature rehabilitated vegetation in Stages 1 and 2 remain stable with a high abundance of native Kunzea ambigua being present. Generally, the groundcover contains a diversity of native grasses with moderate

cover through-out the rehabilitated stages with some bare areas for improvement noted. Continued monitoring, and actions to control weed populations within the REA is recommended throughout the next year. Trigger Action Response Plan classifications for each stage are provided in **Appendix A**.

The field survey record sheets (using Tahmoor Coal Annual Rehabilitation Inspection (Walkover Form)) for the rehabilitation monitoring are provided in **Appendix B**.

Continued weed suppression and eradication of *Acacia saligna* was undertaken during 2024 with no species noted during the walkover. Continued monitoring will be undertaken during 2025.

The following sections provide a general summary on each of the rehabilitated stages within the REA. Additional features recorded during the walkover survey are mapped in Figure 2. This map does not provide all occurrences of the presented features, however, it provides an indication of features which may impact on the on-going progression towards self-sustaining native vegetation.

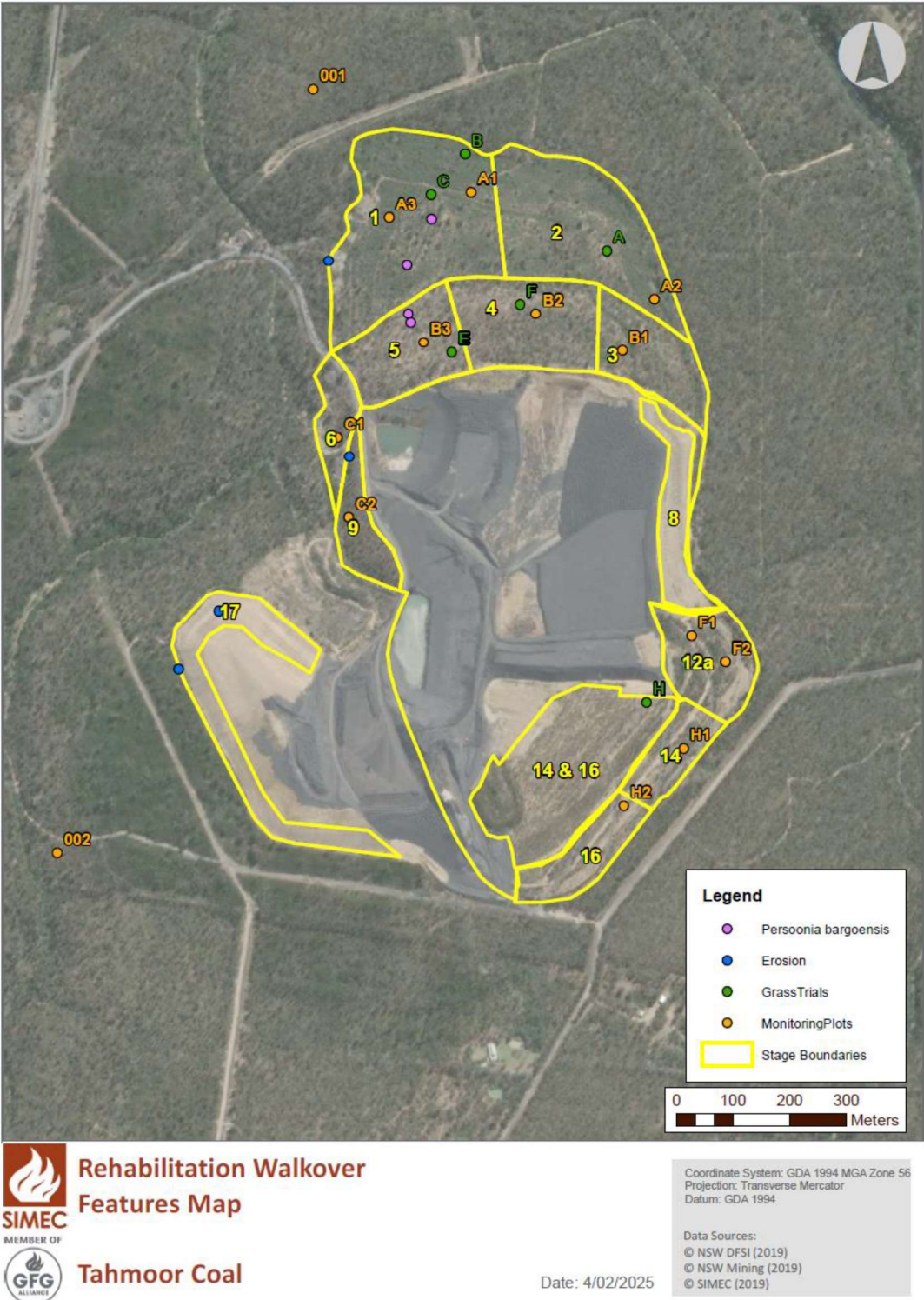


Figure 2 Rehabilitation Walkover Features Identified

4.1 REA Stages 1 & 2:

Planted: Spring 1993 by direct seeding and 1996 by tubestock planting.

The vegetation is progressing towards self-sustaining native vegetation. Continued weed suppression was undertaken during 2024 for weeds and *Acacia saligna*, however some annual weed species were present during the walkover. It is recommended to continue regular ongoing maintenance to manage weed incursion. Maintenance activities, primarily targeted weed control during peak growth periods, are still required within these stages. Strategies should be implemented to extend grass cover and additional canopy species to those areas with limited vegetation establishment:

Soil stability and development:

- Stable with good sound erosion controls (contour banks)
- Soil development continues to progress with nutrient cycling of fallen woody debris and increased leaf litter cover. Ants and termite mounds noted throughout section.
- Rock lined drains to the north-west in good condition with no erosion issues evident.

Native vegetation cover and diversity

- Native grass cover has remained mostly unchanged across stages 1 and 2 since 2023.
- Increase in native seedling diversity emergence across Stage 1 & 2 since 2023. There are patches of monoculture evident with *Casuarina* sp and *Kunzia* sp.
- Canopy approximately 10 – 15 m tall, including; *Eucalyptus punctata*, *Allocasuarina littoralis* and lower canopy species, *Banksia spinulosa*, *Hakea* sp, *Acacia decurrens* and *Acacia binervia*.
- Non-endemic species midstorey species, *Leptospermum laevigatum* is still present with high cover in stage 2, however *Kunzea ambigua* is abundant elsewhere especially in Stage 1.
- Native seedlings and saplings such as *Eucalyptus* spp., and *Allocasuarina littoralis* have continued to grow from the previous year.
- Groundcover diversity across the stages includes native grasses, forbs and shrubs, including, *Themeda triandra*, *Aristida ramosa* and *Astroloma humifusum* among others.
- Many Bare areas noted during inspection. Additional *Eucalyptus* sp and grass species recommended to be planted.

Weed cover

- Weed cover has decreased significantly across stages 1 and 2 over the past few years. *Eragrostis curvula* (African Lovegrass) noted in Stage 2.

4.2 REA Stages 3, 4 &5:

Planted: Autumn 1998 by direct seeding and tubestock planting

The vegetation within these rehabilitation areas is progressing towards self-sustaining native vegetation. Continued maintenance weed control and management of patches with limited vegetation are still required to satisfy this requirement.

Soil stability and development:

- Soil development continues to progress with nutrient cycling of woody debris and increased leaf litter cover
- Some soil crusting noted on the western area of Stage 5
- Gully erosion still present within Stage 5 boundary where the midslope begins
- All contour banks and water management structures are stable.

Native vegetation cover and diversity:

- Native species cover seems to have increased with additional seedlings noted throughout the stages, especially canopy trees (ie. *Eucalypt* sp. and *Allocasuarina littoralis*).
- Native species diversity seems to have remained similar to 2023.
- Second generation *Eucalyptus* spp., seedlings and *Allocasuarina littoralis* seedlings are still present across stages.
- Recruitment of new canopy species *Allocasuarina littoralis* and *Acacia binervia* seedlings is also evident.
- Moderate native grass cover and diversity in these stages, however many bare areas.
- Tree species noted to be in good health overall.

Weed cover

- Low weed presence noted with *Sisymbrium officinale* (Hedge Mustard) across stages 3, 4 and 5, mainly concentrated in the south top sections of the stages and *Hypochaeris radicata* noted throughout stages.
- On-going control is required for *E. curvula*. Hand removal is to be used where weed populations are limited to protect native species. Large patches of these species require spraying of herbicide.

4.3 REA Stages 6 and 9

Planted: Autumn 2000 by direct seeding and tubestock planting.

Prior to 2020, the vegetation within these two stages was slowly progressing towards self-sustaining native vegetation with the presence of limited 2nd generation plants and colonisation from neighbouring bushland. During 2020, these stages were affected by an uncontrolled bushfire in summer 2019/2020. The canopy layer was also consumed by fire, however many canopy species have survived and contain epicormic growth. In general, both the cover and diversity of the groundcover layer improved in post fire conditions.

Several threatened species including *Grevillea parviflora* subsp. *parviflora* and *Persoonia bargoensis* have been recorded across these stages, with most recorded in Stage 6.

During the 2022 rehabilitation assessment, Stages 6 and 9 was recorded to have recovered well in post fire conditions, *Acacia* growth which was dominant in the previous year had begun to be replaced with *Eucalypt* and *Allocasuarina* regeneration whilst continuing to have a high density of *Acacia* growth. The groundcover has also returned with living groundcover species, ranging from approximately 40 – 70% native cover. The groundcover is made up of graminoids, as well as regenerating shrubs such as *Hakea* sp., *Daviesia ulicifolia* and *Kunzea ambigua*.

During 2023, litter cover was noted to have increased in these stages, with low weed cover overall. *Acacia* sp. continue to have a dominant presence across the mid-storey, with a moderate decrease in species diversity overall. Native grass cover was noted as variable, but stable overall.

2024:

Soil stability and development

- Slopes are generally stable

- Minor gully erosion recorded closest to haul road, this has worsened during 2024 during rain events and is scheduled for remediation early 2025.
- Minor gully erosion to the Dam S7B in the north of stage 6 and adjacent to road present
- Litter cover is moderate and has increased since 2023.

Native vegetation cover and diversity

- Native species diversity has remained similar to 2023.
- Acacia spp. continue to have a high cover across the midstorey
- Shrub and canopy species regeneration is evident with emerging Acacia spp. and Allocasuarina littoralis
- A. littoralis and Eucalyptus seedlings continue to be present in the midstorey / low canopy
- Tree health was variable with a small number of A. littoralis and Eucalyptus in poor condition, especially in Stage 6.
- Native grass cover was variable, but stable overall.

Weed cover

- Weed cover continues to be is very low across these stages
- Hypochaeris radicata (Flatweed) continues to dominate these stages, however in very low, sporadic occurrences.

4.4 REA Stages 7, 10 and 12B

These areas were modified by earthworks and mining operations during 2022. Stages 7, 10 and 12b are currently undergoing refuse emplacement activities.

4.5 REA Stage 8

Stage 8 was planted by direct seeding during September 2022

Soil stability and development

- Erosion control rock-lined channels remain stable.

- Some erosion has been remediated in the north section of this area with coir logs installed along contours. Branches and rocks have been emplaced within eroded sections to prevent further degradation.
- Ground is predominately bare with areas of leaf matter and bark deposits strewn across the contours.

Native vegetation cover and diversity

- Species establishing include Acacia sp., Hardenbergia sp., Lomandra sp., and other grass species.

Weed cover

- This area is dominated with weed species and needs regular attention to reduce their prevalence across this stage.
- Weeds identified include Nightshade (Solanum sp.), Verbena sp, and Nova scotia (Scotch thistle).

4.6 REA Stage 12A

Planted: Lower benches (section A) planted by direct seeding in November 2011

Soil stability and development

- Erosion control rock-lined channels remain stable.
- Soil development progressing with nutrient cycling and increased litter cover
- Rip lines present, however becoming less evident as branch, leaf and grass litter continue to accumulate over topsoil.

Native vegetation cover and diversity

- Native species diversity has remained stable for 2024.
- Highly diverse groundcover layer with native grasses, forbs and sedges including Astroloma humifusum, Glycine clandestinum, Entolasia stricta and Mirbelia rubifolia present.
- Juvenile E. punctata, E. fibrosa, Angophora floribunda and A. littoralis still present in

understory vegetation.

- Upper benches have established more effectively than the lower benches for overall vegetation coverage.

- Midstorey composition remains similar to 2023, with many species including *Kunzea ambigua*, *Hakea sericea*, *Melaleuca thymifolia*, *Dodonaea viscosa* subsp. *cuneata* and *Dianella revoluta* var. *revoluta*.

Weed cover

- *Eragrostis curvula* confined to certain areas (ie. Drainage ways) however still present and *Hypochaeris radicata* was noted scattered across the stage however sparse coverage. On-going control is required for these species. Hand removal is to be used where weed populations are limited to protect native species. Large patches of these species require spraying of herbicide.

4.7 REA Stages 14 and 16

Planted: Lower benches planted with native species and sterile pasture species, Japanese Millet and Perennial Rye grass, by direct seeding in December 2012.

Upper benches planted in October 2015 by direct seeding.

Soil stability and development

- Rock lined drains stable and in good condition.
- Native shrubs and groundcovers have good coverage, which continues to stabilise the soil.
- Continued accumulation of grass, leaf litter and mulch/branches throughout this stage.

Native vegetation cover and diversity

- Good coverage and native species diversity.
- Native grass cover is low overall, with many bare areas.
- In 2023 a reduction in canopy species *Eucalyptus punctata* and *Angophora floribunda* recorded in the north of stage 14 and 16, however tree growth otherwise stable for 2024.
- Midstorey composition includes *Kunzea ambigua*, *Dodonaea viscosa* subsp. *Cuneata*, *Persoonia linearis* and several *Acacia* spp.

Weed cover

- *Eragrostis curvula* presence has been reduced however further remediation is required for these stages.

- Still presence of *Eragrostis curvula*, *Conyza bonariensis* and *Cynodon dactylon*. Further remediation is required for these stages.

4.8 No. 2 Shaft 11kV Underground Power Line Corridor

Rehabilitation carried out in November 2017 by the resspreading of topsoil and original cleared vegetation and woody debris (Figure 2).

Soil stability and development

- The corridor is stable with good stability along banks of Tea Tree Hollow Creek with no erosion evident during the assessment.
- Incorporation of organic matter into topsoil has been completed. Ample leaf litter noted.
- Evidence of ants, ant mounds and termite mounds within area.

Native vegetation cover and diversity

- Canopy species present and continue to grow in DBH. Many *Eucalyptus* sp. noted.
- High cover of midstory shrubs regenerating including *Kunzea* sp, *Grevillea* sp and *Leptospermum* sp.
- High cover and abundance of grasses, sedges, forbs, and climbers noted along the corridor continues to be noted.
- Leaf litter, grass litter and plenty of fallen branches are present and contributing to decomposition rates as noted in 2023.

Weed cover

- Generally, very low weed cover. No weed species were identified during the 2024 inspection.

5.0 Recommendations:

- Continue regular weed control maintenance across all stages of the REA through 2025. Regular monitoring in Stage 3 for *Acacia saligna* populations and Stage 1 for *Eragrostis curvula* (African Lovegrass).
- Bare patches in all stages for future improvements have been identified, especially Stage 12a lower slopes.
- Increase canopy and groundcover species in Stages 1-2.
- Erosion noted on the western edge of Stage 1. Continue to regularly monitor and remediate where required.
- Historic waste disposed of on slope at 11KW Powerline easement. Remove if possible.

6.0 Grass Trials

Tahmoor Coal Pty Ltd established grass trials in 2014 to investigate the effectiveness of introducing native grasses into areas with limited vegetation. These were established using several different methods and a mixed of native grass species indigenous to the local area. Based on photos within the establishment report (Peter Harper, Bettersafe, 2014). Trial D has been discontinued as the area has been stripped and re-utilised for additional emplacement.

- Trial E was established by planting Hiko cells, and the other trials were established by raking Organic Growing Medium (OGM) over the soil surface and spreading native grass seed.
- Trial area F was added within Stage 4 and another fenced area was added to the upper slope of stage 14 in 2019.
- Trial H within Stage 14 and 16 upper slopes; and
- Trial G within Stage 8 have a series of single wire fencing set up directly adjacent to trials which were added in 2020.

A brief visual assessment of native grass and exotic cover was carried out within each trial area during the rehabilitation monitoring in November 2024. Photos of trials A, B, C, E, F and H are provided below.

The locations of the trials are indicated in **Figure 2**.



Figure 4: Trial A in Stage 2



Figure 5: Trial B in Stage 1



Figure 6: Trial C within Stage 1



Figure 7: Trial E in Stage 5



Figure 8: Trial F in Stage 4



Figure 9: Trial H (a) in Stage 14 &16



Figure 10: Trial H(b) in Stage 14 & 16



Figure 11: Trial H (c) in Stage 14&16

6.1 Results

A summary of the results recorded from these trials is provided in **Table 3 below**. The establishment of native grasses was highest in grass Trial H, whereby establishment method was by raking OGM and planting Hiko cells. During 2024, weed coverage has decreased in Trial H and still remains the highest in grass cover when compared with all the other Trials. Trial E and F had the least grass coverage however good diversity in emerging seedling species. Trials A, B and C had good grass coverage with less species diversity. Low weed presence was noted for all trails during 2024 inspections.

There was an overall pattern of reduced cover and abundance of exotic species. This decrease in overall vegetative cover and species diversity may be a result of slightly drier and warmer than average temperatures.

Trial areas with successful native grass establishment have shown improved native species cover and diversity over the years since establishment of the trial. Areas with poor grass establishment have shown no significant increase in native ground cover.

Table 3: Grass Trial Results 2024

Trial	Location	Native Grass sp Coverage	Weeds	Comments
A	Stage 2	<15%	None Observed	- Small patches of grass sp. - Many Allocasaurina seedlings establishing - Approx 50% bare ground with minimal amount of branch and leaf litter
B	Stage 1	<5%	None Observed	- Small patches of grass sp. - Trial dominated by Kunzea ambigua with other understorey species incl Acacia longifolia.
C	Stage 1	<40%	None Observed	- Main patch of Aristida ramosa surrounded by individual plants. - <30% Bare ground - Leaf litter present
E	Stage 5	<5%	None Observed	- Many Allocasaurina sp seedlings establishing - Minimal grass species observed with large diversity of many other species establishing within plot. - Plot contains large amount of bare areas littered with other seedling sp. establishing. - Surface has a good amount of leaf litter, branches and plant matter
F	Stage 4	<15%	None Observed	- Large diversity of many understorey and canopy species establishing within this plot incl. Allocasaurina littoralis and Acacia sp. - Approx 50% bare ground littered with fallen branches and some leaf litter
H	Stage 14 & 16	50-60%	A patch of various weeds in Plot b.	- Great ground coverage. - However, there are some weed species observed in plot B. - Plot A has great grass sp. establishment with plot completely full. - Acacia dentata and Acacia longifolia establishing in Plot B. - Plot C contains most bare ground and <15% grass coverage. This plot has one Acacia longifolia establishing with fallen branches and leaf litter present.

7.0 Walkover Form – Native Vegetation/Ecosystem

Tahmoor Coal	
REA Stage	Stages 1 & 2
Date of Inspection	11/11/2024
Inspected by	Natalie Brumby
Signature	

Inspection Item	Comment	Location of Rehabilitation Area	Co-ordinates	Photo No.	Action(s) Recommended
Visual assessment of surface materials (eg. Large rocks, bare areas>0.1ha)	Fallen Debris and branches adding to Organic Matter (OM). Lots of leaf litter (Acacia and Casuarina leaf litter) Minimal reject identified on the surface from Ant mounds.	REA Stage 1&2		See Folder: W:\E&C\7 Environment\19 Rehab & Closure\2024_Rehab Monitoring (Eco)\Rehab Walkover\Photos	
Evidence of erosion (eg. Sheet, rilling, gullying and severity)	None				
Occurrence of potholing or slumping	None				
Evidence of spontaneous combustion	None				

Evidence of contamination or other limitations to vegetative establishment (eg. surface crusting, staining of soil surface etc.)	Some crusting occurring to the east on the contoured bank.			
Stability and function of erosion and sediment control structures	Working and in order.			
Integrity of Water Management Structures (e.g. dams, drains, contour banks)	No issues with dams, drains or contour banks.			
Evidence of soil profile development (e.g. leaf litter, decomposition, pedality etc.)	Yes, plenty of leaf litter and decomposition, ie. Fallen branches etc			
Evidence of poor Growth rates e.g. growth stunting	Some Casaurinas are showing stunted growth, however, still seeding. Understory cover abundant. Allocasaurina seedlings establishing.			

Evidence of plant mortality or dieback	Some Acacia species dead. Many branches have fallen and litter the ground in these Sections.			
Native Species diversity- evidence of target/framework native species present in each stratum i.e. upper, mid and lower	There is a good diversity throughout. There are many patches of monoculture areas occurring (i.e. Casaurina sp, Kunzea sp. And Lomandra sp.			
Evidence of regeneration/seeding	Yes, many species flowering and seeding (ie. Hakea sp.) 2 nd generation canopy species including Eucalyptus sp and Allocasaurina littoralis. 2 nd generation Acacia species and grasses. Many seedlings establishing			
Evidence of biological nutrient cycling in Native woodland/forest areas e.g. puff balls	Surface lichen and mosses Ant and termite activity			
List Other(s)				Continue control of Acacia saligna

Rehabilitation Monitoring 2024

Tahmoor Coal	
REA Stage	Stages 3, 4 & 5
Date of Inspection	11/11/2024
Inspected by	Natalie Brumby
Signature	

Inspection Item	Comment	Location of Rehabilitation Area	Co-ordinates	Photo No.	Action(s) Recommended
Visual assessment of surface materials (eg. Large rocks, bare areas > 0.1ha)	Lots of leaf litter adding to OM. Thick leaf litter mulch in Stage 3 upper benches. (Acacia and Allocasaurina sp.) Bare patches noted throughout sections.	REA Stage 3, 4 & 5		See Folder: W:\E&C\7 Rehab & Closure\2024_Rehab Monitoring (Eco)\Rehab Walkover\Photos	
Evidence of erosion (eg. Sheet, rilling, gullying and severity)	None				
Occurrence of potholing or slumping	None				

Evidence of spontaneous combustion	None				
Evidence of contamination or other limitations to vegetative establishment (eg. surface crusting, staining of soil surface etc.)	None				
Stability and function of erosion and sediment control structures	Working and in order.				
Integrity of Water Management Structures (e.g. dams, drains, contour banks)	No issues with dams, drains or contour banks.				
Evidence of soil profile development (e.g. leaf litter, decomposition, pedality etc.)	Yes, plenty of leaf litter and decomposition, ie. Fallen branches etc				
Evidence of poor Growth rates e.g. growth stunting	None noted during inspection.				

Rehabilitation Monitoring 2024

Evidence of plant mortality or dieback	Acacia species dying back with falling branches across stages.				
Native Species diversity- evidence of target/framework native species present in each stratum i.e. upper, mid and lower	Good diversity throughout stages. More established Canopy trees than compared with Stages 1 & 2.				More groundcover species recommended to cover bare patches in these stages
Evidence of regeneration/seeding	Yes, many species flowering and seeding incl Hakeas and Acacia sp. May seedlings emerging of understory and canopy species.				
Evidence of biological nutrient cycling in Native woodland/forest areas e.g. puff balls	Ant activity noted				
List Other(s)					

Rehabilitation Monitoring 2024

Tahmoor Coal	
REA Stage	Stages 6 & 9
Date of Inspection	11/11/2024
Inspected by	Natalie Brumby
Signature	

Inspection Item	Comment	Location of Rehabilitation Area	Co-ordinates	Photo No.	Action(s) Recommended
Visual assessment of surface materials (eg. Large rocks, bare areas>0.1ha)	Lots of leaf litter adding to OM. Fallen branches and dead Acacia trees adding material for decomposition. Bare patches noted in Stage 9 Reject material on the surface also noted in this stage.	REA Stage 6 & 9		See Folder: W:\E&C\7 Environment\19 Rehab & Closure\2024_Rehab Monitoring (Eco)\Rehab Walkover\Photos	
Evidence of erosion (eg. Sheet, rilling, gullying and severity)	Some erosion noted in Stage 9 around roadway				Erosion to be remediated to prevent impact on rehabilitated section.

Occurrence of potholing or slumping	None				
Evidence of spontaneous combustion	None				
Evidence of contamination or other limitations to vegetative establishment (eg. surface crusting, staining of soil surface etc.)	None				
Stability and function of erosion and sediment control structures	Working and in order.				
Integrity of Water Management Structures (e.g. dams, drains, contour banks)	No issues with dams or contour banks. Some erosion noted around drainage ways into dams				
Evidence of soil profile development (e.g. leaf litter, decomposition, pedality etc.)	Leaf litter and decomposition present, ie. Fallen branches, leaves etc				

Evidence of poor Growth rates e.g. growth stunting	None noted during inspection.			
Evidence of plant mortality or dieback	Acacia species dying back with falling branches across stages.			
Native Species diversity- evidence of target/framework native species present in each stratum i.e. upper, mid and lower	Good diversity throughout stages. Canopy sp: Eucalyptus and Allocasaurina sp, Understory sp: Hakea sericea and Persoonia linearis. Grouncovers: Grasses incl Dianella and Lomandra. Near roadway many grasses established with Allocasaurina sp. seedlings establishing			
Evidence of regeneration/seeding	Yes, many species flowering and seeding incl			

	Hakeas and Acacia sp. Many seedlings emerging of understory and canopy species especially Allocasaurina sp.				
Evidence of biological nutrient cycling in Native woodland/forest areas e.g. puff balls	Ant activity noted				
List Other(s)	Many broadleaf weeds throughout this stage.				

Tahmoor Coal	
REA Stage	Stage 12a
Date of Inspection	11/11/2024
Inspected by	Natalie Brumby
Signature	

Inspection Item	Comment	Location of Rehabilitation Area	Co-ordinates	Photo No.	Action(s) Recommended
Visual assessment of surface materials (eg. Large rocks, bare areas>0.1ha)	Dried grasses cover the surface. Fallen branches and vegetative material are adding to OM on the surface. Some rocks on surface. Bare areas with no canopy species just grass sp. apparent.	REA Stage 12a		See Folder: W:\E&C\7 Environment\19 Rehab & Closure\2024_Rehab Monitoring (Eco)\Rehab Walkover\Photos	
Evidence of erosion (eg. Sheet, rilling, gullying and severity)	None				

Occurrence of potholing or slumping	None				
Evidence of spontaneous combustion	None				
Evidence of contamination or other limitations to vegetative establishment (eg. surface crusting, staining of soil surface etc.)	None				
Stability and function of erosion and sediment control structures	Working and in order.				
Integrity of Water Management Structures (e.g. dams, drains, contour banks)	No issues with drainage or contour banks. No dams in this stage.				
Evidence of soil profile development (e.g. leaf litter, decomposition, pedality etc.)	Leaf litter and decomposition present, ie. Fallen branches, leaves etc				

Evidence of poor Growth rates e.g. growth stunting	None noted during inspection.			
Evidence of plant mortality or dieback	None noted.			
Native Species diversity- evidence of target/framework native species present in each stratum i.e. upper, mid and lower	Good diversity throughout stage, especially upper benches. Canopy sp: Eucalyptus, Callistemons and Allocasaurina sp, Understory sp: Acacia sp and Kunzea ambigua. Grouncovers: Grass sp.			
Evidence of regeneration/seeding	Yes, many species flowering and seeding incl Acacia sp.(seeding) Many seedlings emerging of understory and canopy species			

Evidence of biological nutrient cycling in Native woodland/forest areas e.g. puff balls	Ant activity noted			
List Other(s)	Many broadleaf weeds throughout this stage.			

Tahmoor Coal	
REA Stage	Stage 14 & 16 (upper and lower benches)
Date of Inspection	11/11/2024
Inspected by	Natalie Brumby
Signature	

Inspection Item	Comment	Location of Rehabilitation Area	Co-ordinates	Photo No.	Action(s) Recommended
Visual assessment of surface materials (eg. Large rocks, bare areas>0.1ha)	Fallen branches and vegetative material are adding to OM on the surface. Good amount of	REA Stages 14 & 16 (upper and lower benches)		See Folder: W:\E&C\7 Environment\19 Rehab & Closure\2024_Rehab Monitoring	Bare areas to be additionally rehabilitated.

Rehabilitation Monitoring 2024

	leaf litter accumulating in areas. Some rocks on surface. Bare areas noted. Across all stages.			(Eco)\Rehab Walkover\Photos	
Evidence of erosion (eg. Sheet, rilling, gullying and severity)	None				
Occurrence of potholing or slumping	None				
Evidence of spontaneous combustion	None				
Evidence of contamination or other limitations to vegetative establishment (eg. surface crusting, staining of soil surface etc.)	None noted.				
Stability and function of erosion and sediment control structures	Working and in order. In good condition.				
Integrity of Water Management	No issues with drainage or				

Structures (e.g. dams, drains, contour banks)	contour banks. No dams in these stages.			
Evidence of soil profile development (e.g. leaf litter, decomposition, pedality etc.)	Leaf litter and decomposition present, ie. Fallen branches, leaves etc			
Evidence of poor Growth rates e.g. growth stunting	None noted during inspection.			
Evidence of plant mortality or dieback	None noted.			
Native Species diversity- evidence of target/framework native species present in each stratum i.e. upper, mid and lower	Good diversity throughout stage, especially upper benches. Canopy sp: Eucalyptus, Callistemons and Allocasaurina sp, Understory sp: Acacia sp and Kunzea ambigua. Grouncovers: Grass sp.			

Evidence of regeneration/seeding	Yes, many species flowering and seeding incl Hakea a sp. Many seedlings emerging of understory and canopy species			
Evidence of biological nutrient cycling in Native woodland/forest areas e.g. puff balls	Ant activity noted			
List Other(s)	Many broadleaf weeds throughout this stage.			

Tahmoor Coal	
REA Stage	Stage 17
Date of Inspection	11/11/2024
Inspected by	Natalie Brumby
Signature	

Rehabilitation Monitoring 2024

Inspection Item	Comment	Location of Rehabilitation Area	Co-ordinates	Photo No.	Action(s) Recommended
Visual assessment of surface materials (eg. Large rocks, bare areas>0.1ha)	Section approx. 2 yrs old. Some rocks on surface. Bare areas noted.	REA Stage 17 (newly establishing)		See Folder: W:\E&C\7 Environment\19 Rehab & Closure\2024_Rehab Monitoring (Eco)\Rehab Walkover\Photos	Bare areas to be additionally rehabilitated.
Evidence of erosion (eg. Sheet, rilling, gullying and severity)	Yes there is some erosion noted on the northern-batters				Additional drains would help to reduce future issues. Remediation needed.
Occurrence of potholing or slumping	None				
Evidence of spontaneous combustion	None				
Evidence of contamination or other limitations to vegetative establishment (eg. surface crusting,	None noted.				

staining of soil surface etc.)					
Stability and function of erosion and sediment control structures	Additional needed. No contour drains installed.				
Integrity of Water Management Structures (e.g. dams, drains, contour banks)	Lower drain in good condition, however small amount of erosion noted in a section in the north-west. No dams in this stage.				
Evidence of soil profile development (e.g. leaf litter, decomposition, pedality etc.)	Branches placed across batter to reduce erosion and act as microhabitats, working well to capture sediment and vegetative material, however erosion still occurring.				
Evidence of poor Growth rates e.g. growth stunting	None noted during inspection.				

Evidence of plant mortality or dieback	None noted.			
Native Species diversity- evidence of target/framework native species present in each stratum i.e. upper, mid and lower	Many Acacia sp currently dominating this stage. Canopy sp: Eucalyptus and Acacia sp (Acacia very abundant), Understory sp: Acacia sp. Groundcovers: Kennedia rubicundra, grasses.			
Evidence of regeneration/seeding	Kennedia rubicundra flowering.			
Evidence of biological nutrient cycling in Native woodland/forest areas e.g. puff balls	None noted.			
List Other(s)	Many broadleaf weeds throughout this stage.			

Tahmoor Coal	
REA Stage	Stage 8
Date of Inspection	11/11/2024
Inspected by	Natalie Brumby
Signature	

Inspection Item	Comment	Location of Rehabilitation Area	Co-ordinates	Photo No.	Action(s) Recommended
Visual assessment of surface materials (eg. Large rocks, bare areas>0.1ha)	Good amount of leaf litter accumulating in areas. Some rocks on surface. Bare areas noted.	REA Stage 8 (1 yr old rehab)		See Folder: W:\E&C\7 Environment\19 Rehab & Closure\2024_Rehab Monitoring (Eco)\Rehab Walkover\Photos	
Evidence of erosion (eg. Sheet, rilling, gullying and severity)	None				
Occurrence of potholing or slumping	None				
Evidence of spontaneous combustion	None				

Evidence of contamination or other limitations to vegetative establishment (eg. surface crusting, staining of soil surface etc.)	None noted.			
Stability and function of erosion and sediment control structures	Working and in order. In good condition. Additional Coir logs placed in drains at north of stage.			
Integrity of Water Management Structures (e.g. dams, drains, contour banks)	No issues with drainage or contour banks. No dam in this stage.			
Evidence of soil profile development (e.g. leaf litter, decomposition, pedality etc.)	Leaf litter and decomposition present. Logs placed across contours, helping to accumulate material and soil and creating micro ecosystem			

	with newly emerging seedlings present				
Evidence of poor Growth rates e.g. growth stunting	None noted during inspection.				
Evidence of plant mortality or dieback	None noted.				
Native Species diversity- evidence of target/framework native species present in each stratum i.e. upper, mid and lower	Canopy sp: Acacia sp Understory sp: Acacia and Hakea sp. Groundcovers: Kennedia rubicundra, Hardenbergia and Grass sp. Too young				
Evidence of regeneration/seedling	Ant activity noted				
Evidence of biological nutrient cycling in Native woodland/forest areas e.g. puff balls					
List Other(s)	Many broadleaf and nightshade weeds				

Rehabilitation Monitoring 2024

	throughout this stage.			
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Tahmoor Coal				
REA Stage	No.2 Shaft 11KV Underground Powerline Corridor			
Date of Inspection	11/11/2024			
Inspected by	Natalie Brumby			
Signature				

Inspection Item	Comment	Location of Rehabilitation Area	Co-ordinates	Photo No.	Action(s) Recommended
Visual assessment of surface materials (eg. Large rocks, bare areas>0.1ha)	Good amount of leaf litter accumulating in areas. Shrubs and forbes well established. No significant bare areas. Logs, and scat noted.	No.2 Shaft 11KV Underground Powerline Corridor	34.24841*, 150.58797* 271m elevation	See Folder: W:\E&C\7 Environment\19 Rehab & Closure\2024_Rehab Monitoring (Eco)\Rehab Walkover\Photos	
Evidence of erosion (eg. Sheet, rilling, gullying and severity)	None				

Occurrence of potholing or slumping	None				
Evidence of spontaneous combustion	None				
Evidence of contamination or other limitations to vegetative establishment (eg. surface crusting, staining of soil surface etc.)	None noted.				
Stability and function of erosion and sediment control structures	Good establishment of vegetation. Logs, low gradient and rocks helping process.				
Integrity of Water Management Structures (e.g. dams, drains, contour banks)	No issues with drainage or contour banks. No dam in this stage. Slopes and banks stable.				
Evidence of soil profile development	Leaf litter and scat helping with accumulation of organic matter.				

(e.g. leaf litter, decomposition, pedality etc.)						
Evidence of poor Growth rates e.g. growth stunting	None noted during inspection.					
Evidence of plant mortality or dieback	None noted.					
Native Species diversity- evidence of target/framework native species present in each stratum i.e. upper, mid and lower	Canopy sp: Eucalyptus sp and Acacia sp Understory sp: Acacia, Kunzea ambigua and Hakea sp. Groundcovers: Kennedia rubicundra, Hardenbergia and Grass sp.					
Evidence of regeneration/seeding	Fruiting and seeding occurring on some shrubs and grasses					
Evidence of biological nutrient cycling	Ant mounds and activity, and termite mounds noted					



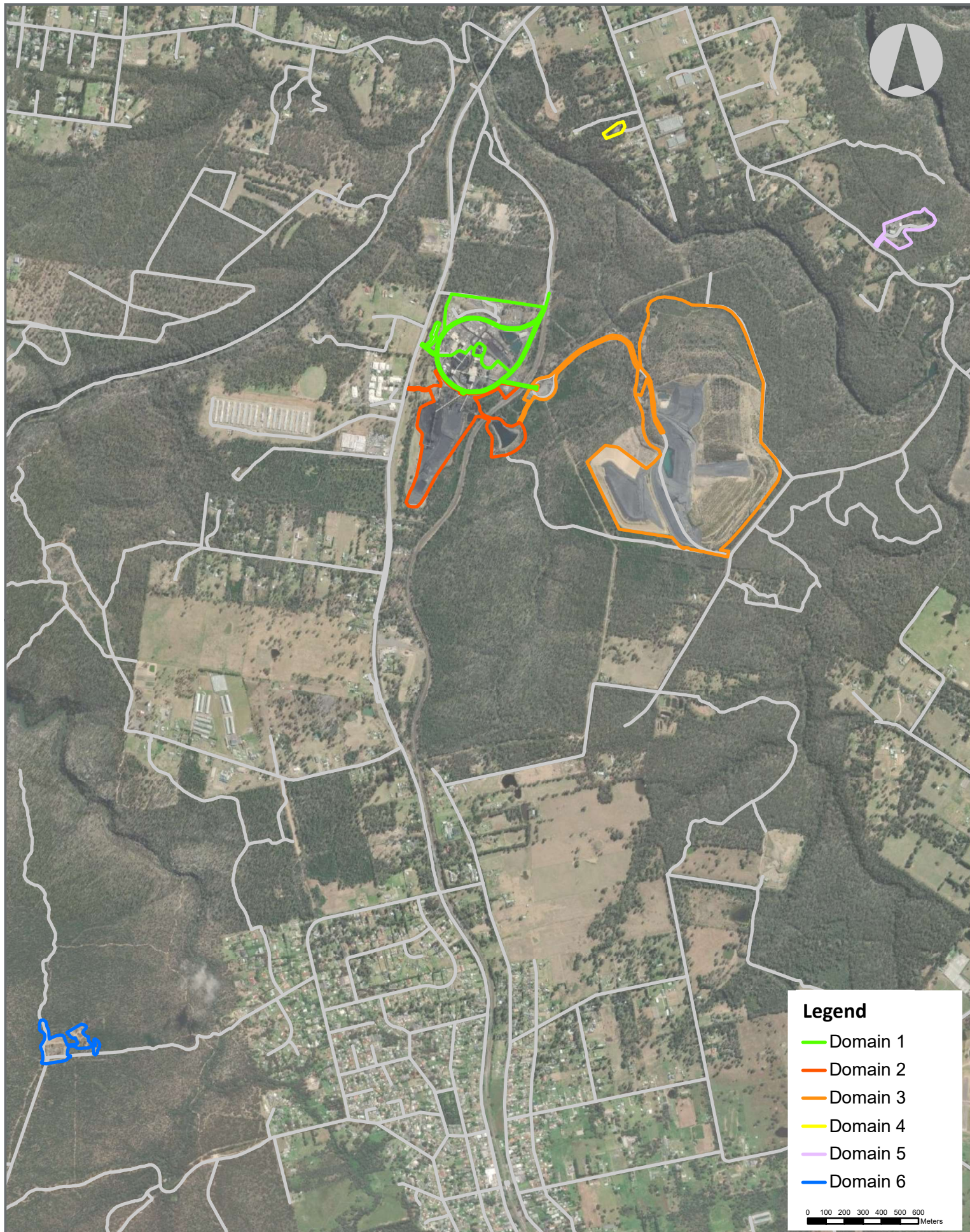
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APPENDIX 8

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