HUNTER VALLEY
OPERATIONS

REHABILITATION MANAGEMENT PLAN

DOCUMENT NUMBER
HVOOC-1797567310-5041

STATUS
Approved

REGULATOR VERSION NUMBER
1.3

OWNER
Environment and Community Coordinator

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1 | INTRODUCTION

This Rehabilitation Management Plan (RMP) outlines the proposed rehabilitation and final land use considerations at Hunter Valley Operations (HVO). HVO comprises Hunter Valley Operations North (HVO North) and Hunter Valley Operations South (HVO South). HVO North and HVO South are separated by the Hunter River and are located approximately 24 kilometres (km) north-west of Singleton in New South Wales (NSW) (see **Figure 1**).

HVO is owned by subsidiary companies of Yancoal and Glencore, as participants in the unincorporated HVO Joint Venture. The HVO Joint Venture is jointly controlled through a Joint Venture Management committee, with HV Operations Pty Ltd as the appointed manager. Coal & Allied Operations Pty Ltd (wholly owned subsidiary of Yancoal) holds 51% of interest in the Joint Venture, and Anotero Pty Ltd (wholly owned subsidiary of Glencore) holds 49%.

HVO North includes the Carrington Pit, West Pit (which includes the Mitchell Pit and Wilton Pit), North Pit Tailings Storage Facility (TSF), Dam 6W TSF, Cumnock Void TSF (under agreement with GCAA), Newdell Coal Preparation Plant (NCPP), Hunter Valley Coal Preparation Plant (HVCPP), Howick Coal Preparation Plant (HCPP), and the stockpiling/train loading facilities at Newdell Load Point (NLP) and Hunter Valley Load Point (HVLP) (see Figure 2).

HVO South includes Cheshunt Pit, Riverview Pit and Lemington South Pit (see **Figure 2**).

This RMP has been prepared in accordance with the NSW Department of Regional NSW – Resources Regulator's (RR) Form and Way: Rehabilitation management plan for large mines (2021). This document has also been developed to satisfy the requirements for a Rehabilitation Management Plan under Schedule 3, Condition 62C of Development Consent DA 450-10-2003 for HVO North and Schedule 3, Condition 36 of Project Approval PA 06_0261 for HVO South.

1.1 | HISTORY OF OPERATIONS

The history of mining at HVO is summarised in **Table 1.1** to **Table 1.6**

Table 1.1 West Pit Development, Mining and Associated Approvals

Year	Details
1949	Mining in the area around West Pit commenced when the operating arm of the Joint Coal Board, the New South Wales Mining Company, started mining leases at Foybrook Open Cut. The New South Wales Mining Company subsequently constructed the NCPP.
1952	Mining at West Pit (which was then known as Howick) commenced when Construction Pty Limited, under contract to the New South Wales Mining Company started operating on the Howick lease in the Pikes Gully Cut.
1968-1974	Title to some of the Howick lease was granted to Clutha Development Pty Limited in 1968 with additional titles granted in 1973 and 1974. A dragline operation started in 1971.
1981	Operations purchased by BP Coal.
1986	Approval granted to increase production at West Pit to 3.5 Mtpa of ROM coal and construct the HCPP to supply coal to the Bayswater and Liddell Power Stations as well as other domestic markets.
1989	An extension towards the south-east was granted with a corresponding increase to 7 Mtpa. At the end of 1989, the operation was purchased by Kembla Coal and Coke, a wholly owned subsidiary of Conzinc Rio Tinto of Australia Ltd (CRA), and operated by Novacoal, a newly established business unit of CRA.

Figure 1-Locality

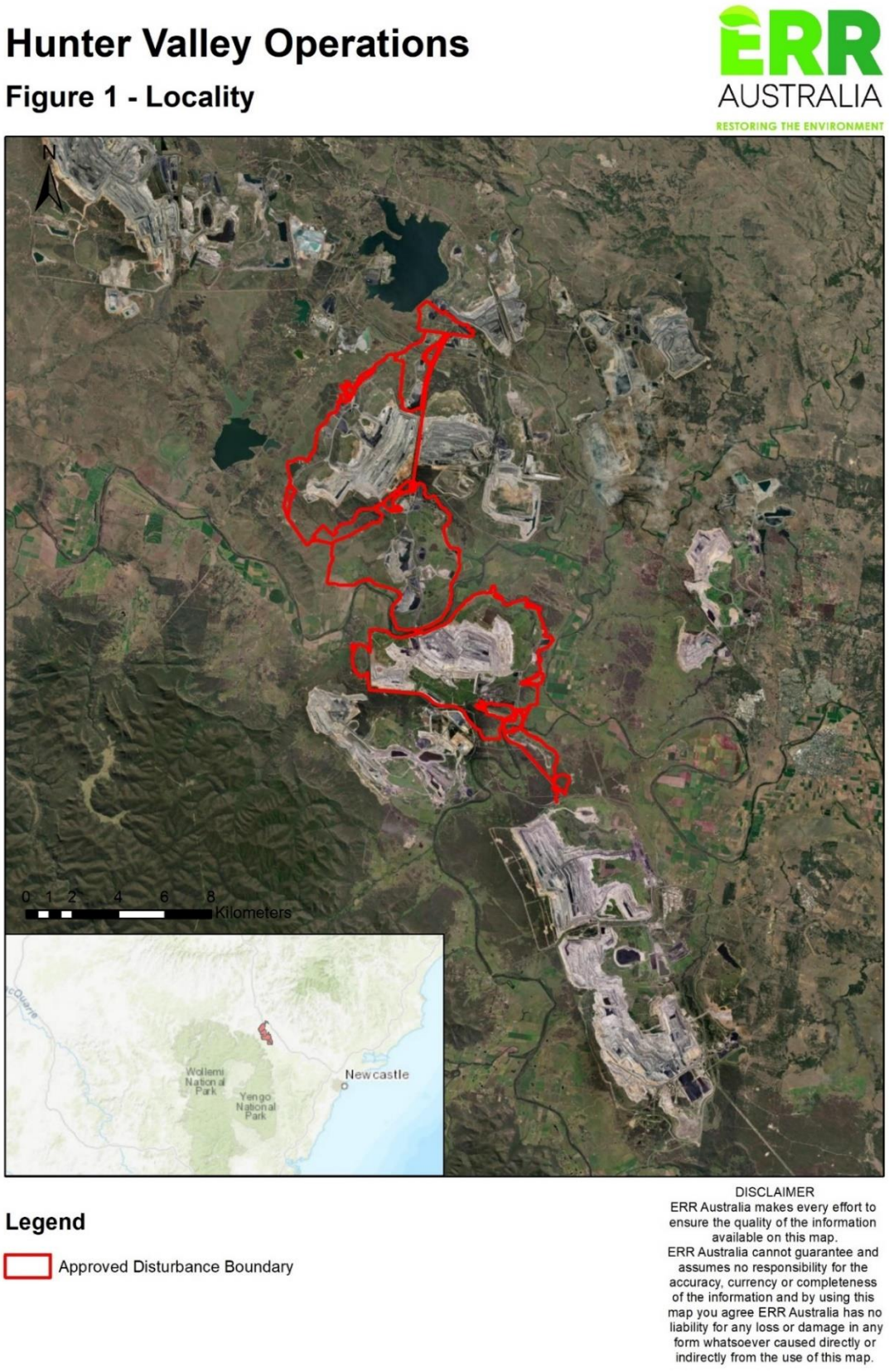


Figure 2-Site Layout

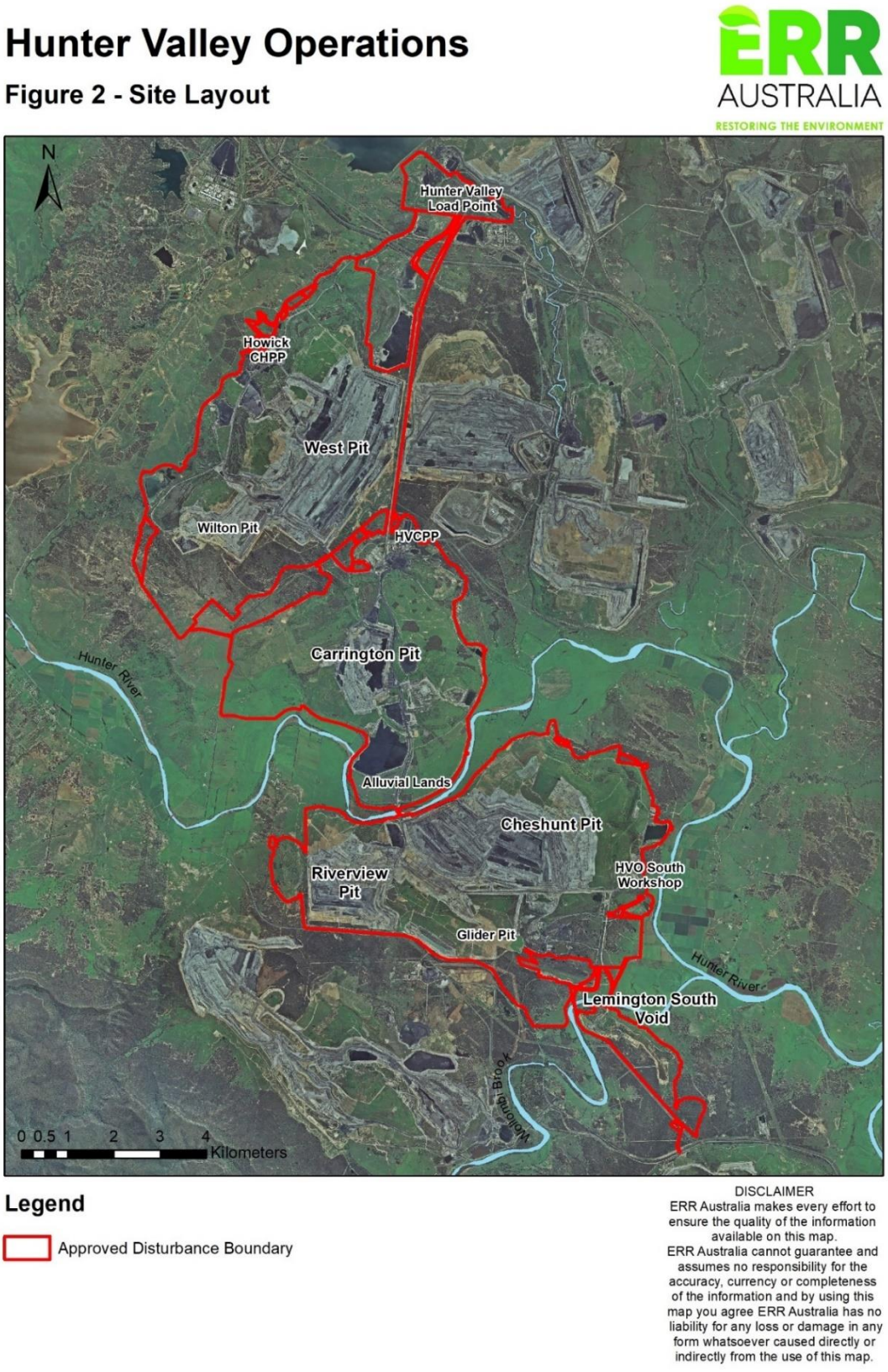


Table 1.2-West Pit Development, Mining and Associated Approvals

Year	Details
1996	Consent was granted for the Howick Coal Mine Expansion Project which included mining Mitchell Pit located to the south west of the original mine. This consent allowed coal production to increase to 12 Mtpa ROM coal and also allowed augmentation of the HCPP and construction of a conveyor to NCPP.
1998	Novacoal and Coal & Allied merged and West Pit became part of HVO.
2000	Consent issued for construction of Western Haul Road and bridge over Lemington Road. Modification to the 1996 consent to permit the transport of up to 8 Mtpa of coal from West Pit to HVCPP. NCPP ceased operations with disused parts of NCPP placed on a care and maintenance plan. Newdell coal receival, stockpiling and train loading facilities continued to be used for coal from HCPP.
2004	Development Consent DA 450-10-2003 granted for HVO North – West Pit Extension and Minor Modifications. For an extension of existing operations at West Pit, increased production capacity at Carrington Pit and consolidation of 15 existing development approvals.
2016	Commonwealth approval EPBC 2016/7640 granted for vegetation clearing in areas with previous State approvals. Modification to consent DA 450-10-2003 granted for HVLP sediment basin and HVO North Communications Towers.
2017	Modification to consent DA 450-10-2003 granted to amend the development consent boundary.

Table 1.3-Carrington Pit Development, Mining and Associated Approvals

Year	Details
1991	Coal & Allied granted original exploration Authorisation (AUTH) 435, covering the Carrington Pit Area.
1997	Exploration Licence (EL) 5417 granted to determine extent of coal seam to the west.
1997	EL 5418 granted to test and monitor groundwater to the south-east.
1999	Exploration boundaries have been extended to the north into Mining Lease (ML) 1428, joint venture with Howick Coal.
2000	Development Consent DA 106-6-99 granted for Carrington Pit.
2004	Carrington Pit integrated into West Pit Extension and Minor Modifications consent, DA 450-10-2003.
2006	Statement of Environmental Effects (SEE) for extension to Carrington Pit approved by the former NSW Department of Planning.
2013	Modification to consent DA 450-10-2003 granted for Carrington West Wing (CWW) Extension (CWW Extension will not commence during RMP term).
2014	Modification to consent DA 450-10-2003 granted for HVO North Fine Reject Emplacement.
2017	Modification to consent DA 450-10-2003 granted for HVO North Carrington In-pit Fine Reject Emplacement.
2017	Modification to consent DA 450-10-2003 granted to amend the development consent boundary.
2019	In-pit tailings commenced at Carrington Pit.

Table 1.4-North Pit Development, Mining and Associated Approvals

Year	Details
1979	Coal production commenced at Hunter Valley No. 1 Mine following the granting of Coal Lease (CL) 193 over an area of approximately 992 hectares (ha). Initial coal production was 1.5 Mtpa. All coal was washed in Liddell CHPP.
1980	Approved production was increased to 4 Mtpa. Construction of HVCPP.
1991	Operations commenced in the former Hunter Valley No. 2 Mine (now known as Cheshunt/Riverview Pit) on the southern side of the Hunter River, with all coal being transported to HVCPP via a dedicated bridge over the Hunter River (constructed in 1990).
1991	Mining commenced in the Southern Extension Area (200 ha) with the granting of Consolidated Coal Lease (CCL) 755 including revocation of CL 193. Production was increased to 6.4 Mtpa.
1995	Mining commenced in the ALRP with an average continued production of 4 Mtpa in the combined North Pit operations.
2003	Approved to receive tailings.
2004	North Pit integrated into West Pit Extension and Minor Modifications consent – DA 450-10-2003.
2017	Modification to consent DA 450-10-2003 granted to amend the development consent boundary.
2018	The receipt of tailings to the North Pit TSF ceased.

Table 1.5- Cheshunt and Riverview Pits Development, Mining and Associated Approvals

Year	Details
1986	Approval gained for Hunter Valley No. 2 Mine.
1990	Approval granted for Western out of pit emplacement of overburden in conjunction with development of Hunter Valley No. 2 Mine, rescheduling of mining of Riverview Pit and permanent re-alignment of Jerrys Plains Road.
1997	Approval granted for small extension (56 ha) to the south west of South Mine (formerly Hunter Valley No. 2 Mine) to re-orientate mining strips to increase mining efficiency.
2000	Approval granted to increase rate of mining to 8 Mtpa and development of the Cheshunt Pit with mining to progress south west through Riverview Pit; out of pit emplacement of overburden on the Lemington Mine site; and overland conveyor from HVO South to HVCPP (not yet commenced).
2001	Modification to approval to allow change in mining schedule to seven day operations from year one rather than year nine.
2002	Approval granted for altered mine plan including concurrent mining at Cheshunt and Riverview Pits; operation of dragline at Riverview Pit; and haulage of coal from Cheshunt and Riverview Pits to either or both the Lemington Coal Preparation Plant (LCPP) or the HVCPP.
2006	Approval granted for extension of open cut coal mining from the Cheshunt Pit through the Barry Property enabling the extraction of approximately 8 Mtpa of ROM coal; and extension of open cut coal mining to the south west of the Riverview Pit.

Year	Details
2009	PA 06_0261 was granted to replace all existing HVO South approvals and to allow: Extension of open cut and highwall mining (increasing the approved mining surface disturbance footprint by 250 hectares); Mining of all coal seams within HVO South to unlimited depth; Mining up to 16 Mtpa ROM coal by a combination of draglines, shovels, excavators and associated haul trucks; Modification, upgrades and / or reconstruction of existing infrastructure including increase of processing capacity of the Lemington Coal Preparation Plant to 16 Mtpa, additional stockpiles and new coal loading infrastructure; and relocation of Comleroi Road and other infrastructure across HVO South; Infrastructure to facilitate transfer of product coal to the Wambo rail spur via either a rail spur and loop, overland conveyor (OLC) or trucks, or any combination; The full integration of operations at HVO South related to new activities as well as upgrades and modifications to approved operations, mining and processing rates, equipment use and relocation, water, reject and tailings disposal and coal handling; and Relocation or reconfiguration of the Hunter Valley Gliding Club (HVGC) airstrip and facilities (if agreed with the Club), to accommodate the integration of the Riverview Pit with South Lemington Pit 2. Subsequent modification to approval to allow raising of Lake James Dam.
2012	Modification to approval to allow transfer of biodiversity offset for HVO South from Archerfield to Goulburn River Biodiversity Area.
2016	Commonwealth approval EPBC 2016/7640 granted for vegetation clearing in areas with previous State approvals.
2018	Modification to the State development consent to enable: Cheshunt Pit to progress and extract the Bayswater Seam below Riverview Pit by open cut methods; Amendment to the approved overburden emplacement strategy to enable an 80m increase in height in some areas up to a maximum height of 240m Australian Height Datum AHD; Increase the rate of extraction to 20 Mtpa ROM coal; and Update the Statement of Commitments within PA 06_0261 to remove redundant commitments and conditions or those inconsistent with measures prescribed in the approved management plans.
2021	Modification to State development consent to enable onsite manufacturing of Ammonium Nitrate Emulsion.
2022	Modification to State development consent to enable storage of water in the Lemington Underground Workings.
2023	Modification to State development consent to enable the construction of an Ammonium Nitrate Storage Facility.

Table 1.6- Cheshunt and Riverview Pits Development, Mining and Associated Approvals

Year	Details
1971	Approval gained to establish open cut mine and No. 1 underground mining complex with 1 Mtpa ROM coal limit; and construct LCPP No. 1
1976	Approval granted to extend mining into No. 2 underground mining complex area and increase ROM coal to 2 Mtpa; and construct second LCPP rated at 440 tph of ROM coal.
1980	Approval granted to extend open cut and underground mining operations within Buchanan-Lemington Colliery; construct haul road from South Lemington to Lemington across Wollombi Brook; and increase capacity of LCPP No. 2 to 660 tph ROM coal.
1981	Approval gained to increase product coal production to 3 Mtpa.
1985	Approval gained to allow northern extension of open cut mining within Buchanan-Lemington Colliery Holding; and north west extension of Lemington Mine.
1987	LCPP No. 1 closed and decommissioned
1993	Approval granted to install a coarse reject transport conveyor to facilitate filling and progressive rehabilitation of underground mine No. 2 portal using coarse reject from LCPP (over 4-5 years).
1998	Approval granted to establish mining in South Lemington – two open cut pits, a scraper slot and trench, supplemented by highwall mining operations to 0.6 Mtpa product; total combined product limit of 3 Mtpa; and removal of 82 ha of Warkworth Sands Woodland (not listed under the former Threatened Species Conservation Act (TSC Act) at that time). South Lemington Pit 2, scraper slot and trench and highwall mining have not yet commenced.
1999	Approval gained to increase production to 3.5 Mtpa of product coal (North Lemington to 2.9 Mtpa and South Lemington to 0.6 Mtpa).
2001	Approval gained to increase saleable production to 4.4 Mtpa (North Lemington to 3.2 Mtpa and South Lemington to 1.2 Mtpa). Mining in South Lemington Pit 1 suspended. Approval granted for temporary crossings of Wollombi Brook to allow dragline and electric shovel relocation.
2003	Coal processing at LCPP No. 2 suspended and plant placed into care and maintenance.
2011	Infrastructure removal and site decontamination completed for LCPP No. 2.
2018	Modification to the State development consent to enable the South Lemington Pit 2 to mine to the base of the Vaux Seam below the Bowfield Seam.

1.2 | CURRENT DEVELOPMENT CONSENTS, LEASES AND LICENCES

1.2.1 | DEVELOPMENT CONSENTS

Table 1.7 summarises the development consents and modification history, including key features approved. Additionally, HVO holds an Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) Approval for the clearing of 61 ha of Central Hunter Valley Eucalypt Forest (CHVEF).

Table 1.7 Development Consents

Consent	Details	Issue Date	Expiry Date
HVO North			
DA 450-10-2003	West Pit Extension	12 June 2004	12 June 2025
	MOD 1 — S96(1A) modification of West Pit Extension – Upgrade of Hunter Valley Loading Point	16 August 2005	
	MOD 2 — Carrington Pit Extension	25 June 2006	
	MOD 3 — CWW Modification	19 March 2013	
	MOD 4 — HVO North Fine Reject Emplacement Modification	16 January 2014	
	MOD 5 — HVLP Sediment Basin and HVO North Communication Towers	9 December 2016	
	MOD 6 — Fine Rejects Carrington In-Pit	25 January 2017	
	MOD 7 — Extension of mining at West Pit	28 July 2017	
HVO South			
PA 06_0261	Granted to replace all existing HVO South approvals	24 March 2009	24 March 2030
	MOD 1 – Amending approval boundary and discharge at Lake James	17 December 2009	
	MOD 2 – Biodiversity offset amendments	3 February 2012	
	MOD 3 – Goulburn River biodiversity offset area amendments	31 October 2012	
	MOD 4 – Goulburn River biodiversity offset area amendments	31 October 2012	
	MOD 5 – Extend mining of Cheshunt Pit into Riverview Pit and down to Vaux Seam at South Lemington Pit 2	28 February 2018	
	MOD 6 – Manufacture of Ammonium Nitrate Emulsion	26 November 2021	
	MOD 7 – Storage of Water in Lemington Underground Workings	27 May 2022	
	MOD 8 – Construction of an Ammonium Nitrate Storage Facility	6 February 2023	
HVO North and South			
EPBC 2016/7640	State Approved Mining	10 October 2016	31 December 2030

As described above, this document has been prepared to satisfy the requirement for a Rehabilitation Management Plan in both development consents. The specific requirements from each of these consents, and where they are addressed in this document are shown in **Table 1.8** and **Table 1.9.** This document also satisfies the requirement for the Landscape and Rehabilitation Management Strategy Condition 32), and flora and fauna procedures (parts of Condition 35) within the HVO North development consent (DA 450-10-2003). These are shown in **Table 1.10**

Table 1.8- RMP Requirements in PA 06_0261

Consent Requirement	Section within this document
36. The Applicant must prepare a Rehabilitation Management Plan for the development in accordance with the provisions under the *Mining Act 1992*, and carry out the development in accordance with this plan. This plan must: (a) be prepared by suitably qualified expert/s;	12.1
(b) be prepared in consultation with the Department, DPE Water, and Council by a suitably qualified and experienced person/s;	4.3
I be submitted for approval within 3 months of the determination of Modification 5, unless otherwise approved by the Planning Secretary;	N/A
(d) be prepared in accordance with any relevant Resources Regulator Guideline;	1.0
(e) describe how the rehabilitation of the site would achieve the objectives identified in Table 16 and be integrated with the measures in the Biodiversity Management Plan;	4.1
(f) include detailed performance and completion criteria for evaluating the performance of progressive and final rehabilitation and include triggers for remedial action, where these performance or completion criteria are not met;	4.2, 10.2
(g) describe the measures to be implemented to meet the performance and completion criteria, to ensure compliance with the relevant conditions of this consent and to address all aspects of rehabilitation including mine closure, final landform (including the final void), final land use/s, and water management in the final landform;	6.0, 7.0
(g) include procedures for the use of interim stabilisation and temporary vegetation strategies, where reasonable to minimise exposed areas;	6.2.3.6
(h) include a program to monitor, independently audit and report on the effectiveness of the rehabilitation measures, and progress against the performance and completion criteria;	8.0, 9.0
(i) identify the potential risks to the successful implementation of rehabilitation, and include a description of the contingency measures to be implemented to mitigate against these risks; and	3.0
(j) include details of who would be responsible for monitoring, reviewing, and implementing the plan.	11.3

Table 1.9-RMP Requirements in DA 450-10-2003

Consent Requirement	Section within this document
62C. The Applicant must prepare a Rehabilitation Management Plan for the HVO North mine to the satisfaction of DRE. This plan must: (a) be prepared in consultation with the Department, DPI Water, OEH, Council and the CCC;	4.3
I(c) be prepared in accordance with any relevant DRE guideline;	1.0
(d) include an Agricultural Land Reinstatement Management Plan;	Addressed in the separate Agricultural Land Reinstatement Plan
(e) include detailed performance and completion criteria for evaluating the achievement of the rehabilitation objectives in Table 17 and the overall rehabilitation of the site, and triggering remedial action (if necessary);	4.2
(f) include proposals to offset the flora and fauna impacts of the development (including proposals resulting from condition 31 above), and an outline of how the plan would integrate with existing and planned corridors of native vegetation in areas surrounding the development;	Addressed in the HVO Integrated Biodiversity Management Plan
(g) describe the measures that would be implemented to ensure compliance with the relevant conditions of this consent, and address all aspects of rehabilitation including mine closure, final landform and final land use;	2.0, 5.0, 6.0, 7.0
(h) outline how the proposed plan would be integrated with the landscape management and rehabilitation of the other operations within Hunter Valley Operations (both north and south of the Hunter River) and other coal mines in the vicinity;	5.0
(i) include interim rehabilitation where necessary to minimise the area exposed for dust generation;	6.2.3.6
(j) include a program to monitor, independently audit and report on the effectiveness of the measures, and progress against the detailed performance and completion criteria; and	8.0
(k) build to the maximum extent practicable on the other management plans required under this consent.	Entire document
The Applicant must implement the approved management plan as approved from time to time by the Secretary.	N/A

Table 1.10- Additional Requirements in DA 450-10-2003

Consent Requirement	Section within this document
32. By 30 June 2007, the Applicant must prepare a conceptual Landscape and Rehabilitation Management Strategy, in consultation with affected agencies, to the satisfaction of the Secretary. The strategy must: include objectives for landscape management and rehabilitation of the site and a justification for the proposed strategy;	4.0
present a conceptual plan for a landscape management and rehabilitation of the site;	5.0
be integrated with the relevant requirements of the Mining Operations Plan;	MOP replaced by this RMP
describe the measures that would be implemented to achieve the objectives (including an indicative timetable for mine closure);	6.0
include proposals to offset the flora and fauna impacts of the development (including proposals resulting from condition 31 and 31A above), and an outline of how the strategy would integrate with existing and planned corridors of native vegetation in areas surrounding the development; and	Addressed in the HVO Integrated Biodiversity Management Plan
outline how the proposed strategy would be integrated with the landscape management and rehabilitation of the other operations within Hunter Valley Operations (both north and south of the Hunter River) and other coal mines in the vicinity.	6.2.3
35. The Applicant must prepare procedures for the management of flora and fauna for the development. These procedures must: provide details on: delineating areas of disturbance	6.2.1.2
protecting areas outside of the disturbance areas;	Addressed in the HVO Integrated Biodiversity Management Plan
identifying when pre-clearance surveys are required for fauna;	Addressed in the HVO Integrated Biodiversity Management Plan
determining the best time to clear vegetation to avoid nesting/breeding activities of threatened fauna;	Addressed in the HVO Integrated Biodiversity Management Plan
capturing and releasing fauna;	Addressed in the HVO Integrated Biodiversity Management Plan

Consent Requirement	Section within this document
relocating bat roosts;	Addressed in the HVO Integrated Biodiversity Management Plan
salvaging habitat resources and collecting seed;	6.2.1.2
controlling weeds in regeneration/rehabilitation areas; and	6.2.5, 6.2.6
controlling access to the regeneration/rehabilitation areas;	6.2.6
describe how the land in regeneration areas would be revegetated;	Addressed in the HVO Integrated Biodiversity Management Plan
describe how the mined areas would be rehabilitated for grazing and biodiversity values;	6.0
identify actions to minimise the potential impacts of the development on threatened fauna;	Addressed in the HVO Integrated Biodiversity Management Plan
describe how the performance of the revegetation/rehabilitation strategies would be monitored over time including, as a minimum, the parameters in Table 18; and	8.0
identify who is responsible for monitoring, reviewing, and implementing the procedures.	11.0

1.2.2 | MINING TENEMENTS

Table 1.11 lists the mining titles applicable to both HVO North and HVO South. While not subject to the RMP at time of submission Mining Lease Applications (MLA's) are listed for completeness.

Table 1.11- Mining Tenements

Title	Titleholder	Grant Date	Expiry Date	Status
AL 32	Coal & AlliedPty Ltd and Anotero Pty Ltd	04/11/2020	03/11/2026	Granted
AL 33	Coal & AlliedPty Ltd and Anotero Pty Ltd	04/11/2020	03/11/2026	Granted
AL 34	Coal & AlliedPty Ltd and Anotero Pty Ltd	04/11/2020	03/11/2026	Granted
AUTH72	Coal & AlliedPty Ltd and Anotero Pty Ltd	08/03/1977	8/03/2027	Granted
EL 5291	Coal & AlliedPty Ltd and Anotero Pty Ltd	28/04/1997	28/04/2029	Granted
EL 5292	Coal & AlliedPty Ltd and Anotero Pty Ltd	28/04/1997	27/04/2028	Granted
EL 5417	Coal & AlliedPty Ltd and Anotero Pty Ltd	23/12/1997	23/12/2024	Granted
EL 5418	Coal & AlliedPty Ltd and Anotero Pty Ltd	23/12/1997	23/12/2028	Granted

Title	Titleholder	Grant Date	Expiry Date	Status
EL 5606	Coal & AlliedPty Ltd and Anotero Pty Ltd	11/08/1999	11/08/2029	Granted
EL 8175	Coal & AlliedPty Ltd and Anotero Pty Ltd	23/09/2013	23/09/2026	Granted
EL 8821	Coal & AlliedPty Ltd and Anotero Pty Ltd	13/02/2019	13/02/2025	Granted
(Part) CCL 708	Liddell Tenements PtyLtd	17/05/1990	29/12/2023	Granted
CCL 714	Coal & AlliedPty Ltd and Anotero Pty Ltd	23/05/1990	30/08/2030	Granted
CCL 755	Coal & AlliedPty Ltd and Anotero Pty Ltd	24/01/1990	05/03/2030	Granted
CL 327	Coal & AlliedPty Ltd and Anotero Pty Ltd	06/03/1989	06/03/2031	Granted
CL 359	Coal & AlliedPty Ltd and Anotero Pty Ltd	21/05/1990	21/05/2032	Granted
CL 360	Coal & AlliedPty Ltd and Anotero Pty Ltd	29/05/1990	29/05/2032	Granted
CL 398	Coal & AlliedPty Ltd and Anotero Pty Ltd	04/06/1992	04/06/2034	Granted
CL 584	Coal & AlliedPty Ltd and Anotero Pty Ltd	01/01/1982	31/12/2044	Granted
CML 4	Coal & AlliedPty Ltd and Anotero Pty Ltd	02/03/1993	03/06/2033	Granted
ML 1324	Coal & AlliedPty Ltd and Anotero Pty Ltd	19/08/1993	19/08/2035	Granted
ML 1337	Coal & AlliedPty Ltd and Anotero Pty Ltd	01/02/1994	01/02/2034	Granted
ML 1359	Coal & AlliedPty Ltd and Anotero Pty Ltd	01/11/1994	31/10/2015	Renewal Pending
ML 1406	Coal & AlliedPty Ltd and Anotero Pty Ltd	27/02/1997	10/02/2027	Granted
ML 1428	Coal & AlliedPty Ltd and Anotero Pty Ltd	15/04/1998	14/04/2040	Granted
ML 1465	Coal & AlliedPty Ltd and Anotero Pty Ltd	21/02/2000	21/02/2042	Granted
ML 1474	Coal & AlliedPty Ltd and Anotero Pty Ltd	24/11/2000	23/11/2042	Granted
ML 1482	Coal & AlliedPty Ltd and Anotero Pty Ltd	19/03/2001	19/03/2040	Granted
ML 1500	Coal & AlliedPty Ltd and Anotero Pty Ltd	21/12/2001	20/12/2043	Granted
ML 1526	Coal & AlliedPty Ltd and Anotero Pty Ltd	03/12/2002	02/12/2044	Granted
ML 1560	Coal & AlliedPty Ltd and Anotero Pty Ltd	28/01/2005	27/01/2026	Granted
ML 1589	Coal & AlliedPty Ltd and Anotero Pty Ltd	02/11/2006	01/11/2027	Granted
ML 1622	Coal & AlliedPty Ltd and Anotero Pty Ltd	22/10/2010	10/03/2027	Granted
ML 1634	Coal & AlliedPty Ltd and Anotero Pty Ltd	31/07/2009	31/07/2030	Granted
ML 1682	Coal & AlliedPty Ltd and Anotero Pty Ltd	16/12/2012	15/12/2033	Granted
ML 1704	Coal & AlliedPty Ltd and Anotero Pty Ltd	05/12/2014	05/12/2035	Granted
ML 1705	Coal & AlliedPty Ltd and Anotero Pty Ltd	17/12/2014	17/12/2035	Granted

Title	Titleholder	Grant Date	Expiry Date	Status
ML 1706	Coal & AlliedPty Ltd and Anotero Pty Ltd	09/12/2014	09/12/2035	Granted
ML 1707	Coal & AlliedPty Ltd and Anotero Pty Ltd	09/12/2014	09/12/2035	Granted
ML 1710	Coal & AlliedPty Ltd and Anotero Pty Ltd	22/12/2016	10/03/2027	Granted
ML 1732	Coal & AlliedPty Ltd and Anotero Pty Ltd	06/04/2016	06/04/2037	Granted
ML 1734	Coal & AlliedPty Ltd and Anotero Pty Ltd	06/04/2016	06/04/2037	Granted
ML 1748	Coal & AlliedPty Ltd and Anotero Pty Ltd	05/12/2016	04/12/2037	Granted
ML 1753	Coal & AlliedPty Ltd and Anotero Pty Ltd	19/04/2017	19/04/2038	Granted
ML 1810	Coal & AlliedPty Ltd and Anotero Pty Ltd	04/11/2020	04/11/2041	Granted
ML 1811	Coal & AlliedPty Ltd and Anotero Pty Ltd	04/11/2020	04/11/2041	Granted
ML 1840	Coal & AlliedPty Ltd and Anotero Pty Ltd	3/11/2022	3/11/2043	Granted
ML 1841	Coal & AlliedPty Ltd and Anotero Pty Ltd	3/11/2022	3/11/2043	Granted
ML 1849	Coal & AlliedPty Ltd and Anotero Pty Ltd	16/05/2023	16/05/2044	Granted
ML 1867	Coal & AlliedPty Ltd and Anotero Pty Ltd	16/11/2023	16/11/2044	Granted
ML 1869	Coal & AlliedPty Ltd and Anotero Pty Ltd	15/12/2023	15/12/2044	Granted
ML 1870	Coal & AlliedPty Ltd and Anotero Pty Ltd	15/12/2023	15/12/2044	Granted
ML 1871	Coal & AlliedPty Ltd and Anotero Pty Ltd	15/12/2023	15/12/2044	Granted

1.2.3 | OTHER APPROVALS

1.2.3.1 | LICENCES

Current licences applicable to HVO are summarised in **Table 1.12**

Table 1.12-Licences

Licence / Permit No.	Description	Expiry Date
HVO North and South		
EPL 640	Environmental Protection Licence	1 April (anniversary) 10/09/2025 (Review due date)
RML 5085293	Radiation Management Licence	14/11/2025
HVO North		
NDG 037852	Dangerous Goods Notification (for the storage and handling of hazardous chemicals)	No expiry date
HVO South		
XSTR200117	Licence to Store Dangerous Good/Explosives	02/05/2026

Licence / Permit No.	Description	Expiry Date
2394538	Road Occupancy Licences – Golden Highway	30/06/2025
11718/2024	Road Closure Approval – Lemington Road	30/06/2025

1.2.3.2 | WATER LICENCES

The water approvals and licences applicable to HVO are listed in **Table 1.13** and **Table 1.14**

Table 1.13- Water Approvals

Licence Number	Type of Licence	Purpose	Legislation	Description	Expiry Date
20BL030566	Bore	Well	Part 5 Water Act1912	East Open Cut	Perpetuity
20BL141584	Bore	MonitoringBore	Part 5 Water Act1912	HVO North – Carrington Work Licence	Perpetuity
20BL166637	Bore	MonitoringBore	Part 5 Water Act1912	No Current Bores	Perpetuity
20BL168820	Bore	MonitoringBore	Part 5 Water Act1912	HVO North – Bores:CGW39, CGW45a, CGW46, CGW47, CGW47a, CGW48, CGW49, P50/38.5, CGW56, 4036C, 4035P,4032P, 4034P, 4033P, 4053P, 4052P, 4051C, 4040P, 4038C, 4037P Destroyed: CGW7, CGW50,CGW57, CGW58, CGW59, CGW60, CGW61, CGW62, CGW63	Perpetuity
20BL169241	Bore	MonitoringBore	Part 5 Water Act1912	HVO North – Bores: DM1,HF3, HF7 Destroyed: DM2	Perpetuity
20BL169641	Bore	Monitoring Bore	Part 5 Water Act1912	HVO North – Bores: CGW5, CGW51A, CGW52, CGW53, CGW54, CGW55A, CGW53A, CGW52A, CGW54A, CGW6, CFW55, CFW57, CFW57A, CFW59, CFW55R Destroyed: CGW1, CGW2,CGW3, CGW5, CGW8, CGW9, CGW10, CGW12, CGW13 CGW14, CGW30,CGW33, CGW34, CGW35, CGW36,CGW37, CGW38, CGW40, CGW41,CGW42, CGW43, CGW44, CFW56, CFW56A, CFW58	Perpetuity

Licence Number	Type of Licence	Purpose	Legislation	Description	Expiry Date
20BL170496	Bore	MonitoringBore	Part 5 Water Act1912	HVO South – Bores: BZ10(CHPZ 2A), BZ11 (CHPZ 3A), BZ18 (CHPZ 10A), BZ20 (CHPZ 12A), BZ21 (CHPZ 13D), BZ21A (CHPZ 13A), BZ20A (CHPZ 12D), BZ11A (CHPZ 3D) Destroyed: AP50/47.5, AQ52, AV50/56.5, AS50/62.5, AR55, Bunc 3, BZ25 (Bunc 12), BZ23 (Bunc 14), BZ24 (Bunc 13),	Perpetuity
20BL170497	Bore	MonitoringBore	Part 5 Water Act1912	HVO South – Bores: BZ15(CHPZ 7A), BZ16 (CHPZ 8D), BZ17 (CHPZ 9A), BZ19 (CHPZ 11A), BZ16A(CHPZ 8A), Bunc 46D Destroyed: Bunc 39 (Shallow & Deep), Bunc44D	Perpetuity
20BL170498	Bore	MonitoringBore	Part 5 Water Act1912	HVO South – Bores: BZ12(CHPZ 4A), BZ13 (CHPZ 5A), BZ14, BZ9 (CHPZ 1A), BC1, BC1a, BZ8-1, BZ8-2, BZ8-3, HG1, HG2,HG2a, HG3, S4, S6, BZ22(CHPZ14D), BZ22A (CHPZ 14A), BZ5-1, BZ5-2 Destroyed: S2, S3, S9,S11	Perpetuity
20BL171423	Bore	MonitoringBore	Part 5 Water Act1912	E1.5	Perpetuity
20BL171424	Bore	MonitoringBore	Part 5 Water Act1912	Destroyed: GW9711	Perpetuity
20BL171425	Bore	MonitoringBore	Part 5 Water Act1912	Bores: GW9701, GW9710	Perpetuity
20BL171426	Bore	MonitoringBore	Part 5 Water Act1912	Bores: GW9702 Destroyed: D2(WH236)	Perpetuity
20BL171427	Bore	MonitoringBore	Part 5 Water Act1912	Bores: C335, C630 (BFS)	Perpetuity
20BL171428	Bore	MonitoringBore	Part 5 Water Act1912	D807	Perpetuity
20BL171429	Bore	MonitoringBore	Part 5 Water Act1912	HVO South – Bores: B925(BFS), C122 (BFS), C122 (WDH)	Perpetuity
20BL171430	Bore	MonitoringBore	Part 5 Water Act1912	HVO South – Bores: C613(BFS), C809 (GM/WDH)	Perpetuity
20BL171431	Bore	MonitoringBore	Part 5 Water Act1912	HVO South – Bores: B631(BFS), B631 (WDH)	Perpetuity
20BL171432	Bore	MonitoringBore	Part 5 Water Act1912	HVO South – Bores: C130(AFSH1), C130 (ALL), C130(BFS), C130 (WDH)	Perpetuity
20BL171433	Bore	Monitoring Bore	Part 5 Water Act 1912	HVO South – Bore B334 (BFS)	Perpetuity

Licence Number	Type of Licence	Purpose	Legislation	Description	Expiry Date
20BL171434	Bore	Monitoring Bore	Part 5 Water Act 1912	HVO South – Bores: C317 (BFS), C317 (WDH)	Perpetuity
20BL171435	Bore	Monitoring Bore	Part 5 Water Act 1912	HVO South – Bores: BZ3- 1, BZ3-2, BZ3-3	Perpetuity
20BL171436	Bore	Monitoring Bore	Part 5 Water Act 1912	HVO South – Bores: BZ4A(1), BZ4A(2), BZ4B	Perpetuity
20BL171437	Bore	Monitoring Bore	Part 5 Water Act 1912	Bores: WG1, WG2, WG3	Perpetuity
20BL171439	Bore	Monitoring Bore	Part 5 Water Act 1912	Bores: BRN, E012	Perpetuity
20BL171492	Bore	Monitoring Bore	Part 5 Water Act 1912	Bores: C1(WJ039), GW9704, North, GWAR981	Perpetuity
20BL171681	Bore	Monitoring Bore	Part 5 Water Act 1912	HVO South – Bores: Bunc 45A, Bunc 45D	Perpetuity
20BL171725	Bore	Monitoring Bore	Part 5 Water Act 1912	HVO South – Bores: B425 (WDH), BRS, C621 (BFS), C919 (ALL), D317 (BFS), D317(ALL), D317(WDH) Destroyed: D420, D425, D621, PB02	Perpetuity
20BL171726	Bore	Monitoring Bore	Part 5 Water Act 1912	Bores: SR002, SR003, SR004, SR005, SR006, SR007	Perpetuity
20BL171727	Bore	Monitoring Bore	Part 5 Water Act 1912	SR001	Perpetuity
20BL171728	Bore	Monitoring Bore	Part 5 Water Act 1912	HVO South – Bores: BZ2B, BZ1-1, BZ1-2, BZ1- 3, BZ2-1, BZ2-2	Perpetuity
20BL171762	Bore	Monitoring Bore	Part 5 Water Act 1912	HVO South – Bores: C817, D010 (BFS), D214 (BFS), D406 (BFS) (AFS), D510 (BFS), PB01 (ALL), D510 (AFS), D010 (GM), D010 (WDH), D406 (BFS) (AFS), D612 (AFS), D612 (BFS)	Perpetuity
20BL171851	Bore	Monitoring Bore	Part 5 Water Act 1912	HVO North/South – Bores: HV2, PZ1CH200, PZ2CH400, PZ3CH800, 4118P, 4119P	Perpetuity
20BL171852	Bore	Monitoring Bore	Part 5 Water Act 1912	HVO North – PZ4CH1380	Perpetuity
20BL171853	Bore	Monitoring Bore	Part 5 Water Act 1912	HVO North – DM3	Perpetuity
20BL171854	Bore	Monitoring Bore	Part 5 Water Act 1912	HVO North – Bores: DM5, PZ6CH2450	Perpetuity
20BL171855	Bore	Monitoring Bore	Part 5 Water Act 1912	HVO North – PZ5CH1800	Perpetuity
20BL171856	Bore	Monitoring Bore	Part 5 Water Act 1912	HVO North – Bores: HV6, HV3, DM6, HV2 (2), 4113P, 4114P. 4116P, 4117P	Perpetuity

Licence Number	Type of Licence	Purpose	Legislation	Description	Expiry Date
20BL171857	Bore	Monitoring Bore	Part 5 Water Act 1912	Bores: HV4, HV4 (2) (GA3), GA3,	Perpetuity
20BL171858	Bore	Monitoring Bore	Part 5 Water Act 1912	HVO North – DM4	Perpetuity
20BL171895	Bore	Monitoring Bore	Part 5 Water Act 1912	HVO West – Destroyed: NPZ4	Perpetuity
20BL171896	Bore	Monitoring Bore	Part 5 Water Act 1912	HVO West – NPZ2	Perpetuity
20BL171897	Bore	Monitoring Bore	Part 5 Water Act 1912	HVO West – Bores: NPZ1 Destroyed: NPZ5	Perpetuity
20BL171898	Bore	Monitoring Bore	Part 5 Water Act 1912	HVO West – NPZ3	Perpetuity
20BL173062	Bore	Monitoring Bore	Part 5 Water Act 1912	RC14	Perpetuity
20BL173065	Bore	Monitoring Bore	Part 5 Water Act 1912	HQ11	Perpetuity
20BL173063	Bore	Monitoring Bore	Part 5 Water Act 1912	RC07, RC08	Perpetuity
20BL173064	Bore	Monitoring Bore	Part 5 Water Act 1912	RC06	Perpetuity
20BL173069	Bore	Monitoring Bore	Part 5 Water Act 1912	RC11	Perpetuity
20CA201247	Works Approval	Pumping Plant	Water Management Act 2000	Associated with WAL965	Perpetuity
20CA212713	Works Approval	Pumping Plant	Water Management Act 2000	Associated with WAL36190	30/05/2025
20FW213280	Flood Work Approval	Levee	Water Management Act 2000	HVO North – Carrington Levee 5	21/09/2027
20FW213281 Formerly 20CW802613	Flood Work Approval	Levee	Water Management Act 2000	HVO South – Barry Levee	21/09/2027
20FW213277 Formerly 20CW802603	Flood Work Approval	Block Dam	Water Management Act 2000	HVO South – Hobden Gully Levee	21/09/2027
20FW213278 Formerly 20CW802604	Flood Work Approval	Levee	Water Management Act 2000	HVO North – North Pit Levee 3	21/09/2027

Licence Number	Type of Licence	Purpose	Legislation	Description	Expiry Date
20WA210991 (See WAL 18307) Formerly 20SL050903	Stream Diversion	Stream Diversion	Water Management Act 2000	HVO West – Parnells Creek Dam	09/01/2033
20WA211427 Formerly 20SL061290	Stream Diversion	Cutting (Diversion Drain)	Section 10 Water Act 1912	Pikes Gully Creek Stream Diversion	07/09/2033
20WA210985 (See WAL 18327) 20SL042746	Diversion Works	Industrial	Water Management Act 2000	HV Loading Point Pump Bayswater Creek	08/09/2032
20WA211428 20SL061594	Stream Diversion	Cutting (Diversion Drain)	Water Management Act 2000	HVO North – Carrington Stream Diversion	31/07/2032
20WA201238 (see WAL 962)	Diversion Works	Pumping Plant	Water Management Act 2000	HVCPP River Pump	16/03/2028
20WA201257 (see WAL 970)	Diversion Works	Pumping Plant	Water Management Act 2000	HVO South – LCPP River Pump	Perpetuity
20WA201338 (See WAL 1006)	Diversion Works	Pumping Plant	Water Management Act 2000	HVO South – LCPP River Pump	Perpetuity
20WA201501 (See WAL 1070)	Diversion Works	Pumping Plant	Water Management Act 2000	HVO South – LCPP River Pump	Perpetuity
20WA201685 (See WAL 13387)	Diversion Works	Pumping Plant	Water Management Act 2000	HVO West – "Lake Liddell" Licence	Perpetuity
20FW213274	Flood Work Approval	Levee	Water Management Act 2000	Riverview	26/10/2028

Table 1.14- Water Access Licences

Licence Number	Description	Water Source	Water Sharing Plan	Water Source – Management Zone	Approved Extraction (ML)
WAL867	Comleroi, farming & irrigation	Hunter River	Hunter Regulated River WSP	Zone 2a (Hunter River from Glennies Creek Junction to Wollombi Brook Junction)	486
WAL962	HVO North – HVCPP River Pump – Water Access Licence	Hunter River	Hunter Regulated River WSP	Zone 1b (Hunter River from Goulburn River Junction to Glennies Creek Junction)	3,165
WAL969	HVO South – Former Riverview pump	Hunter River	Hunter Regulated River WSP	Zone 1b (Hunter River from Goulburn River Junction to Glennies Creek Junction)	39
WAL970	HVO South – LCPP River Pump – Water Access Licence	Hunter River	Hunter Regulated River WSP	Zone 2a (Hunter River from Glennies Creek Junction to Wollombi Brook Junction)	500
WAL1006	HVO South – LCPP River Pump – Water Access Licence	Hunter River	Hunter Regulated River WSP	Zone 2a (Hunter River from Glennies Creek Junction to Wollombi Brook Junction)	500
WAL1070	HVO South - LCPP River Pump – Water Access Licence	Hunter River	Hunter Regulated River WSP	Zone 2a (Hunter River from Glennies Creek Junction to Wollombi Brook Junction)	500
WAL13387	Macquarie Generation Hunter River Pump Station	Hunter River	Hunter Regulated River WSP	Zone 1b (Hunter River from Goulburn River Junction to Glennies Creek Junction)	20
WAL 13391	HVO North – Alluvial Rehabilitation Irrigation.	Hunter River	Hunter Regulated River WSP	Zone 1b (Hunter River from Goulburn River Junction to Glennies Creek Junction	420 (908 ML after transfers)
WAL18127	Carrington BB1	Hunter River Alluvium	Hunter Unregulated and Alluvial Water Sources WSP	Hunter Regulated River Alluvial Water Source – Upstream Glennies Creek management zone	383
WAL18158	Ollenberry	Hunter River Alluvium	Hunter Unregulated and Alluvial Water Sources WSP	Hunter Regulated River Alluvial Water Source – Upstream Glennies Creek management zone	65
WAL18307	HVO West – Parnells Creek Dam (Diversion Works By wash)	Unregulated River	Hunter Unregulated and Alluvial Water Sources WSP	Jerrys Water Source; Jerrys Management Zone	500

Licence Number	Description	Water Source	Water Sharing Plan	Water Source – Management Zone	Approved Extraction (ML)
WAL18327	HV Loading Point Pump Bayswater Creek (Diversion Works)	Unregulated River	Hunter Unregulated and Alluvial Water Sources WSP	Jerrys Water Source; Jerrys Management Zone	150
WAL23889	Greenleek	Wollombi Brook	Hunter Unregulated and Alluvial Water Sources WSP	Low er Wollombi Brook Water Source	144
WAL36190	HVO North, old farm bore	Hunter River Alluvium	Hunter Unregulated and Alluvial Water Sources WSP	Hunter Regulated River Alluvial Water Source – Jerrys Management Zone	120

1.2.3.3 | HERITAGE PERMITS

The Section 90 Heritage Permits applicable to HVO South are listed in **Table 1.15.**

Table 1.15- Section 90 Permits

Permit No.	Location Description	Authority	Expiry Date
C0001890	Care Agreement	OEH	3 June 2036
C0002193	Aboriginal Heritage Impact Permit	OEH	6 December 2026

1.2.3.4 | TAILINGS EMPLACEMENT AREA APPROVALS

Tailings emplacement approvals held for active or un-capped facilities at HVO North are listed in **Table 1.16**. Additionally, a portion of the GCAA-owned Cumnock Void TSF is utilised under agreement by HVO for the storage of tailings from the HCPP.

Table 1.16- Tailings Emplacement Area Approvals

Approval	Approval Date	TSF Status
Central TSF	17 April 1998	Inactive
South-East TSF	5 October 2001	Capped and rehabilitated
Bobs Dump TSF – Stage 2	23 December 2003	Inactive capping in progress
North Pit TSF	13 June 2003	Inactive
Dam 6W TSF	18 August 2011	Inactive
Carrington In-Pit TSF	25 January 2017	Active

1.3 | LAND OWNERSHIP AND LAND USE

1.3.1 | HISTORIC AND CURRENT

HVO owns the majority of the lands within the existing leases area. A schedule of HVO land ownership on and adjacent to HVO coal leases is attached as (as reproduced from Appendix A of DA 450-10-2003 and PA 06_0261) and is shown on **Figure 3.**

HVO is situated in a landscape that is characterised by mining land, grazing land, more intensive agriculture on the Hunter River alluvial zone (cropping and dairying) and some private and public woodland (**Figure 4**). HVO is adjoined by Bayswater Power Station to the north, Ravensworth Operations to the north east, grazing land to the east and west, grazing properties, residences and Mount Thorley Warkworth mining operations to the south east, and United Wambo Open Cut to the south west.

Figure 3-Land Ownership

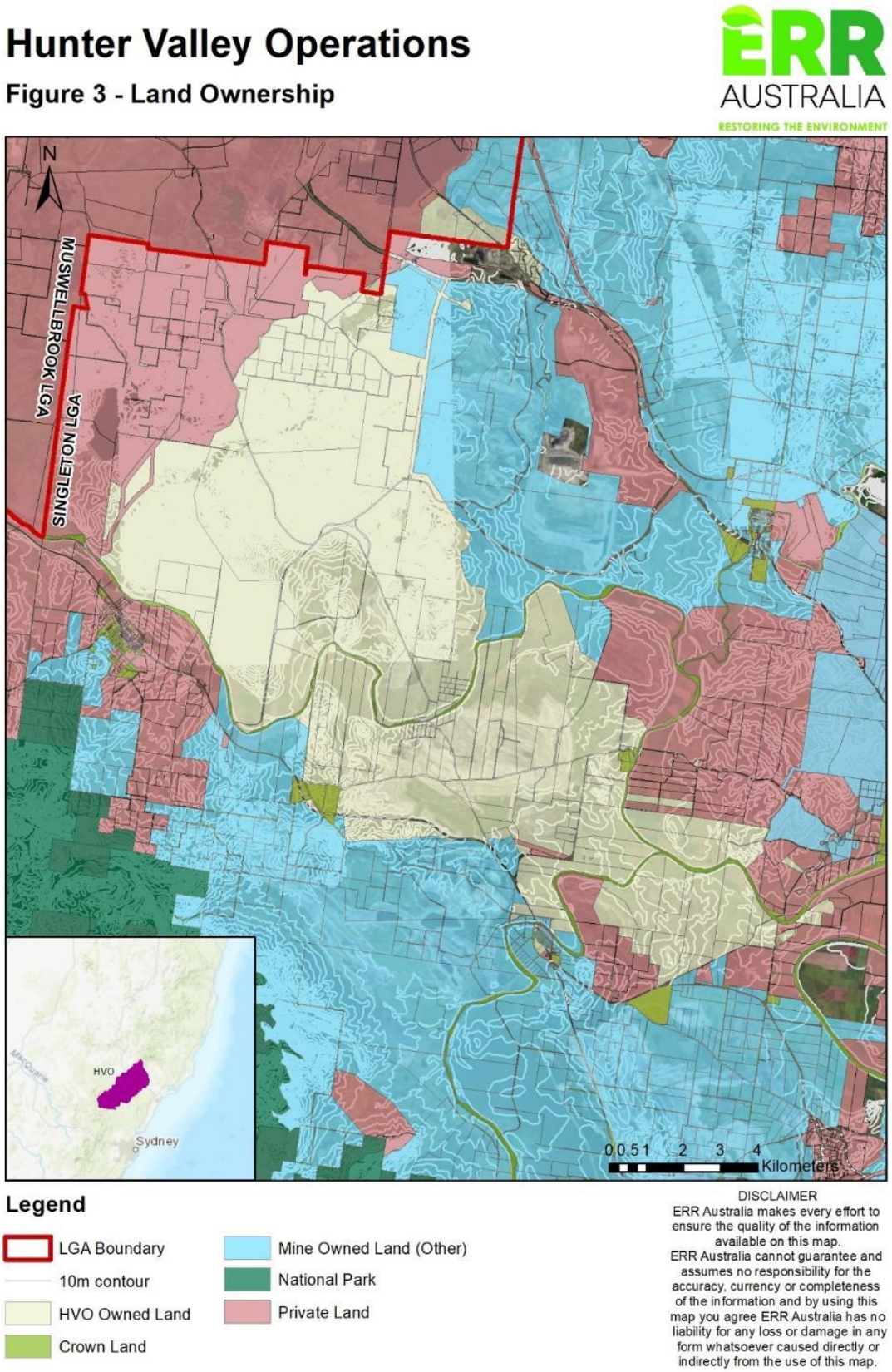
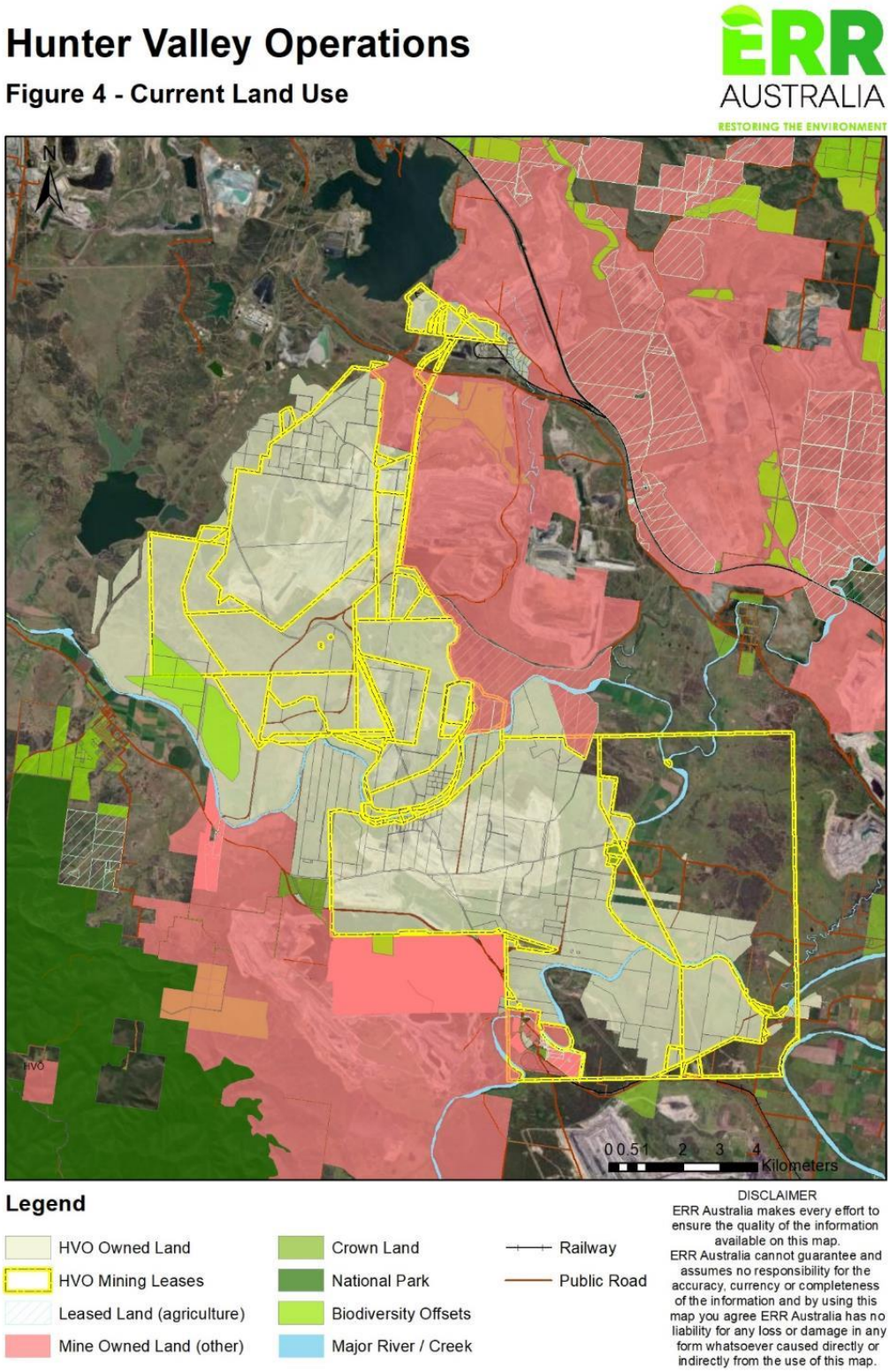


Figure 4-Current Land Use



1.3.2 | FINAL LAND USE

The proposed final land use for HVO is discussed in detail in Section 2.

2 | FINAL LAND USE

2.1 | REGULATORY REQUIREMENTS FOR REHABILITATION

The regulatory requirements related to rehabilitation and the final land use for the site are described in **Section 2.2.**

2.2 | FINAL LAND USE STATEMENT

The approved final land use for the operation is a mixture of grazing land and woodland for biodiversity and native habitat.

For HVO North, 70% of rehabilitation will be restored for grazing on native or introduced pastures, which will provide some biodiversity values for native fauna species that are able to persist in grazed or disturbed areas. The remaining 30% of the landscape will be restored to a woodland community with a more diverse native suite of species. This will include overstorey strata to provide habitat and encourage native fauna populations and threatened species that are known to occur, or traverse, in and around HVO.

In regard to HVO South, 60-70% of rehabilitation will be restored for grazing with native or introduced pasture. The remaining 30-40% will be rehabilitated to a woodland community.

Additionally, the Carrington West Wing (CWW) Extension, which was approved in 2013 by Modification 3 of DA 450-10-2003 requires the following (subject to the proposed mining occurring):

- Reinstatement of 65ha of Class II land;
- Reinstatement of 65ha of Class III land; and
- Rehabilitation of 4ha of land that is consistent with the Central Hunter Grey Box Ironbark Woodland community.

Plan 1 in **Appendix A** provides a conceptual final rehabilitation plan showing the proposed location of these final land uses.

2.3 | FINAL LAND USE AND MINING DOMAINS

2.3.1 | FINAL LAND USE DOMAINS

Final land use domains are defined as land management units characterised by similar final land use objectives. Each final land use domain will require specific decommissioning and rehabilitation methods. The final land use domains have been selected to be consistent with those specified in Form and Way: Rehabilitation management plan for large mines (RR, 2021), and are listed with their descriptions in **Table 2.1**. The final land use domains are shown on **Plans 1 and 2** in **Appendix A**.

Table 2.1- Final Land Use Domains

Domain	Description	Code
Native Ecosystem	Areas to be rehabilitated with woodland species commensurate with adjacent remnant vegetation. Approximately 30% (HVO North) and 30-40% (HVO South) of mined land will be returned to woodland. This will also include a network of tree corridors to ensure connectivity of woodland community areas, as well as 4ha of land consistent with the Central Hunter Grey Box Ironbark Woodland[1].	A
Agricultural - Grazing	Areas to be rehabilitated with selected native and exotic grasses and pasture species. Approximately 70% (HVO North) and 60-70% (HVO South) of mined land will be returned to pasture. Includes 65ha of Class II and 65ha of Class III land[1].	B
Water Management Area	A network of dams and surface water management structures are planned to be retained to assist in ongoing water and land management (e.g. stock watering).	F
Water Storage (excluding final voids)	Two large water storage dams (Parnells Dam and Lake James) are proposed to remain in the final landform.	G
Final Void	Three final voids are planned to remain in place at completion of mining at HVO North. Two separate voids will remain in West Pit and a single final void in Carrington Pit. One final void is planned to remain in place at HVO South following the cessation of mining. This is located in the south-western corner of the Riverview Pit. Final voids will create permanent water bodies. Landforms above pit water level will be vegetated where practical with woodland vegetation communities.	J

[1] Subject to proposed mining occurring and triggering this rehabilitation requirement

2.3.2 | MINING DOMAINS

Mining domains have been defined as the set of discrete areas that have a particular operational or functional purpose. All areas previously disturbed by mining have been assigned to an appropriate mining domain (as per Form and Way: Rehabilitation management plan for large mines), as listed in **Table 2.2**.The current footprint of each mining domain is also depicted on **Plan 3.**

Table 2.2- Mining Domains

Domain	Description	Code
Infrastructure	Existing infrastructure and facilities including the pit top, workshops, administration buildings, access roads, haul roads, hardstand/laydown areas, topsoil stockpiles, unsealed boreholes and monitoring equipment.	1
Tailings Storge Facility	The footprint of current tailings emplacement areas (fine rejects).	2
Water Management Area	This domain includes the network of dams and associated water management structures at HVO.	3

Domain	Description	Code
Overburden Emplacement Areas	The footprint of all in-pit and out of pit waste rock emplacements (overburden and coarse rejects).	4
Active Mining	The footprint of the HVO active mining areas, including: Pre-strip areas ahead of mining; Active mining areas; and Voids and inactive in-pit areas prior to commencement of backfilling.	5
Beneficiation Facility	The footprint of the coal washing facilities, and associated infrastructure.	7
Other	Includes all areas that don't fall into the above categories including: Existing pasture and woodland rehabilitation areas; Temporary rehabilitation areas; and Topsoil stockpiles.	8

3 | REHABILITATION RISK ASSESSMENT

Risks to achieving rehabilitation completion have been identified and assessed in accordance with the GCAA Risk Management Standard (GCAA-625378177-2844) and Clause 7 of Schedule 8A of the Mining Regulation 2016.

The initial rehabilitation risk assessment for HVO was undertaken on 7 February 2022 and was used in the initial development of this RMP (Version 1.0). This risk assessment was reviewed in October 2024 and finalised in December 2024. There were no risks identified as being high risk to the establishment of rehabilitation. The ten medium risks identified were:

- Failure to identify topsoil types when salvaging/stockpiling (e.g. pasture vs woodland)
- Limited biological resources available for salvage.
- Soil (topsoil and/or subsoil) deficit for rehabilitation activities.
- Soils inadequate to support revegetation or agricultural land capability.
- Weed infestation limiting target species / community.
- Low tailings beach shear strength delays capping.
- TSF final landforms contained by constructed embankments not geotechnically stable.
- Weather and climatic influences (drought, flood) during initial establishment.
- Insufficient establishment of target species and limited species diversity.
- Acacia Saligna infestations limiting target species/community.

A table outlining all of the risks identified, their risk ranking, controls and where the controls are included in this RMP is included as **Appendix C.**

4 | REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA

4.1 | REHABILITATION OBJECTIVES

Rehabilitation objectives for the site were initially developed during the environmental assessment and approval phases, before being refined during the operational phase and being approved by the NSW Resources Regulator in August 2024. The rehabilitation objectives stated in each of the Development Consents (and on which the approved objectives are based) are displayed in **Table 4.1**. The objectives approved by the NSW Resources Regulator in September 2024) are displayed in **Table 4.2.**

Table 4.1- Development Consent Rehabilitation Objectives

Area / Domain	Rehabilitation Objective
HVO North	
Mine site (as a whole), including the final void	Safe, stable & non-polluting
Carrington West Wing revised proposed extension area	Reinstatement of Rural Land Capability agricultural land values to be measured as: 65.0 hectares of Class II and 65.0 hectares
Surface infrastructure	To be decommissioned and removed, unless DRE agrees otherwise
Community	Ensure public safety Minimise the adverse socio-economic effects associated with mine closure
HVO South	
All areas of the site affected by the development	Safe, stable and non-polluting Fit for the intended post-mining land use/s
Areas proposed for native ecosystem re-establishment	Establish self-sustaining native woodland ecosystems characteristic of vegetation communities found in the local area
Areas proposed for agricultural land	Establish/restore grassland areas to support sustainable agricultural activities Achieve the nominated land capability classification
Final Landform	Stable and sustainable for the intended post-mining land use/s Integrated with surrounding natural landforms Incorporate micro-relief and drainage lines that are consistent with surrounding topography, to the greatest extent practicable Maximise surface water drainage to the natural environment (excluding final void catchment) Protect and maintain, to the greatest extent practicable, existing views of the Wollemi National Park and associated escarpments for residences of Maison Dieu
Final void	Designed as long term groundwater sink to maximise ground water flows across backfilled pits to the final void Minimise to the greatest extent practicable: the size and depth of final voids; the drainage catchment of final voids; any high wall instability risk; and the risk of flood interaction

Area / Domain	Rehabilitation Objective
Surface infrastructure of the development	Decommissioned and removed, unless the Resources Regulator agrees otherwise
Rehabilitation materials	Materials from areas disturbed under this consent (including topsoils, substrates and seeds) are to be recovered, managed and used as rehabilitation resources, to the greatest extent practicable
Water quality	Water retained on the site is fit for the intended post-mining land use/s Water discharged from the site is suitable for receiving waters and fit for aquatic ecology and riparian vegetation
Community	Ensure public safety Minimise adverse socio-economic effects associated with mine closure

Table 4.2- NSW Resources Regulator Approved Rehabilitation Objectives

Rehabilitation Objective Category	Rehabilitation Objective	Spatial References
Removal of Infrastructure	All infrastructure that is not required as part of the final land use will be removed.	A1, B1, F1
Retention of Infrastructure	All infrastructure that is to remain as part of the final land use is safe and has relevant approvals in place.	A1, B1, F1
Land Contamination	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.	A1, A2, A4, B1, B2, B3, B4, B7, F1, F3, F4, F5, J2, J5
Landform Stability	The final landform is stable and does not present a risk of environmental harm downstream/downslope of the site or a safety risk to the public/stock/native fauna.	A1, A2, A4, B1, B2, B3, B4, B7, F1, F3, F4, F5, J2, J5
Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	A1, A2, A4, B1, B2, B3, B4, B7, F1, F3, F4, F5, J2, J5
Surface Water	Runoff water quality is similar to, or better than the pre-mining disturbance runoff water quality.	A1, A2, A4, B1, B2, B3, B4, B7, F1, F3, F4, F5, J2, J5
Groundwater	Groundwater quality and groundwater regime are within range as predicted in environmental assessment and Water Management Plan. The risk to important groundwater assets (GDE's, Alluvial Aquifers, Landholder bores) has been addressed by the rehabilitation.	A1, A2, A4, B1, B2, B3, B4, B7, F1, F3, F4, F5, J2, J5
Water Approvals	Structures that take water are appropriately licensed.	A1, A2, A4, B1, B2, B3, B4, B7, F1, F3, F4, F5, J2, J5
Ecological Rehabilitation	Approximately 30% (HVO North) and 30-40% (HVO South) of mined land re-established as woodland areas.	A1, A2, A4
	Establish a minimum of 4ha of Central Hunter Grey Box Ironbark Woodland and 0.14ha of Swamp Oak Floodplain Forest.	A1, A2, A4
	The vegetation composition of the rehabilitation is recognisable as, or is trending towards Swamp Oak Floodplain Forest.	A1
	The vegetation composition of the rehabilitation is recognisable as, or is trending towards Central Hunter Grey Box Ironbark Woodland.	A1, A2, A4

Rehabilitation Objective Category	Rehabilitation Objective	Spatial References
	The vegetation structure of the rehabilitation is recognisable as, or is trending towards Swamp Oak Floodplain Forest.	A1
	The vegetation structure of the rehabilitation is recognisable as, or is trending towards Central Hunter Grey Box Ironbark Woodland.	A1, A2, A4
	Levels of ecosystem function have been established that demonstrate the rehabilitation is self-sustainable (Swamp Oak Floodplain Forest).	A1
	Levels of ecosystem function have been established that demonstrate the rehabilitation is self-sustainable (Central Hunter Grey Box Ironbark Woodland).	A1, A2, A4
	The vegetation composition of the native woodland rehabilitation contains species that are commensurate with the Central Hunter Grey Box - Ironbark Woodland and Central Hunter Ironbark - Spotted Gum - Grey Box Forest communities found in the local area.	A1, A2, A4
	The vegetation structure of the native woodland rehabilitation is similar to that of the Central Hunter Grey Box - Ironbark Woodland and Central Hunter Ironbark - Spotted Gum - Grey Box Forest communities found in the local area.	A1, A2, A4
	Levels of ecosystem function have been established that demonstrate the rehabilitation is self-sustainable.	A1, A2, A4
	Habitat features (e.g. logs, rocks and nest boxes), including structures suitable for native species are incorporated into rehabilitation areas at required densities.	A1, A2, A4
	Habitat corridors are established and consistent with target vegetation community compositions in final rehabilitation.	A1, A2, A4
	Monitoring confirms target native fauna species are recorded utilising rehabilitation areas or habitat suitable for target species is present	A1, A2, A4
Agricultural Revegetation	Approximately 70% (HVO North) and 60-70% (HVO South) of mined land re-established as stable, productive pasture areas.	B1, B2, B3, B4, B7
	Revegetation is sustainable for the long term and only requires maintenance that is consistent with the intended final land use.	B1, B2, B3, B4, B7
	Land use capability is capable of supporting the target agricultural land use of Class 1.	B4
	Land use capability is capable of supporting the target agricultural land use of Class 2.	B4
	Land use capability is capable of supporting the target agricultural land use of Class 3.	B4
	Land use capability is capable of supporting the target agricultural land use of minimum of Class 6.	B1, B2, B3, B4, B7

4.2 | REHABILITATION COMPLETION CRITERIA

The completion criteria are objective target levels or values assigned to a variety of indicators (i.e. slope, species diversity, groundcover etc.), which can be measured to demonstrate progress and ultimate success of rehabilitation. They provide a defined end point, at which point in time rehabilitation can be deemed successful and the lease relinquishment process can proceed.

The preliminary rehabilitation completion criteria for HVO are provided in **Appendix D**. Completion criteria have been developed considering site specific issues, objectives and regulatory requirements (refer **Section 2.1**). It is envisaged that HVO will submit completion criteria to the Resources Regulator for approval in 2025.

4.3 | STAKEHOLDER CONSULTATION

Consultation on rehabilitation objectives and completion criteria for HVO's operations has been undertaken over many years and for numerous purposes, including:

- Consultation for the HVO South Environmental Assessment (Modification 5)
- Consultation for the HVO North Environmental Assessment (Modification 7)
- Consultation with the RR on the HVO Mining Operations Plan 2020-2022
- Consultation for the RMP

A brief outline of this consultation is provided in the sections below in **Table 4.3**. A copy of relevant consultation evidence can be found in **Appendix F.**

4.3.1 | ENVIRONMENTAL ASSESSMENTS

Table 4.3- Environmental Assessment Summary of Consultation

Government Agency	Summary of Consultation
HVO South Modification 5 Environmental Assessment	
DPIE	Three meetings were held in March and September 2015 and April 2016. Items discussed during the consultation process included a project briefing, planning pathway and matters requiring consideration.
Community	Community consultation included meetings with the HVO CCC, 25 near neighbours and two open community BBQ events. Matters raised during this consultation relevant to the RMP included visual amenity and the final landform (specifically, the height of overburden emplacements relative to nearby operations) and the mining of existing rehabilitation. These issues were considered were addressed within the Modification 5 Environmental Assessment document.
HVO North Modification 6 Environmental Assessment	
DPIE	Two meetings held in September and October 2016 which included discussion on the preferred final land use
HVO North Modification 4 Environmental Assessment	
DPIE	One meeting in July 2012 to discuss a project briefing, the need to document alternatives considered and additional key matters requiring consideration.
DRE	Two meetings held in July and December 2012 regarding fine reject management and the sites rehabilitation strategy

A copy of the 2022 RMP has been sent to relevant stakeholders to meet the consultation requirements of:

- Schedule 2, Condition 15 of PA 06_0261;
- Schedule 3, Condition 36 (b) of PA 06_0261;

- Schedule 2, Condition 15 of DA 450-10-2003; and
- Schedule 3, Condition 62C of DA 450-10-2003.

Stakeholders have had the chance to comment on the post mining land use, rehabilitation objectives and completion criteria.

4.3.2 | HVO MOP

Representatives from HVO, SLR and the RR met to discuss the development of the previous Mine Operations Plan (MOP) on 24 October 2018. On 12 June 2020, HVO requested approval from the Secretary to undertake targeted consultation with regulators during the preparation of this MOP. The DPE approved this request on 6 October 2020 given that the MOP did not involve material changes to rehabilitation, disturbance or landforms. The DPE required that the MOP be prepared in consultation with the Resources Regulator.

HVO has previously met with Singleton Council who expressed that their concerns lie with ensuring sufficient detail regarding the identified final land use within the various domains. This is consistent with discussions that HVO has had with the Resource Regulator and, as such, specific rehabilitation objectives and completion criteria that clearly define the final land uses were emphasised in the previous MOP and have also been included in this RMP.

4.3.3 | RMP

The initial version of this RMP was developed throughout 2022 and included consultation with all relevant government agencies referenced in the development consents as outlined in the table below in **Table 4.4.**

Version 1.2 (October 2024) was updated to include the Rehabilitation Objectives (ROBJs) approved by the NSW Resources Regulator in August 2024 as well as minor updates to reflect administrative feedback from the NSW RR revegetation Targeted Assessment Program (TAP) completed in June 2024.This version of the RMP (1.3) was updated in December 2024 to reflect the review of the rehabilitation risk assessment which was finalised in December 2024.In accordance with requirements in Schedule 8A of the Mining Regulation HVO is required to update the RMP following approval of Rehabilitation Objectives and to reflect any changes to the risk control measures in the prepared plan that are identified in a rehabilitation risk assessment. Due to the cause and nature of these changes, further consultation was not undertaken with other agencies and stakeholders.

Table 4.4- Summary of Consultation on RMP

Government Agency	Summary of Consultation	Actions by HVO
DPE Water	Copy of RMP provided to DPE Water via DPE Portal 5 July 2022. DPE water consultation advice: Final RMP to be made publicly available on external website. Ongoing water take is quantified and complies with relevant licensing. Aquifer interference and groundwater impacts are minimised. Monitoring and review program is completed to ensure rehabilitation outcomes are met.	Appendix F of this document includes consultation evidence. The final RMP will be made electronically available on the HVO website as per previous versions. Water take / discharge and sharing is detailed within HVO's currently approved Water Management Plan dated 27 July 2018. This plan also details the site's water management system. Groundwater monitoring is completed as per the site's current Groundwater Management Plan which details any impacts on groundwater or private groundwater bores. An annual rehabilitation monitoring program is completed as per Section 8 of this document.
BCD (previously OEH)	Copy of RMP provided to BCD via DPE Portal 5 July 2022.	Nil matters raised by OEH, no response received.
Council	Copy of RMP provided to Council via DPE Portal 5 July 2022.	Nil matters raised by Council, no response received.
CCC	Copy of RMP provided to CCC members via email 5 July 2022.	Nil matters raised by CCC.
CLWD (Crown Lands)	Copy of RMP provided to Crown Lands via DPE Portal 5 July 2022.	Nil matters raised by Crown Lands.

Government Agency	Summary of Consultation	Actions by HVO
NSW RR	Rehabilitation Objectives Statement (ROBJ0001092) submitted to the Resources Regulator in July 2022 in accordance with 'Form and way: Rehabilitation objectives, rehabilitation completion criteria and final landform and rehabilitation plan for large mines'. Feedback was received from the RR in in December 2022, December 2023 and July 2024.	ROBJ0001092 was updated and resubmitted to the RR in February 2023, February 2024 and August 2024 to reflect feedback provided by the RR. The Rehabilitation Objectives were approved by the RR in September 2024 and approved objectives have been updated in this RMP (Oct 2024) .
	Final landform and Rehabilitation Plan (FLRP0001076) submitted to the RR in July 2023 in accordance with Form and way: Rehabilitation objectives, rehabilitation completion criteria and final landform and rehabilitation plan for large mines'. Feedback was provided by the RR in December 2022 and December 2023.	FLRP0001076 was updated and resubmitted to the RR in February 2023 and February 2024 to reflect provided by the RR. This RMP will be updated upon the acceptance of FLRP0001076 by the RR.
DPHI	HVO South uploaded to NSW Major Projects Planning Portal 4th August 2022 Portal reference: MP06-0261-PA-100. HVO North uploaded to NSW Major Projects Planning Portal 4th August 2022. Portal reference: DA450-10-2003-PA-65.	Response received in June 2023 stating DPHI had no feedback on RMP.
	RMP updated to include consultation evidence (as required by an audit finding) and resubmitted to the Major Projects Planning Portal on the 11th August 2023.Reference MP06_0261-PA-13.	Response not yet received from DPHI.

5 | FINAL LANDFORM AND REHABILITATION PLAN

In accordance with the requirements of the Form and Way: Rehabilitation Objectives, Rehabilitation Completion Criteria and Final Landform and Rehabilitation Plan for Large Mine (NSWRR, 2021), two Final Landform and Rehabilitation Plans (**Plans 1** and **2, Appendix A**) have been prepared to show the proposed final land use and final landform at the end of mine life.

Final landform slopes in West Pit will vary according to erosion hazard, stability and drainage requirements. Maximum external slopes will be less than 10°. Internal slopes may be steepened to grades up to 18° (with regulatory approval). Slopes above 10° would typically be covered by woodland. Final landforms at Carrington Pit, CWW Extension, North Pit and the Alluvial Lands will reflect pre mining landscapes of undulating hills, and flat and gently sloping areas. The rehabilitation objective with DA 450-10-2003 requires the mine site to be safe, stable and non-polluting.

The proposed final landform for HVO North will include three final voids across West Pit North, West Pit South, and Carrington and operating as a mix of evaporative sinks and pit lakes. HVO South will include an evaporative basin in the south-western corner of the Deep Cheshunt Pit (currently Riverview Pit).

HVO South will incorporate micro-relief and natural landform drainage lines that are consistent with surrounding topography and the approved final landform, noting that historical rehabilitation areas were constructed using traditional landforms and slopes in accordance with the approvals applicable at the time.

6 | REHABILITATION IMPLEMENTATION

6.1 | LIFE OF MINE REHABILITATION SCHEDULE

All areas disturbed as part of the operation will be progressively rehabilitated throughout the life of the mine. Each year HVO prepares an Annual Rehabilitation and Closure Plan which identifies all available rehabilitation and required closure / decommissioning activities.

Progressive rehabilitation includes the decommissioning and rehabilitation of tailings storage facilities. The status and proposed decommissioning schedule for each of the remaining storages is provided in **Table 6.1.**

Table 6.1- Tailings Storage Facility Rehabilitation Schedule

Site	Status	Average Depth (m)	Storage (Mm^3) and Volume (ML)	Start	Finish	Estimated Capping Volume (kBCM)	Capping Source	Estimated Rehabilitation Timeframe
Bob's Dump TSF	Inactive Capping in progress	8	1.84 Mm^3	2001	Dec 2012	1,000	Mitchell and Wilton Pits	Est 2026[1]
Central TSF	Inactive	12	1.9 Mm^3	2001	Mar 2009	500	Carrington out of pit dump	Est. 2033-2035
Dam 6 TSF (Stage 2)	Inactive (full, consolidating)	24	4.4 Mm^3	Jan 2013	Dec 2021	1,000	Mitchell and Wilton Pits, stockpiled	Est. 2031-2035

North Void TSF	Inactive (consolidation, void filling permitted annually)	26	19.5 Mm^3	Jan 2004	Feb 2019	5,000	Carrington out of pit dump	Est. 2038-2040
Carrington In-Pit	Active	30	11.83Mm^3	Feb 2019	Mar 2030	4,000	Carrington out of pit dump	Est. 2038-2040
Lemington 1 TSF (Cell A&B)	Capped and Rehabilitated							
Lemington 4 TSF (Cell A&B)	Capped and Rehabilitated							
Eastern TSF	Capped and Rehabilitated							
Western TSF (Cell A&B)	Capped and Rehabilitated							
Lemington 2	Capped and Rehabilitated							
Lemington 3	Capped and Rehabilitated							
Lemington 5	Capped and Rehabilitated							
Howick TSF	Capped and Rehabilitated							
Pikes Gully TSF	Capped and Rehabilitated							
South East TSF	Capped and Rehabilitated							

[1] Capping of the Bobs Dump TSF will be completed in 2026.Seeding of final land use species will not occur until 2030 once the area has reached final landform height.

Further details regarding the tailings storage facilities is provided in the HVO Fine Reject Management Strategy. Additionally, HVO undertakes an annual closure and environment risk assessment which identifies any emerging tailings risks and the appropriate critical controls required.

The proposed rehabilitation schedule for the life of the mine is outlined on **Plans 3 – 8 in Appendix A**. It should be noted that this rehabilitation schedule is based on the current approved mining timeframes in DA 450-10-2003 and PA 06-0261. HVO is currently developing a continuation project which if approved will extend both mining and rehabilitation activities beyond these dates and will be reflected in future updates to this RMP.

6.2 | PHASES OF REHABILITATION AND GENERAL METHODOLOGIES

The ultimate rehabilitation objective for HVO is to create stable, non-polluting post mining landforms that are cognisant of site constraints and allow the achievement of the agreed post mining land uses. This will be achieved by demonstrating completion of a series of conceptual phases of rehabilitation which are described as:

1. Active Mining – stripping and salvaging, stockpiling and ongoing management of topsoil resources including testing and characterisation and weed management;
2. Decommissioning – decommissioning of all on-site infrastructure, including the CPP's, administration buildings and train loading facilities; removal of haul road, rail crossings and hard stand areas, the completion of contamination studies for relevant areas and subsequent decontamination where required, removal of hazardous materials;

3. Landform Establishment – incorporates slope, aspect, drainage, substrate material characterisation and morphology;
4. Growth Medium Development – incorporates physical, chemical and biological components of the growing media and ameliorants that are used to optimise the potential of the media to support the preferred vegetative cover;
5. Ecosystem and Land Use Establishment – incorporates revegetating lands, habitat augmentation, species selection, species presence and growth together with weed and pest animal control /management and establishment of flora;
6. Ecosystem and Land Use Sustainability – incorporates components of floristic structure, nutrient cycling recruitment and recovery, community structure and function which are the key elements of a sustainable landscape; and
7. Land Relinquishment – completion criteria for rehabilitation are met and the land is determined to be suitable to be relinquished from the mining tenement.

6.2.1 | ACTIVE MINING

Environmental mitigation and management strategies will be implemented during the active phase of the operation to minimise environmental impacts. A number of activities will be undertaken during the active mining phase which will be specifically aimed at enhancing rehabilitation outcomes. Activities undertaken in this regard are summarised below.

6.2.1.1 | TOPSOIL MANAGEMENT

6.2.1.1.1 | *TOPSOIL STRIPPING*

Topsoil will be stripped and salvaged correctly to maximise its value for re-use in rehabilitation. Where possible, the topsoil is directly transported from stripping to rehabilitation areas. If this is not possible, topsoil is stockpiled for later reuse. Topsoils are also characterized and stripped and stockpiled separately, where possible, to ensure re-use on appropriate rehabilitation areas (e.g. pasture topsoil is used on pasture rehabilitation).

Areas that are planned to be mined are stripped of soil prior to commence of mining. Excessive advance clearing and soil removal is kept to a minimum to reduce dust generation and potential impacts on fauna species. However, this is balanced with clearing a large enough area to aid flexibility in the scheduling of stripping activities to enable works to occur in favourable conditions and outside of fauna breeding periods. Soil is stripped using appropriately sized earthmoving equipment, generally bulldozers. Prior to stripping of soil, appropriate sediment controls are installed to prevent off-site loss of soil sediments.

6.2.1.1.2 | *SOIL MANAGEMENT AND HANDLING*

Stripped topsoil and subsoil needs to be managed to prevent erosion and weed infestation, and to ensure that the maximum soil reserves are retained for reuse during rehabilitation works.

Where feasible, soil is transferred directly from stripping to re-spreading operations, eliminating the need for storage. However, mine scheduling dictates that soil storage will be necessary on occasion for extended periods. Where stockpiling is required, the following principles are sought to be adopted:

- stockpiles are preferentially located away from heavily trafficked or active mining areas, watercourses and are placed on areas of flat topography or along the contour to minimise erosion;

- soils are stockpiled separately according to source, nature and history, and characterisation, and records maintained;
- soil stockpiles are identified, volume recorded, and management inspections are undertaken;
- stockpiles are constructed to a height of approximately 3 m, or less;
- where necessary and/or practical, bunding, sediment fencing or other appropriate sediment controls are installed around the base of the stockpile to minimise soil loss;
- stockpiles are sown with cover crop to help maintain topsoil viability and minimise erosion and weed infestation if not being reused for prolonged periods; and
- topsoil stockpiles are scalped, if necessary, prior to re-spreading onto rehabilitation areas to prevent the spread of weed seed into new rehabilitation.

6.2.1.1.3 | SOIL TREATMENT

Where topsoil quality data is not available, soil testing is undertaken to inform if soil treatment is required. Soil ameliorants, such as gypsum, compost, and fertilisers are applied where required to improve soil condition. The ameliorant type and application rate are confirmed by characterisation testing of topsoils at appropriate times during the stripping and reuse cycle and, generally, reference to specialist agronomic advice.

Where appropriate topsoil resources are not available, alternate growth mediums such as subsoils and mine spoil may be used, typically with amelioration and informed by characterisation of the planned growth medium. Organics such as green waste or composted municipal waste materials may be used in place of chemical fertilisers to enhance soil nutrient and organic levels and improve soil or growth medium structure. Revegetation can then be undertaken progressively as surface preparation and amelioration is completed.

6.2.1.2 | FLORA AND FUANA

Clearing protocols are implemented before and during disturbance activities to mitigate impacts and to salvage appropriate resources, namely the Ground Disturbance Permit (GDP) approval process. The GDP process ensure that:

- key stakeholders are notified of work which will disturb land;
- works are assessed for potential impacts (on threatened and non-threatened flora and fauna);
- appropriate controls are identified and implemented, including delineation of disturbance areas; and
- resources that may be useful for rehabilitation (topsoil, seeds, hollow trees, woody debris) are identified and salvaged.

6.2.1.3 | ROCK AND OVERBURDEN EMPLACEMENT

All overburden and interburden material generated from mining operations at HVO is road hauled on current emplacement areas behind the active mining operation. Historical HVO has also direct placed overburden using a dragline both these ceased operation in 2023.

All mining waste emplacements will be reshaped as required to construct the approved final landform. The method and height of emplacement areas will be in accordance with the final approved landforms and HVO procedures for dumping. The heights of emplacement at HVO will be generally in accordance with the proposed final landform levels and as shown on **Plan 2: Final Landform Contours.**

6.2.1.4 | WASTE MANAGEMENT

Recycling and disposal of waste at HVO focuses on the correct handling, storage, segregation and reuse of materials. HVO recycles waste wherever possible, to reduce the amount of waste destined for landfill.

Waste will be managed in accordance with the following waste management hierarchy principles:

- Waste avoidance;
- Waste re-use;
- Waste recycling; and
- Waste removal and disposal.

6.2.1.5 | GEOLOGY AND GOECHEMISTRY

HVO extract coal seams within the Permian aged Jerrys Plains Subgroup of the Hunter Coalfields. The Jerrys Plains Subgroup comprises economic coal seams, along with overburden and interburden consisting of sandstone, siltstone, tuffaceous mudstone and conglomerate. The Permian coal measures are stratified (layered) sequences that have undergone deformation resulting in strata dipping at a shallow angle of 2° to 5° to the south-west at HVO North. Regionally, the stratigraphy dips in a general south-westerly direction, towards the Hunter River from Carrington Pit void.

Overburden material varies in physical and geochemical properties, in accordance with the geology of the area and the extent of exposure to weathering. Chemical analysis of HVO spoil material indicates that, in general, the overburden is slightly sodic and alkaline, but within acceptable ranges for use as a plant growth medium.

Further discussion on the potential impacts of geology and geochemistry on the rehabilitation (spontaneous combustion and acid mine drainage) is provided in the sections below.

6.2.1.6 | MATERIAL PRONE TO SPONTANEOUS COMBUSTION

HVO has procedures for managing spontaneous combustion in mine and rehabilitation areas. The objectives of HVO spontaneous combustion management is to:

- Ensure that spontaneous combustion outbreaks are minimised;
- Endeavour to identify potential areas that may be prone to spontaneous combustion before an outbreak occurs;
- Ensure that all carbonaceous material is placed in such a manner that reduces the possible occurrence of spontaneous combustion; and
- Where longer term spontaneous combustion problems occur, develop and implement a management plan to address until resolved

Any spontaneous combustion will be managed in accordance with the *Spontaneous Combustion Principal Hazard Management Plan (HVO 2021).*

6.2.1.7 | MATERIAL PRONE TO GENERATING ACID MINE DRAINAGE

Mineral wastes may pose an environmental risk because of acid drainage, however the potential for acid mine drainage (AMD) at HVO is low. The EIS prepared by EMGA (2010) as part of Mod 3 to DA 450-10-2003 states that as with most Hunter Valley coal seams, the coal measures within the site have a high buffering capacity and relatively low sulphur content, so there is no significant risk from acid rock drainage.

The Archerfield Sandstone, tailings and coarse rejects are materials most likely to present the highest AMD risk and are managed in accordance with internal mine planning procedures.

Existing management processes are in place to ensure AMD material is managed appropriately. In accordance with Schedule 3, Condition 62A of DA 450-10-2003, potentially acid forming interburden material is not emplaced at elevations within the pit shell or out of pit emplacement areas where they may promote acid or sulphate species generation and migration beyond the pit shell or out of pit emplacement areas.

6.2.1.8 | ORE BENEFICIATION WASTE MANAGEMENT (REJECT AND TAILINGS DISPOSAL)

6.2.1.8.1 | *COARSE REJECTS*

Coarse reject consists predominantly of fine-grained sedimentary rock types with minimal quantities of carbonaceous material. The reject contains no energy, is of no current commercial use and has low potential for spontaneous combustion. This material has similar properties to overburden in contact with coal seams and is generally saline and alkaline.

Coarse rejects are transported by truck and buried below the final surface level in overburden emplacements as part of the final landform design. The depth of cover is determined by a suitably qualified engineer in accordance with the approved management plans applicable to the location to ensure that potential acid mine drainage matters or spontaneous combustion are mitigated.

6.2.1.8.2 | *TAILINGS*

Fine reject (tailings) is thickened into a solid density of approximately 20% to 30% by weight and is predominantly fine rock and clay with some coal and flocculent. The tailings are wet with moderate conductivity.

Tailings are currently transported to the following emplacement areas:

- Carrington In-Pit TSF; and
- Cumnock Void TSF – under an agreement with Glencore (Ravensworth) to utilise 25% of the void capacity.

Intermittent deposition of tailings will occur at North Pit TSF, Dam 6W TSF and Central TSF as part of ongoing management towards decommissioning, subject to approval from the Regulator. TSF locations are shown on Figure 2, and Section 6.1 provides information on the plans for capping and rehabilitation of TSFs for the life of the operation.

6.2.1.9 | EROSION AND SEDIMENT CONTROL

Erosion and sedimentation at HVO is managed in accordance with the Water Management Plan (HVO 2018).

During and following ground disturbance, structures such as sediment dams, sediment fences and catch drains will be utilised as appropriate to manage runoff water and manage erosion and sedimentation. Inspections will be carried out to ensure the effectiveness of erosion and sediment control structures. Additional stabilisation works for these areas may include reshaping, amelioration of dispersive soil, revegetation, fencing and weed control.

6.2.1.10 | ONGOING MANAGEMENT OF BIOLOGICAL RESOURCES FOR USE IN REHABILITATION

All risks and mitigation measures associated with the management of topsoil, seeds and other biological resources are discussed in **Section 6.2.1.1** and **Section 6.2.1.2.**

6.2.1.11 | MINE SUBSIDENCE

The former Lemington Underground Mine operated from 1971 to 1992 using bord and pillar mining methods in the Mount Arthur Seam, with areas of longwall extraction. The former Lemington Underground Mine was acquired and merged into HVO South in 2001. The underground workings are located south-east of the current mining areas at HVO South, below the South Lemington Pit 1, and north-west of Warkworth Mine. The Mount Arthur Seam floor in the former workings ranges from approximately 40 metres Australian Height Datum (mAHD) to approximately -205 mAHD, generally dipping from the north-east to the south-west.

In 2022, Mod 7 of PA 06_0261 was approved allowing for the storage of water in the underground workings. There is not expected to be any subsidence impacts on current or future operations or rehabilitation.

6.2.1.12 | MANAGEMENT OF POTENTIAL CULTURAL AND HERITAGE ISSUES

Aboriginal cultural heritage is managed in accordance with the HVO North Aboriginal Heritage Management Plan (HVO 2020a) and the HVO South Aboriginal Cultural Heritage Management Plan (HVO 2020b). HVO works closely with the local Aboriginal community on all aspects of cultural heritage management. Regularly community consultation occurs via the HVO Aboriginal Cultural Heritage Working Group on matters pertaining to Aboriginal cultural heritage at HVO.

HVO has also constructed and maintains Cultural Heritage Databases and a Geographical Information System (GIS) to better manage and protect sites. The GDP system has also been implemented at HVO and must be authorised by cultural heritage staff and completed prior to any disturbance of HVO outside current mining operations.

There are no cultural heritage features associated with the final landform.

There are no listed items of European Heritage in planned rehabilitation areas at HVO and therefore no management measures are required.

6.2.1.13 | MANAGEMENT OF POTENTIAL CULTURAL AND HERITAGE ISSUES

Aboriginal cultural heritage is managed in accordance with the HVO North Aboriginal Heritage Management Plan (HVO 2020a) and the HVO South Aboriginal Cultural Heritage Management Plan (HVO 2020b). HVO works closely with the local Aboriginal community on all aspects of cultural heritage management. Regularly community consultation occurs via the HVO Aboriginal Cultural Heritage Working Group on matters pertaining to Aboriginal cultural heritage at HVO.

HVO has also constructed and maintains Cultural Heritage Databases and a Geographical Information System (GIS) to better manage and protect sites. The GDP system has also been implemented at HVO and must be authorised by cultural heritage staff and completed prior to any disturbance of HVO outside current mining operations.

There are no cultural heritage features associated with the final landform.

There are no listed items of European Heritage in planned rehabilitation areas at HVO and therefore no management measures are required.

6.2.1.14 | EXPLORATION

Exploration drilling will be undertaken within the HVO mining lease areas to obtain further information regarding the resources to be mined as well as define geological and geotechnical information relevant to the mining and construction activities that will be undertaken. Additional drill holes to install groundwater and gas monitoring bores may also be required.

Construction, sealing and abandonment of boreholes will be in accordance with relevant standards and guidelines published by the DPIE–RR and in force at the time.

6.2.2 | DECOMMISSIONING

As part of the mine closure process, infrastructure which is not able to be utilised by subsequent approved land uses will be removed. Soils within and surrounding former infrastructure areas will be assessed for potential contamination. Any contamination present will be remediated, and contaminated material will be treated or appropriately disposed of. As with other disturbed areas, former infrastructure areas will be revegetated unless proposed for other land uses.

As part of the mine closure process, dams forming part of the mine water management system will be removed unless they are to be utilised for habitat purposes, are associated with long-term stability and water management, or are beneficial to subsequent land uses (e.g. stock dams). Removal of sediment from mine water dams will occur as required as part of the closure and rehabilitation processes regardless of the suitability of the dams for other purposes.

A Phase 1 Contamination Assessment has been completed across the operation, with a Phase 2 assessment also completed at the former Lemington CHPP location. The operation, in particular infrastructure areas, will be further assessed prior to decommissioning or demolition.

6.2.2.1 | SITE SECURITY

Site security measures will be implemented for the duration of the operation. These measures will be maintained during closure, decommissioning and demolition activities to prevent unauthorised access and to ensure public safety. Security measures will include:

- fencing and sign posting of the site;
- all personnel, contractors and visitors will be required to undertake a relevant site induction and sign in and out of the site; and
- all visitors will be required to be accompanied by a site representative at all times.

6.2.2.2 | INFRASTRUCTURE TO BE REMOVED OR DEMOLISHED

6.2.2.2.1 | BUILDING AND FIXED PLANT

All buildings, fixed plant and other infrastructure that are not required as part of the post-closure land use will be demolished and removed from the site. Where appropriate, the materials recovered during demolition will be sold for reuse or recycled. This includes ROM and product stockpiling and transport infrastructure such as bins and conveyors.

Concrete footings and pads, along with other inert building waste, will be broken up and buried with overburden in the pit area or used in rehabilitation where appropriate. Footings and pads will be removed to a depth of 0.5m below the ground surface and covered with inert material. It is noted that an EPL variation will be required to permit the disposal of this inert waste on site.

Where they do not pose a constraint to the proposed final land use, structures such as footings, underground water pipelines and disconnected power cables may be left in situ. This may include where it is not practical to retrieve the structures or where their removal may lead to environmental damage. These remaining structures will be surveyed and recorded on a plan.

6.2.2.2.2 | EQUIPMENT STORAGE AREAS

Any redundant plant or equipment will either be sold or disposed of at an appropriate landfill facility.

Storage areas will be assessed for potential contamination (e.g. hydrocarbons) and remediation undertaken as required.

6.2.2.2.3 | HARDSTAND AREAS, ROADWAYS AND CAR PARKS

Hardstand areas, roadways and car parks will be removed (unless required for a post mining land use) with inert waste material (e.g. bitumen, concrete) being placed and capped in the tailings/overburden emplacement areas or incorporated into the final voids.

6.2.2.3 | BUILDINGS, STRUCTURES AND FIXED PLANT TO BE RETAINED

At this stage, no buildings, structures or fixed plant are proposed to be retained as part of the final landform. However this will be reviewed during the detailed mine closure planning process which will be undertaken as the operation approaches mine closure.

6.2.2.4 | MANAGEMENT OF CARBONACEOUS / CONTAMINATED MATERIAL

Excess coal material remaining at closure will be scraped up and either reprocessed or disposed of within the tailings/coarse reject emplacement areas on site.

Any remaining carbonaceous material (e.g. coal reject) on the base of the coal stockpile area will be either capped with inert material in accordance with relevant guidelines or scraped up, removed and disposed of with tailings or as coarse reject within the emplacement area.

Where there is potential that contamination may have occurred as a result of site activities (e.g. refuelling areas, workshops, etc), investigations will be undertaken to determine the presence and extent of any contamination. Where identified, contaminated material will be bioremediated on site or disposed of offsite at an authorised waste facility.

If applicable, a suitable qualified contamination expert will be engaged to verify that any contamination has been adequately managed.

6.2.2.5 | HAZARDOUS MATERIAL MANAGEMENT

Hazardous materials and dangerous goods used at HVO include sealed radiation sources, gases for cutting and welding, explosive precursors and diesel fuels. Dangerous goods and explosives are managed in accordance with relevant legislation.

HVO manages hazardous material through the ChemAlert system whereby all chemicals used on site are registered through a central database. The central database contains all information contained in the Safety Data Sheets (SDS) and an inventory of chemicals held onsite.

Radiation sources at the CPP are fully sealed and managed by an appointed radiation safety officer in accordance with radiation licences issued under the Radiation Control Act 1990.

HVO implements procedures and controls to minimise the potential for land and water contamination from the handling, storage and disposal of hazardous substances. These controls include storage within properly sealed containers and controlled areas, bunded for medium to long-term storage requirements.

6.2.2.6 | UNDERGROUND INFRASTRUCTURE

There is no underground mining currently undertaken at HVO, or planned to be undertaken, and therefore there is no requirement for the removal or decommissioning of underground infrastructure. HVO has approval for storage of water in the closed Lemington underground workings via boreholes and any existing or planned water infrastructure will decommissioned, surface infrastructure removed and boreholes rehabilitated.

6.2.3 | LANDFORM ESTABLISHMENT

6.2.3.1 | WATER MANAGEMENT INFRASTRUCTURE

Drainage patterns on rehabilitated areas are designed to be compatible with the surrounding drainage network, and report rehabilitation catchments of similar size to pre-mining catchments to the approximate location of the pre-mining flow lines.

The approach to drainage from rehabilitation areas at HVO can be split into two main categories: traditional drainage and natural drainage. Traditional drainage methods will be used on rehabilitation areas in the West Pit and Carrington Pit areas in accordance with approval commitments for these areas. Some older rehabilitation areas within HVO South will also incorporate traditional drainage, where they were constructed before the HVO South PA 06_0261 approval. Natural drainage methods will be utilised for all rehabilitation areas constructed in HVO South following this approval.

The traditional drainage approach is achieved using a combination of controls such as graded banks, designed channels and where necessary, water course reinforcement. Diversion drains to collect surface runoff are designed with an approximate slope of 1 – 1.5% to minimise erosion.

The key aspects of the natural drainage design include:

- the drainage density of the final landform is to reflect the nature of the drainage patterns in surrounding landforms;
- steeper slopes are to be located higher in the catchment (where water flows are smallest), with slope gradients flattening out downstream;
- drainage lines will have both channel and floodplain components to provide stability during high rainfall events; and
- gentle flow transitions which emulate natural transitions and maintain a balance between scour risk and sedimentation.

Drainage depressions, attenuation basins, and sedimentation dams are incorporated into the final landform where appropriate to collect water runoff and allow suspended sediment to settle out. At present, base of system sediment basins are generally dewatered to site storages to prevent turbid waters flowing to the offsite environment. However, once an adequate vegetation cover is established and the slope is stable, this water can be released from site following a period of sampling that indicates suitable water quality. Sedimentation dams will be designed in accordance with HVO's approved Water Management plan and consistent with Managing Urban Stormwater: Soils and Construction (Blue Book) design criteria.

Drainage from Carrington rehabilitation will be reinstated to the adjacent Carrington Billabong once the rehabilitation is safe, stable and non-polluting.

The proposed water management infrastructure that will remain at mine closure is outlined on **Plan 1: Final Landform Features.** All dams that will remain post-closure will be appropriately designed and constructed in accordance with the relevant design standard at the time.

6.2.3.2 | FINAL LANDFORM DESIGN

The final landform design for HVO was prepared as part of the EIS for HVO North (ERM 2003) and HVO South (ERM 2008), and subsequent modifications. The proposed final landform has been designed in consideration of the surrounding landscape and includes stable, natural profiles, as shown on **Plan 2: Final Landform Contours.**

Overburden is shaped to be generally compatible with adjacent land surfaces and the final landform. The final landscape will consist of a series of hills, ridges and minor valley systems. Final landform slopes vary according to erosion hazard, stability and drainage requirements. Overburden emplacement external slopes will generally be regraded to less than 10°. Internal slopes may be steepened to grades up to 18°.

6.2.3.3 | REJECT EMPLACEMENT AREAS AND TAILINGS DAMS

Tailings and fine rejects at HVO are managed in accordance with the *HVO Fine Reject Management Strategy (ATC Williams 2023)* and Operation and Maintenance Manuals. The Strategy is a requirement of the HVO North Development Consent (DA 450-10-2003) and outlines the tailings deposition schedule, status and design parameters of each TSF, estimated capping volumes, rehabilitation methodology and controls associated with potential ground and surface water impacts of each facility.

HVO's current tailings disposal strategy satisfies the predicted HVO tailings storage requirements to March 2030. HVO South currently has no active tailings storage facilities as all previously active facilities have been closed, capped and rehabilitated.

The rehabilitation of the South East TSF was completed in 2022.Works have commenced in 2024 on capping the Bobs dump TSF with works expected to be completed by 2026. The placement of tailings at the North Void TSF ceased in 2019 and is being managed to limit the size of the decant pond to promote solar drying and consolidation. Capping of this facility will be subject to adequate surface strength being gained. The current proposal to achieve this is via deposition of thin layers of tailings, however, this method is yet to receive approval from the EPA pending satisfactory demonstration of seepage mitigation. In-pit tailings emplacement commenced at Carrington Pit during 2019. Tailings will continue to be emplaced within the Cumnock Void in accordance with a management agreement with Ravensworth Operations to utilise a defined capacity of Cumnock Void as a TSF. Under the agreement, the responsibility to rehabilitate Cumnock Void TSF will lie with Ravensworth Operations.

The main elements of the closure and rehabilitation strategy for TSF's include:

- where possible, reducing tailings deposition rate (towards end of filling) to provide for development of a 5 m thick tailings crust to support closure activities;
- provide supplementary tailings in thin layers to fill areas of settlement within the TSF prior to capping;
- developing a capping and landform design and submission of a High Risk Activity notification;
- placement of layers of capping fill materials, comprising typically mine overburden material, at a minimum of 2 m thick; and
- revegetation to the final land use as shown on **Plan 1: Final Landform Features.**

To assist with desiccation and stabilisation of the TSFs, HVO have adopted a tailings disposal strategy that utilises secondary (or Pipe Head) flocculation for all active storages. Along with beach management and thin layer deposition as the facilities near the end of their capacity, secondary flocculation will assist with

the desiccation and consolidation of the tailings to a suitable depth. Upon ceasing to use a TSF, sporadic deposition of tailings may be required to consolidate voids arising from settlement during the drying phase. This will assist to maintain a positive surface drainage underlying the capping material and contribute to the long-term stability of the facility.

Material deemed suitable for capping is identified and, if necessary, stockpiled in proximity to each TSF. Where this has not occurred to date, sufficient material will be identified ahead of the closure of each facility (as part of the capping design) and will be reserved for that use. The volume of capping material takes into account ongoing settlement of the consolidating tailings to provide a free-draining surface. Volumes of material required and stockpile locations are detailed in the Fine Reject Management Strategy. Sampling of capping materials will be undertaken as part of material selection to ensure adequacy for structural, water management and vegetation aspects.

Existing rehabilitated TSFs are revegetated primarily with pasture species and light woody vegetation. As of 2024, HVO will use a pasture only seed mix for vegetation establishment on rehabilitated TSF's. HVO considers a 2 m thick cap of overburden material to be an adequate growth medium for woodland vegetation without risk of compromising the integrity of the cap and exposing tailings. Long term scientific monitoring of the rehabilitation will provide data to confirm this. HVO will monitor any new research or industry findings that explore capping depth requirements for long-term stability.

Potential water impacts associated with active and capped tailings are managed in accordance with HVO's Water Management Plan and Water Monitoring Programme. Management of potential surface and groundwater impacts associated with TSF's is assessed as part of the EIS process and also summarised in the HVO Fine Reject Management Strategy.

6.2.3.4 | FINAL VOIDS, HIGHWALLS AND LOW WALLS

The proposed final landform for HVO North will include three final voids across West Pit North, West Pit South, and Carrington and operating as a mix of evaporative sinks and pit lakes. HVO South will include an evaporative basin in the south-western corner of the Deep Cheshunt Pit (currently Riverview Pit).

The final voids will be constructed in accordance with the objectives and criteria for voids outlined in **Sections 4.1 and 4.2**. Further detailed information will be developed as part of a Detailed Mine Closure Plan for the operation

6.2.3.5 | CREEK / RIVER DIVERSIONS

A number of Creeks have been diverted in sections to enable the passage of mining and siting of infrastructure. These diversions include sections of Parnells Creek, Pikes Creek, Farrells Creek and an unnamed creek in Carrington. The diversions were constructed in accordance with best practice methods at the time. HVO will undertake erosion and geomorphic reviews of the diversion prior to closure to confirm that the diversion meets the closure criteria provided in **Section 4.2**

[1] It has been common practice in the past to utilise coarse rejects for the development of an initial cap followed by placement of mine overburden. Existing rehabilitated TSF's will likely include a coarse reject layer as part of the 2m cap.

6.2.3.6 | TEMPORARY STABILISATION

Where progression to final rehabilitation is significantly delayed overburden areas may be shaped to an interim or final landform and suitable cover crops or other surface stabilisation applied to minimise dust generation and erosion. Temporary stabilisation may also be undertaken on unshaped overburden dumps and other disturbed areas. Temporary stabilisation of these areas is primarily designed to control fugitive dust emissions however can also improve visual amenity.

Temporary stabilisation by seeding with sterile cover crops may be undertaken on disturbed areas during construction activities or during the staging of construction works.

6.2.4 | GROWTH MEDIUM DEVELOPMENT

Surface preparation activities for rehabilitated areas will commence as soon as practicable following the completion of mining activities and landform establishment. Appropriately sized earthmoving equipment will be used for these processes to avoid unnecessary compaction.

If topsoil characterisation has not previously been undertaken, sampling of the topsoil stockpile to be used for a rehabilitation area will be conducted prior to spreading to determine whether specific amelioration techniques (e.g. addition of gypsum or organic matter) are required (refer to Section 6.2.1.1).

The general surface preparation activities to be undertaken for rehabilitation areas include:

Install contours or drainage structures in accordance with site standards and project approval conditions;

- Deep rip overburden;
- Rock rake;
- Spread topsoil (topsoil management is detailed further in Section 6.2.1);
- Spread gypsum and/or other ameliorants at rate determined by soil analysis;
- Spread timber or other habitat features in selected locations;
- Final rock rake; and
- Scarify/light rip or aerate the final surface ahead of sowing.

A Quality Control Checklist (**refer to Section 7**) has been developed to ensure that appropriate inspections are completed and each step has been completed adequately before progressing.

Where monitoring and inspections indicate that growth medium conditions may be less than ideal, or initial germination is less than expected, additional topsoil analysis may be undertaken to ensure ameliorants have been effective

6.2.5 | ECOSYSTEM AND LAND USE ESTABLISHMENT

Following ground preparation and growth medium development works, revegetation activities will commence as soon as possible. Where possible, this is scheduled to be during Autumn or early Spring (ideal sowing times). However due to mining and other operational constraints, this is not always possible and seeding may occur outside these periods. Experience at HVO and other Hunter Valley mining operations has indicated satisfactory results can still be achieved when seeding outside of optimum times, especially for native woodland species.

Seeding may however be delayed in the short-term to avoid adverse weather conditions such as prolonged rain, extended drought or high winds. In these instances, operational personnel will review forecast weather conditions and delay final ground preparation (e.g. final ripping or scarification) until an adequate window is available for seeding.

HVO is rehabilitating its lands with a combination of pasture and woodland. The location of pasture and woodland plots has been determined based on their most appropriate location within the landform. Where possible, agricultural / pasture areas have been preferentially located on flat or gently sloping parts of the landform. Woodland corridors are subsequently located mostly on the inner and outer facing slopes. These preferences have been modified where necessary to ensure minimum target areas are met (e.g. 30 or 40 percent woodland) or where legacy rehabilitation areas suit a particular final land use option.

To achieve diversity targets, long-term seed mixes will contain species to achieve the following:

- Plant structure and form (e.g. tree vs. shrub);
- Floristics (e.g. spread over a range of plant genera); and
- Life cycle (e.g. short lived primary coloniser vs. long lived understory shrubs).

Seed will be spread using the most appropriate equipment for the area. This will most often be drill-seeder which can be adjusted to modify the drill depth based on the type of seed being spread.

Seed is supplied by a third party contractor who collects seed from the local area where possible. All supplied seed undergoes best practice treatment and viability testing.

Following the completion of seeding, rehabilitation areas are appropriately delineated to prevent unauthorised access and disturbance. This can include a range of controls including windrows, signage and OCE witches' hats.

6.2.5.1 | PASTURE REHABILITATION

Typical pasture species and rates of application are shown in **Appendix E**. Lightly scattered groups of native trees, shrubs and groundcovers will also be planted in pastures to give shade and shelter for livestock, to provide native forests for wildlife habitat and possible future commercial timber operations. Fertiliser is added based on soil testing results.

6.2.5.2 | NATIVE WOODLAND REHABILITATION

Native woodland rehabilitation within HVO, aimed at enhancing biodiversity, will be promoted by:

- Using native endemic seeds (to match those already found on the subject site) where possible, for seeding and replanting programmes;
- Rehabilitating groundcover, understorey and canopy species by seeding and planting (planting understorey and tree species will be undertaken where grass competition restricts the use of direct seeding);
- Planting a variety of species as opposed to a monoculture, especially species that flower at different times of the year or that provide foraging resources for affected species;
- Creating a diversity of landforms and habitats such as woodland, regrowth and open forest on ridgetops and lower slopes;
- Placement of habitat features such as logs, rocks, drainage depressions, and dams; and
- Linkage of areas rehabilitated with trees with adjacent remnant vegetation to promote regional corridors.

Woodland areas to be seeded during this RMP term will continue to include native understorey species with seed mixes being assembled in accordance with **Appendix E.** This table includes diversity targets for seed mixes with targets set for minimum number of species/genera to be included for the functional groups in each strata of the target vegetation community.

6.2.6 | ECOSYSTEM AND LAND USE DEVELOPMENT

Activities associated with the Ecosystem and Land Use Development Phase of rehabilitation are generally ongoing maintenance and land management activities and rehabilitation monitoring.

The requirement for maintenance works is assessed on an ongoing basis through the rehabilitation monitoring program (refer to **Section 8**) and by routine inspections. Key issues covered by the maintenance program are outlined in the sections below.

6.2.6.1 | WEED AND FERAL ANIMAL CONTROL

Weeds can limit tree growth and out compete emerging native plants, particularly in the early stages after seeding. The rehabilitation process at HVO has been designed to limit the growth of weeds over the longer term, by maximising the number of trees and shrubs in native woodland areas.

Key weed species that have the potential to impact on the longer-term sustainability and relinquishment of rehabilitation at HVO include:

- Acacia Saligna (woodland and pasture areas);
- Galenia (woodland and pasture areas);
- Fireweed (pasture areas); and
- Exotic perennial grasses e.g. Coolatai grass, Rhodes grass, green panic (woodland areas).

Targeted weed control campaigns will be undertaken on an ongoing basis to manage and limit the spread of weeds within rehabilitation areas. The scope of these campaigns will be determined by regular inspections and annual monitoring programmes (refer to Section 8). Weed control programs will be prioritised based on the size and severity of the infestation, along with the probability of it spreading to adjacent rehabilitation or remnant vegetation areas. Weed control works in rehabilitation areas will be undertaken by experienced contractors so that there is minimal to no impact on trees, shrubs and other native plants.

Higher priority weed species such as those listed above will be managed strategically across the site, with priority being given to eliminating them from defined areas and working outwards. Management of exotic grasses will be particularly important for woodland rehabilitation, and targeted management of topsoil stockpiles will be completed to prevent their being spread onto woodland areas.

Weed infestations identified during various inspections and monitoring programs will be recorded in GIS so that their location and status can be monitored over time.

Similarly, the need for feral animal control programs will be determined by annual monitoring programs. Any targeted shooting, baiting or trapping programs will be conducted by a licensed contractor in consultation with NSW Local Land Services (LLS).

6.2.6.2 | EROSION AND DRAINIAGE CONTROLS

Erosion features that are identified during monitoring programs that may require repair include rill and gully erosion, tunnelling, slumping or ponding. Repair methods may include hand seeding (to limit additional disturbance), ripping and re-seeding, re-grading of contour banks or re-construction of failed structures.

Erosion and drainage repairs will be prioritised on the likelihood of the erosion worsening or developing into adjacent rehabilitation areas, and the potential for failures to report to the clean water management system.

6.2.6.3 | RE-SEEDING / RE-PLANTING OF REHABILITATION AREAS

If rehabilitation monitoring programs identify areas of rehabilitation that have failed, or do not contain the required species composition or diversity, re-seeding or re-planting works will be panned and scheduled. These works may include:

- Spraying, ground preparation and re-seeding of a full targeted seed mix

- Hand seeding of specific species that are not represented in the rehabilitation area, either across the whole area or in specific pockets of the rehabilitation;
- Over-sowing of pasture grass species were total biomass or palatable species are lacking to support grazing activities; or
- Planting of tube-stock to increase overall species diversity or to improve species composition.

6.2.6.4 | MAINTENANCE FERTILISING

The need for maintenance fertilising will be assessed during regular rehabilitation monitoring programs, particularly in agricultural final land use areas where grazing is occurring or planned to occur. The application method (e.g. tractor spreader or aerial spreading) will be determined based on the existing vegetation, landform and timing of application.

6.2.6.5 | REPAIR OF FENCE LINES, ACCESS TRACKS AND OTHER GENERAL LAND MANAGEMENT ACTIVITIES

The condition of fence lines, access tracks and other features (e.g. dams, troughs) will be assessed during the Annual Rehabilitation Walkover (Section 8.2) and targeted agricultural or pastoral assessments completed as part of grazing activities conducted by leases.

The requirement for fencing, access and water points for future agricultural activities within rehabilitation areas will be assessed as part of HVO's ongoing budget process, and when establishing lease agreements.

6.2.6.6 | ENVIRONMENTAL MONITORING AND MANAGEMENT

HVO maintains an Environmental Management System (EMS) as a means to facilitate compliance with environmental standards and requirements. The EMS provides a framework for managing all environmental and community aspects, impacts and performance of the mining operations. As part of the EMS, management plans, procedures and standards have been developed to meet statutory requirements, manage activities on site to minimise risk to the environment and to continually improve the performance of operations. These management plans and their controls apply to all rehabilitation areas and will continue to apply and be implemented until rehabilitation relinquishment.

6.3 | REHABILITATION OF AREAS AFFECTED BY SUBSIDENCE

The Lemington Underground Mine operated from 1971 to 1992 using bord and pillar mining methods in the Mount Arthur Seam, with areas of longwall extraction. The former Lemington Underground Mine was acquired and merged into HVO South in 2001. The underground workings are located south-east of the current mining areas at HVO South, below the South Lemington Pit 1.). The Mount Arthur Seam floor in the former workings ranges from approximately 40 metres Australian Height Datum (mAHD) to approximately 205 mAHD, generally dipping from the north east to the south west.

The underground operation was decommissioned and all surface infrastructure rehabilitated. Subsidence occurred during the operation of the mine and the likelihood of further ground movement has been assessed and estimated to be very low.

7 | REHABILITATION QUALITY ASSURANCE PROCESS

HVO will implement a rehabilitation quality assurance process for each phase of rehabilitation. These processes will ensure:

- rehabilitation is being implemented in accordance with the nominated methodologies;
- identification of those responsible for implementation; and
- identified risks to rehabilitation are being adequately addressed at each phase of rehabilitation

The specific processes for each phase are outlined in the sections below.

7.1 | ACTIVE MINING

The quality assurance and documentation processes that will be implemented during the active mining phase include:

- maintenance of up to date mine plans by the sites survey department;
- completion of GDP's, including inspections during and post works, and documentation of pre-clearance surveys;
- maintenance of a topsoil register which includes an inventory of stockpiles and their original location, characterisation results, condition and inspection results;
- surface water monitoring and regular review of trigger levels;
- regular inspections of temporary and permanent erosion and sediment controls;
- regular inspections to identify potential weed infestations;
- documentation of all weed management and eradication programs and follow-up inspections; and
- waste tracking and recording of volumes removed from site.

7.2 | DECOMMISSIONING

Quality assurance processes will be identified during the development of the sites closure plan. However, these are likely to include the following as a minimum:

- inspections and demolition reports to confirm all infrastructure has been removed;
- validation testing to ensure any contamination has been appropriately remediated and/or removed;
- updates to mine plans and record tracings; and
- waste tracking to confirm removal of all hazardous wastes from site.

7.3 | LANDFORM ESTABLISHMENT

To facilitate efficient and accurate handover of rehabilitation areas between departments and phases, HVO has developed *a Rehabilitation Design and Bulk Shaping Handover Checklist*. The checklist includes:

- confirmation the landform design complies with approval requirements;
- consideration of drainage requirements; and
- confirmation that bulk shaping has been completed adequately and to design.

The checklist includes a sign-off by relevant departments to certify the work has been completed.

7.4 | GROWTH MEDIUM DEVELOPMENT

In addition to the landform establishment elements described above, the *Rehabilitation Design and Bulk Shaping Handover Checklist* includes the following elements:

- confirmation that drainage structures have been constructed to design;
- confirmation ground preparation elements such as deep ripping and rock removal have been completed; and
- confirmation that topsoil stockpiles have been scalped, topsoil has been placed at the appropriate depth and ameliorants have been applied at the correct rate

7.5 | ECOSYSTEM AND LAND USE ESTABLISHMENT

Documentation of seeding or planting activities is completed in the *Rehabilitation Design and Bulk Shaping Handover Checklist* and includes:

- date of planting;
- weather conditions;
- seed mix;
- seeding rate (kg/ha) and/or planting rate (tubestock/ha);
- fertiliser or ameliorant rate (kg/ha);

In addition to the above records, rehabilitation monitoring will commence during this phase and will primarily include initial establishment monitoring and an Annual Walkover Inspection which will document rehabilitation condition and maintenance requirements.

7.6 | ECOSYSTEM AND LAND USE DEVELOPMENT

Quality control processes during the ecosystem and land use development phase involve the sites ongoing rehabilitation monitoring program which is detailed in Section 8. Monitoring program results will feed into HVO's rehabilitation maintenance schedule which includes:

- detailed maintenance requirements for each rehabilitation block including weed control, erosion repairs and re-seeding or planting requirements;
- indicative schedules for completion of required maintenance; and
- indicative costs and resources required to complete maintenance activities.

Completion of maintenance activities will be documented by contractors completing the works, and reported in the Annual Rehabilitation Report and Forward Program (ARRFP) and Annual Review.

8 | REHABILITATION MONITORING PROGRAM

HVO has developed a rehabilitation monitoring program to confirm rehabilitation areas are trajecting towards meeting the rehabilitation objectives, and performance and closure criteria. Monitoring will be undertaken in accordance with *GCAA's Completion Criteria and Rehabilitation Monitoring Procedure* (2020) which includes:

- an annual rehabilitation walkover inspection;

- initial establishment monitoring; and
- long term rehabilitation monitoring (including analogue sites).

8.1 | ANALOGUE SITE BASELINE MONITORING

GCAA has developed a shared rehabilitation reference site monitoring program for its NSW operations following advice from University of Queensland's Centre for Mined Land Rehabiltiation (CMLR, 2020) and ERR Australia (ERR, 2020). The combined reference program ensures adequate spatial and temporal coverage for each target vegetation community, as well as sufficient replication to enable statistical analysis of monitoring results to ensure completion criteria have been met. In accordance with this program, HVO has established three woodland reference sites which are monitored biennially as per the program schedule.

In addition, HVO has established two permanent pasture reference sites which will be used to develop completion criteria for pasture final land use rehabilitation blocks.

8.2 | REHABILITATION ESTABLISHMENT MONITORING

The *Completion Criteria and Rehabilitation Monitoring Procedure* requires rehabilitation blocks less than three years old to be monitored using the Initial Establishment Monitoring (IEM) method which is a rapid style assessment principally to determine germination success and landform stability. Each monitoring site is assessed twice within the first three years, and includes the following parameters:

- Erosion – presence and depth of erosion gullies or rills;
- Bare ground – visual estimate of bare ground percentage;
- Ground cover – visual estimate of ground cover percentage;
- Weed cover – rapid assessment of High Threat Exotics and Priority Weeds;
- Pasture species composition – foliage cover of desirable pasture species (pasture rehabilitation sites only);
- Native species richness – rapid assessment of native species present; and
- Tree stem density – number of tree stems within plot area.

Once rehabilitation blocks become older than three years, they are amalgamated where possible (i.e. adjacent blocks with the same final land use) and monitoring sites move into the next phase of monitoring.

8.3 | MEASURING PERFORMANCE AGAINST REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA

Rehabilitation blocks that are older than three years are subject to the Long Term Monitoring (LTM) methodology in accordance with the Completion Criteria and Rehabilitation Monitoring Procedure. The LTM methods include more detailed assessments of rehabilitation performance, and are targeted towards evaluating progress of rehabilitation towards fulfilling completion criteria and, ultimately, the targeted post-mining land use.

Rehabilitation monitoring reports include an assessment of results against both the Trigger Action Response Plan (TARP) (**Section 9.2**) and the closure criteria. Where rehabilitation areas are not progressing towards the criteria, recommendations will be made to improve rehabilitation performance.

In addition, each year HVO undertakes an Annual Walkover Inspection of rehabilitated areas to provide a general assessment on rehabilitation health and potential emerging issues that require maintenance (e.g. weeds, erosion, poor growth rates). The walkover inspection does not review rehabilitation areas against the closure criteria, but provides management recommendations to assist the rehabilitation in moving towards the criteria.

9 | REHABILITATION RESEARCH, MODELLING AND TRIALS

9.1 | CURRENT REHABILITATION RESEARCH, MODELLING AND TRIALS

No current rehabilitation research, modelling or trials are currently being undertaken.

9.2 | FUTURE REHABILITATION RESEARCH, MODELLING AND TRIALS

HVO currently has no plans to conduct any rehabilitation research, modelling or trials. HVO will continue to keep abreast of current rehabilitation best practice methods through collaboration with other Hunter Valley sites and through industry forums.

10 | INTERVENTION AND ADAPTIVE MANAGEMENT

Where rehabilitation monitoring indicates that rehabilitation outcomes are not trending toward the nominated completion criteria, HVO will instigate early intervention and adaptive management to minimise the potential for rehabilitation failure. Identification of threats to rehabilitation and the subsequent intervention is discussed in the following sections.

10.1 | THREATS TO REHABILITATION

Threats to rehabilitation may include events such as periods of drought, bushfire events, or pressures from weeds and feral animals. **Table 10.1** provides key threats to rehabilitation that have been identified at HVO.

Table 10.1- Key Threats to Rehabilitation

Threat	Caused by
Erosion and Sediment Control	• Rainfall events • Lack of appropriate vegetation cover • Failure of water management structures
Soil Type(s) and Suitability	• Inadequate topsoil available • Poor topsoil quality • Weed infested topsoil • Poor recovery of topsoil from currently rehabilitated areas
Water	• Saline runoff and erosion resulting in a surface water trend of salinity increase, or pH reduction/increase • Saline seepage of groundwater resulting in localised impacts
Spontaneous Combustion	• Poor management of materials with propensity for spontaneous combustion
Flora	• Not considering requirements in rehabilitation planning • Failure to manage weeds • Pest species / grazing pressures (kangaroos, rabbits, etc.) • Biodiversity targets (offsets), not maintained
Geotechnical	• Geotechnical failure
Acid Mine Drainage	• Poor knowledge of material that may result in AMD • Poor management of the materials that have a propensity to AMD
Geology and Geochemistry	• Poor knowledge of material and its geochemistry • Inappropriate placement of materials
Contaminated Land	• Long term use of the site • Spills, leaks, etc
Bushfire	• Proximity to state forest • Regional fire • Lightning strike

10.2 | TRIGGER ACTION RESPONSE PLAN

The following TARP for rehabilitation has been developed to identify required management actions in the event of impacts to rehabilitation, or where rehabilitation outcomes are not achieved in an acceptable timeframe. Where necessary, rehabilitation procedures will be amended accordingly with the aim of continually improving rehabilitation standards.

The responses specified within the TARP have been based upon the rehabilitation completion criteria and the rehabilitation monitoring program. Monitoring of the TARP will be undertaken as outlined in the rehabilitation monitoring program (Section 8). The monitoring program will trigger response actions as specified in the TARP to ensure that threats to rehabilitation do not become unmanageable.

Following a trigger, the scope and timing of response actions are prioritised and an indicative schedule for implementation is developed. Discrete actions are prioritised and managed on a risk basis within the rehabilitation maintenance program. High risk triggers will be addressed first. Ongoing monitoring of trigger issues occurs to ensure current prioritisation within the maintenance program remains appropriate and issues are escalated as necessary.

The TARP is provided as **Table 10.2** and will continue to be developed as completion criteria are refined and as new threats to rehabilitation are identified.

Table 10.2- Trigger Action Response Plan

Aspect / Category	Item	Key Element	Monitoring Program	Trigger Response	Condition Green	Condition Amber	Condition Red
Landform stability	1	Slope gradient	Annual Walkover	Trigger	Rehabilitation areas have overall slopes that are generally <10˚.	Rehabilitation areas have overall slopes >10° but <14˚ and not approved. Internal slopes <18º and assessed as being safe and stable.	Rehabilitation areas have overall slopes >15° and not approved. Internal slopes may be steepened to grades up to 18º.
			Annual Performance Assessment	Response	No response required. Continue monitoring program.	Undertake regrading and revegetation of the area, if it is not designed to be >10° <14˚. If designed to be >10° <14˚, seek approval from RR. Internal slopes that are designed to be <18° and assessed as being safe and stable require no further response. Continue monitoring program.	If overall slopes designed to be >15°, seek approval from RR. Otherwise, undertake a review of the landform design, including survey if required. Undertake regrading and revegetation of the area, if required. If internal sloped >18° undertake a review of the landform design, including survey if required. Undertake regrading and revegetation of the area, if required.
	2	Erosion control	Annual Walkover IEM LTM Annual Performance Assessment Inspection Program	Trigger	No active gully or tunnel erosion. No active rilling present.	Minor active gully or tunnel erosion present and/or active rilling <300 mm deep.	Significant active gully or tunnel erosion present and/or active rilling >300 mm deep.
				Response	No response required. Continue monitoring program.	An inspection of the site will be undertaken by a suitably trained person. Investigate opportunities to install water management infrastructure or other controls to address erosion. Remediate as appropriate.	Undertake a review of the drainage of the area and provide recommendations to appropriately remediate the erosion. Remediate as soon as practicable.

Aspect / Category	Item	Key Element	Monitoring Program	Trigger Response	Condition Green	Condition Amber	Condition Red
	3	Drainage Condition	Annual Walkover	Trigger	Drainage condition is in accordance with the design criteria established within this document.	Landforms exhibiting minor drainage issues but do not threaten to cause rehabilitation failure.	Landforms exhibiting significant drainage issues, threatening or causing rehabilitation failure.
			Annual Performance Assessment Inspection Program	Response	No response required. Continue monitoring program.	An inspection of the site will be undertaken by a suitably trained person. Investigate opportunities to address issues. Remediate as appropriate.	Undertake a review of the drainage design and provide recommendations to appropriately remediate the area. Remediate as soon as practicable.
Water Quality	4	Monitoring parameters	Water Monitoring Program	Trigger	Surface water quality of runoff from rehabilitation areas is within criteria and rehabilitation performance criteria established within this document.	Water quality exceeds performance criteria but does not indicate a long-term rehabilitation issue.	Water quality exceeds criteria, indicating a long term rehabilitation liability.
			Inspection Program	Response	No response required. Continue monitoring program.	Review and investigation of water quality monitoring and management where appropriate. Implement relevant remedial measures where required.	Reporting as per relevant statutory reporting requirements. Implement relevant responses and undertake immediate review to determine source of issues and implement remediation measures identified as soon as practicable.
Soil/spoil Quality	5	Monitoring parameters	Annual Walkover	Trigger	Soil properties meet criteria and no indication of not being able to support vegetation establishment.	Soil properties are not meeting criteria and indication of not being able to support vegetation establishment.	Soil properties have not met criteria and are not supporting vegetation establishment.

Aspect / Category	Item	Key Element	Monitoring Program	Trigger Response	Condition Green	Condition Amber	Condition Red
			Inspection Program	Response	No response required. Continue monitoring program.	Conduct investigation and take samples of soil/spoil to determine the need for ameliorants or other management options.	Engage a consultant to assist with recommendations to appropriately remediate soil/spoil quality and depth. Remediate as soon as practicable.
Vegetation (Woodland)	6	Surface cover	Annual Walkover LTM	Trigger	Five years following revegetation to woodland, a minimum of 70% total ground cover (vegetation, leaf litter, mulch) is present within rehabilitated areas.	Five years following revegetation to woodland, total ground cover (vegetation, leaf litter, mulch) is a minimum of 60% in rehabilitated areas.	Five years following revegetation to woodland, total ground cover (vegetation, leaf litter, mulch) is a minimum of 40% within rehabilitated areas.
			Inspection Program	Response	No response required. Continue monitoring program.	Review rehabilitation procedures where required to increase vegetation cover. Assess opportunities for corrective actions as appropriate.	A suitably trained person to inspect the site. Investigate use of appropriate management options to remediate. Remediate as appropriate.
	7	Species composition	LTM	Trigger	Five years following revegetation to woodland, species composition comprises native tree and shrub species consistent with reference sites.	Five years following revegetation to woodland, native tree and shrub species composition comprises <75% species diversity of reference sites.	Five years following revegetation to woodland, native tree and shrub species composition comprises <50% species diversity of reference sites
				Response	No response required. Continue monitoring program.	Review rehabilitation records to identify possible causal factors. Review native seed mix and amend if necessary. Consider remedial actions such as tube-stock planting or re-seeding to achieve required species composition.	An inspection of the site will be undertaken by a suitably trained person. Investigate remedial options to achieve required species composition.

Aspect / Category	Item	Key Element	Monitoring Program	Trigger Response	Condition Green	Condition Amber	Condition Red
Vegetation (Pasture)	8	Surface cover	LTM	Trigger	Following rehabilitation to pasture or native grassland, vegetative cover (vegetation, leaf litter, mulch) is within 10-20% of analogue sites.	Following rehabilitation to pasture or native grassland, total ground cover (vegetation, leaf litter, mulch) is within 20-40% of analogue sites.	Following rehabilitation to pasture or native grassland, total ground cover (vegetation, leaf litter, mulch) is more than 40% of the range of analogue sites.
				Response	No response required. Continue monitoring program.	Review procedures where required to increase vegetation cover.	An inspection of the site will be undertaken by a suitably trained person. Investigate use of appropriate management options to remediate. Remediate as appropriate.
	9	Species composition	Annual Walkover IEM LTM	Trigger	Two years following revegetation to grassland, species composition consists of grasses and legumes appropriate to the district and recognised as suitable for beef cattle grazing.	Two years following revegetation to grassland, <75% of grasses and legumes appropriate to the district and recognised as suitable for beef cattle grazing	Two years following revegetation to grassland, species composition comprises <30% appropriate to the district and recognised as suitable for beef cattle grazing
				Response	No response required. Continue monitoring program.	Investigate additional weeding and re-seeding where required and ensure seed mix utilised is consistent with desired species composition.	An inspection of the site will be undertaken by a suitably trained person. Investigate remedial options to achieve required species composition.
Vegetation (woodland / pasture)	10	Weed presence	Annual Walkover	Trigger	Twelve months following revegetation, no significant weed infestations present.	Twelve months following revegetation, >25% but <50% cover of undesirable species present.	Twelve months following revegetation, >50% cover of undesirable species present.

Aspect / Category	Item	Key Element	Monitoring Program	Trigger Response	Condition Green	Condition Amber	Condition Red
			IEM LTM Inspection Program	Response	No response required. Continue routine maintenance and monitoring program.	Review monitoring report to identify the nature of the weeds present and recommendations from monitoring report. Undertake weed control to remove noxious and problematic weeds if required.	Undertake weed control to remove noxious and problematic weeds from the site as soon as practicable. Investigate management measures to assist native plant establishment including use of ameliorants and implement as appropriate. Review relevant site procedures, if required.
Biodiversity	11	Habitat Corridors	LTM	Trigger	Monitoring indicates corridors are successfully established and consistent with the desired vegetation community composition and are suitable for fauna species movement.	Habitat corridors are successfully established however are not suitable for fauna species movement (size, habitat complexity).	Monitoring indicates that vegetation corridors are not established, have been removed, or are no longer suitable for the movement of fauna species.
				Response	No response required. Continue monitoring program.	Investigate whether sufficient habitat features (rock piles, felled hollow bearing trees, nest boxes etc.) are present. Source and incorporate additional habitat features, if required.	Engage ecologist/rehabilitation specialist to recommend remedial rehabilitation works such as additional planting or seeding, soil amelioration, or weed reduction. Ensure sufficient habitat features are available for fauna.
Topsoil Availability	12	Topsoil Quantity	Annual Walkover	Trigger	Sufficient topsoil identified for rehabilitation over the life of the mine.	Topsoil balance indicates a deficiency in topsoil available for rehabilitation over the life of the mine.	Deficiency significant enough to delay rehabilitation progression during the life of the mine

Aspect / Category	Item	Key Element	Monitoring Program	Trigger Response	Condition Green	Condition Amber	Condition Red
			Annual Topsoil Reconciliation	Response	No response required.	Investigate options and alternatives (e.g. organic ameliorants) to meet future topsoil requirements. Trial methods of rehabilitation that are more topsoil efficient i.e. use of compost on overburden.	Source suitable growth medium for use in rehabilitation. Investigate use of alternatives or subsoil in suitable locations.
Bushfire	13	Fuel Load	Annual Walkover IEM	Trigger	Fuel loads are assessed and managed as required (including maintaining fire-breaks) and there is firefighting access across rehabilitation areas and water resources available for fighting fires.	Monitoring indicates elevated fuel loads.	A fire on site damages rehabilitated areas.
			LTM Inspection Program	Response	No response required. Continue monitoring program.	Assess fuel load reduction options. Reduce fuel loads and ensure access tracks are cleared. Inspect water sources and ensure sufficient water is available.	Review and update (if required) the Bushfire Management Plan to ensure monitoring and maintenance is completed for fuel loads and access tracks.
Tailings	14	Inadequate capping	Annual Walkover	Trigger	The capped tailings landform is constructed in accordance with the approved capping design and is free-draining and no ponding is present.	Inspections indicate some temporary ponding on the tailings landform, however settlement is within the range considered in the detailed capping design.	Landform is exhibiting permanent or significant ponding issues.

Aspect / Category	Item	Key Element	Monitoring Program	Trigger Response	Condition Green	Condition Amber	Condition Red
			IEM / LTM Annual Performance Assessment Inspection Program	Response	No response required. Continue monitoring program.	A suitably trained person to inspect the site. Implement survey program to monitor and/or confirm settlement.	Undertake a review of the capping and drainage design and provide recommendations to appropriately remediate the area. Remediate as soon as practicable.
Groundwater	15	Void water balance	Water Monitoring Program Annual Groundwater Review	Trigger	Water balance and groundwater monitoring indicate void water balance is in line with predictions	Groundwater monitoring TARP trigger activated in area of void influence and indicates that inflows into the void may be higher than the water balance assumptions which, in combination with high surface runoff, could result in the voids filling higher than predicted.	Groundwater inflows are significantly higher than predicted in the water balance and, in combination with high surface runoff, could result in overtopping of the voids.
				Response	No response required. Continue monitoring program.	Undertake groundwater investigation based upon TARP trigger exceedance.	Engage a qualified groundwater specialist to undertake a risk assessment and develop controls. Assess potential ways to further reduce surface catchment of voids.
Spontaneous Combustion	15	Carbonaceous material near surface	Annual Walkover	Trigger	No spontaneous combustion within rehabilitation area	Localised area of spontaneous combustion within rehabilitation area.	Widespread or multiple areas of spontaneous combustion in rehabilitation areas.

Aspect / Category	Item	Key Element	Monitoring Program	Trigger Response	Condition Green	Condition Amber	Condition Red
			Annual Performance Assessment Inspection Program	Response	No response required. Continue with existing carbonaceous material management practices.	Develop and implement risk based monitoring and/or remediation plan with advice from suitably trained person.	Review carbonaceous material management practices. Develop remediation plan based on advice from suitably qualified person.
Feral Animals	16		Annual monitoring & control program Inspection Program	Trigger	Vertebrate pest populations stable. Impacts in rehabilitation areas limited or absent.	Vertebrate pest populations increasing, and increasing presence or impacts in rehabilitation areas.	Vertebrate pest populations significantly impacting in rehabilitation area or areas.
				Response	No response required. Maintain with existing controls.	Assess opportunities for augmentation of existing controls, or implementation of supplementary controls.	Implement additional targeted controls. Engage with external stakeholders. Review ongoing control framework.

11 | REVIEW, REVISION AND IMPLEMENTATION

11.1 | REVIEW OF THE REHABILITATION MANAGEMENT PLAN

Reviews are conducted to assess the effectiveness of the procedures against the objectives of the RMP. The RMP must be reviewed and, if necessary, revised, within 3 months following the submission of the following:

- annual review;
- incident report;
- audit;
- updated or new Management Plans that are relevant to rehabilitation; or
- any modification to the conditions of the Project Approval.
- Additionally, the RMP may also be revised due to:
    - deficiencies being identified;
    - results from the monitoring and review program;
    - recommendations resulting from the monitoring and review program;
    - changing environmental requirements;
    - improvements in knowledge or technology become available;
    - change in legislation;
    - where a risk assessment identifies the requirement to alter the RMP; and
    - significant change in the activities or operations.
    - Approval of rehabilitation outcomes documents (within 30 days of approval)

Any major amendments to the RMP that affect its application will be undertaken in consultation with the appropriate regulatory authorities and stakeholders. Revised RMP will be submitted within 6 weeks of completing the review.

11.2 | INDEPENDENT ENVIRONMENTAL AUDIT

As required by Schedule 5, Condition 5 of PA 06_0261 and Schedule 5, Condition 10 of DA 450-10-2003, HVO will undertake an Independent Environmental Audit every three years. The audit will include a review of the rehabilitation undertaken during the reporting period, and an assessment of compliance with this RMP.

11.3 | IMPLEMENTATION

Table **11.1** identifies the personnel who are responsible for the monitoring, review and implementation of this RMP.

Table 11.1- Accountabilities for implementation of this RMP

Position	Accountabilities
Mine Production Manager	• Implement the procedures referenced in this RMP; • Undertake training in relevant Management Plans and procedures as required; • Provide adequate resources for the completion of rehabilitation activities; and • Construct landforms in accordance with this RMP.
Technical Services Manager	• Implement the procedures referenced in this RMP; • Undertake training in relevant Management Plans and procedures as required; • Provide resources required to implement these procedures; • Develop mine plans to allow for progressive rehabilitation of mined land; and • Liaise with the Environment and Community Department to ensure that regulatory commitments relating to rehabilitation are considered during mine planning processes.
Manager Environment and Community	• Ensure the relevant Management Plans are prepared; • Coordinate the development of annual rehabilitation plans to guide rehabilitation activities; • Coordinate the development of the site rehabilitation objectives and closure criteria in consultation with key stakeholders; • Coordinate the completion of rehabilitation activities in accordance with this document; • Coordinate the rehabilitation monitoring program and an annual review of monitoring results to provide a continual improvement process for rehabilitation. • Coordinate maintenance as required; • Consult with regulatory authorities as required; • Ensure all personnel undertaking works in relation to this RMP are trained and competent; • Report the progress of rehabilitation in accordance with Development Consent and Clauses 9 and 13 of Schedule 8A to the Mining Regulation 2016
Site Commercial Manager	• Ensure that there are adequate provisions available for mine closure by implementing and updating an accrual system over the life of mine.

12 | DOCUMENT INFORMATION

12.1 | CHANGE INFORMATION

Full details of the document history are recorded in the document control register, by version. A summary of the current change is provided in table below.

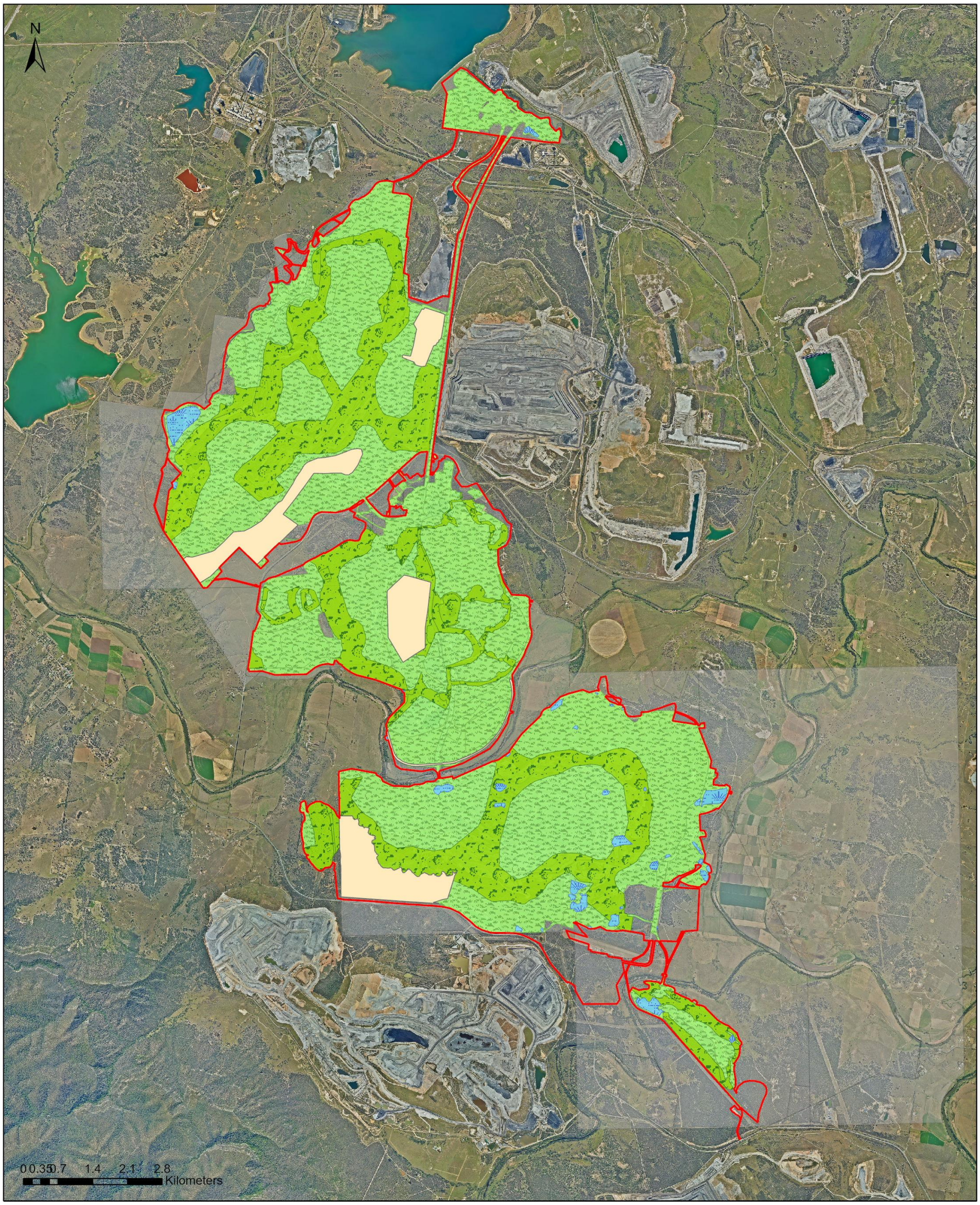
Version	Date	Review Team	Details of Change
1.0	July 2022	Tom Scott (ERR Australia), Andrew Speechly (HVO), Greg Peard (HVO)	Original document for DPE review.
1.1	August 2023	Darby O'Sullivan (HVO)	Updated to include summary of consultation and update of rehabilitation objectives to reflect RR feedback.
1.2	September 2024	Darby O'Sullivan (HVO), Tom Scott (ERR)	Update to reflect RR approval of HVO Rehabilitation Objectives and feedback from the RR Revegetation TAP
1.3	December 2024	Darby O'Sullivan (HVO)	Update to reflect review of rehabilitation risk assessment

APPENDIX A: PLANS

Hunter Valley Operations

Plan 1: Final Landform Features

HUNTER VALLEY OPERATIONS



Legend

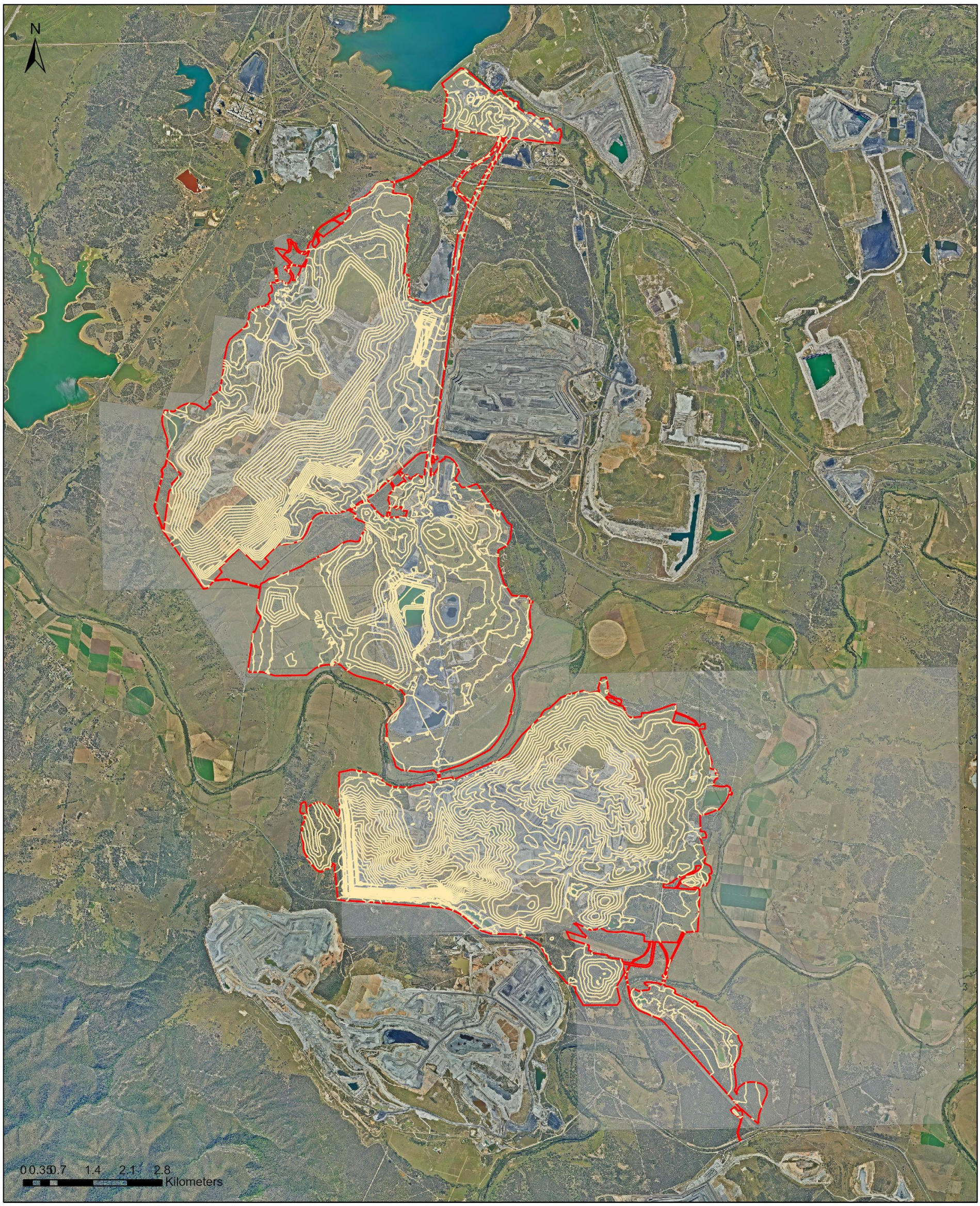
- Approved Disturbance Boundary
- Coal Titles
- Agricultural – Grazing
- Final Void
- Native Ecosystem
- Water Management Areas
- Final Landform Features

Mine Name:	Hunter Valley Operations
Plan Name:	Plan 1: Final Landform Features
Year:	2024
Theme	4070, 7086
Submission No's:	
Plan Date:	01/10/2024

Hunter Valley Operations

Plan 2: Final Landform Contours

HUNTER VALLEY
OPERATIONS



Legend

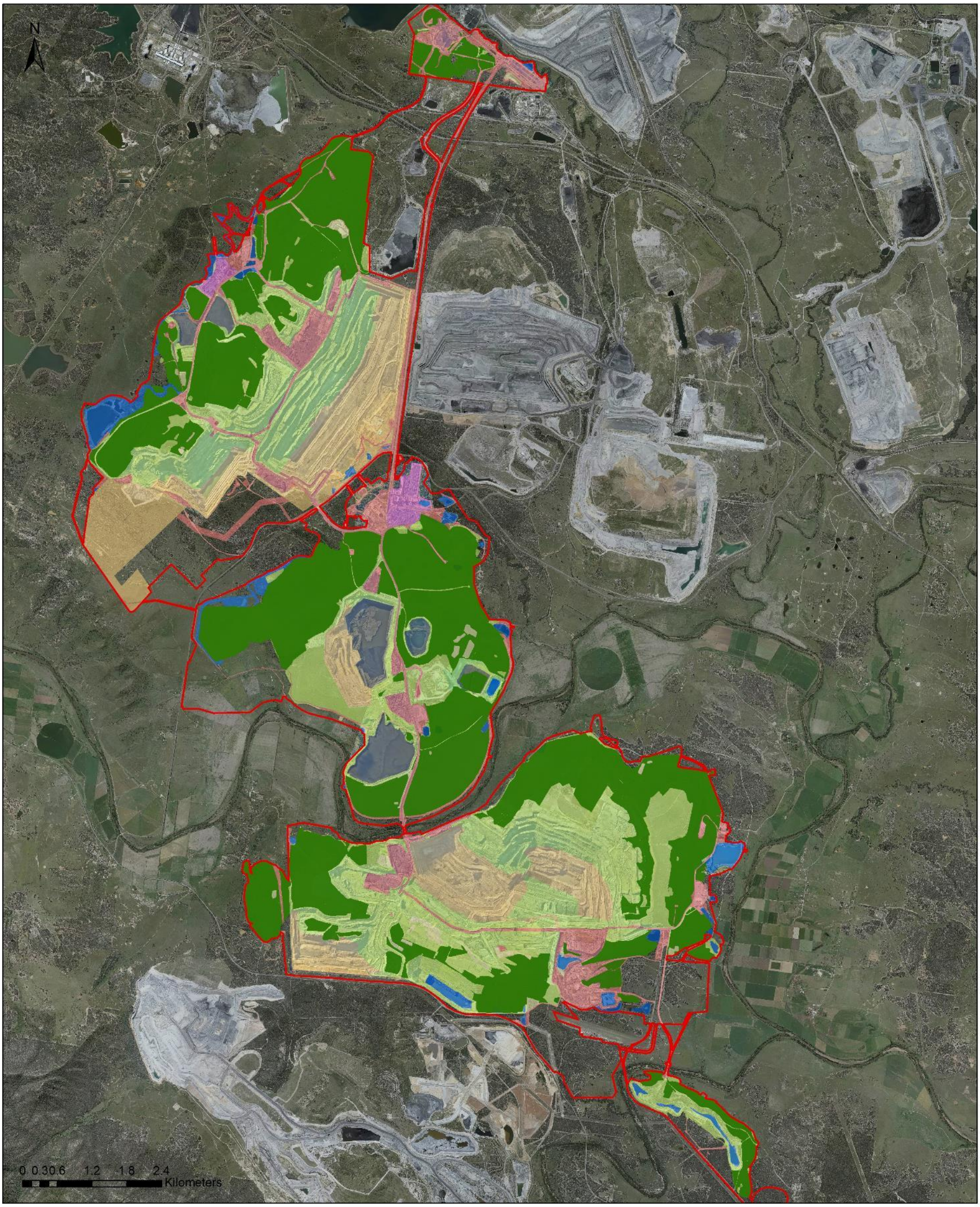
- Approved Disturbance Boundary
- Coal Titles
- Final Landform Contours

Mine Name:	Hunter Valley Operations
Plan Name:	Plan 2: Final Landform Contours
Year:	2024
Theme	3976, 4070
Submission No's:	
Plan Date:	01/10/2024

Hunter Valley Operations

Plan 3: Rehabilitation Schedule 2022

HUNTER VALLEY
OPERATIONS



Legend

- Approved Disturbance Boundary
- Rehabilitation

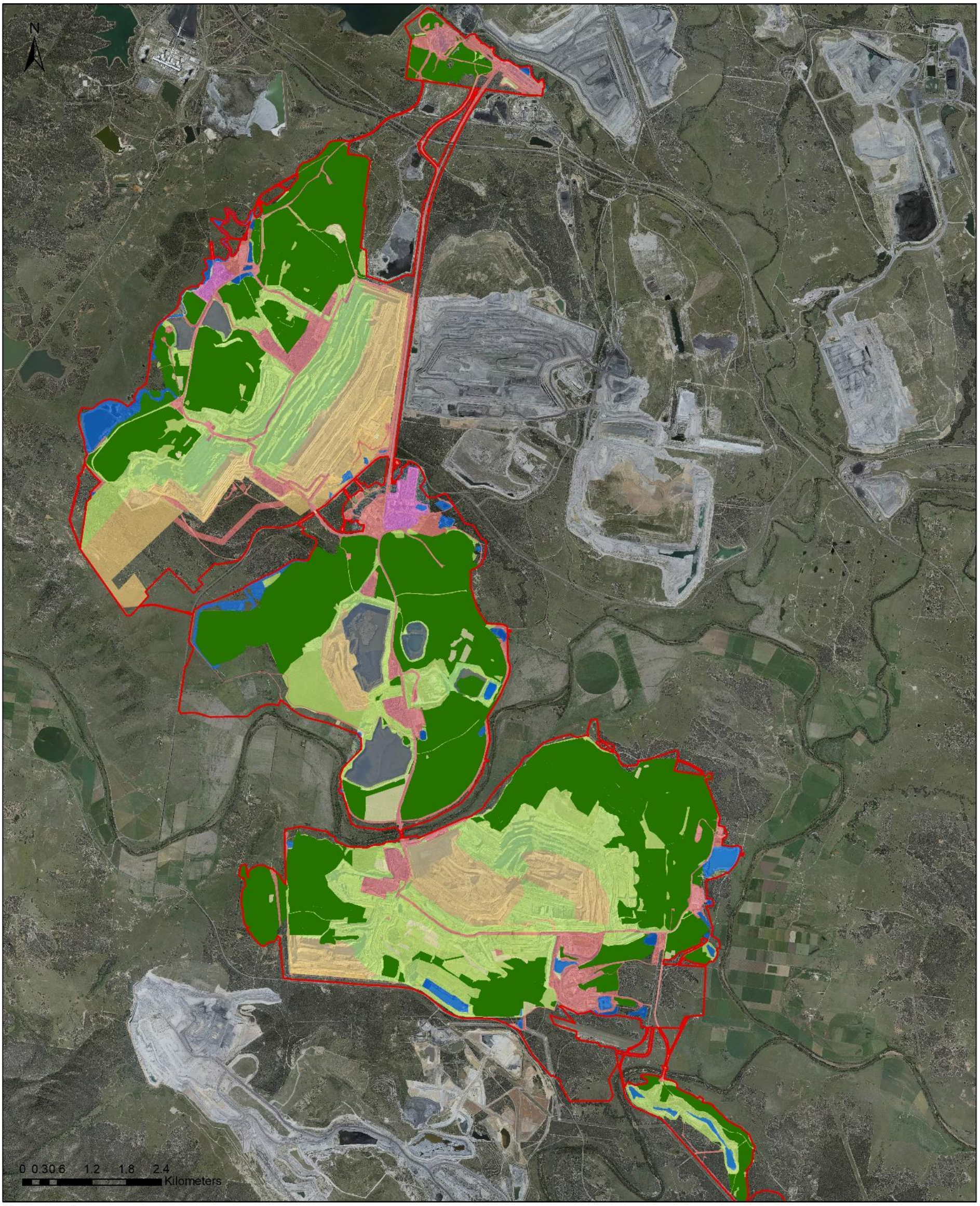
Mining Domains

- Active Mining Area (Open cut void)
- Beneficiation Facility
- Infrastructure Area
- Other
- Overburden Emplacement Area
- Tailings Storage Facility
- Water Management Area

Hunter Valley Operations

Plan 4: Rehabilitation Schedule 2023

HUNTER VALLEY
OPERATIONS



Legend

- Approved Disturbance Boundary
- Rehabilitation

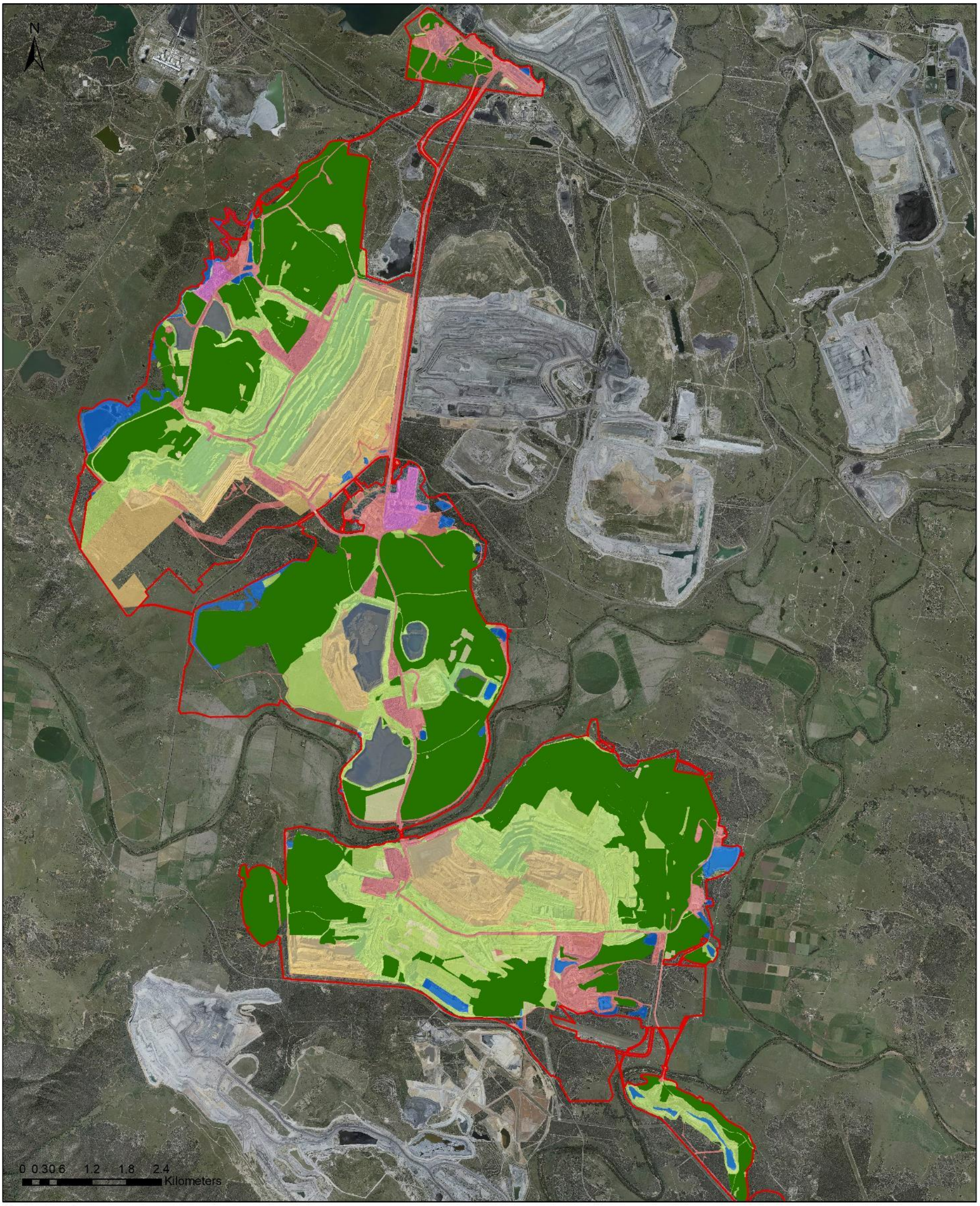
Mining Domains

- Active Mining Area (Open cut void)
- Beneficiation Facility
- Infrastructure Area
- Other
- Overburden Emplacement Area
- Tailings Storage Facility
- Water Management Area

Hunter Valley Operations

Plan 4: Rehabilitation Schedule 2023

HUNTER VALLEY
OPERATIONS



Legend

- Approved Disturbance Boundary
- Rehabilitation

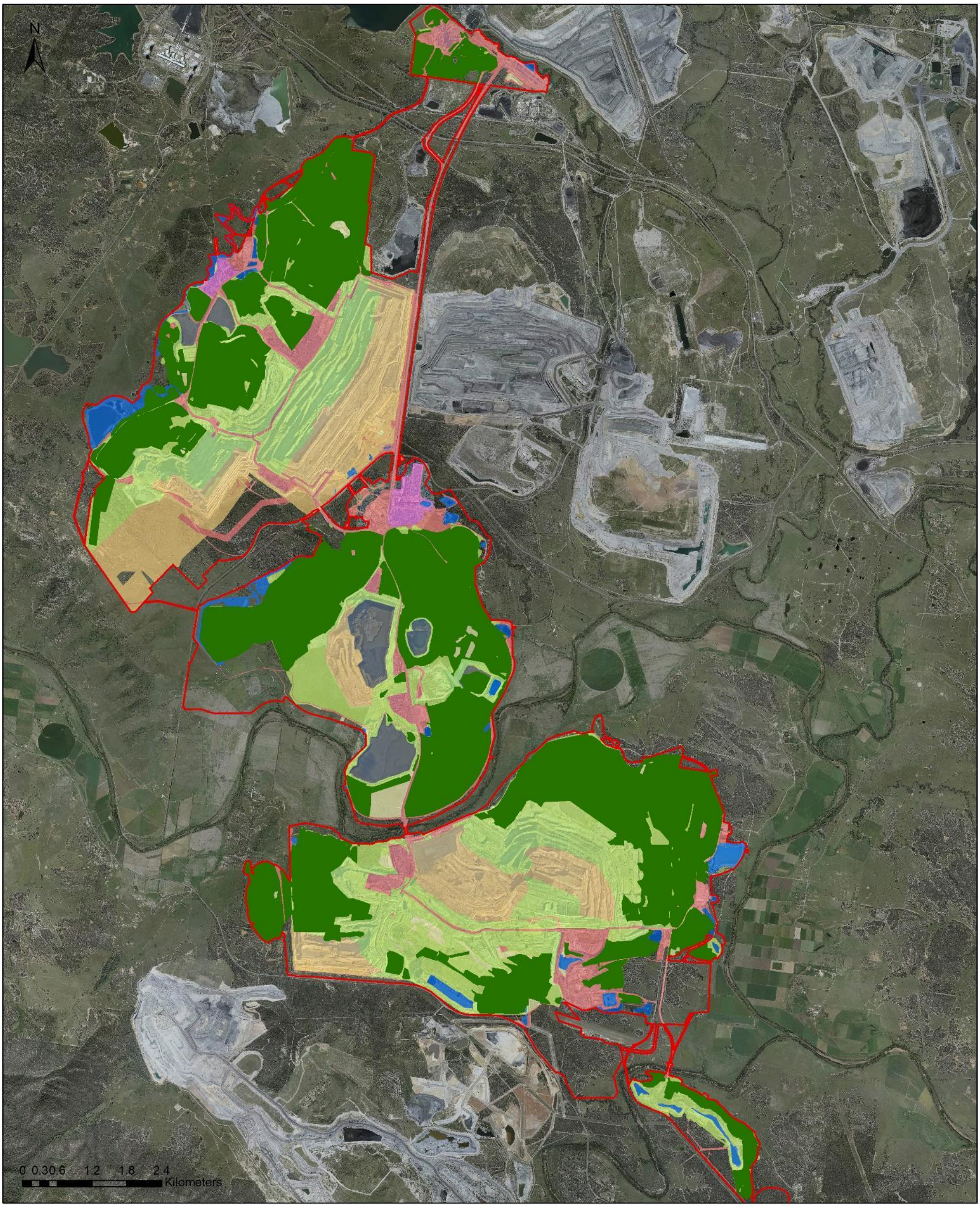
Mining Domains

- Active Mining Area (Open cut void)
- Beneficiation Facility
- Infrastructure Area
- Other
- Overburden Emplacement Area
- Tailings Storage Facility
- Water Management Area

Hunter Valley Operations

Plan 5: Rehabilitation Schedule 2024

HUNTER VALLEY OPERATIONS



Legend

- Approved Disturbance Boundary
- Rehabilitation

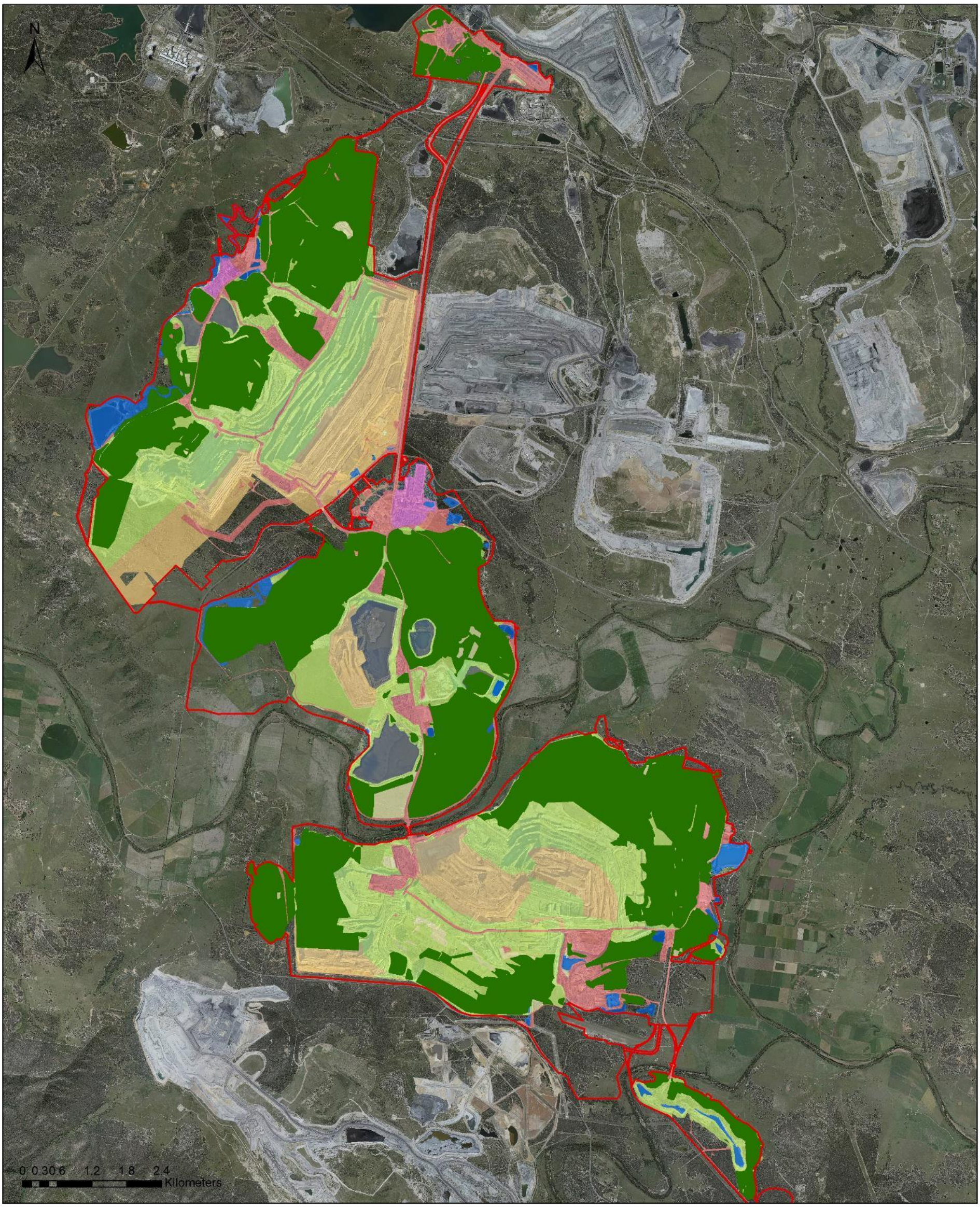
Mining Domains

- Active Mining Area (Open cut void)
- Beneficiation Facility
- Infrastructure Area
- Other
- Overburden Emplacement Area
- Tailings Storage Facility
- Water Management Area

Hunter Valley Operations

Plan 6: Rehabilitation Schedule 2025

HUNTER VALLEY
OPERATIONS



Legend

- Approved Disturbance Boundary
- Rehabilitation

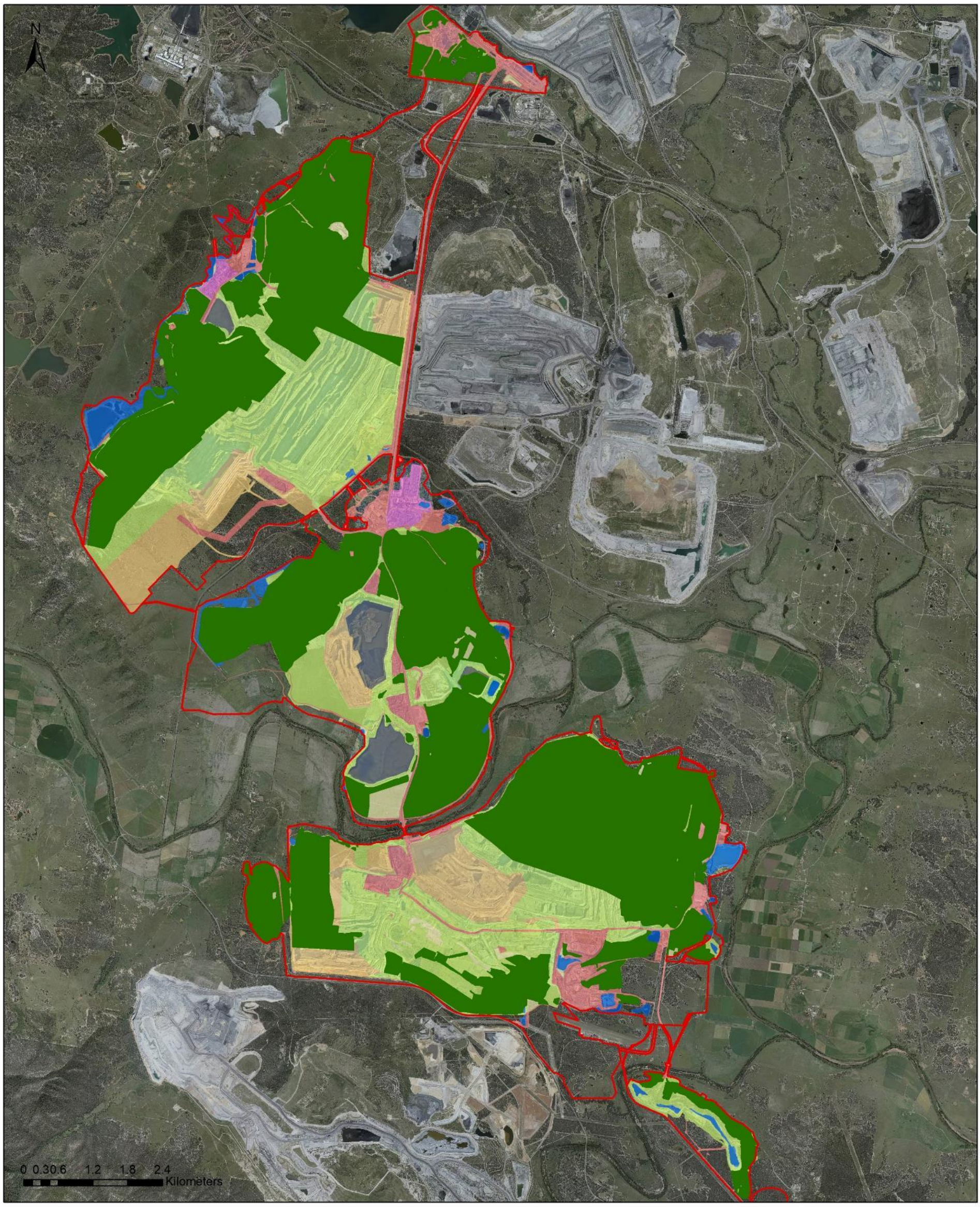
Mining Domains

- Active Mining Area (Open cut void)
- Beneficiation Facility
- Infrastructure Area
- Other
- Overburden Emplacement Area
- Tailings Storage Facility
- Water Management Area

Hunter Valley Operations

Plan 7: Rehabilitation Schedule 2030

HUNTER VALLEY
OPERATIONS



Legend

- Approved Disturbance Boundary
- Rehabilitation

Mining Domains

- Active Mining Area (Open cut void)
- Beneficiation Facility
- Infrastructure Area
- Other
- Overburden Emplacement Area
- Tailings Storage Facility
- Water Management Area

Hunter Valley Operations

Plan 8: Rehabilitation Schedule 2035

HUNTER VALLEY
OPERATIONS

Legend

- Approved Disturbance Boundary
- Rehabilitation

Mining Domains

- Active Mining Area (Open cut void)
- Beneficiation Facility
- Infrastructure Area
- Other
- Overburden Emplacement Area
- Tailings Storage Facility
- Water Management Area

Land Ownership Schedule

HVO South

Lot//DP	Owner
3//3005	ES BOWMAN
4//3005	ES BOWMAN
5//3005	ES BOWMAN
6//3005	RUSSELL JOHN & JANELLE SUSAN WENHAM
7//3005	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
8//3005	GREGORY JOHN ERNST
9//3005	GREGORY JOHN ERNST
10//3005	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//48394	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//48591	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//48592	COAL & ALLIED OPERATIONS PTY LIMITED
1//48646	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//48646	Coal & Allied Operations Pty Ltd
3//48646	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//66331	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//70857	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//90052	Telstra Corporation Limited
1//90727	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
7001//93632	The State of New South Wales
1//105943	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//111381	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//111381	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
3//111381	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//113342	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
3//113342	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
4//113342	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//113343	WAMBO COAL PTY LIMITED
2//113343	WAMBO MINING CORPORATION PTY. LIMITED
3//113343	WAMBO MINING CORPORATION PTY. LIMITED
4//113343	WAMBO MINING CORPORATION PTY. LIMITED
5//113343	WAMBO MINING CORPORATION PTY. LIMITED
10//113343	WAMBO MINING CORPORATION PTY LIMITED
1//114966	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//114966	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//123374	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//129808	COAL & ALLIED OPERATIONS PTY LIMITED
1//129811	Warkworth Mining Limited
2//129811	Warkworth Mining Limited
3//129811	Warkworth Mining Limited
1//182139	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//191982	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//195523	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//246201	Warkworth Mining Limited
5//247239	CONSTRUCTION, FORESTRY, MINING & ENERGY UNION
6//247239	Anthony John Maher and Andrew William Vickers
7//247239	Anthony John Maher and Andrew William Vickers
8//247239	Anthony John Maher and Andrew William Vickers
10//247239	HUNTER VALLEY GLIDING CLUB CO-OPERATIVE LIMITED
12//247239	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
13//247239	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
14//247239	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
15//247239	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
16//247239	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//249327	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
5//251617	COAL & ALLIED OPERATIONS PTY LTD (61.447%) and HVO RESOURCES PTY LTD (29.454%) & GREGORY JOHN ERNST (9.099%)
1//251877	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
202//257063	WAMBO COAL PTY LIMITED
2//300150	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//306421	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
A//386100	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
B//386100	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//532623	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
134//566275	Anthony John Maher and Andrew William Vickers
2//583524	WAMBO COAL PTY LIMITED

1420//586339	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1421//586339	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
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745//597317	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
300//597726	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
31//610878	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
32//610878	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
33//610878	United Collieries Pty Limited & Wambo Coal Pty Limited
2//617852	Anthony John Maher and Andrew William Vickers
1//619309	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
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153//704486	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
154//704486	THE STATE OF NEW SOUTH WALES
155//705446	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//710088	THE STATE OF NEW SOUTH WALES
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1//729985	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
91//733895	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
92//733895	HUNTER VALLEY GLIDING CLUB CO-OPERATIVE LIMITED
1//737796	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//737880	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//737880	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//738657	WAMBO COAL PTY LIMITED
2//738657	WAMBO COAL PTY LIMITED
10//740183	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//741544	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
17//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
18//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
21//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
22//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
89//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
98//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
117//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
118//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
119//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
120//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
121//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
122//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
123//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
124//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
125//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
126//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
127//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
164//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
170//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
171//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%

12//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
13//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
14//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
15//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
16//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
19//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
20//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
21//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
22//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
23//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
24//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
25//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
26//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
27//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
28//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
29//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
30//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
31//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
75//753792	Unable to verify ownership in Info Track as says “could not be verified”. Narrow residual lot/road inbetween 300//597726 and Crown road
86//753792	WAMBO COAL PTY LIMITED
87//753792	WAMBO COAL PTY LIMITED
88//753792	WAMBO COAL PTY LIMITED
89//753792	WAMBO COAL PTY LIMITED
115//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
120//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
121//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
122//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
130//753792	THE STATE OF NEW SOUTH WALES
140//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
141//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
147//753792	United Collieries Pty Ltd
151//753792	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//755267	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
14//755267	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
40//755267	GLENCORE COAL (NSW) PTY LIMITED
41//755267	GLENCORE COAL (NSW) PTY LIMITED
43//755267	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
86//755267	WAMBO COAL TERMINAL PTY LTD
88//755267	WAMBO COAL TERMINAL PTY LTD
108//755267	COAL & ALLIED OPERATIONS PTY LIMITED
112//755267	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
114//755267	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
118//755267	COAL & ALLIED OPERATIONS PTY LIMITED
119//755267	COAL & ALLIED OPERATIONS PTY LIMITED
121//755267	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
122//755267	COAL & ALLIED OPERATIONS PTY LIMITED
123//755267	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
128//755267	COAL & ALLIED OPERATIONS PTY LIMITED
135//755267	COAL & ALLIED OPERATIONS PTY LIMITED
142//755267	COAL & ALLIED OPERATIONS PTY LIMITED
143//755267	COAL & ALLIED OPERATIONS PTY LIMITED
145//755267	COAL & ALLIED OPERATIONS PTY LIMITED
171//755267	WAMBO COAL TERMINAL PTY LTD
174//755267	WAMBO COAL TERMINAL PTY LTD
186//755267	GLENCORE COAL (NSW) PTY LIMITED
193//755267	Singleton Council Road
194//755267	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
195//755267	COAL & ALLIED OPERATIONS PTY LIMITED
199//755267	WAMBO MINING CORPORATION PTY. LIMITED
1/1/759053	WAMBO COAL PTY LIMITED
½/759053	WAMBO COAL PTY LIMITED
¼/759053	WAMBO MINING CORPORATION PTY. LIMITED
1/5/759053	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1/6/759053	Singleton Shire Council
1/16/759053	WAMBO MINING CORPORATION PTY. LIMITED
1/17/759053	WAMBO MINING CORPORATION PTY. LIMITED
1/21/759053	WAMBO MINING CORPORATION PTY. LIMITED

1/25/759053	Wanaruah Local Aboriginal Land Council
2/1/759053	WAMBO COAL PTY LIMITED
2/2/759053	WAMBO COAL PTY LIMITED
2/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
2/5/759053	The State of New South Wales
2/6/759053	Singleton Shire Council
2/16/759053	WAMBO COAL PTY LIMITED
2/17/759053	WAMBO MINING CORPORATION PTY. LIMITED
2/21/759053	WAMBO MINING CORPORATION PTY. LIMITED
2/25/759053	Wanaruah Local Aboriginal Land Council
3/1/759053	WAMBO COAL PTY LIMITED
3/2/759053	WAMBO COAL PTY LIMITED
¾/759053	The State of New South Wales
3/5/759053	The State of New South Wales
3/16/759053	WAMBO COAL PTY LIMITED
3/21/759053	WAMBO MINING CORPORATION PTY. LIMITED
4/1/759053	WAMBO COAL PTY LIMITED
4/2/759053	WAMBO COAL PTY LIMITED
4/3/759053	WAMBO COAL PTY LIMITED
4/4/759053	The State of New South Wales
4/21/759053	WAMBO COAL PTY LIMITED
5/1/759053	WAMBO COAL PTY LIMITED
5/2/759053	WAMBO COAL PTY LIMITED
5/3/759053	WAMBO COAL PTY LIMITED
5/4/759053	The State of New South Wales
5/21/759053	WAMBO COAL PTY LIMITED
6/1/759053	WAMBO COAL PTY LIMITED
6/2/759053	WAMBO COAL PTY LIMITED
6/3/759053	WAMBO COAL PTY LIMITED
6/4/759053	The State of New South Wales
7/1/759053	WAMBO COAL PTY LIMITED
7/2/759053	WAMBO COAL PTY LIMITED
7/3/759053	WAMBO COAL PTY LIMITED
7/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
8/1/759053	WAMBO COAL PTY LIMITED
8/2/759053	WAMBO COAL PTY LIMITED
8/3/759053	WAMBO COAL PTY LIMITED
8/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
9/1/759053	WAMBO COAL PTY LIMITED
9/2/759053	WAMBO COAL PTY LIMITED
9/3/759053	WAMBO COAL PTY LIMITED
9/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
10/1/759053	WAMBO COAL PTY LIMITED
10/2/759053	WAMBO COAL PTY LIMITED
10/3/759053	WAMBO COAL PTY LIMITED
10/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
11/2/759053	WAMBO COAL PTY LIMITED
11/3/759053	WAMBO COAL PTY LIMITED
11/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
12/2/759053	WAMBO COAL PTY LIMITED
12/3/759053	WAMBO COAL PTY LIMITED
12/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
13/2/759053	WAMBO COAL PTY LIMITED
13/3/759053	WAMBO COAL PTY LIMITED
13/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
14/3/759053	WAMBO COAL PTY LIMITED
14/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
15/3/759053	WAMBO COAL PTY LIMITED
15/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
16/3/759053	WAMBO COAL PTY LIMITED
16/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
17/3/759053	WAMBO COAL PTY LIMITED
17/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
18/3/759053	WAMBO COAL PTY LIMITED
18/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
19/3/759053	WAMBO COAL PTY LIMITED
19/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
20/3/759053	WAMBO COAL PTY LIMITED

20/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
21/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
22/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
23/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
24/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
25/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
26/4/759053	WAMBO MINING CORPORATION PTY. LIMITED
1//770904	GLENCORE COAL (NSW) PTY LIMITED
2//770904	GLENCORE COAL (NSW) PTY LIMITED
3//770904	GLENCORE COAL (NSW) PTY LIMITED
4//770904	GLENCORE COAL (NSW) PTY LIMITED
5//770904	GLENCORE COAL (NSW) PTY LIMITED
6//770904	Edward John & Carol Lesley Anne Burley
7//770904	GLENCORE COAL (NSW) PTY LIMITED
1//770905	GLENCORE COAL (NSW) PTY LIMITED
1//782299	Glencore COAL PTY LIMITED
1//783484	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//783484	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
3//783484	COAL & ALLIED OPERATIONS PTY LIMITED
4//783484	COAL & ALLIED OPERATIONS PTY LIMITED
5//783484	COAL & ALLIED OPERATIONS PTY LIMITED
1001//785197	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1002//785197	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//794506	WAMBO COAL PTY LIMITED
2//794506	WAMBO COAL PTY LIMITED
3//794506	WAMBO COAL PTY LIMITED
1//797721	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//808301	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
204//821040	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//821123	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//821127	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//822177	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//823767	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
170//823775	The State of NSW
172//823775	The State of NSW
173//823775 / CL586318	The State of NSW – Access Licence 586318
175//823775	The State of NSW (TSR)
176//823775	Singleton Shire Council
179//823775	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
180//823775	Singleton Shire Council
182//823775	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//835812	Anthony John Maher and Andrew William Vickers
3//835812	Anthony John Maher and Andrew William Vickers
4//835812	Anthony John Maher and Andrew William Vickers
9//835812	Anthony John Maher and Andrew William Vickers
11//843432	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
12//843432	TELSTRA CORPORATION LIMITED
50//848334	WAMBO COAL PTY LIMITED
1//857021	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//876447	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//876447	COAL & ALLIED OPERATIONS PTY LIMITED
1//901179	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//947886	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//963714	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
146//970755	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//997228	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//998117	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//998117	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
854//1000822	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//1041635	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//1043120	GLENCORE COAL (NSW) PTY LIMITED
3//1085145	Wambo Coal Pty Ltd
4//1085145	Wambo Coal Pty Ltd
5//1085145	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
20//1085391	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//1088908	WAMBO COAL TERMINAL PTY LTD
2//1088908	WAMBO COAL TERMINAL PTY LTD

1//1090601	WAMBO COAL PTY LIMITED
1//1102213	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//1103396	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
21//1109631	Warkworth Hall Community Centre Incorporated
84//1124139	Warkworth Mining Limited
33//1125285	AZSA PASTORAL HOLDINGS PTY LIMITED
34//1125285	AZSA PASTORAL HOLDINGS PTY LIMITED
1//1126528	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
350//1135536	Warkworth Mining Limited
360//1135647	Warkworth Mining Limited
2011//1137289	The State of New South Wales
73//1137954	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//1153480	WAMBO COAL TERMINAL PTY LTD
1000//1153575	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//1156393	Singleton Shire Council
11//1262456	Trustee of Church Property for the Diocese of Newcastle
12//1262456	Trustee of Church Property for the Diocese of Newcastle
13//1262456	Trustee of Church Property for the Diocese of Newcastle
3//1171764	Trustee of Church Property for the Diocese of Newcastle
1//1177768	Anthony John Maher and Andrew William Vickers
1//1217808	Janelle Susan Wenham
EP 51200	EP (assume to Coal and Allied Operations Pty Limited)
CL 565353	THE STATE OF NEW SOUTH WALES
Crown Licence 175936	Crown (Coal & Allied Operations Pty Limited) Licence 175936
Various crown and council road reserves	
Bed and banks of the Hunter River	
Bed and banks of Wollombi Brook	

HVO North

Lot//DP	Owner
1//48165	Her most gracious majesty Queen Elizabeth the second
2//48165	Crown
3//48165	Her most gracious majesty Queen Elizabeth the second
4//48165	Crown
5//48165	Her most gracious majesty Queen Elizabeth the second
6//48165	Crown (Lemington Road)
7//48165	Road
8//48165	Her most gracious majesty Queen Elizabeth the second
9//48165	Her most gracious majesty Queen Elizabeth the second
2//48555	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
3//48555	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
4//48555	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
5//48555	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
7//48555	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//90727	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
7001//93617	THE STATE OF NEW SOUTH WALES
1//110662	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//114966	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//114966	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//125406	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//125406	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
3//125406	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
4//125406	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
5//125406	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
6//125406	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
7//125406	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
8//125406	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
9//125406	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
10//125406	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
11//125406	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
4//130831	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//135459	State Rail Authority of NSW
1//191982	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//211043	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
3//252530	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
4//252530	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
5//252530	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%

8//252530	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
201//544091	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//574166	AGL MACQUARIE PTY LTD
2//574166	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
300//597726	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//659810	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
100//700429	ALPHA DISTRIBUTION MINISTERIAL HOLDING CORPORATION (Ausgrid)
1//727260	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//729048	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//737796	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
10//740183	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
53//752468	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
54//752468	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
65//752468	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
66//752468	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
68//752468	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
70//752468	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
71//752468	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
80//752468	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
81//752468	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
82//752468	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
83//752468	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
84//752468	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
93//752468	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
94//752468	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
102//752468	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
127//752468	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
156//752468	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
157//752468	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
158//752468	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
159//752468	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
89//752470	TBC
17//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
18//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
21//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
22//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
38//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
58//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
82//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
83//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
89//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
98//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
117//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
118//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
119//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
120//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
121//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
122//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
123//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
124//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
125//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
126//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
127//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
164//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
170//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
171//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
200//752481	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//776382	Crown Road
4//776382	Crown lands - water course Bayswater Creek
1//779625	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
21//786904	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
22//786904	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//794836	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//808301	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//808431	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//808431	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//823767	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
16//848095	Cumnock No 1 Colliery Pty Limited, ICRA CUMNOCK PTY LIMITED

300//856881	Cumnock No 1 Colliery Pty Limited, ICRA CUMNOCK PTY LIMITED
11//858172	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
304//868175	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
22//869399	Resource Pacific Ltd, Cumnock No.1 Colliery Pty Ltd, Muswellbrook Coal Company Ltd, ICRA Cumnock Pty Ltd
380//869839	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
182//975271	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
183//975271	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
184//975271	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
192//975271	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
193//975271	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
211//975271	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
212//975271	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
217//975271	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
218//975271	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
219//975271	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
221//975271	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
101//1017998	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
601//1019325	AGL MACQUARIE PTY LTD
111//1059007	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//1078618	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
20//1085391	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
102//1103268	LIDDELL TENEMENTS PTY LIMITED, MITSUI MATSUSHIMA AUSTRALIA PTY LIMITED, ENEX LIDDELL PTY LIMITED
103//1103268	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//1113789	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//1113789	Singleton Shire Council
3//1113789	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
4//1113789	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
5//1113789	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
6//1113789	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
7//1113789	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1481//1129164	THE STATE OF NEW SOUTH WALES
3000//1132357	Cumnock No 1 Colliery Pty Limited, ICRA CUMNOCK PTY LIMITED
1//1152619	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//1152619	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
3//1152619	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
4//1152619	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1000//1153575	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
1//1155775	AGL MACQUARIE PTY LTD
1//1158958	Transport for NSW
2//1167986	AGL MACQUARIE PTY LTD
120//1174907	AGL MACQUARIE PTY LTD
121//1174907	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
122//1174907	Coal & Allied Operations Pty Ltd 51% and Anotero Pty Limited 49%
2//1193186	RAVENSWORTH OPERATIONS PTY LIMITED
Part Crown (Coal & Allied Operations Pty Limited) Licence 175936	
Crown land - Closed road - north side 7001//93617	
Part Crown land South Bank Hunter River	
Old Highway Rd	
Lemington Road	
Liddell Station Rd	
NEW ENGLAND HWY New England HWY	
Railway - Newdell Rail Spur	
Various Crown and Council Roads	
Bed and banks of Hunter River	
Bed and banks of Bayswater Creek	

APPENDIX B: REHABILITATION RISK ASSESSMENT SUMMARY

Risk Ref.	*Steps of process*	Risk Event Description (Risk of….)	Cause (Due to…)	Consequence (Resulting in..)	Risk Owner	Potential Maximum Consequence (PMC)		Existing Controls	Risk Control Effectiveness	Current Risk with Existing Controls					Risk Treatment/Actions
						Consequence Categories	PMC			Consequence Categories	Highest Consequence	Likelihood	Residual Risk Rating	Tolerability approval required	Risk Treatment/ Actions
1	1. General	Insufficient skills and experience of rehab personnel.	LTA training & education Failure to follow Protocols, Plans, Procedures and Permits	Poor quality rehabilitation / failure to meet closure criteria	Andrew Speechly	Environment	2	Contract for ground prep and revegetation works Rehabilitation & Disturbance Procedure General Hunter Valley rehab contractor experience	Satisfactory	Environment	1	D	2	No	
2	1. General	Lack of defined responsibilities.	LTA training & education	Poor quality rehabilitation / failure to meet closure criteria	Andrew Speechly	Environment	1	HVO Organisation Chart Rehabilitation Management Plan Rehabilitation & Disturbance Procedure Annual Rehabilitation Closure Plan (ARCP)	Satisfactory	Environment	1	D	2	No	
3	1. General	Insufficient funding for or prioritisation of rehabilitation activities	Current designs do not adequately mitigate a specific landform / feature / contaminated site risk Exact scope of works unknown Insufficient skill & experience to complete task LTA engagement with relevant stakeholders LTA identification of risks and opportunities to support closure objectives Monitoring, Reconciliation and Management LTA Planning parameters LTA Unresolved / unclear completion criteria and data requirements for relinquishment approval	Failure to meet closure criteria	Andrew Speechly	Environment	3	LOM Process Budget process ARCP	Satisfactory	Environment	1	D	2	No	

Risk Ref.	*Steps of process*	Risk Event Description (Risk of….)	Cause (Due to…)	Consequence (Resulting in..)	Risk Owner	Potential Maximum Consequence (PMC)		Existing Controls	Risk Control Effectiveness	Current Risk with Existing Controls					Risk Treatment/Actions
						Consequence Categories	PMC			Consequence Categories	Highest Consequence	Likelihood	Residual Risk Rating	Tolerability approval required	Risk Treatment/ Actions
4	2. Active Mining Phase	Failure to identify topsoil types when salvaging / stockpiling (e.g. pasture vs woodland)	Failure to follow Protocols, Plans, Procedures and Permits LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA Skilled Contractors Availability LTA	Topsoil use on inappropriate areas (e.g. pasture on woodland)	Andrew Speechly	Environment	3	Topsoil Management Plan GDP Process Project Specific Topsoil Plan ARCP	Satisfactory	Environment	3	C	13	No	Trial areas with compost instead of topsoil in native veg areas when suitable topsoil not available..(Existing action ECRA) Add a step to budget planning process to consider allocation of corrct topsoil type based on the final landuse of the planned rehabilitation areas. Reference to be made to the 5 year toposil plan.
5	2. Active Mining Phase	Limited biological resources for salvage (soil, vegetation, seeds, habitat resources)	Failure to follow Protocols, Plans, Procedures and Permits Geographical location Inherent weed prevalence in topsoil LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA Skilled Contractors Availability LTA	Insufficient material for rehabilitation	Andrew Speechly	Environment	3	Rehabilitation & Disturbance Procedure Topsoil Management Plan and Topsoil Balance Vegetation Clearance Plan GDP Process Topsoil balance	Satisfactory	Environment	2	B	12	No	Trial areas with compost instead of topsoil in native veg areas when suitable topsoil not available..(Existing action ECRA)
6	2. Active Mining Phase	Low tailings beach shear strength delays capping	LTA deposition practices Monitoring, Reconciliation and Management LTA Planning & execution LTA	Increased / additional costs. Delayed relinquishment	Luke Winkelman	Financial	3	GCAA Tailings Protocol and HVO Dam Management Plan Operation and Maintaintenace Manual Fine Reject Management Strategy Primary flocc in CHPP's Secondary flocc at all discharge points Multi-point discharge systems Decant pumps & return lines	Satisfactory	Financial	3	D	9	No	

Risk Ref.	*Steps of process*	Risk Event Description (Risk of….)	Cause (Due to…)	Consequence (Resulting in..)	Risk Owner	Potential Maximum Consequence (PMC)		Existing Controls	Risk Control Effectiveness	Current Risk with Existing Controls					Risk Treatment/Actions
						Consequence Categories	PMC			Consequence Categories	Highest Consequence	Likelihood	Residual Risk Rating	Tolerability approval required	Risk Treatment/ Actions
7	2. Active Mining Phase	Adverse surface and groundwater quality and quantity (outside of expected projections)	Current designs do not adequately mitigate a specific landform / feature / contaminated site risk Exact scope of works unknown Insufficient skill & experience to complete task LTA engagement with relevant stakeholders LTA identification of risks and opportunities to support closure objectives Monitoring, Reconciliation and Management LTA Planning parameters LTA Unresolved / unclear completion criteria and data requirements for relinquishment approval	Failure to meet closure criteria	Andrew Speechly	Environment	2	Rehabilitation & Disturbance Procedure Topsoil Management Plan Water Management Plan Water Monitoring Program Rehabilitation Monitoring	Satisfactory	Environment	2	D	5	No	
8	2. Active Mining Phase	Poor biological resource salvage and maintenance (soil, vegetation, seeds, habitat resources)	Failure to follow Protocols, Plans, Procedures and Permits Geographical location Inherent weed prevalence in topsoil LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA Skilled Contractors Availability LTA	Insufficient material for rehabilitation	Andrew Speechly	Environment	2	Rehabilitation & Disturbance Procedure Topsoil Management Plan Vegetation Clearance Plan GDP Process ARCP Topsoil balance	Satisfactory	Environment	1	C	4	No	

Risk Ref.	*Steps of process*	Risk Event Description (Risk of….)	Cause (Due to…)	Consequence (Resulting in..)	Risk Owner	Potential Maximum Consequence (PMC)		Existing Controls	Risk Control Effectiveness	Current Risk with Existing Controls					Risk Treatment/Actions
						Consequence Categories	PMC			Consequence Categories	Highest Consequence	Likelihood	Residual Risk Rating	Tolerability approval required	Risk Treatment/ Actions
9	2. Active Mining Phase	Adverse geochemical/chemical composition of materials (overburden, soils, rejects,TSF capping)	Failure to follow Protocols, Plans, Procedures and Permits Geographical location LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA LTA identification of hazardous properties and quantities of hazardous materials or potential effects of hazardous materials	Poor quality rehabilitation / failure to meet closure criteria Increased / additional costs.	Andrew Speechly	Environment	3	Rehabilitation & Disturbance Procedure Topsoil Management Plan Dig and dump checklists (management of ARD/carbonaceous material) HVO Spontaneous Combustion Prinicipal Hazard Management Plan HVO Geochemical Sampling Procedure	Satisfactory	Environment	1	C	4	No	
10	2. Active Mining Phase	Overtipping from active dumps on establishing rehabilitation areas	Failure to follow Protocols, Plans, Procedures and Permits Geographical location LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA	Poor quality rehabilitation / failure to meet closure criteria	Andrew Speechly	Financial	1	Dig and dump checklists Windrows Rehabilitation bulk shaping checklist Survey and conformance to design checks GPS design in dump dozer / survey pegs	Satisfactory	Financial	1	C	4	No	

Risk Ref.	*Steps of process*	Risk Event Description (Risk of….)	Cause (Due to…)	Consequence (Resulting in..)	Risk Owner	Potential Maximum Consequence (PMC)		Existing Controls	Risk Control Effectiveness	Current Risk with Existing Controls					Risk Treatment/Actions
						Consequence Categories	PMC			Consequence Categories	Highest Consequence	Likelihood	Residual Risk Rating	Tolerability approval required	Risk Treatment/ Actions
11	2. Active Mining Phase	Clearing in adverse seasonal and weather conditions when salvaging biological resources	Failure to follow Protocols, Plans, Procedures and Permits Geographical location LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA	Poor quality rehabilitation / failure to meet closure criteria	Andrew Speechly	Environment	1	Rehabilitation & Disturbance Procedure Topsoil Management Plan Vegetation Clearance Plan GDP Process Budget planning ARCP	Satisfactory	Environment	1	D	2	No	
12	2. Active Mining Phase	Poor handling and containment of geochemical and geotechnically unsuitable tailings and reject materials	Failure to follow Protocols, Plans, Procedures and Permits LTA training & education Maintenance Regime LTA Planning & execution LTA LTA identification of hazardous properties and quantities of hazardous materials or potential effects of hazardous materials	Poor quality rehabilitation / failure to meet closure criteria Increased / additional costs.	Andrew Speechly	Environment	3	Rehabilitation & Disturbance Procedure Fine Reject Management Strategy HVO Spontaneous Combustion Prinicipal Hazard Management Plan HVO Geochemical Sampling Procedure Dig and dump checklists (management of ARD/carbonaceous material) Historical sampling - majority of HVO material has been identified as NAF with surplus acid buffering capacity	Satisfactory	Environment	1	D	2	No	Finalaise and publish the Geochemical Management Plan (existing action Action 1958136)
13	3. Decommissioning Phase	Inadequate identification and/or management of contaminated material	LTA identification of hazardous properties and quantities of hazardous materials or potential effects of hazardous materials Failure to follow Protocols, Plans, Procedures and Permits	Increased / additional costs. Failure to meet closure criteria	Andrew Speechly	Environment	3	Monthly inspections Surface and groundwater monitoring programs Phase 1 & 2 assessments Operational closure plan GDP process / project topsoil plan	Satisfactory	Environment	1	C	4	No	

Risk Ref.	*Steps of process*	Risk Event Description (Risk of….)	Cause (Due to…)	Consequence (Resulting in..)	Risk Owner	Potential Maximum Consequence (PMC)		Existing Controls	Risk Control Effectiveness	Current Risk with Existing Controls					Risk Treatment/Actions
						Consequence Categories	PMC			Consequence Categories	Highest Consequence	Likelihood	Residual Risk Rating	Tolerability approval required	Risk Treatment/ Actions
14	3. Decommissioning Phase	Poor management of material and waste products from demolition activities	Failure to follow Protocols, Plans, Procedures and Permits LTA training & education Planning & execution LTA Poor management practices LTA identification of hazardous properties and quantities of hazardous materials or potential effects of hazardous materials LTA engagement with relevant stakeholders	Increased / additional costs. Failure to meet closure criteria	Andrew Speechly	Environment	2	Operational Closure Plan EMS - compliance/assurance program Glencore Project Standard	Satisfactory	Environment	1	D	2	No	
15	3. Decommissioning Phase	Poor management of retained infrastructure (infrastructure not required or dilapidated)	Failure to follow Protocols, Plans, Procedures and Permits LTA training & education Maintenance Regime LTA Poor management practices LTA site access control ie fencing, gates, boundaries	Increased / additional costs. Failure to meet closure criteria	Andrew Speechly	Environment	2	Operational Closure Plan (project management process and monitoring) Budget process	Satisfactory	Environment	1	D	2	No	

Risk Ref.	*Steps of process*	Risk Event Description (Risk of….)	Cause (Due to…)	Consequence (Resulting in..)	Risk Owner	Potential Maximum Consequence (PMC)		Existing Controls	Risk Control Effectiveness	Current Risk with Existing Controls					Risk Treatment/Actions
						Consequence Categories	PMC			Consequence Categories	Highest Consequence	Likelihood	Residual Risk Rating	Tolerability approval required	Risk Treatment/ Actions
16	4. Landform establishment phase of rehabilitation	Lack of availability of suitable materials for capping of adverse materials (including tailings)	LTA engagement with relevant stakeholders Failure to follow Protocols, Plans, Procedures and Permits Mine Plan design LTA Current designs do not adequately mitigate a specific landform / feature / contaminated site risk Mine Plan design Non compliance Unexpected or early mine closure LTA material characterisation	Increased / additional costs. Poor quality rehabilitation /Failure to meet closure criteria Ground and Surface water impacts	Andrew Speechly	Environment	3	Closure Risk Assessment Fine Reject Management Strategy Existing capping stockpile for Carrington Pit area Dig and dump process / dig design checklist HVO Spontaneous Combustion Prinicipal Hazard Management Plan Bulk shaping and rehab checklist Water Managememt Plan Dam Management Plan Geochemical sampling program	Satisfactory	Environment	2	D	5	No	Update Dam Management Plan to include minimum capping depth and to reference Fine Reject Management Stratergy
16	4. Landform establishment phase of rehabilitation	Exposure or release of geochemical and/or geotechnically adverse material (typically tailings or waste rock) associated with containment design and construction, including capping/cover system, drainage and liner (if required)	Inadequate closure and capping design Unexpected or greater than predicted consolidation (subsidence or differential settlement) Insufficent or unsutiable capping material	Poor quality rehabilitation / failure to meet closure criteria Increased / additional costs.	Andrew Speechly	Environment	3	Conceptual final landform HVO Final Void Management Strategy- outlines deposition strategy and closure plans Fine Fine Reject Management Strategy HVO Dam Management Plan HVO Mine Closure Plan Rehabilitation monitoring program	Satisfactory	Environment	1	D	2	No	

Risk Ref.	*Steps of process*	Risk Event Description (Risk of….)	Cause (Due to…)	Consequence (Resulting in..)	Risk Owner	Potential Maximum Consequence (PMC)		Existing Controls	Risk Control Effectiveness	Current Risk with Existing Controls					Risk Treatment/Actions
						Consequence Categories	PMC			Consequence Categories	Highest Consequence	Likelihood	Residual Risk Rating	Tolerability approval required	Risk Treatment/ Actions
18	4. Landform establishment phase of rehabilitation	Long term settlement and ponding of water on dumps and tailings cap	Failure to follow Protocols, Plans, Procedures and Permits Weather conditions Mine Plan and tailings design LTA Planning & execution LTA Current designs do not adequately mitigate a specific landform / feature / contaminated site risk Mine Plan design Non compliance	Increased / additional costs. Failure to meet closure criteria	Andrew Speechly	Financial	1	Detailed landform design Survey and confirmance to plan checks Rehab and bulk shaping checklist Annual Walkover and ecological monitoring program ARCP Fine Reject Strategy Dam Management Plan Settlement monitoring on capped TSF's	Satisfactory	Financial	1	C	4	No	Investigate with Chris Waygood whether settlement is factored into the landform design and whether it can be improved (e.g. for site specific conditions). Collect site specific settlement data so it can potentially be incorporated into the landform design / demonstrate landforms are stable,
19	4. Landform establishment phase of rehabilitation	Unstable landform due to erosion and/or mass movement associated with inappropriate design and/or quantity assurance during landform construction	Current designs do not adequately mitigate a specific landform / feature / contaminated site risk Exact scope of works unknown Insufficient skill & experience to complete task LTA engagement with relevant stakeholders LTA identification of risks and opportunities to support closure objectives Monitoring, Reconciliation and Management LTA Planning parameters LTA Unresolved / unclear completion criteria and data requirements for relinquishment approval	Failure to meet closure criteria	Andrew Speechly	Environment	3	Conceptual final landform Landform design process Expert consultant input (WSP / SLR) / erosion modelling Rehab and Disturbance Procedure Bulk shaping and rehab checklist GPS control in shaping dozers	Satisfactory	Environment	1	D	2	No	

Risk Ref.	*Steps of process*	Risk Event Description (Risk of….)	Cause (Due to…)	Consequence (Resulting in..)	Risk Owner	Potential Maximum Consequence (PMC)		Existing Controls	Risk Control Effectiveness	Current Risk with Existing Controls					Risk Treatment/Actions
						Consequence Categories	PMC			Consequence Categories	Highest Consequence	Likelihood	Residual Risk Rating	Tolerability approval required	Risk Treatment/ Actions
20	4. Landform establishment phase of rehabilitation	Final landform unsuitable for final land use (e.g. large rocks affecting cultivation)	Current designs do not adequately mitigate a specific landform / feature / contaminated site risk Exact scope of works unknown Insufficient skill & experience to complete task LTA engagement with relevant stakeholders LTA identification of risks and opportunities to support closure objectives Monitoring, Reconciliation and Management LTA Planning parameters LTA Unresolved / unclear completion criteria and data requirements for relinquishment approval	Failure to meet closure criteria	Andrew Speechly	Environment	3	Rehabilitation Management Plan ARCP Rehab and Disturbance Procedure Bulk shaping and rehab checklist Rehabilitation Monitoring	Satisfactory	Environment	1	D	2	No	
21	4. Landform establishment phase of rehabilitation	Landform aspect not suitable for intended target plant species	Failure to follow Protocols, Plans, Procedures and Permits Geographical location Inherent weed prevalence in topsoil LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA Skilled Contractors Availability LTA	Poor quality rehabilitation / failure to meet closure criteria	Andrew Speechly	Environment	1	Rehabilitation Management Plan ARCP Rehab and Disturbance Procedure Final Landform Rehabilitation Plan	Satisfactory	Financial	1	E	1	No	

Risk Ref.	*Steps of process*	Risk Event Description (Risk of….)	Cause (Due to…)	Consequence (Resulting in..)	Risk Owner	Potential Maximum Consequence (PMC)		Existing Controls	Risk Control Effectiveness	Current Risk with Existing Controls					Risk Treatment/Actions
						Consequence Categories	PMC			Consequence Categories	Highest Consequence	Likelihood	Residual Risk Rating	Tolerability approval required	Risk Treatment/ Actions
22	5. Growth medium development	Soil (topsoil and/or subsoil) deficit for rehabilitation activities	Failure to follow Protocols, Plans, Procedures and Permits LTA training & education Planning & execution LTA Poor management practices	Increased / additional costs. Failure to meet closure criteria	Andrew Speechly	Environment	3	Topsoil Management Plan (lists options for making up deficit) Topsoil balance Rehab and Disturbance Procedure	Satisfactory	Environment	2	B	12	No	Trial areas with compost instead of topsoil in native veg areas when suitable topsoil not available..(Existing action ECRA)
23	5. Growth medium development	Degradation of soil quality due to lack of stockpile maintenance.	Failure to follow Protocols, Plans, Procedures and Permits Geographical location LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA	Poor quality rehabilitation / failure to meet closure criteria	Andrew Speechly	Financial	2	Topsoil Management Plan Annual topsoil inspections ARCP / Maintenance plan	Satisfactory	Financial	1	C	4	No	
24	5. Growth medium development	Poor / unsuitable physical and structural properties of soils	Failure to follow Protocols, Plans, Procedures and Permits Geographical location LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA	Poor quality rehabilitation / failure to meet closure criteria	Andrew Speechly	Environment	3	Rehabilitation & Disturbance Procedure Topsoil Management Plan (soil testing) GDP Process Walkover inspection and rehabilitation monitoring	Satisfactory	Environment	1	D	2	No	

Risk Ref.	*Steps of process*	Risk Event Description (Risk of….)	Cause (Due to…)	Consequence (Resulting in..)	Risk Owner	Potential Maximum Consequence (PMC)		Existing Controls	Risk Control Effectiveness	Current Risk with Existing Controls					Risk Treatment/Actions
						Consequence Categories	PMC			Consequence Categories	Highest Consequence	Likelihood	Residual Risk Rating	Tolerability approval required	Risk Treatment/ Actions
	5. Growth medium development	Soils inadequate to support revegetation or agricultural land capability (e.g. lack of organic matter, nutrient deficiency, adverse chemical properties, weed seed bank)	Failure to follow Protocols, Plans, Procedures and Permits Geographical location LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA	Poor quality rehabilitation / failure to meet closure criteria	Andrew Speechly	Environment	3	Rehabilitation & Disturbance Procedure Topsoil Management Plan ARCP (maintenance) Rehabilitation Monitoring Agricultural land capability review	Satisfactory	Environment	2	B	12	No	
26	6. Ecosystem and land use establishment	Weed infestation limiting target species/community (general)	Failure to follow Protocols, Plans, Procedures and Permits Geographical location Inherent weed prevalence in topsoil LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA Skilled Contractors Availability LTA	Poor quality rehabilitation / failure to meet closure criteria	Andrew Speechly	Environment	3	Rehabilitation Monitoring Reports Annual Walkover assessment Detailed Maintenance Plans ARCP Budget process Topsoil Management Plan Rehab and disturbance Procedure	Satisfactory	Environment	2	B	12	No	
27	6. Ecosystem and land use establishment	Weather and climatic influences (drought, flood) during initial establishment	Failure to follow Protocols, Plans, Procedures and Permits Geographical location LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA	Poor quality rehabilitation / failure to meet closure criteria	Andrew Speechly	Environment	3	Rehabilitation & Disturbance Procedure (ground prep methods) Native seed mix consists of drought tolerant species Annual Rehab Monitoring Annual walkover assessment	Satisfactory	Environment	2	C	8	No	

Risk Ref.	*Steps of process*	Risk Event Description (Risk of….)	Cause (Due to…)	Consequence (Resulting in..)	Risk Owner	Potential Maximum Consequence (PMC)		Existing Controls	Risk Control Effectiveness	Current Risk with Existing Controls					Risk Treatment/Actions
						Consequence Categories	PMC			Consequence Categories	Highest Consequence	Likelihood	Residual Risk Rating	Tolerability approval required	Risk Treatment/ Actions
28	6. Ecosystem and land use establishment	Acacia saligna infestations limiting target species/community	Failure to follow Protocols, Plans, Procedures and Permits Geographical location Inherent weed prevalence in topsoil LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA Skilled Contractors Availability LTA	Poor quality rehabilitation / failure to meet closure criteria	Andrew Speechly	Financial	3	Annual walkover and ecological monitoring ARCP / detailed maintenance plan Specific budget item Topsoil Management Plan / maintenance Targeted/specific equipment used on site	Satisfactory	Financial	1	B	7	No	
29	6. Ecosystem and land use establishment	Unseasonal / adverse weather conditions at the time of seeding	Failure to follow Protocols, Plans, Procedures and Permits Geographical location LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA	Poor quality rehabilitation / failure to meet closure criteria	Andrew Speechly	Financial	1	Native seed mix consists of drought tolerant species Adequte on-site seed storage	Satisfactory	Financial	1	C	4	No	Include item in the rehab bulk shaping checklist to prompt a review of the weather forecast and ensure it is appropriate for the target land use / seed mix. (existing action 2131620)
30	6. Ecosystem and land use establishment	Lack of availability and quantity of target seed resources	Failure to follow Protocols, Plans, Procedures and Permits Geographical location LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA	Poor quality rehabilitation / failure to meet closure criteria	Andrew Speechly	Financial	1	Long term seed contract with Diversity Native Seed - extensive systems in place Seed list designed to allow flexibility based on availability Seed species common across Hunter Valley Majority of rehab in the future is pasture - less reliance on woodland species.	Satisfactory	Financial	1	D	2	No	

Risk Ref.	*Steps of process*	Risk Event Description (Risk of….)	Cause (Due to…)	Consequence (Resulting in..)	Risk Owner	Potential Maximum Consequence (PMC)		Existing Controls	Risk Control Effectiveness	Current Risk with Existing Controls					Risk Treatment/Actions
						Consequence Categories	PMC			Consequence Categories	Highest Consequence	Likelihood	Residual Risk Rating	Tolerability approval required	Risk Treatment/ Actions
31	6. Ecosystem and land use establishment	Poor seed viability	Failure to follow Protocols, Plans, Procedures and Permits Geographical location Inherent weed prevalence in topsoil LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA Skilled Contractors Availability LTA	Poor quality rehabilitation / failure to meet closure criteria	Andrew Speechly	Environment	2	Long term seed contract with viability and quality benchmarks Reputable suppliers in Hunter Valley All viability data is stored on seed portal	Satisfactory	Environment	1	D	2	No	Review seed storage and develop a register for managing seed stored for longer periods of time. Consider potential viability testing for seed stored longer periods of time.
32	6. Ecosystem and land use establishment	Insect and/or plant disease imapcting vegetation (particularly early establishment)	Failure to follow Protocols, Plans, Procedures and Permits Geographical location Inherent weed prevalence in topsoil LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA Skilled Contractors Availability LTA	Poor quality rehabilitation / failure to meet closure criteria	Andrew Speechly	Environment	1	Long term seed contract with seed treatment specifications Rehabilitation Monitoring Rehab maintenance schedule Vegetation Clearance Plan (managing plant disease)	Satisfactory	Environment	1	D	2	No	

Risk Ref.	*Steps of process*	Risk Event Description (Risk of….)	Cause (Due to…)	Consequence (Resulting in..)	Risk Owner	Potential Maximum Consequence (PMC)		Existing Controls	Risk Control Effectiveness	Current Risk with Existing Controls					Risk Treatment/Actions
						Consequence Categories	PMC			Consequence Categories	Highest Consequence	Likelihood	Residual Risk Rating	Tolerability approval required	Risk Treatment/ Actions
33	6. Ecosystem and land use establishment	Lack of availability, or poor quality of tubestock for supplementary planting	Failure to follow Protocols, Plans, Procedures and Permits Geographical location Inherent weed prevalence in topsoil LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA Skilled Contractors Availability LTA	Poor quality rehabilitation / failure to meet closure criteria	Andrew Speechly	Environment	2	ARCP Budget process Rehabilitation Monitoring Rehab and disturbance procedure Experienced suppliers / nurseries within Hunter Valley	Satisfactory	Environment	1	D	2	No	
34	6. Ecosystem and land use establishment	Use of inappropriate or inadequate rehabilitation techniques, including equipment fleet	Failure to follow Protocols, Plans, Procedures and Permits Geographical location LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA	Poor quality rehabilitation / failure to meet closure criteria	Andrew Speechly	Environment	2	Rehabilitation & Disturbance Procedure Rehabilitation / Revegetation works contract Rehabilitation Design Handover Checklist	Satisfactory	Environment	1	D	2	No	
35	6. Ecosystem and land use establishment	Inappropriate revegetetation species mix for targeted final land use	Failure to follow Protocols, Plans, Procedures and Permits Geographical location LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA	Poor quality rehabilitation / failure to meet closure criteria	Andrew Speechly	Environment	3	Rehabilitation Monitoring Reports Annual Walkover assessment Specific rehab seed mixes (recently updated)	Satisfactory	Environment	1	D	2	No	

Risk Ref.	*Steps of process*	Risk Event Description (Risk of….)	Cause (Due to…)	Consequence (Resulting in..)	Risk Owner	Potential Maximum Consequence (PMC)		Existing Controls	Risk Control Effectiveness	Current Risk with Existing Controls					Risk Treatment/Actions
						Consequence Categories	PMC			Consequence Categories	Highest Consequence	Likelihood	Residual Risk Rating	Tolerability approval required	Risk Treatment/ Actions
36	6. Ecosystem and land use establishment	Trees and/or deep rooting shrubs establish on tailings capping rehabilitation areas	Failure to follow Protocols, Plans, Procedures and Permits LTA training & education Maintenance Regime LTA Planning & execution LTA Poor management practices	Expsoure of underlying tailings to water/oxygen etc.	Andrew Speechly	Financial	1	Final Land Use and Rehabilitation Plan (pasture only on tailings dams) Pasture seed mix Rehabilitation Monitoring and Annual Walkover Capping design - capping at least 2m Geochemical management plan - period testing	Satisfactory	Financial	1	D	2	No	Document strategy for maintenance of tailings/pasture rehabilitation areas. Complete a review of historical tailings dams with rehabilitation over them (West TSF/ Lemington) to investigate tree health and root depth.
37	6. Ecosystem and land use establishment	Availability of areas for revegetation in optimal seasonal conditions (seeding)	Failure to follow Protocols, Plans, Procedures and Permits Geographical location LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA	Poor quality rehabilitation / failure to meet closure criteria	Andrew Speechly	Environment	2	Budget process ARCP Rehabilitation & Disturbance Procedure (ground prep methods) Native seed mix consists of drought tolerant species	Satisfactory	Environment	1	D	2	No	
38	7. Ecosystem and land use development	TSF final landforms contained by constructed embankments not geotechnically stable	Not stable under static and/or siesmic loads Failure of erosion and sediment controls LTA design	Resulting in rehab failure / failure to meet closure criteria Exposure of tailings/pollution	Scott Munns	Financial	3	Containment embankments designed by competent engineers. Included stability (static & dynamic) analysis. Embankment construction include appropriate QA/QC GCAA Tailings Protocol and HVO Dam Management Plan Operation and Maintaintenace Manual includes routine surveillance by engineer	Satisfactory	Financial	3	D	9	No	

Risk Ref.	*Steps of process*	Risk Event Description (Risk of….)	Cause (Due to…)	Consequence (Resulting in..)	Risk Owner	Potential Maximum Consequence (PMC)		Existing Controls	Risk Control Effectiveness	Current Risk with Existing Controls					Risk Treatment/Actions
						Consequence Categories	PMC			Consequence Categories	Highest Consequence	Likelihood	Residual Risk Rating	Tolerability approval required	Risk Treatment/ Actions
39	7. Ecosystem and land use development	Insufficient establishment of target species and limited species diversity	Current designs do not adequately mitigate a specific landform / feature / contaminated site risk Exact scope of works unknown Insufficient skill & experience to complete task LTA engagement with relevant stakeholders LTA identification of risks and opportunities to support closure objectives Monitoring, Reconciliation and Management LTA Planning parameters LTA Unresolved / unclear completion criteria and data requirements for relinquishment approval	Failure to meet closure criteria	Andrew Speechly	Environment	3	Rehabilitation Management Plan Rehabilitation & Disturbance Procedure Detailed / extensive seed mixes Rehabilitation Monitoring Annual Walkover assessment Detailed Maintenance Plans Existing/approved closure criteria	Satisfactory	Environment	2	C	8	No	

Risk Ref.	*Steps of process*	Risk Event Description (Risk of….)	Cause (Due to…)	Consequence (Resulting in..)	Risk Owner	Potential Maximum Consequence (PMC)		Existing Controls	Risk Control Effectiveness	Current Risk with Existing Controls					Risk Treatment/Actions
						Consequence Categories	PMC			Consequence Categories	Highest Consequence	Likelihood	Residual Risk Rating	Tolerability approval required	Risk Treatment/ Actions
40	7. Ecosystem and land use development	Long term water quality and quantity issues outside of projections (e.g. acid-drainage, high salinity)	Current designs do not adequately mitigate a specific landform / feature / contaminated site risk Exact scope of works unknown Insufficient skill & experience to complete task LTA engagement with relevant stakeholders LTA identification of risks and opportunities to support closure objectives Monitoring, Reconciliation and Management LTA Planning parameters LTA Unresolved / unclear completion criteria and data requirements for relinquishment approval Consolidation of fine rejects will expel pore water of moderate salinity	Failure to meet closure criteria	Andrew Speechly	Environment	3	Rehabilitation & Disturbance Procedure Topsoil Management Plan Water Management Plan Water Monitoring Program including sampling of sediment dams Rehabilitation Monitoring Fine Reject Management Strategy	Satisfactory	Environment	2	D	5	No	Existing Action 1991044-2056133:Review rehab dam water quality and assess whether dam water is of suitable quality to be released offsite
41	7. Ecosystem and land use development	Weather and climatic influences (drought, flood, bushfire) impacting vegetation long term survival	Failure to follow Protocols, Plans, Procedures and Permits Geographical location LTA operating budget Mine Plan design LTA Monitoring, Reconciliation and Management LTA Planning & execution LTA	Poor quality rehabilitation / failure to meet closure criteria	Andrew Speechly	Environment	3	Rehabilitation Monitoring Reports Annual Walkover assessment Bushfire Management Plan Native seed mix consists of locally sourced and drought tolerant species	Satisfactory	Environment	1	C	4	No	

Risk Ref.	*Steps of process*	Risk Event Description (Risk of….)	Cause (Due to…)	Consequence (Resulting in..)	Risk Owner	Potential Maximum Consequence (PMC)		Existing Controls	Risk Control Effectiveness	Current Risk with Existing Controls					Risk Treatment/Actions
						Consequence Categories	PMC			Consequence Categories	Highest Consequence	Likelihood	Residual Risk Rating	Tolerability approval required	Risk Treatment/ Actions
42	7. Ecosystem and land use development	Lack of consideration towards licencing of runoff water from rehabilitation areas (water take)	Failure to follow Protocols, Plans, Procedures and Permits Adequate licencing not in place	Fine / prosecution	Andrew Speechly	Legal	1	Licensing not required until water becomes 'clean' Water Management Plan Water Monitoring Program including sampling of sediment dams GCAA Mine Closure Standard	Satisfactory	Legal	1	C	4	No	
43	7. Ecosystem and land use development	Unauthorised damage to rehabilitation (fauna, stock, vandalism, vehicles, unauthorised clearing)	Failure to follow Protocols, Plans, Procedures and Permits LTA training & education LTA site access control ie fencing, gates, boundaries	Increased / additional costs. Failure to meet closure criteria	Andrew Speechly	Environment	3	Rehabilitation Management Plan Vertebrate Pest Control Program Rehabilitation areas fenced off from stock Lease agreements (stock areas) GDP Process Monthly inspections Rehabilitation Monitoring Rehab maintenance/budget ARCP	Satisfactory	Environment	1	C	4	No	
44	7. Ecosystem and land use development	Erosion and failure of landforms or structures (contours, drop structures, dams)	Extreme weather event Maintenance Regime LTA Planning & execution LTA Water Infrastructure LTA Failure of erosion and sediment controls Current designs do not adequately mitigate a specific landform / feature / contaminated site risk Mine Plan design Non compliance	Increased / additional costs. Failure to meet closure criteria	Andrew Speechly	Environment	3	Rehabilitation Management Plan Rehabilitation & Disturbance Procedure Rehabilitation Monitoring Annual Walkover assessment Detailed Maintenance Plans Rehab Report Card Landform Design long term modelling (geofluv) Drainage design for contours and drop structures and compliance check Bulk shaping and rehab checklist	Satisfactory	Environment	1	C	4	No	Review contour design specs to consider tie-ins with existing rehab (accounting for settlement)

Risk Ref.	*Steps of process*	Risk Event Description (Risk of….)	Cause (Due to…)	Consequence (Resulting in..)	Risk Owner	Potential Maximum Consequence (PMC)		Existing Controls	Risk Control Effectiveness	Current Risk with Existing Controls					Risk Treatment/Actions
						Consequence Categories	PMC			Consequence Categories	Highest Consequence	Likelihood	Residual Risk Rating	Tolerability approval required	Risk Treatment/ Actions
45	7. Ecosystem and land use development	Re-disturbance of established rehabilitation areas	Mine Plan design LTA Planning & execution LTA Unresolved / unclear completion criteria and data requirements for relinquishment approval LTA identification of risks and opportunities to support closure objectives	Increased / additional costs	Andrew Speechly	Environment	2	LOM / Budget planning process ARCP GDP Process Rehab and disturbance procedure Topsoil Management Plan	Satisfactory	Environment	1	D	2	No	
46	7. Ecosystem and land use development	Limited vegetation structural development and habitat for fauna species	Current designs do not adequately mitigate a specific landform / feature / contaminated site risk Exact scope of works unknown Insufficient skill & experience to complete task LTA engagement with relevant stakeholders LTA identification of risks and opportunities to support closure objectives Monitoring, Reconciliation and Management LTA Planning parameters LTA Unresolved / unclear completion criteria and data requirements for relinquishment approval	Failure to meet closure criteria	Andrew Speechly	Environment	2	Rehabilitation Management Plan Rehabilitation & Disturbance Procedure Detailed / extensive seed mixes Rehabilitation Monitoring Annual Walkover assessment Detailed Maintenance Plans	Satisfactory	Environment	1	D	2	No	

Risk Ref.	*Steps of process*	Risk Event Description (Risk of….)	Cause (Due to…)	Consequence (Resulting in..)	Risk Owner	Potential Maximum Consequence (PMC)		Existing Controls	Risk Control Effectiveness	Current Risk with Existing Controls					Risk Treatment/Actions
						Consequence Categories	PMC			Consequence Categories	Highest Consequence	Likelihood	Residual Risk Rating	Tolerability approval required	Risk Treatment/ Actions
47	7. Ecosystem and land use development	Lack of infrastructure to support intended final land use (e.g. stock dams, fences)	Planning & execution LTA LTA identification of risks and opportunities to support closure objectives Unresolved / unclear completion criteria and data requirements for relinquishment approval Closure planning required further detail Unexpected or early mine closure	Increased / additional costs. Failure to meet closure criteria	Andrew Speechly	Environment	2	Rehabilitation Management Plan ARCP Final Landform Rehabilitation Plan - access to all pasture areas Lease agreements for grazing areas (existing fencing/water)	Satisfactory	Environment	1	D	2	No	Develop a conceptual infrastructure plan for pasture rehabilitation areas. This should include water sources, access points and fencing locations for cattle.
48	7. Ecosystem and land use development	Insufficient productivity in Alluvial Lands or other Class 1, 2, 3 final land use areas	Maintenance Regime LTA Inherent weed prevalence in topsoil LTA identification of risks and opportunities to support closure objectives Unresolved / unclear completion criteria and data requirements for relinquishment approval Unexpected or early mine closure	Resulting in rehab failure / failure to meet closure criteria	Andrew Speechly	Financial	2	Alluvial Lands Land Capability Assessment Rehabilitation monitoring Lease agreements on current areas Alluvial lands cropping study (mid-2000s) Agricultural Land Reinstatement Management Plan	Satisfactory	Financial	1	D	2	No	Prepare and implement a plan to segregate mine-water and haulroad runoff from the Alluvial Lands pasture irrigation area (Existing action 2139643)
49	8. Mine subsidence affected areas	Unplanned or greater than predicted subisdence impacts (Cheshunt / Newdell)	Historical data LTA Maintenance Regime LTA LTA identification of risks and opportunities to support closure objectives	Increased / additional costs.	Andrew Speechly	Environment	1	Geotech report of subsidence risks for Lemington Underground Geotech PHMP Rehabilitation Monitoring Rehabilitation Maintenance Plans ARCP	Satisfactory	Environment	1	D	2	No	

APPENDIX C: COMPLETION CRITERIA

Table 1 – Infrastructure Criteria

FINAL LAND USE DOMAIN	MINING DOMAIN	REHABILITATION OBJECTIVES	INDICATOR (specific attribute associated with the objective)	COMPLETION CRITERIA (benchmark for the indicator)	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS	SPATIAL REFERENCE	STATUS
Native Ecosystem (CEEC/EEC or non CEEC/EEC) or Agricultural Land Use	• Infrastructure Area; • Tailings Storage Facility; • Water Management Area; • Overburden Emplacement Area; • Void (Open Cut void); • Underground Mining Area (subsidence management); • Beneficiation Facility; and • Other	Infrastructure	All site services have been removed (electricity, telecommunications etc.). Where services are buried (i.e. pipelines, cables etc.) and their retrieval may lead to further disturbance, the infrastructure may be left in situ provided that they don't pose constraints to the post mining land use. In this situation, the location of the services will be surveyed and marked on the record tracings and a suitable caveat developed to provide that they are readily identifiable for future land holders.	Services and utility infrastructure removed.	Statement provided. Survey record tracings	A – all B - all	Proposed
			Removal of all buildings and other infrastructure, unless there is a written agreement with the RR for infrastructure to remain in situ.	Infrastructure removed.	Statement provided Demolition records from certified contractor	A – all B - all	Proposed
			Heritage obligations (e.g. development consent under the *Environmental Planning and Assessment Act 1979,* approvals under the *Heritage Act 1977,* etc.) have been met (e.g. archival recording, building retention or building demolition with footings preserved).	Permits and approval documents issued; archival reports (where required) complete and submitted.	Copy of any relevant approval documentation.	A – all B - all	Proposed
			Removal of all plant, equipment and associated infrastructure including processing facilities, stockpile areas, rail infrastructure and loading facilities, underground hydrocarbon storage tanks, office complex, portable offices, exploration core samples, camp facilities, storage racks, samples.	Infrastructure removed.	As-constructed final landform plan, photos etc.	A – all B - all	Proposed
			Removal of all footings or removal to a certain depth (0.5 metres) OR equivalent depth of cover	Infrastructure removed.	Demolition records from certified contractor Surveyed and marked on the as-constructed final landform plan.	A – all B - all	Proposed

FINAL LAND USE DOMAIN	MINING DOMAIN	REHABILITATION OBJECTIVES	INDICATOR (specific attribute associated with the objective)	COMPLETION CRITERIA (benchmark for the indicator)	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS	SPATIAL REFERENCE	STATUS
			Removal of all water management infrastructure (including dams, drains, sediment, pumps, pipes and power) not required for final land uses.	Infrastructure removed.	Statement provided and before/after photos.	A – all B - all	Proposed
			All drill cores have been removed and either taken to authorised storage or disposal location.	Cores removed.	Statement provided Waste tracking reports	A – all B - all	Proposed
			All drill holes, excavations, and groundwater monitoring bores are decommissioned and sealed in accordance with RR requirements, excluding those being retained for monitoring purposes.	Sealing complete.	Engineering report/statement Plug and Abandonment log, photos etc.	A – all B - all	Proposed

Table 2 – Infrastructure to Remain Criteria

FINAL LAND USE DOMAIN	MINING DOMAIN	REHABILITATION OBJECTIVES	INDICATOR (specific attribute associated with the objective)	COMPLETION CRITERIA (benchmark for the indicator)	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS	SPATIAL REFERENCE	STATUS
Native Ecosystem (CEEC/EEC or non CEEC/EEC) or Agricultural Land Use	• Infrastructure Area; • Tailings Storage Facility; • Water Management Area; • Overburden Emplacement Area; • Void (Open Cut void); • Underground Mining Area (subsidence management); • Beneficiation Facility; and • Other	<u>Infrastructure to Remain</u> All infrastructure that is to remain as part of the final land use is safe and has relevant approvals in place.	Where applicable, necessary approvals are in place (e.g. development consent under the Environmental Planning and Assessment Act 1979) where buildings and infrastructure are to be retained as part of final land use	Permits and approval documents issued	Copy of any relevant approvals.	A – all B - all	Proposed
			Potential hazards (e.g. electrical, mechanical) have been effectively isolated.	Hazards isolated.	Statement provided.	A – all B - all	Proposed
			Access tracks that are to remain are in a trafficable condition that is suitable for their intended purposes.	Any required Repairs or Upgrades complete.	Copy of any relevant plans, photos etc.	A – all B - all	Proposed
			Heritage obligations as required under the *Environmental Planning and Assessment Act 1979*, *Heritage Act 1977,* etc. have been met (e.g. archival recording, building retention and restoration).	Permits and approval documents issued; archival reports (where required) complete and submitted.	Copy of any relevant approval documentation.	A – all B - all	Proposed

FINAL LAND USE DOMAIN	MINING DOMAIN	REHABILITATION OBJECTIVES	INDICATOR (specific attribute associated with the objective)	COMPLETION CRITERIA (benchmark for the indicator)	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS	SPATIAL REFERENCE	STATUS
			The structural integrity of the infrastructure has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended final land use.	Structural integrity reports received and confirm structures are safe	Engineering report/statement, photos etc.	A – all B - all	Proposed
			If any underground pipelines or other infrastructure are to remain in situ, they do not pose a hazard for the intended final land use. Note: If any underground pipelines or other infrastructure are to remain in situ in areas to be returned for Agriculture – cropping they are at a depth >0.5m	The location of the infrastructure has been marked on a plan and registered with the relevant local authority (e.g. local Council) and Dial Before You Dig where this is required by the Council or the relevant Authority.	Surveyed and marked on the as-constructed final landform plan. Copy of notification to or correspondence with local Council and Dial Before You Dig	A – all B - all	Proposed

Table 3 – Land Contamination, Landform Stability, Bushfire, Surface Water Quality, Groundwater Quality, Groundwater Regime, Water Approvals

FINAL LAND USE DOMAIN	MINING DOMAIN	REHABILITATION OBJECTIVES	INDICATOR (specific attribute associated with the objective)	COMPLETION CRITERIA (benchmark for the indicator)	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS	SPATIAL REFERENCE	STATUS
Native Ecosystem (CEEC/EEC or non CEEC/EEC) or Agricultural Land Use	• Infrastructure Area; • Tailings Storage Facility; • Water Management Area; • Overburden Emplacement Area; • Void (Open Cut void); • Underground Mining Area (subsidence management); • Beneficiation Facility; and • Other	<u>Land Contamination</u> There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.	Contamination will be appropriately remediated to a condition that does not pose a threat of environmental harm or constrain the final land use	Contamination will be appropriately remediated so that appropriate guidelines for land use are met, e.g. Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999).	Contamination Remediation Report prepared by Land Contamination Consultant Site Contamination Audit Report and Site Audit Statement prepared by EPA Accredited Auditor (where required)	All	Proposed
			Hazardous materials are identified and removed from site including hydrocarbons, chemicals, explosive products, asbestos containing materials (ACMs), lead paints, synthetic mineral fibres (SMFs) and polychlorinated biphenyls (PCBs) (verified by Certificates of disposal).	Waste tracking reports show removal of all hazardous materials	Waste tracking reports	All	Proposed
			Where practical, exposed carbonaceous material will be removed and co-disposed within the mining voids or suitably capped in situ, including coal stockpile areas.	Carbonaceous material removed and no longer present on surface	Rehabilitation monitoring reports Survey records	All	Proposed

FINAL LAND USE DOMAIN	MINING DOMAIN	REHABILITATION OBJECTIVES	INDICATOR (specific attribute associated with the objective)	COMPLETION CRITERIA (benchmark for the indicator)	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS	SPATIAL REFERENCE	STATUS
			Exposed coal seams will be capped with at least 3m of benign material where required to prevent spontaneous combustion	Capping completed	Survey records Photos	All	Proposed
			Net acid generating and carbonaceous materials will be capped by a minimum of 5 m of benign material where practical.	Material capped	Capping surveys / Survey record tracings Final landform plan	All	Proposed
			Monitoring records verify that there is no evidence of spontaneous combustion.	Monitoring records verify that there is no evidence of spontaneous combustion.	Aerial surveys Inspections Rehabilitation monitoring reports	All	Proposed
			Residual waste materials stored on site (e.g. tailings dams) will be appropriately contained / encapsulated and free draining so it doesn't pose any threat of environmental harm or constrain the intended final land use	The structural integrity of the infrastructure has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended final land use and does not pose threat of environmental harm.	Engineered capping design with specifications. As-built capping surveys	All	Proposed

FINAL LAND USE DOMAIN	MINING DOMAIN	REHABILITATION OBJECTIVES	INDICATOR (specific attribute associated with the objective)	COMPLETION CRITERIA (benchmark for the indicator)	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS	SPATIAL REFERENCE	STATUS
		<u>Landform Stability</u> The final landform is stable and does not present a risk of environmental harm downstream/downslope of the site or a safety risk to the public/stock/native fauna.	Landform is generally compatible within the context of the local topography	Landform is contiguous with surrounding environment.	Final landform plan	All	Proposed
			Overburden emplacement external slopes will generally be graded to an average of less than 10 degrees. Internal slopes may be steepened to grades up to 18 degrees. Note: localised steepening of slopes will occur due to contour bank construction or natural landform shapes etc.	Slopes generally comply with approval requirements and are stable	Final landform plan	All	Proposed
			Creek diversions are assessed to be stable as defined by the CSIRO Ephemeral Stream Assessment	Creek diversions are assessed to be stable as defined by the CSIRO Ephemeral Stream Assessment	Channel assessment reports	All	Proposed
			Landforms are assessed to be geotechnically stable and free draining to local watercourses	Geotech reports received and confirm landforms are stable	Geotechnical assessment report Rehabilitation monitoring reports Erosion surveys	All	Proposed
			A safety berm and/or security fence is constructed at the void crest (highwalls and endwalls) that provides an adequate engineered barrier for vehicles.	Berm constructed	Survey records Photos	All	Proposed

FINAL LAND USE DOMAIN	MINING DOMAIN	REHABILITATION OBJECTIVES	INDICATOR (specific attribute associated with the objective)	COMPLETION CRITERIA (benchmark for the indicator)	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS	SPATIAL REFERENCE	STATUS
			Minimal erosion that would not require moderate to significant ongoing care and maintenance works. Any areas of active erosion are within the parameters for safe and stable landform. Discharge points from rehabilitated landform to natural channels are stable.	The final landform has been constructed in accordance with the approved Final Landform & Rehabilitation Plan . Signs of erosion and or land instability are recorded, measured and assessed. The average annual soil loss from the final landform at completion is to be equal or less than that specified by the Revised Universal Sediment Loss Equation (or equivalent) for the approved land use. Spillway (where required) of final void and any remaining dams has been constructed in accordance with hydrological design.	Before and after photos Rehabilitation monitoring reports As-constructed surveys Erosion surveys Independent reports that demonstrate long term stability of rehabilitated landform. Depending on the nature, scale and risks associated with a specific site, stability will need to be evaluated over a number of years (e.g. 5 years).	All	Proposed

FINAL LAND USE DOMAIN	MINING DOMAIN	REHABILITATION OBJECTIVES	INDICATOR (specific attribute associated with the objective)	COMPLETION CRITERIA (benchmark for the indicator)	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS	SPATIAL REFERENCE	STATUS
		<u>Bushfire</u> The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	Appropriate bushfire hazard controls (where required) have been implemented on the advice from the NSW Rural Fire Service.	Bushfire controls implemented appropriate to the final land use.	Statement provided and before/after photos.	All	Proposed
		<u>Surface Water Quality</u> Runoff water quality is similar to, or better than the pre-mining disturbance runoff water quality	Runoff water quality from rehabilitation areas represent an acceptable level of change from a background condition (baseline study).	Assessment of runoff water quality against local background water quality including: - EC - TSS - pH - Metals - Biological health in accordance with Australian River Assessment System (AUSRIVAS) or equivalent	Independent surface water assessment report Water quality monitoring reports. Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).	All	Proposed
			Water quality in all storages left on site (other than final voids) is suitable for the approved final land use	Assessment of water quality against guidelines for the final land use (e.g. agricultural, industrial, recreational)	Independent surface water assessment report Water quality monitoring reports. Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).	All	Proposed
FINAL LAND USE DOMAIN	MINING DOMAIN	REHABILITATION OBJECTIVES	INDICATOR (specific attribute associated with the objective)	COMPLETION CRITERIA (benchmark for the indicator)	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS	SPATIAL REFERENCE	STATUS
			Water quality in any approved final voids does not pose a risk to the final land use.	Final void study completed, which includes predicted water quality and assessment of toxicity.	Independent surface water assessment report Water quality monitoring reports. Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).	All	Proposed

		Groundwater Quality & Regime Groundwater quality and groundwater regime are within range as predicted in environmental assessment and Water Management Plan	Groundwater quality and groundwater regime are within range as predicted in environmental assessments and in accordance with water sharing plans and water allocations held by the site.	The measured water quality at important groundwater assets meets predictions. Modelled drawdown and water take is within predictions.	Independent hydro-geological assessment report Monitoring reports Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).	All	Proposed
		Water Approvals Structures that take water are appropriately licensed.	Licenses held, where required.	Hydrological and hydro-geological assessments are undertaken to determine water take at completion from the relevant water sources to confirm that sufficient allocations are held.	Confirmation from relevant Government Agency (e.g. DPI Water) that licences are held.	All	Proposed

Table 4 – Targeted Ecological Rehabilitation

FINAL LAND USE DOMAIN	MINING DOMAIN	REHABILITATION OBJECTIVES	INDICATOR (specific attribute associated with the objective)	COMPLETION CRITERIA (benchmark for the indicator)	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS	SPATIAL REFERENCE	STATUS
			Plant competition is “suitable” for sustaining the target plant community(s)	The total cover of exotic plant species is recorded at fixed monitoring plots or transects as per BAM. Cover of High Threat Exotic and Priority Weeds is less than 10%	Rehabilitation monitoring reports Independent ecological reports (where required). Monitoring in accordance with NSW OEH BAM Methodology.	A - all	Proposed
			Habitat features (e.g. logs, rocks and nest boxes), including structures suitable for target species are incorporated into rehabilitation areas at required densities, as required by Approvals Native rehabilitation areas provide a range of structural features (e.g. trees, shrubs, ground cover, developing litter layer etc.).	Habitat and structural features recorded	Rehabilitation monitoring reports Independent ecological reports (where required). Monitoring in accordance with NSW OEH BAM Methodology.	A - all	Proposed

Table 5 – Non Targeted Native Woodland

FINAL LAND USE DOMAIN	MINING DOMAIN	REHABILITATION OBJECTIVES	INDICATOR (specific attribute associated with the objective)	COMPLETION CRITERIA (benchmark for the indicator)	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS	SPATIAL REFERENCE	STATUS
Native Vegetation (Non CEEC/EEC)	All domains	Approximately 30% (HVO North) and 30-40% (HVO South) of mined land re-established as woodland areas.	Approximately 30% of mined land re-established as woodland areas. Approximately 30-40 % of mined land re-established as woodland areas.	GIS records and pasture monitoring reports indicate minimum percentages have been attained.	Rehabilitation monitoring reports GIS records	A - all	Proposed
		Vegetation Composition	Rehabilitation areas contain flora species assemblages characteristic of the target native vegetation communities found in the local area.	≥30 native species present and ≥50 to <70% of native species recorded also occur at analogue sites	Rehabilitation monitoring reports Independent ecological reports (where required).	A - all	Proposed
			Indicative minimum total tree/shrub densities for seeded areas to be comparable to that of analogue sites (no./area).	250 - 500 stem/ha for native canopy species	Rehabilitation monitoring reports Independent ecological reports (where required).	A - all	Proposed
			Weed presence is within range found analogue sites and does not present a risk to the establishment and ongoing health of native species.	Less than 10% cover of High Threat Exotic and Priority Weeds	Rehabilitation monitoring reports Independent ecological reports (where required).	A - all	Proposed

FINAL LAND USE DOMAIN	MINING DOMAIN	REHABILITATION OBJECTIVES	INDICATOR (specific attribute associated with the objective)	COMPLETION CRITERIA (benchmark for the indicator)	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS	SPATIAL REFERENCE	STATUS
			Total groundcover (vegetation, leaf litter, mulch, rock) is comparable to that of analogue sites (% Cover).	Ground cover (vegetation, leaf litter, mulch, rock) is greater than 60%	Rehabilitation monitoring reports Independent ecological reports (where required).	A - all	Proposed
		The rehabilitation is self-sustainable	Evidence of flowering and seeds or second generation juveniles for trees and shrubs or likely to be, based on comparable older rehabilitation sites.	Trees and shrubs are monitored for evidence of second generation juveniles and evidence of flowers and seeds	Rehabilitation monitoring reports Independent ecological reports (where required).	A - all	Proposed
		Habitat features incorporated	Habitat features (e.g. logs, rocks and nest boxes), including structures suitable for target species are incorporated into rehabilitation areas at required densities, as required by Approvals Native rehabilitation areas provide a range of structural features (e.g. trees, shrubs, ground cover, developing litter layer etc.).	Habitat and structural features recorded	Rehabilitation monitoring reports Independent ecological reports (where required).	A - all	Proposed

FINAL LAND USE DOMAIN	MINING DOMAIN	REHABILITATION OBJECTIVES	INDICATOR (specific attribute associated with the objective)	COMPLETION CRITERIA (benchmark for the indicator)	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS	SPATIAL REFERENCE	STATUS
		Habitat corridors are established and consistent with target vegetation community compositions in final rehabilitation.	Habitat corridors are established and consistent with target vegetation community compositions, as required by Approvals.	Habitat corridors recorded	Rehabilitation monitoring reports Independent ecological reports (where required).	A - all	Proposed
		Target fauna assemblages and habitat in rehabilitation areas	Monitoring confirms target native fauna species are recorded utilising rehabilitation areas or habitat suitable for target species is present, as required by Approvals.	Monitoring for the presence and abundance of target fauna species and habitat	Rehabilitation monitoring reports Independent ecological reports (where required).	A - all	Proposed
		Feral animal density	Feral animal species do not pose a threat to final land uses	Feral animals are not impacting on vegetation establishment or health	Rehabilitation monitoring reports Independent ecological reports (where required).	A - all	Proposed

Table 6 – Agricultural Rehabilitation

FINAL LAND USE DOMAIN	MINING DOMAIN	REHABILITATION OBJECTIVES	INDICATOR (specific attribute associated with the objective)	COMPLETION CRITERIA (benchmark for the indicator)	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS	SPATIAL REFERENCE	STATUS
Agricultural Land Use	All domains	Approximately 70% (HVO North) and 60-70% (HVO South) of mined land re-established as stable, productive pasture areas.	70% of disturbed HVO North mining areas returned to productive pasture areas. 60-70% of disturbed HVO South mining areas returned to productive pasture areas.	GIS records and pasture monitoring reports indicate minimum percentages have been attained.	Rehabilitation monitoring reports GIS records	B - All	Proposed
		Rehabilitation is sustainable for the long term and only requires maintenance that is consistent with the intended final land use.	Land and Soil Capability classification or Agricultural Land Classification criteria met.	Land and Soil Capability classification or Agricultural Land Classification assessed against Approval requirements The re-established growth medium substrate (e.g. topsoil / subsoil) is capable of supporting the targeted pasture / cropping regime on a sustained basis.	Rehabilitation monitoring reports Independent agronomist /consultant reports, photos	B - All	Proposed
			Rehabilitation areas comprise palatable grasses and legumes appropriate to the district and suitable for cattle grazing.	>50% of herbage biomass comprises pasture species that are representative of species listed in site Approval documents or otherwise species that are perennial, palatable, and productive	Rehabilitation monitoring reports Independent agronomist /consultant reports, photos	B - All	Proposed

FINAL LAND USE DOMAIN	MINING DOMAIN	REHABILITATION OBJECTIVES	INDICATOR (specific attribute associated with the objective)	COMPLETION CRITERIA (benchmark for the indicator)	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS	SPATIAL REFERENCE	STATUS
			Weed presence is within range found analogue sites and does not present a risk to palatable pasture composition.	Less than 20% cover of High Threat Exotic and Priority Weeds	Rehabilitation monitoring reports Independent agronomist /consultant reports, photos	B - All	Proposed
			Cropping / Pasture establishment is in good health and provides adequate cover.	Ground cover (vegetation, leaf litter, mulch) is greater than 70%	Rehabilitation monitoring reports Independent agronomist /consultant reports, photos	B - All	Proposed
			Cropping yields from rehabilitated pasture areas is similar to adjacent cropping land.	Biomass >1500kg DM/ha (Green Dry Matter)	Rehabilitation monitoring reports Independent agronomist /consultant reports, photos	B - All	Proposed
			Production in tonnes /ha /year of Lucerne hay grown on the Class I and II lands of the ALRP is comparable to the district average.	7.6 to 15 t/ha.	Rehabilitation monitoring reports Independent agronomist /consultant reports, photos	B - All	Proposed
			Production in tonnes / ha / year of Lucerne hay grown on the Class II and III lands of the CWW Extension is comparable to the unmined reference sites.	TBD. Criteria to be developed with review of ALRP prior to commencement of CWW Extension.	Rehabilitation monitoring reports Independent agronomist /consultant reports, photos	B - All	Proposed

FINAL LAND USE DOMAIN	MINING DOMAIN	REHABILITATION OBJECTIVES	INDICATOR (specific attribute associated with the objective)	COMPLETION CRITERIA (benchmark for the indicator)	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS	SPATIAL REFERENCE	STATUS
			Appropriate and reliable access to water for livestock. Appropriate shade and shelter for livestock (i.e. wooded/treed areas) during extreme weather conditions.	Location and density of dams or other watering points appropriate for the intended final land use Location and availability of shade and shelter for livestock appropriate for the intended final land use	Independent agronomist /consultant reports, photos	B - All	Proposed

APPENDIX D: SEED MIXES

Woodland

Categories and Species Options	Preferred Seed Mix		
	Species % of category	Sowing rate (kg/ha)	Species Count
Dominant Trees			
Angophora floribunda	20%	0.050	1
Corymbia maculata	0%	0.000	
Eucalyptus albens	0%	0.000	
Eucalyptus blakelyi	0%	0.000	
Eucalyptus crebra	40%	0.100	1
Eucalyptus dawsonii	0%	0.000	
Eucalyptus fibrosa	0%	0.000	
Eucalyptus glaucina	0%	0.000	
Eucalyptus moluccana	40%	0.100	1
Eucalyptus punctata	0%	0.000	
Eucalyptus tereticornis	0%	0.000	
Total - Dominant Trees	**100%**	**0.250**	**3**
Sub-Dominant Trees			
Acacia decurrens	0%	0.000	
Acacia implexa	33%	0.050	1
Acacia linearifolia	0%	0.000	
Acacia parvipinnula	0%	0.000	
Acacia salicina	67%	0.100	1
Allocasuarina gymnanthera	0%	0.000	

Allocasuarina leuhmanii	0%	0.000	
Allocasuarina verticillata	0%	0.000	
Brachychiton populneus	0%	0.000	
Bursaria spinosa	0%	0.000	
Callitris endlicheri	0%	0.000	
Notelaea microcarpa	0%	0.000	
Total - Sub-Dominant Trees	**100%**	**0.150**	**2**
Shrubs- Acacias			
Acacia amblygona	40%	0.200	1
Acacia brownii	0%	0.000	
Acacia crassa	0%	0.000	
Acacia cultriformis	0%	0.000	
Acacia decora	20%	0.100	1
Acacia elongata	0%	0.000	
Acacia falcata	40%	0.200	1
Acacia paradoxa	0%	0.000	
Acacia spectabilis	0%	0.000	
Total - Shrubs - Acacias	**100%**	**0.500**	**3**
Shrubs- Fabaceaea			
Daviesia genistifolia	0%	0.000	
Daviesia ulicifolia	0%	0.000	
Daviesia ulicifolia subsp. Stenophylla	0%	0.000	
Hardenbergia violacea	0%	0.000	
Indigofera australis	0%	0.000	

Jacksonia scoparia	0%	0.000	
Podolobium ilicifolium	0%	0.000	
Pultenaea microphylla	0%	0.000	
Pultenaea spinosa	0%	0.000	
Total - Shrubs- Fabaceae	**100%**	**0.000**	**0**
Non-Nitrogen Fixing Shrubs			
Cassinia aculeata	0%	0.000	
Cassinia arcuata	0%	0.000	
Cassinia quinquefaria	0%	0.000	
Dodonaea viscosa subsp cuneata	100%	0.200	1
EreRMPhila deserti	0%	0.000	
Hakea sericea	0%	0.000	
Kunzea ambigua	0%	0.000	
Melaleuca decora	0%	0.000	
Melaleuca nodosa	0%	0.000	
Melichrus urceolatus	0%	0.000	
Myoporum montanum	0%	0.000	
Olearia elliptica	0%	0.000	
Ozothamnus diosmifolius	0%	0.000	
Pandorea pandorana	0%	0.000	
Senna artemesioides subsp. zygophylla	0%	0.000	
Total - Non-Nitrogen Fixing Shrubs	**100%**	**0.200**	**1**
Forbs and Subshrubs			
Ajuga australis	4%	0.010	1
Atriplex semibaccata	0%	0.000	

Calocephalus critreus	0%	0.000	
Calotis cuneifolia	0%	0.000	
Calotis lappulacea	8%	0.020	1
Chrysocephalum apiculatum	8%	0.020	1
Desmodium brachypodum	0%	0.000	
Einadia hastata	0%	0.000	
Einadia nutans	20%	0.050	1
Einadia polygonoides	0%	0.000	
Einadia trigonos	20%	0.050	1
Enchylaena tomentosa	0%	0.000	
EreRMPhila debilis	0%	0.000	
Glycine clandestina	0%	0.000	
Glycine latifolia	0%	0.000	
Glycine tabacina	0%	0.000	
Haloragis heterophylla	0%	0.000	
Hibbertia obtusifolia	0%	0.000	
Hypericum gramineum	0%	0.000	
Mentha satureoides	0%	0.000	
Maireana microphylla	20%	0.050	1
Neptunia gracilis	0%	0.000	
Podolepis neglecta	0%	0.000	
Pomax umbellata	0%	0.000	
Spartothamnella juncea	0%	0.000	
Solanum cinereum	0%	0.000	
Spartothamnella juncea	0%	0.000	
Swainsona galegifolia	0%	0.000	

Vittadinia spp.	20%	0.050	1
Wahlenbergia spp.	0%	0.000	
Total - Forbs and Subshrubs	**100%**	**0.250**	**7**
Grasses - Primary Colonising			
Austrostipa scabra	20%	0.500	1
Bothriochloa biloba	10%	0.250	1
Bothriochloa decipiens	20%	0.500	1
Bothriochloa macra	10%	0.250	1
Chloris truncata	20%	0.500	1
Digitaria spp.	8%	0.200	1
Enteropogon acicularis	8%	0.200	1
Panicum spp.	4%	0.100	1
Total Grasses - Primary Colonising	**100%**	**2.500**	**8**
Grasses - Long Term understorey			
Aristida spp.	13%	0.500	1
Austrodanthonia spp.	13%	0.500	1
Austrostipa aristiglumis	5%	0.200	1
Capillipedium spicigerum	7%	0.250	1
Chloris ventricosa	13%	0.500	1
Dicanthium sericeum	13%	0.500	1
Elymus scaber	0%	0.000	
Eragrostis spp.	7%	0.250	1
Eulalia aurea	0%	0.000	
Heteropogon contortus	0%	0.000	
Paspalidium distans	7%	0.250	1

Sporobolus creber	3%	0.100	1
Themeda avenacea	7%	0.250	1
Themeda triandra	13%	0.500	1
Total Grasses - Long Term Understorey	**100%**	**3.800**	**11**
Grasses - Shade tolerant			
Austrostipa ramosissima	0%	0.000	
Austrostipa verticillata	21%	0.300	1
Cymbopogon refractus	14%	0.200	1
Dichelachne crinita	0%	0.000	
Imperata cylindrica	14%	0.200	1
Microleana stipoides	36%	0.500	1
Poa labillardieri	14%	0.200	1
Total Grasses - shade tolerant	**100%**	**1.400**	**5**
Total - Native Grasses		**7.700**	**24**
TOTAL ALL CATEGORIES		**9.050**	**40**

Pasture Light Woody

Categories and Species Options	Preferred Seed Mix		
	Species % of category	Sowing rate (kg/ha)	Species Count
Dominant Trees			
Angophora floribunda	11%	0.100	1
Corymbia maculata	11%	0.100	1
Eucalyptus albens	0%	0.000	
Eucalyptus blakelyi	9%	0.080	1

Eucalyptus crebra	33%	0.300	1
Eucalyptus dawsonii	0%	0.000	
Eucalyptus fibrosa	2%	0.020	1
Eucalyptus glaucina	0%	0.000	
Eucalyptus moluccana	33%	0.300	1
Eucalyptus punctata	0%	0.000	
Eucalyptus tereticornis	0%	0.000	
Total - Dominant Trees	**100%**	**0.900**	**6**
Sub-Dominant Trees			
Acacia decurrens	33%	0.300	1
Acacia implexa	11%	0.100	1
Acacia linearifolia	0%	0.000	
Acacia parvipinnula	22%	0.200	1
Acacia salicina	22%	0.200	1
Allocasuarina gymnanthera	0%	0.000	
Allocasuarina leuhmanii	11%	0.100	1
Allocasuarina verticillata	0%	0.000	
Brachychiton populneus	0%	0.000	
Bursaria spinosa	0%	0.000	
Callitris endlicheri	0%	0.000	
Notelaea microcarpa	0%	0.000	
Total - Sub-Dominant Trees	**100%**	**0.900**	**5**
Shrubs- Acacias			
Acacia amblygona	17%	0.200	1
Acacia brownii	0%	0.000	
Acacia crassa	0%	0.000	

Acacia cultriformis	17%	0.200	1
Acacia decora	25%	0.300	1
Acacia elongata	8%	0.100	1
Acacia falcata	25%	0.300	1
Acacia paradoxa	8%	0.100	1
Acacia spectabilis	0%	0.000	
Total - Shrubs - Acacias	**100%**	**1.200**	**6**
Shrubs- Fabaceaea			
Daviesia genistifolia	29%	0.150	1
Daviesia ulicifolia	0%	0.000	
Daviesia ulicifolia subsp. Stenophylla	29%	0.150	1
Hardenbergia violacea	19%	0.100	1
Indigofera australis	10%	0.050	1
Jacksonia scoparia	10%	0.050	1
Podolobium ilicifolium	0%	0.000	
Pultenaea microphylla	0%	0.000	
Pultenaea spinosa	4%	0.020	1
Total - Shrubs- Fabaceae	**100%**	**0.520**	**6**
Non-Nitrogen Fixing Shrubs			
Cassinia aculeata	0%	0.000	
Cassinia arcuata	17%	0.100	1
Cassinia quinquefaria	17%	0.100	1
Dodonaea viscosa subsp cuneata	33%	0.200	1
EreRMPhila deserti	0%	0.000	

Hakea sericea	0%	0.000	
Kunzea ambigua	0%	0.000	
Melaleuca decora	0%	0.000	
Melaleuca nodosa	0%	0.000	
Melichrus urceolatus	0%	0.000	
Myoporum montanum	8%	0.050	1
Olearia elliptica	8%	0.050	1
Ozothamnus diosmifolius	8%	0.050	1
Pandorea pandorana	0%	0.000	
Senna artemesioides subsp. zygophylla	8%	0.050	1
Total - Non-Nitrogen Fixing Shrubs	**100%**	**0.600**	**7**
Forbs and Subshrubs			
Ajuga australis	3%	0.020	1
Atriplex semibaccata	3%	0.020	1
Calocephalus critreus	0%	0.000	
Calotis cuneifolia	0%	0.000	
Calotis lappulacea	5%	0.040	1
Chrysocephalum apiculatum	7%	0.050	1
Desmodium brachypodum	0%	0.000	
Einadia hastata	13%	0.100	1
Einadia nutans	7%	0.050	1
Einadia polygonoides	0%	0.000	
Einadia trigonos	7%	0.050	1
Enchylaena tomentosa	11%	0.080	1
EreRMPhila debilis	7%	0.050	1

Glycine clandestina	0%	0.000	
Glycine latifolia	0%	0.000	
Glycine tabacina	5%	0.040	1
Haloragis heterophylla	0%	0.000	
Hibbertia obtusifolia	0%	0.000	
Hypericum gramineum	0%	0.000	
Mentha satureoides	0%	0.000	
Maireana microphylla	7%	0.050	1
Neptunia gracilis	0%	0.000	
Podolepis neglecta	0%	0.000	
Pomax umbellata	0%	0.000	
Rhagodia parabolica	0%	0.000	
Solanum cinereum	3%	0.020	1
Spartothamnella juncea	7%	0.050	1
Swainsona galegifolia	7%	0.050	1
Vittadinia spp.	11%	0.080	1
Wahlenbergia spp.	0%	0.000	
Total - Forbs and Subshrubs	**100%**	**0.750**	**15**
Grasses			
Aristida spp.	11%	0.500	1
Austrodanthonia spp.	2%	0.100	1
Austrostipa aristiglumis	0%	0.000	
Austrostipa ramosissima	0%	0.000	
Austrostipa scabra	9%	0.400	1
Austrostipa verticillata	5%	0.200	1
Bothriochloa biloba	5%	0.200	1

Bothriochloa decipiens	9%	0.400	1
Bothriochloa macra	5%	0.200	1
Capillipedium spicigerum	2%	0.080	1
Chloris truncata	9%	0.400	1
Chloris ventricosa	9%	0.400	1
Cymbopogon refractus	2%	0.100	1
Dicanthium sericeum	9%	0.400	1
Dichelachne crinita	0%	0.000	
Digitaria spp.	2%	0.100	1
Elymus scaber	0%	0.000	
Enteropogon acicularis	2%	0.100	1
Eragrostis spp.	2%	0.100	1
Eulalia aurea	0%	0.000	
Heteropogon contortus	0%	0.000	
Imperata cylindrica	0%	0.000	
Microleana stipoides	0%	0.000	
Panicum spp.	2%	0.100	1
Paspalidium distans	2%	0.100	1
Poa labillardieri	0%	0.000	
Sporobolus creber	2%	0.100	1
Themeda avenacea	0%	0.000	
Themeda triandra	9%	0.400	1
Total - Grasses	**100%**	**4.380**	**19**
TOTAL ALL CATEGORIES		**9.250**	**64**
Cover Crop			
Oats / Millet		5.00	

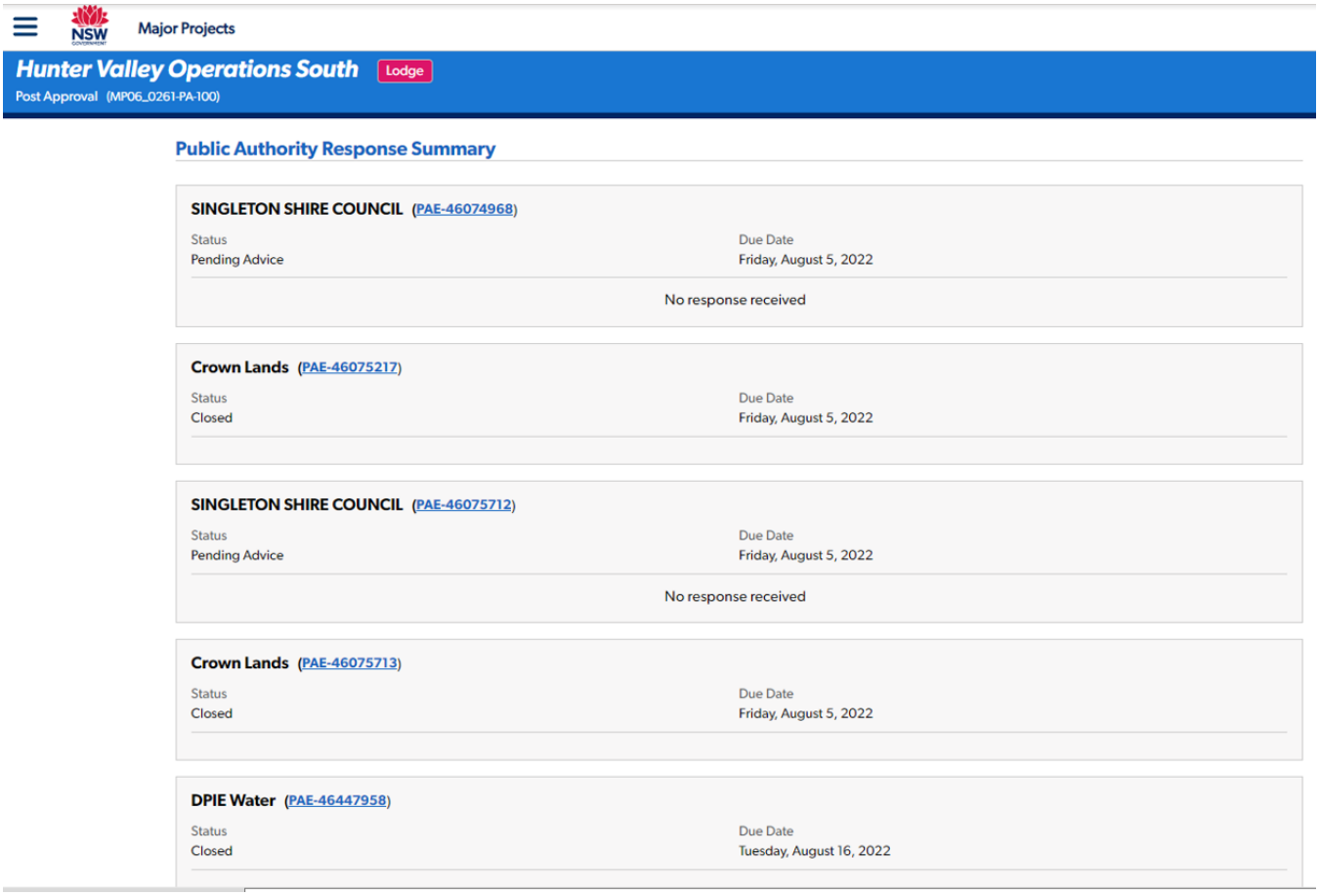
Couch		2.00
Rye		1.00
Bulking Agent		6.00
Total - Cover Crop		**14.00**

Pasture

PASTURE		Sowing Rate (kg/ha)	
Species	**Variety Options**	**Spring/Summer**	**Autumn/Winter**
Japanese Millet	*Shirohie, Rebound*	5	0
Oats	*Yarran, Coolabah e*	0	15
Kikuyu*	*Whittet, Noonan*	5	4
Digit Grass	*Premier*	5	3
Setaria	*Solander, Narok*	3	2
Paspalum	*Common*	3	2
Couch	*Hulled*	4	3
Tall Fescue	*Quantum, Fortune, Tower, Demeter*	2	5
Cocksfoot	*Porto, Uplands, Drover*		3
Ryegrass	*Wimmera, Tetila*	2	5
Lucerne	*Aurora, Titan 5 etc*	6	8
White Clover	*Haifa*	2	3
Barrel Medic	*Sephi, Jester etc*	2	5
Arrowleaf Clover	*Zulu, Cefalu*	3	4
Woolly Pod Vetch	*Namoi, Capello*		4
Chicory	*Puna, Command, Choice*	2	2
Plantain	*Tonic, Ecotain*	1	2
TOTAL		**40**	**55**

* Not used in areas adjacent to young woodland rehabilitation

APPENDIX E: CONSULTATION EVIDENCE



Major Projects

Hunter Valley Operations South Lodge

Post Approval (MP06_0261-PA-100)

Public Authority Response Summary

SINGLETON SHIRE COUNCIL (PAE-46074968)

Status	Due Date
Pending Advice	Friday, August 5, 2022

No response received

Crown Lands (PAE-46075217)

Status	Due Date
Closed	Friday, August 5, 2022

SINGLETON SHIRE COUNCIL (PAE-46075712)

Status	Due Date
Pending Advice	Friday, August 5, 2022

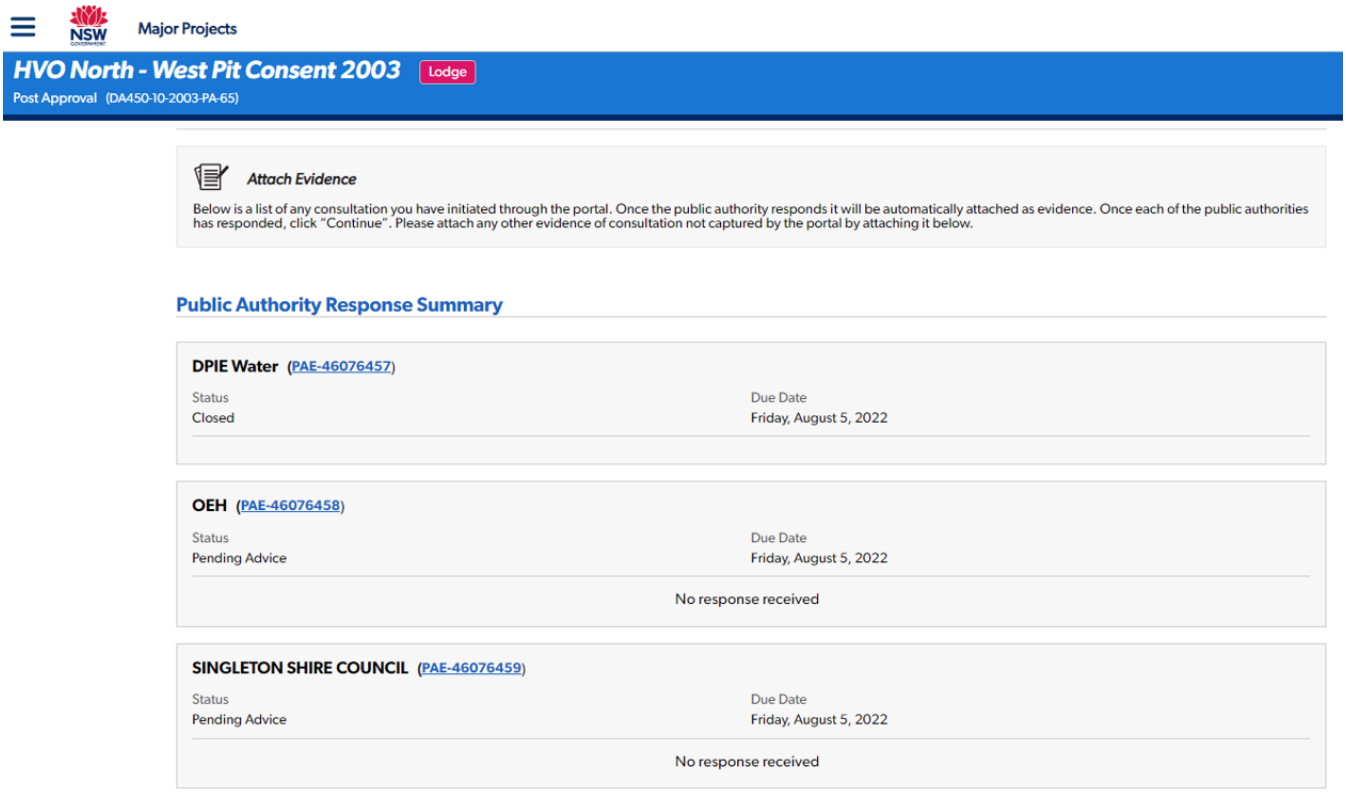
No response received

Crown Lands (PAE-46075713)

Status	Due Date
Closed	Friday, August 5, 2022

DPIE Water (PAE-46447958)

Status	Due Date
Closed	Tuesday, August 16, 2022



Major Projects

HVO North - West Pit Consent 2003 Lodge

Post Approval (DA450-10-2003-PA-65)

Attach Evidence

Below is a list of any consultation you have initiated through the portal. Once the public authority responds it will be automatically attached as evidence. Once each of the public authorities has responded, click "Continue". Please attach any other evidence of consultation not captured by the portal by attaching it below.

Public Authority Response Summary

DPIE Water (PAE-46076457)

Status	Due Date
Closed	Friday, August 5, 2022

OEH (PAE-46076458)

Status	Due Date
Pending Advice	Friday, August 5, 2022

No response received

SINGLETON SHIRE COUNCIL (PAE-46076459)

Status	Due Date
Pending Advice	Friday, August 5, 2022

No response received

Rehabilitation Management Plan - CCC Consultation

BM Bar [redacted] Forward ...

To

Tue 5/07/2022 3:29 PM

Cc [redacted] Peard, Greg (Hunter Valley Operations - AU)

HVO Rehabilitation Management Plan_1 July 2022.pdf
.pdf File

Dear CCC members,

In accordance with the North Development Consent (DA 450-10-2003), HVO is required to consult with the Community Consultation Committee (CCC) when preparing a Rehabilitation Management Plan.

I have attached the Rehabilitation Management Plan for your review.

Can you please let me know if you have any comments no later than **Tuesday 19 July.**

Regards,

Merri

Merri Bartlett | Environment and Community Officer

HUNTER VALLEY OPERATIONS
Address: 1011 Lemington Road Lemington NSW 2330 Australia
Postal: [redacted] 2330 Australia
Mobile: [redacted]
E-mail: merri.bartlett@hvo.com.au

HUNTER VALLEY OPERATIONS THINK SAFE WORK SAFE HOME SAFE

Department of Planning and Environment

Our ref: OUT22/11186

Andrew Speechly

Email andrew.speechly@hvo.com.au

26 July 2022

Subject: Hunter Valley Operations North and South (MP06_0261 and DA450_10_2003) Rehabilitation Management Plan

Dear Andrew,

I refer to your request seeking advice from the Department of Planning and Environment – Water (the department) on preparation of a Rehabilitation Management Plan for the above matter. It is understood this consultation is in accordance with conditions of approval for the project.

The department requests the Rehabilitation Management Plan be prepared to achieve the following general and specific outcomes. These are intended to meet the department's legislative, policy and water management requirements.

General

- Sharing of water must protect the water source, its dependent ecosystems and basic landholder rights.
- Water sources, floodplains and dependent ecosystems are protected and restored.
- Activities within a water source should avoid or minimise land degradation, including soil erosion, compaction, geomorphic instability, contamination, and where possible land should be rehabilitated.
- The final Rehabilitation Management Plan is made electronically available on a public accessible website.

Specific

- A conceptual model/diagram clearly presents how the groundwater and surface water systems interact with the final landform. This is to be informed by recent environmental assessments/modelling reviews.
- The final design and location of surface drainage features achieves a stable landform and maintains or improves riparian corridor functioning. This is to be completed with reference to industry guidelines such as: "*Rehabilitation Manual for Australian Streams* (LWRRDC 2000)", "*Guideline: Works that interfere with water in a watercourse for a resource activity* (DNRME 2019)" and "*Guidelines for Controlled Activities on Waterfront Land* (2012)" or their latest versions.
- Dirty runoff catchment areas are rehabilitated and the conveyance of clean surface runoff downstream is maximised.
- Decommissioning of groundwater boreholes is in accordance with the "Minimum Construction Requirements for Water Bores in Australia (2020)".

4 Parramatta Square, 12 Darcy Street, Parramatta NSW 2150
Locked Bag 5022, Parramatta NSW 2124
www.dpie.nsw.gov.au

Department of Planning and Environment

- Ongoing water take by the final landform via interception, storage or diversion is quantified and complies with relevant approvals and licences under the *Water Management Act 2000* or a relevant exemption. Please note exemptions from the requirement to hold approvals under s.90 and 91 of the *Water Management Act 2000* for approved SSD/SSI projects will not apply once the project approval ceases. Therefore, any relevant water management works that are to be retained will need to obtain an approval prior to the development consent lapsing.
- Aquifer interference activities are designed to minimise ongoing water take and water quality impacts and meet the requirements of the NSW Aquifer Interference Policy.
- Residual risk to water sources is clearly understood and minimised. This is to include relevant assessment documentation and updated risk assessments to meet the requirements of the NSW Aquifer Interference Policy. Further detail can be found in Fact Sheet 5 in Appendix C of the "*Guidelines for Groundwater Documentation for SSD/SSI Projects. Technical guideline* (DPE 2022)".
- A monitoring and review program is included to ensure the rehabilitation outcomes are met.

Should you have any further queries in relation to this submission please do not hesitate to contact DPE Water Assessments at water.assessments@dpie.nsw.gov.au

Yours sincerely,

Tim Baker
Senior Project Officer
Water Assessments
Department of Planning and Environment: Water

4 Parramatta Square, 12 Darcy Street, Parramatta NSW 2150
Locked Bag 5022, Parramatta NSW 2124

www.dpie.nsw.gov.au

Department of Planning and Environment

Our ref: MP06_0261-PA-100

Andrew Speechly
Manager – Environment and Community
HV OPERATIONS PTY LTD
1011 Lemington Road
Lemington NSW 2330

15/06/2023

Subject: Consultation on HVO Rehabilitation Management Plan

Dear Mr Speechly

I refer to your request seeking the Department's comment on the updated Hunter Valley Operations Rehabilitation Management Plan (version 1.0, dated July 2022) which has been prepared in accordance with condition 36 of Schedule 3 of PA06_0261 and condition 62C of Schedule 3 of DA 450-10-2003 and the NSW Resource Regulator Form and Way Guideline.

The Department has reviewed the updated Rehabilitation Management Plan and confirms it satisfies the requirements of the condition and consent.

Accordingly, the Department confirms it has no comments regarding the content or structure of the plan.

You are reminded that if there are any inconsistencies between the Rehabilitation Management Plan and the conditions of approval, the conditions prevail.

Please ensure you make the document publicly available on the project website at the earliest convenience.

If you wish to discuss the matter further, please contact me on (02) 4908 6896.

Yours sincerely

Joe Fittell
Team Leader
Energy and Resource Assessments
As nominee of the Planning Secretary

4 Parramatta Square, 12 Darcy Street, Parramatta NSW 2150
Locked Bag 5022, Parramatta NSW 2124

www.dpie.nsw.gov.au

1

Department of Planning and Environment

Our ref: DA450-10-2003-PA-65

Andrew Speechly
Manager – Environment and Community
HV OPERATIONS PTY LTD
1011 Lemington Road
Lemington NSW 2330

15/06/2023

Subject: Consultation on HVO Rehabilitation Management Plan

Dear Mr Speechly

I refer to your request seeking the Department's comment on the updated Hunter Valley Operations Rehabilitation Management Plan (version 1.0, dated July 2022) which has been prepared in accordance with condition 36 of Schedule 3 of PA06_0261 and condition 62C of Schedule 3 of DA 450-10-2003 and the NSW Resource Regulator Form and Way Guideline.

The Department has reviewed the updated Rehabilitation Management Plan and confirms it satisfies the requirements of the condition and consent.

Accordingly, the Department confirms it has no comments regarding the content or structure of the plan.

You are reminded that if there are any inconsistencies between the Rehabilitation Management Plan and the conditions of approval, the conditions prevail.

Please ensure you make the document publicly available on the project website at the earliest convenience.

If you wish to discuss the matter further, please contact me on (02) 4908 6896.

Yours sincerely

Joe Fittell
Team Leader
Energy and Resource Assessments
As nominee of the Planning Secretary

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