NSW GOVERNMENT

NSW Resources Regulator

ARR0001011

MUSWELLBROOK COAL ANNUAL REHABILITATION REPORT

Saturday 1 January 2022 to Saturday 31 December 2022

Contents

Summary table....3
Important....3
Project description....4
Life of mine....4
Current development consents, leases and licences....4
Changes to land ownership and land use....4
Surface disturbance and rehabilitation activities during the reporting period....5
Disturbance and rehabilitation statistics....7
Current disturbance and rehabilitation progression....7
Rehabilitation key performance indicators (KPIs)....7
Progressive achievement of established rehabilitation....8
Variation to the rehabilitation schedule....8
Rehabilitation monitoring and research findings....9
Rehabilitation monitoring....9
Status of performance against rehabilitation objectives and rehabilitation completion criteria....9
Outcomes of rehabilitation research and trials....16
Attachment 1 – Reporting Definitions....18
Attachment 2 – Definitions....21
Attachment 3 – Stakeholder consultation....23
Attachment 4 – Plans....30

Summary table

DETAIL	
Mine	Muswellbrook Coal
Reference	ARR0001011
Annual report period commencement date	Saturday 1 January 2022
Annual report period end date	Saturday 31 December 2022
Forward program	FWP0001071
Mining leases	ML 1304 (1992), CCL 713 (1973), ML 1562 (1992)
Lease holder(s)	Muswellbrook Coal Company Limited
Contact	Julie Thomas
Date of submission	

Important

The department may make the information in your report and any supporting information available for inspection by members of the public, including by publication on its website or by displaying the information at any of its offices. If you consider any part of your report to be confidential, please communicate this to the department via the message function on this submission within the NSW Resources Regulator Portal.

Mine details

Project description

Muswellbrook Coal Company Limited (MCC) operates the Muswellbrook Open Cut Coal Mine, located approximately three kilometres (km) to the north-east of Muswellbrook in the Hunter Valley of New South Wales. MCC is a wholly owned subsidiary of Idemitsu Australia Pty Limited (IA).

On 1 September 2003, Development Consent for DA 205/2002 was granted by Muswellbrook Shire Council (MSC) to extend the former MCC No.1 Open Cut. The No.1 Open Cut Extension commenced operations in March 2005 and has a capacity to produce up to 2,000,000 tonnes coal per annum with mining operations approved until end of 2022. Rehabilitation activities will progress past this date.

The current mine life at MCC is zero years. Mining operations ceased in 2022, with coal storage, handling and transport continuing until the end of March 2023.

Life of mine

0 years

Current development consents, leases and licences

Development consents granted under the *Environmental Planning and Assessment Act 1979*

Authorisations covering the mining area granted under the *Mining Act 1992*

ML 1304 (1992), CCL 713 (1973), ML 1562 (1992)

Any other approvals, licences, or authorities issued by government agencies that are relevant to the progress of mining operation and rehabilitation activities

Environmental Protection Licence 656
Water Licences WAL39806, WAL41503 and WAL41521

Summary of the scope and/or purpose of the new applications or modifications to existing approvals (if applicable)

During the reporting period, MCC's development consent DA 205/2002 was modified to allow for the storage, handling and transportation of coal to continue until the end of March 2023.

This modification was supported by a Modification Report that was submitted to Muswellbrook Shire Council (MSC). MSC sought feedback from other regulatory agencies and the public before approving this modification.

During the reporting period, new mining lease conditions were received for CCL713, ML1304 and ML1562. These conditions were received as part of changes made to Mining Regulation 2016.

Changes to land ownership and land use

There were no changes to land ownership or land use during the reporting period.

Surface disturbance and rehabilitation activities during the reporting period

Surface disturbance and rehabilitation activities that were conducted and an analysis of the progress against the rehabilitation schedule

There was no surface disturbance undertaken during the reporting period and mining operations continued in previously disturbed areas. Mining operations at MCC continued longer than expected during the reporting reported. This extension of mining operations was due to wet weather delaying mining activities and the identification of additional coal reserves available to mine.

The proposed rehabilitation work was to complete the reshaping of Open Cut 2, installation of a drop structure and contour drains, application of growth media and to seed the area.

The actual work completed was finalisation of the reshaping of Open Cut 2 and commencement of the installation of the drop structure and contour drains. Excessive and extensive rainfall received during the reporting period delayed the reshaping of the area, which in turn delayed the commencement of the installation of the drop structure and contour drains. In addition to the commencement delay, illness (mostly Covid) affected the ability of the contractor to provide resources to complete the work in a timely manner. These factors resulted in MCC not completing the proposed rehabilitation works in Open Cut 2.

Work is continuing on the installation of the drop structure and contour drains and this will be completed in Q2 2023. Following the completion of the installation of these water management structures, growth media and seed will be applied to the area.

Rehabilitation planning activities that were conducted, including any specialist studies

During the reporting period MCC commenced a series of studies relating to mine closure. The studies are being undertaken in consultation with Subject Matter Experts (SME's) and they include rehabilitation activities and other activities relating to mine relinquishment. The outcomes of these studies that are applicable to the ongoing rehabilitation of the site will be included in future revisions of the Rehabilitation Management Plan.

As part of the mine closure studies and planning for future rehabilitation activities, MCC continued with a Phase 2 contamination assessment of the site during the reporting period.

This assessment will identify if there are any areas of contamination that need to be managed as part of the rehabilitation activities on site.

Overview of subsidence repair and/or remediation works undertaken

Subsidence is not expected to impact on areas of rehabilitation. Historical bord and pillar underground mining has been undertaken at the site, which typically results in minimal subsidence therefore the risk of impact to rehabilitation is considered very low. No subsidence repair and/or remediation was required during the reporting period.

Overview of rehabilitation management and maintenance activities

Rehabilitation management and maintenance activities that occurred during the reporting period included:

- Spreading and incorporating compost and seeding an area of rehabilitation near Open Cut 2 where the vegetation had not established.
- Bare areas in rehabilitation across the site were spread with compost and reseeded to encourage vegetation to establish.
- Removing areas of spontaneous combustion in rehabilitation areas and replacing with inert material.
- Weed control on rehabilitation areas. Target species included Galenia, Acacia Saligna, Prickly Pear, Fleabane, Fireweed, Castor Oil and African Boxthorn.
- Wild dog baiting.

Details of any rehabilitation actions taken as required by any letters, notices or directions issued by government agencies, including the NSW Resources Regulator

In June 2022, MCC received a Notice under the Mining Act 1992 section 240 from the Resources Regulator. This notice resulted from a site inspection conducted in March 2022 where concerns were raised about areas of erosion that were identified in a previous inspection in April 2021 and during the 2021 Independent Environmental Audit.

The s240 Notice has directed MCC to undertake an assessment of the long-term erosional stability of the approved final landforms as part of the rehabilitation of the mine, using an industry accepted Landform Evolution Model. At the end of the reporting period work has commenced on this assessment, with the assessment to be finalised early in 2023. The findings from the assessment will be reported in the next Annual Rehabilitation Report.

Details of any rehabilitation areas that have achieved the final land use

There are no areas at MCC that have achieved final land use.

Key production milestones

MATERIAL	UNIT	FWP0001071 YEAR 1	THIS REPORT
Stripped topsoil (if applicable)	(m^3)	0	0
Rock/overburden	(m^3)	52,000	1,774,000
Ore	(Mt)	0.12	1.31
Reject material[1]	(Mt)	0.05	0.21
Product	(Mt)	0.11	1.13

[1] This includes coarse rejects, tailings and any other wastes resulting from beneficiation.

Disturbance and rehabilitation statistics

Current disturbance and rehabilitation progression

	ELEMENT	UNIT	FWP0001071 YEAR 1	THIS REPORT
A	**Total surface disturbance footprint**	(ha)	618.07	618.07
B	**Total active disturbance**	(ha)	203.32	219.51
C	**Land prepared for rehabilitation**	(ha)	84.14	61.44
D	**Ecosystem and land use establishment**	(ha)	82.79	0
E	**Ecosystem and land use development**	(ha)	N/A	337.12
F	**Rehabilitation completion**	(ha)	N/A	0

Rehabilitation key performance indicators (KPIs)

	ELEMENT	UNIT	FWP0001071 YEAR 1	THIS REPORT
G	**Total new active disturbance area**	(ha)	0	0
H	**New rehabilitation commenced during annual reporting period**	(ha)	82.79	0
J	**Annual rehabilitation to disturbance ratio**	%	0	0
I	**Established rehabilitation**	(ha)	N/A	337.12
K	**Rehabilitated land to total mine footprint**	%	N/A	54.54

Progressive achievement of established rehabilitation

	ELEMENT	UNIT	THIS REPORT
L	**Established rehabilitation - agricultural final land uses**	%	67.52
M	**Established rehabilitation - native ecosystem final land uses**	%	32.23
N	**Established rehabilitation - other/non-vegetated final land uses**	%	0.24

Variation to the rehabilitation schedule

Identify the components of the most recent forward program that were not achieved

The proposed work was to complete the reshaping of Open Cut 2, installation of a drop structure and contour drains, application of growth media and to seed the area. The actual work completed was the reshaping of Open Cut 2 and the commencement of the installation of the drop structure.

Key factors that delayed progressive rehabilitation

The actual work completed was finalisation of the reshaping of Open Cut 2 and commencement of the installation of the drop structure and contour drains. Excessive and extensive rainfall received during the reporting period delayed the reshaping of the area, which in turn delayed the commencement of the installation of the drop structure and contour drains. In addition to the commencement delay, illness (mostly Covid) affected the ability of the contractor to provide resources to complete the work in a timely manner. These factors resulted in MCC not completing the proposed rehabilitation works in Open Cut 2 during the reporting period.

Outline actions that will be included in the forward program and carried out to minimise disturbance and undertake progressive rehabilitation as far as reasonably practical

Work is continuing on the installation of the drop structure and contour drains and this will be completed in Q2 2023. Following the completion of the installation of these water management structures, growth media and seed will be applied to the area. These areas are shown as being completed in 2023 in the Forward Program.

Rehabilitation monitoring and research findings

Rehabilitation monitoring

The rehabilitation monitoring carried out in the annual reporting period

The Rehabilitation Monitoring Report demonstrated that overall, the rehabilitation areas are performing well. When the results were compared to relevant completion criteria, only one assessed item did not reach the target. This was the native ground cover levels at the Woodland rehabilitation sites.

No other specialist reports were completed.

Status of performance against rehabilitation objectives and rehabilitation completion criteria

The monitoring program that has been implemented

Woodland Summary

• All of the Rehabilitation woodland areas met the required completion criteria targets for characteristic species assemblage, priority and High Threat Exotic (HTE) weed burden cover and evidence of characteristic species seedlings.

• Rehabilitation woodland areas met three of the four components of the completion criteria targets for foliage cover being Native Overstorey, Native Midstorey and Litter, however, Native ground cover fell below the 10th percentile variation range of the Analogue woodland sites. Rehabilitation woodland areas may require further intervention (weed control or overseeding with competitive native species) to decrease weed cover/exotic grass cover and increase native grass cover to allow them to reach the completion criterion benchmark for native groundcover.

• Monitoring confirms that multiple native fauna species including ground-dwelling mammals, woodland birds, microbats, and reptiles are utilising rehabilitation woodlands across the site and that various fauna habitats are available for use by these species.

• Little significant active erosion occurring, no immediate action is required.

Pasture Summary

• All of the Rehabilitation pasture areas met the required completion criteria targets for groundcover, herbage biomass, priority weed burden and pasture composition (pasture quality).

• Weed management is recommended to reduce the priority weed burden at Rehabilitation pasture sites RP1, RP4 and RP6.

Are all rehabilitation areas in Landform Establishment phase or higher represented in the monitoring program to assess performance against the rehabilitation objectives and approved or, if not yet approved rehabilitation completion criteria and final landform and rehabilitation plan?

NO

Year rehabilitation areas will be included as part of the monitoring program

N/A

An appraisal of whether rehabilitation is moving towards achieving the proposed rehabilitation objectives, approved or, if not yet approved, rehabilitation completion criteria and final landform and rehabilitation plan as soon as reasonably practicable.

Rehabilitation is moving towards achieving the final land use as soon as reasonably practicable.

Appraisal description

Rehabilitation is moving towards achieving the final land use as soon as reasonably practicable.

Rehabilitation monitoring program findings

Rehabilitation monitoring was undertaken during the reporting period in accordance with the requirements of the RMP. A summary of the rehabilitation monitoring is shown below.

Rehabilitation Woodland – Vegetation

Based on the monitoring results, Rehabilitation woodland sites are performing well with species assemblages containing more than the minimum 25% of species being characteristic of the Vegetation Classes and Threatened Ecological Community's (TECs) within the region.

All sites also recorded native overstory species that occur in Plant Community Types (PCTs) and associated TECs within the region and are in the recommended species mix as shown in the RMP.

Across the Rehabilitation woodlands, the median foliage cover for Native Overstorey, Native Midstorey and Litter was within the 10th and 90th percentile variation range of the Analogue woodland sites, however, the Native ground cover fell below the 10th percentile variation range of the Analogue woodland sites.

The total priority and HTE cover has been calculated at 12% across rehabilitation woodlands and is below the completion criteria threshold of <15%.

Rehabilitation Woodland – Fauna

Overall, there seems to have been a slight increase in the overall numbers of fauna species recorded at Analogue and Rehabilitation sites.

Mammals, particularly the larger mammals, appeared to show a preference for utilisation of Rehabilitation areas over Analogue areas.

There has been an overall increase in the average number of bird species recorded within Rehabilitation woodland sites from 2015 to 2022.

Rehabilitation woodland site RW3 recorded presence of Pomatostomus temporalis (Grey crowned Babbler) which is listed as Vulnerable under the Biodiversity Conservation Act 2016 (BC Act).

Monitoring indicates good microbat activity, with both common species recorded at all Analogue and woodland sites, and threatened species recorded across all Analogue and Rehabilitation sites.

Rehabilitation pasture – Vegetation

Rehabilitation pasture sites are preforming well. Overall, ground cover was good with all sites well above the minimum >50% ground cover require. The median herbage mass yield was much greater than the Analogue pastures 10th percentile and the minimum 1000 kg/ha threshold required for sustainable grazing. The species composition showed that vegetative cover was dominated by desirable and palatable pasture species.

The median value for weeds recorded at the Rehabilitation pasture sites was well below the 90th percentile criteria threshold based on Analogue pasture sites.

Rehabilitation – Erosion and landform stability

Generally, there was little active erosion occurring within the rehabilitation sites.

Performance issues and their causes including identification of any knowledge gaps that must be addressed

The Rehabilitation Monitoring Report identified that targeted weed management may be required to prevent degradation of rehabilitated areas. The Rehabilitation Monitoring Report also identified that rehabilitation woodland areas may require further intervention (weed control or overseeding with competitive native species) to decrease weed cover/exotic grass cover and increase native grass cover to allow them to reach the completion criterion benchmark for native groundcover.

Outcomes of rehabilitation research and trials

RRT NUMBER	PROJECT/TRIAL NAME	OBJECTIVE OF TRIAL/PROJECT	METHODOLOGY	EXPECTED DATE OF COMPLETION	UPDATED DATE OF COMPLETION	STATUS	ON TRACK?	ON TRACK UPDATE
ARR000101 1								

Outcomes of completed trials and research

As this trial has only recently been completed, the findings have not been included in rehabilitation planning documents yet. The findings will be captured in relevant documents and planning processes during 2023.

Attachment 1 – Reporting Definitions

REPORTING CATEGORY		DEFINITION
A1	Total disturbance footprint – surface disturbance	All areas within a mining lease that either have at some point in time or continue to pose a rehabilitation liability due to surface disturbance activities. The total disturbance footprint is the sum of the total active disturbance, decommissioning, landform establishment, growth medium development, ecosystem and land use establishment, ecosystem and land use development and rehabilitation completion (see definitions below). Underground mining operations should not include the footprint of underground mining areas/subsidence management areas in the total disturbance footprint.
A2	Underground Mining Area	Underground mining operations areas/subsidence management areas.
B	Total active disturbance	Includes on-lease exploration areas, stripped areas ahead of mining, infrastructure areas, water management infrastructure, sewage treatment facilities, topsoil stockpile areas, access tracks and haul roads, active mining areas, waste rock emplacements (active/unshaped/in or out-of-pit), tailings dams (active/unshaped/uncapped) and temporary stabilised areas (e.g. areas sown with temporary cover crops for dust mitigation and temporary rehabilitation).
C	Rehabilitation – land preparation	Includes the sum of all disturbed land within a mining lease that have commenced any, or all, of the following phases of rehabilitation– decommissioning, landform establishment and growth medium development. Refer to the glossary of terms in this document for the definition of these phases of rehabilitation.

REPORTING CATEGORY		DEFINITION
D	Ecosystem and land use establishment	Includes the area which has been seeded/planted with the target vegetation species for the intended final land use. However, vegetation has not matured to a stage where it can be demonstrated that it will be sustainable for the long term and or require only a maintenance regime consistent with target reference/analogue sites. Typically, rehabilitation areas would be in this phase for at least two years (and usually more) before rehabilitation can be classified as being in the ecosystem and land use development phase. This phase does not apply to infrastructure areas that are being retained as part of final land use for the site.
E	Ecosystem and Land Use Development	Rehabilitation has matured to a level where target revegetation outcomes are on a trajectory towards meeting the final rehabilitation objectives and rehabilitation completion criteria (as verified by monitoring). This phase includes infrastructure areas that are to be retained for an approved post mining land use, following completion of all necessary measures to render the infrastructure fit for this purpose (for example structural integrity).
F	Rehabilitation Completion	The NSW Resources Regulator has determined in writing that the mining area has achieved the approved rehabilitation objectives and approved rehabilitation completion criteria and final landform and rehabilitation plan following the submission of *Form: ESF2 Rehabilitation completion and/or review of rehabilitation cost estimate and/or notification of mine or petroleum site closure.*
G	New active disturbance area	The area of any new active disturbance that has been created during the annual reporting period (definition A1 in Table 5).
H	New rehabilitation commenced during annual reporting period	The sum of any new rehabilitation commenced in the annual reporting period. These areas may be in the rehabilitation land preparation phase or the ecosystem & land use establishment phase (definitions C and D in Table 5).
I	Established rehabilitation (hectares)	The total area of land that is verified to be within either the ecosystem and land use development phase or the rehabilitation completion phase (definitions E & F in Table 5).

REPORTING CATEGORY		DEFINITION
J	Annual rehabilitation to disturbance ratio	The rehabilitation to disturbance ratio (H/G) indicates how many hectares of new rehabilitation are undertaken for each hectare of land disturbed during the year. A ratio of 1/1 indicates that the area of new rehabilitation and disturbance in that year are the same.
K	% Rehabilitated land to total mine footprint	The proportion of the total mine footprint (area of land that has been disturbed by past or present surface disturbance activities) that has established rehabilitation (I/A1 x 100). For open cut mining, the proportion of the total mine footprint verified to be "established rehabilitation" should substantially increase as an operation progresses towards mine closure.
L	Established rehabilitation for agricultural final land uses (hectares)	The percentage of total area of land that is verified to be within either the ecosystem and land use development phase or the rehabilitation completion phase (definitions E & F in Table 5) that have been returned to an agricultural final land use.
M	Established rehabilitation for native ecosystem final land uses (hectares)	The percentage of total area of land that is verified to be within either the ecosystem and land use development phase or rehabilitation completion phase (definitions E & F in Table 5) that have been returned to native ecosystem final land use.
N	Established rehabilitation for other/non-vegetated final land uses (hectares)	The percentage of total area of land that is verified to be within either the ecosystem and land use development phase or the rehabilitation completion phase (definitions E & F in Table 5) that have been returned to other/non-vegetated final land use.

Attachment 2 – Definitions

WORD	DEFINITION
Active	In the context of rehabilitation, land associated with mining domains is considered 'active' for the period following disturbance until the commencement of rehabilitation.
Active mining phase of rehabilitation	In the context of rehabilitation, the active mining phase of rehabilitation constitutes the rehabilitation activities undertaken during mining operations such as salvaging and managing soil resources, salvaging habitat resources, and native seed collection. This phase also includes management actions taken during operations to manage risks to rehabilitation and enhance rehabilitation outcomes such as selective handling of waste rock and management of tailings emplacements.
Analogue site	In the context of rehabilitation, an analogue site is a 'reference site' that represents an example of the defining characteristics (such as vegetation composition and structure or agricultural productivity) of the final land use. Characteristics of analogue sites can be assessed to develop the rehabilitation objectives and completion criteria for final land use domains.
Annual rehabilitation report and forward program	As described in the Mining Regulation 2016.
Annual reporting period	As defined in the Mining Regulation 2016.
Closure	A whole-of-mine-life process, which typically culminates in the relinquishment of the mining lease. It includes decommissioning and rehabilitation to achieve the approved final land use(s).
Decommissioning	The process of removing mining infrastructure and removing contaminants and hazardous materials.
Decommissioning Phase of Rehabilitation	Activities associated with the removal of mining infrastructure and removal and/or remediation of contaminants and hazardous materials. In the context of the rehabilitation management plan this phase of rehabilitation may also include studies and assessments associated with decommissioning and demolition of infrastructure or works carried out to make safe or 'fit for purpose' built infrastructure to be retained for future use(s) following lease relinquishment.

WORD	DEFINITION
Department	The Department of Regional NSW.
Disturbance	See Surface Disturbance.
Disturbance area	An area that has been disturbed and that requires rehabilitation. This may include areas such as on-licence exploration areas, stripped areas ahead of mining, infrastructure areas, water management infrastructure, sewage treatment facilities, topsoil stockpile areas, access tracks and haul roads, active mining areas, waste emplacements (active/unshaped/in or out-of-pit), tailings dams (active/unshaped/uncapped), and areas requiring rehabilitation that are temporarily stabilised (i.e. managed to minimise dust generation and/or erosion).
Domain	An area (or areas) of the land that has been disturbed by mining and has a specific operational use (mining domain) or specific final land use (final land use domain). Land within a domain typically has similar geochemical and/or geophysical characteristics and therefore requires specific rehabilitation activities to achieve the associated final land use.
Ecosystem and Land Use Development	This phase of rehabilitation consists of the activities to manage maturing rehabilitation areas on a trajectory to achieving the approved rehabilitation objectives and completion criteria. For vegetated land uses this phase may include processes to develop characteristics of functional self-sustaining ecosystems, such as nutrient recycling, vegetation flowering and reproduction, and increasing habitat complexity, and development of a productive, self-sustaining soil profile. This phase of rehabilitation may include specific vegetation management strategies and maintenance such as tree thinning, supplementary plantings and weed management.
Ecosystem and Land Use Establishment	This phase of rehabilitation consists of the processes to establish the approved final land use following construction of the final landform. For vegetated land uses this rehabilitation phase includes establishing the desired vegetation community and implementing land management activities such as weed control. This phase of rehabilitation may also include habitat augmentation such as installation of nest boxes.
Exploration	Has the same meaning as that term under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

WORD	DEFINITION
Final landform and rehabilitation plan	As defined in the Mining Regulation 2016.
Final land use	As defined in the Mining Regulation 2016.
Form and way	Means the form and way approved by the Secretary. Approved form and way documents are available on the Department's website.
Growth Medium Development	This phase of rehabilitation consists of activities required to establish the physical, chemical and biological components of the substrate required to establish the desired vegetation community (including short lived pioneer species. This phase may include spreading the prepared landform with topsoil and/or subsoil and/or soil substitutes, applying soil ameliorants to enhance the physical, chemical and biological characteristics of the growth media, and actions to minimise loss of growth media due to erosion.
Habitat	Has the same meaning as that term under the *Biodiversity Conservation Act 2016* and the *Fisheries Management Act 1994* (as relevant).
Indicator	An attribute of the biophysical environment (e.g. pH, topsoil depth, biomass) that can be used to approximate the progression of a biophysical process. It can be measured and audited to demonstrate (and track) the progress of an aspect of rehabilitation towards a desired completion criterion (i.e. defined end point). It may be aligned to an established protocol and used to evaluate changes in a system.
Land	As defined in the *Mining Act 1992.*
Landform Establishment	This phase of rehabilitation consists of the processes and activities required to construct the final landform. In addition to profiling the surface of rehabilitation areas to the approved final landform profile this phase may include works to construct surface water drainage features, encapsulate problematic materials such as tailings, and prepare a substrate with the desired physical and chemical characteristics (e.g. rock raking or ameliorating sodic materials).
Large mine	As defined in the Mining Regulation 2016.
Lease holder	The holder of a mining lease.

WORD	DEFINITION
Life of mine	The timeframe of how long a mine is approved to mine, from commencement to closure.
Mine rehabilitation portal	Means the NSW Resources Regulator's online portal that lease holders must use (via a registered account) to: ■ upload rehabilitation geographical information system (GIS) spatial data ■ develop rehabilitation GIS spatial data (using online tracing functions) ■ generate rehabilitation plans and rehabilitation statistics using the map viewer and Rehabilitation Key Performance Indicator functionalities. Data submitted to the mine rehabilitation portal is collated in a centralised geodatabase for use by the NSW Resources Regulator to regulate rehabilitation performance of lease holders.
Mining area	As defined in the *Mining Act 1992*.
Mining domain	A land management unit with a discrete operational function (e.g. overburden emplacement), and therefore similar geophysical characteristics, that will require specific rehabilitation treatments to achieve the final land use(s).
Mining land	As defined in the *Mining Act 1992.*
Native vegetation	Has the same meaning as that term under section 60B of the *Local Land Services Act 2013.*
Overburden	Material overlying coal or a mineral deposit.
Performance indicator	An attribute of the biophysical environment (for example pH, slope, topsoil depth, biomass) that can be used to demonstrate achievement of a rehabilitation objective. It can be measured and audited to demonstrate (and track) the progress of an aspect of rehabilitation towards a desired completion criterion, that is, a defined end point. It may be aligned to an established protocol and used to evaluate changes in a system.

WORD	DEFINITION
Phases of rehabilitation	The stages and sequences of actions required to rehabilitate disturbed land to achieve the final land use. The phases of rehabilitation are: ■ active mining ■ decommissioning ■ landform Establishment ■ growth medium development ■ ecosystem and land use establishment ■ ecosystem and land use development.
Progressive rehabilitation	The progress of rehabilitation towards achieving the approved rehabilitation completion criteria. This may be described in terms of domains, phases, performance indicators and rehabilitation completion criteria.
Rehabilitation Completion	The final phase of rehabilitation when a rehabilitation area has achieved the approved rehabilitation objectives and rehabilitation completion criteria for the final land use. Rehabilitation areas may be classified as complete when the NSW Resources Regulator has determined in writing that the relevant rehabilitation obligations have been fulfilled following submission of *Form ESF2 Rehabilitation completion and/or review of rehabilitation cost estimate* application by the lease holder.
Rehabilitation Completion criteria	As defined in the Mining Regulation 2016.
Rehabilitation cost estimate	As defined in the Mining Regulation 2016.
Rehabilitation management plan	As defined in the Mining Regulation 2016.
Rehabilitation objectives	As defined in the Mining Regulation 2016.
Rehabilitation risk assessment	As defined in the Mining Regulation 2016.
Rehabilitation schedule	The defined timeframes for progressive rehabilitation set out in the forward program.

WORD	DEFINITION
Relevant stakeholders	Means any persons or bodies who may be affected by the mining operations, including rehabilitation, carried out on the lease land, and includes: ■ the relevant development consent authority ■ the local council ■ the relevant landholder(s) ■ community consultative committee (if required under the development consent) or equivalent consultative group ■ affected land holder(s) ■ government agencies relevant to the final land use ■ affected infrastructure authorities (electricity, telecommunications, water, pipeline, road, rail authorities) ■ local Aboriginal communities, and ■ any other person or body determined by the Minister to be a relevant stakeholder in relation to a mining lease.
Risk	The effect of uncertainty on objectives. It is measured in terms of consequences and likelihood (AS/NZS ISO 31000:2009).
Secretary	The Secretary of the Department.
Security deposit	An amount that a mining lease holder is required to provide and maintain under a mining lease condition, to secure funding for the fulfilment of obligations under the lease (including obligations that may arise in the future).
Surface disturbance	Includes activities that disturb the surface of the mining area, including mining operations, ancillary mining activities and exploration.
Tailings	A combination of the fine-grained solid material remaining after the recoverable metals and minerals have been extracted from the mined ore, and any process water[2].
Waste	Has the same meaning as that term under the *Protection of the Environment Operations Act 1997*.

[2] Commonwealth of Australia (DITR), 2007. *Tailings Management.*

Attachment 2 – Rehabilitation Complaints

DATE	COMPLAINANT	COMPLAINT DETAILS	RESPONSE DETAILS	STATUS OF RESPONSE	DATE RESPONSE COMPLETED (IF APPLICABLE)

Attachment 3 – Stakeholder consultation

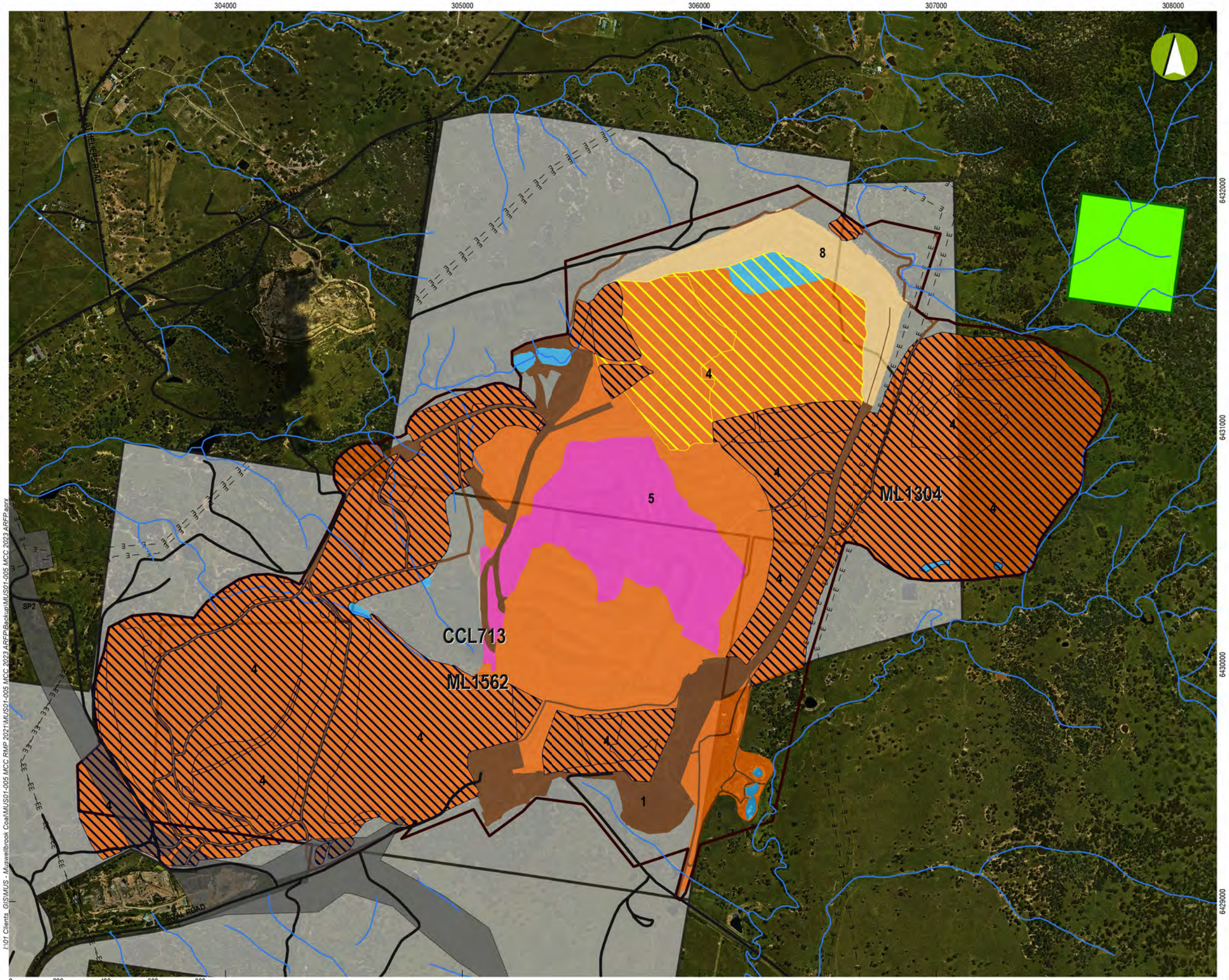
DATE	STAKEHOLDER	CONSULTATION ACTIVITIES AND FORMS	MATTERS SUBJECT TO CONSULTATION	ACTIONS TAKEN
31 May 2022	Community	Newsletter	Information on rehabilitation included in annual community newsletter.	No feedback was received from the community in relation to this information.
22 Sep 2022	Community Consultative Committee (CCC)	Presentation via email	Information on Rehabilitation Management Plan included in presentation.	No actions
22 Mar 2022	Resources Regulator	Site Inspection	Review of rehabilitation progress on site.	A notice was received following this site inspection regarding the requirement to undertake Landform Evolution Modelling. This modelling is due to be completed by the end of January 2023.
1 Aug 2022	NSW Resources Regulator	Online portal	Submission of Rehabilitation Objectives, Completion Criteria and Final Landform and Rehabilitation Plan to online portal.	No comments have been received by the end of the reporting period.
4 Aug 2022	DPE – Environment, Energy and Science (formally OEH)	Letter	Copy of the RMP provided requesting comments.	No comments have been received by the end of the reporting period.
6 Dec 2022	Community Consultative Committee (CCC)	Meeting	Update on mine closure activities included in general presentation.	General discussion during the meeting. No action required.
7 Jun 2022	Community Consultative Committee (CCC)	Meeting	Update on mine closure activities included in general presentation.	General discussion during the meeting. No action required.
4 Aug 2022	Community Consultative Committee (CCC)	Letter	Copy of the RMP provided requesting comments.	No comments have been received by the end of the reporting period.
4 Aug 2022	Muswellbrook Shire Council	Letter	Copy of the RMP provided requesting comments.	MSC provided comments on the RMP. MCC has prepared a response to these comments with these comments to

DATE	STAKEHOLDER	CONSULTATION ACTIVITIES AND FORMS	MATTERS SUBJECT TO CONSULTATION	ACTIONS TAKEN
				be submitted to MSC along a response to comments on a pending consent modification.
7 Apr 2022	Community Consultative Committee (CCC)	Meeting	Presentation on mine closure activities.	General discussion on mine closure during the meeting. No action required.
27 Oct 2022	Resources Regulator and Muswellbrook Shire Council	Combined Meeting	Provide an update on mine closure activities.	General discussion during the meeting. No actions from meeting in relation to rehabilitation.

Attachment 4 – Plans

Rehab Report Plan 1A Current Status Mining 2022.pdf

Rehab Report Plan 1B Current Landform Contours 2022.pdf



Legend

- Project Approval Boundary
- Road
- Electricity Transmission Line
- Waterways
- Biodiversity Offset Area

Current Authorisations

- Coal - Current Titles

Land Zone

- Bypass Zoning

Mining Domain Type

- Domain 1: Infrastructure Area
- Domain 3: Water Management Area
- Domain 4: Overburden Emplacement Area
- Domain 5: Active Mining Area (Open cut void)
- Domain 8a: Other - Highwall

Rehabilitation Phase

- Landform Establishment
- Ecosystem and Land Use Development

I:\01 Clients_GIS\MUS - Muswellbrook Coal\MUS01-005 MCC RMP 2021\MUS01-005 MCC 2023 ARFP Backup\MUS01-005 MCC 2023 ARFP.aprx

INTEGRATED ENVIRONMENTAL MANAGEMENT AUSTRALIA
www.iema.com.au

Sheet Size : A3

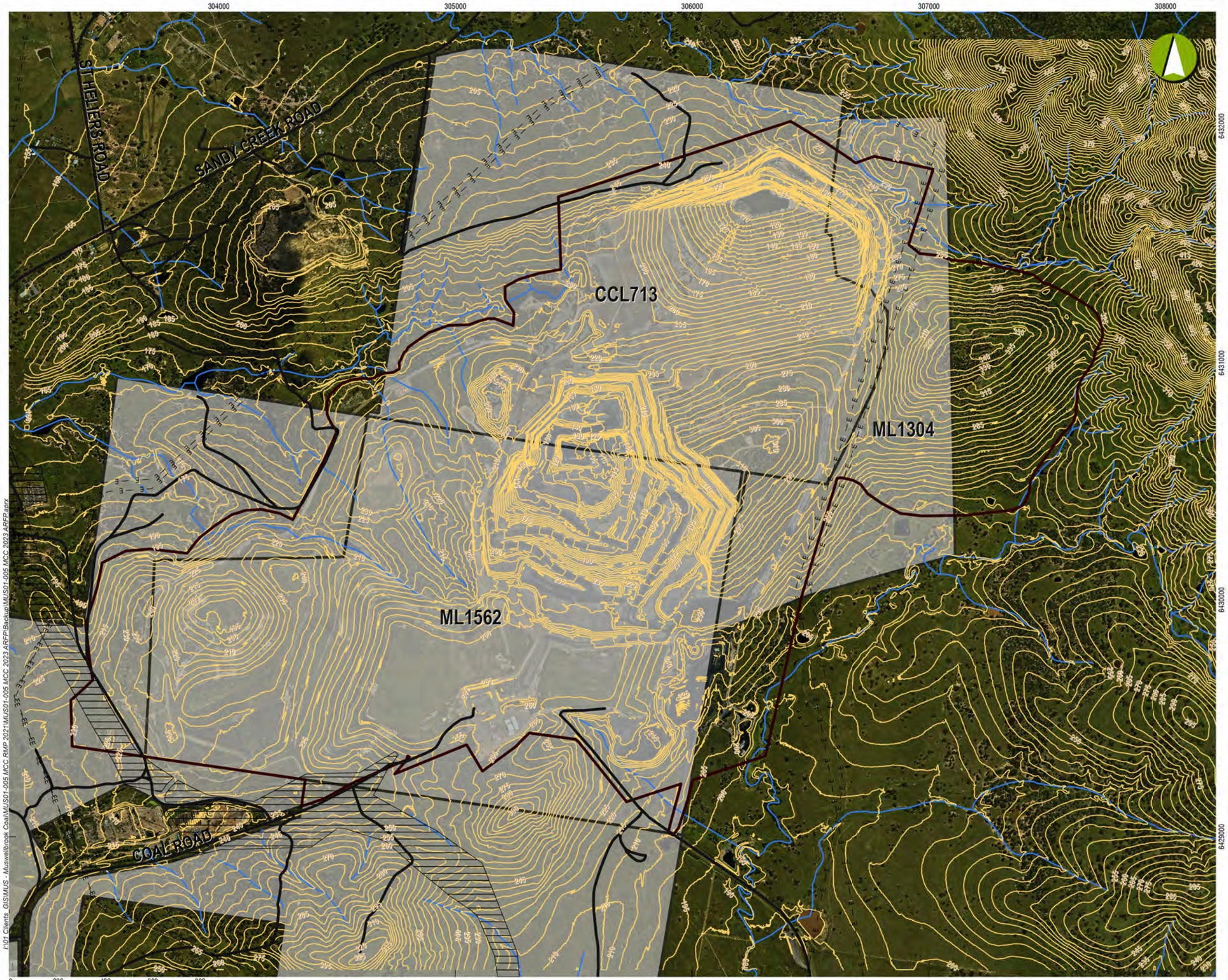
Source: Project approval boundary, rehabilitation, disturbance, watercourses, current authorisations and aerial imagery from Muswellbrook Coal (2022).

Muswellbrook Coal ARR 2022

Current Status of Mining and Rehabilitation Plan

PLAN 1A

Mine name	Muswellbrook Coal
Plan name	Annual Rehabilitation Report
Year of anticipated relinquishment	2050
Data theme submission ID No.	2493 and 4031
Spatial Reference	GDA 1994 MGA Zone 56
Plan date (date created)	20/02/2023



Legend

- Current Landform Contours (5m)
- Project Approval Boundary
- Electricity Transmission Line
- Railway
- Road
- Waterways

Land Zone

- Bypass Zoning

Current Authorisations

- Coal - Current Titles

I:\01 Clients_GIS\MUS - Muswellbrook Coal\MUS01-005 MCC RMP 2021\MUS01-005 MCC 2023 ARFP Backup\MUS01-005 MCC 2023 ARFP.aprx

INTEGRATED ENVIRONMENTAL MANAGEMENT AUSTRALIA
www.iema.com.au

Sheet Size : A3

Source: Project approval boundary, watercourses, current authorisations and aerial imagery from Muswellbrook Coal (2022). Contours from Muswellbrook Coal (2023) and Aerometrex (2022).

Muswellbrook Coal ARR 2022

Current Landform Contours

PLAN 1B

Mine name	Muswellbrook Coal
Plan name	Annual Rehabilitation Report
Year of anticipated relinquishment	2050
Data theme submission ID No.	3972
Spatial Reference	GDA 1994 MGA Zone 56
Plan date (date created)	20/02/2023