NSW GOVERNMENT

NSW Resources Regulator

FWP0001119

DARTBROOK MINE FORWARD PROGRAM

Monday 19 December 2022 to Thursday 18 December 2025

Contents

Summary

DETAIL	
Mine	Dartbrook Mine
Reference	FWP0001119
Forward program commencement date	Monday 19 December 2022
Forward program end date	Thursday 18 December 2025
Forward program revision (if applicable)	
Contact	Jeff William Beatty
Mining leases	ML 1497 (1992), CL 386 (1973), ML 1381 (1992), ML 1456 (1992)
Project location	AQC DARTBROOK PTY LTD
Date of submission	Monday 30 January 2023

Important

The department may make the information in your program 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 program to be confidential, please communicate this to the department via the message function on this submission within the NSW Resources Regulator Portal.

Three-year forecast – surface disturbance activities

Project description

Dartbrook Mine is managed under Development Consent DA 231-07-2000 granted on 28 August 2001. DA 231-07-2000 authorises coal extraction from the Kayuga, Mt Arthur, Piercefield and Wynn coal seams. To date, mining operations have been conducted in the Kayuga and Wynn seams. Modification 7 to DA 231-07-2000 (approved 11 March 2022) facilitated bord and pillar mining of the Kayuga Seam and extended the approved period of mining until 5 December 2027. All four of the target seams are approved to be mined using longwall mining methods; however, no longwall mining is proposed in this Forward Work Program.

Dartbrook Mine includes surface facilities on the eastern and western sides of the New England Highway, known as the East Site and West Site, respectively.

Dartbrook Mine has been under care and maintenance since 2007. Mining operations are proposed to re-commence in 2023 and continue for the remainder of the approved mining period.

Description of surface disturbance activities

Exploration activities

No exploration activities are proposed for the term of this Forward Work Program.

Construction activities

Recommencement of mining operations will entail the use of surface infrastructure for coal processing, product transportation, water & waste management and other ancillary activities. The surface infrastructure required for these ancillary mining activities is already in place.

Due to the prolonged period of care and maintenance at Dartbrook Mine, some infrastructure components may need to be refurbished or replaced. In addition, certain components will be fitted with additional noise attenuation measures. These works will take place within the existing infrastructure areas and therefore will not entail any surface disturbance.

Mining schedule

Mining development method and sequencing and general mine features.

Mining operations will recommence through bord and pillar mining of the Kayuga Seam, as approved through Modification 7 to DA 231-07-2000.

Three longwall panels were extracted in the Kayuga Seam prior to Dartbrook Mine being placed under care and maintenance. The existing longwall panels have a west-east orientation. To facilitate the scheduled bord and pillar mining, primary headings (known as the Western Mains) will be driven towards the west. The Western Mains will be immediately north of and parallel to the previous Kayuga Seam longwall panels. The bord and pillar mine plan includes nine production panels that emanate from the Western Mains in a north-south orientation.

Bord and pillar mining is an underground mining method and therefore will not result in surface disturbance. The bord and pillar workings will also be designed such that subsidence is imperceptible.

Areas identified for emplacements, the sequencing of emplacements, construction, and management.

No overburden emplacement is required for bord and pillar mining.

Processing infrastructure activities and the location of tailings facilities and schedule for emplacement

Raw coal is transported from the underground mine to the East Site via conveyors in the Hunter Tunnel. The Hunter Tunnel 'daylights' at the ROM hopper, where coal is crushed and screened. Crushed coal is then processed at the CHPP (if required) to produce a product suitable for export.

Rejects materials (coarse and fine) will be deposited within the approved REA, which is located on the slopes of the adjacent Browns Mountain. Coarse rejects and dried tailings will initially be stockpiled to the east of the CHPP. The approved reject stockpile was cleared of carbonaceous material during care and maintenance, but will be recommissioned for future operations. Stockpiled materials will be transported to the REA using trucks. The haulage route is predominantly defined by an existing unsealed road. This road will be sealed to minimise dust generation.

The approved REA encompasses a large area to the east of the CHPP. A relatively small portion of the approved REA was utilised for reject emplacement prior to 2007. It is proposed that reject materials generated by future mining will be deposited immediately south of the completed portion of the REA.

Reject emplacement will be undertaken from recommencement of mining to the end of the operational phase. Reject materials will be emplaced in lifts until the target elevation is achieved in the final year of mining (i.e. 2027).

Waste disposal and materials handling operations.

Dartbrook Mine produces a range of non-mineral waste materials as a result of its activities onsite. To maximise recycling opportunities onsite, Dartbrook Mine utilises a colour coded recycling system. A waste management contractor is responsible for the removal and disposal of all non-process waste generated onsite.

Offsite treatment and disposal facilities are used to ensure that all waste is appropriately tracked, disposed of and reported in accordance with the approved Waste Management Plan.

Key production milestones

MATERIAL	UNIT	YEAR 1	YEAR 2	YEAR 3
Stripped topsoil (if applicable)	(m^3)	2,253	6,948	4,992
Rock/overburden	(m^3)	23,443	115,800	83,200
Ore	(Mt)	0.08	1.57	2.32
Reject material[1]	(Mt)	0.02	0.39	0.58
Product	(Mt)	0.06	1.18	1.74

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

Three-year rehabilitation forecast

Rehabilitation planning schedule

Rehabilitation planning schedule

The existing mine infrastructure will be required for the entirely of the operational phase (i.e. until 5 December 2027). Decommissioning of infrastructure and rehabilitation of disturbed areas will take place following cessation of operations. The RMP identifies the assets that will be retained for the post-mining use and those that will be decommissioned.

Additional disturbance will occur due to further development of the REA. Progressive rehabilitation of the REA is scheduled to commence in 2024 and will continue until the post-mining phase.

Stakeholder consultation

In early 2022, AQC sold the portion of its landholding that is not required for Dartbrook Mine's surface infrastructure. Consultation with the new owner (Trepang Services) has confirmed that agriculture (primarily grazing) is the intended post-mining land use for the site.

It is proposed that the Dartbrook rail loop and spur will be retained for future use rather than decommissioned. AQC has previously entered into a memorandum of understanding with Australian Rail Track Corporation regarding control of the rail loop and spur.

It is proposed that the Western Access Road will be dedicated as a public road following cessation of mining. This will be the subject of further consultation with Muswellbrook Shire Council.

Consultation with these potential future land users will continue over the next three years.

Rehabilitation studies, risk assessments and/or design work

A rehabilitation risk assessment (RRA) was undertaken in March 2022 to identify potential risks to achieving the post-mining land use. The RRA included input from experts in mining engineering, geotechnical engineering, hydrogeology, soils and rehabilitation.

The RRA considered all assets at Dartbrook Mine, including both surface and underground infrastructure. Each asset was assigned its relevant rehabilitation objectives under the Development Consent. For each asset, the risks to achieving the relevant rehabilitation

objectives were identified and control measures were recommended (where appropriate). The outcomes of the RRA are presented in Section 3 of the RMP.

A conceptual design has been developed for the REA, including the additional reject materials to be generated from 2023 to 2027. The REA has been designed to be consistent with the rehabilitation objectives under DA 231-07-2000, integrate with the surrounding landscape and be suitable for the post-mining land use.

Rehabilitation research and trials

RRT NUMBER	PROJECT/TRIAL NAME	OBJECTIVE OF TRIAL/PROJECT	METHODOLOGY	EXPECTED DATE OF COMPLETION	STATUS
RRT0001083	**REA Grazing Trial**	Determine whether the rehabilitated REA can support cattle grazing.	The suitability of the rehabilitated REA for agriculture was assessed using weight gain in cattle and pasture growth as indicators. From April to December 2015, 27 steers were grazed within the rehabilitated REA. These cattle were weighed at the beginning and end of the trial to determine their growth. Pasture growth was also monitored at five sites within the rehabiltitated REA. Different combinations of grass species were used at the monitoring sites. The trial concluded in December 2015	20 Jan 2023	Complete

Rehabilitation maintenance and corrective actions

AQC will implement a rehabilitation monitoring program that compares rehabilitated areas with analogue sites. Analogue sites will be established at two years before the cessation of mining operations (i.e. established by December 2025) to establish baseline conditions. If practicable, at least one analogue site should be established within the Hunter River floodplain, as such a site would be indicative of high-quality agricultural land.

Monitoring of rehabilitation areas will commence at the Ecosystem and Land Use Establishment phase. It is recommended that at least five rehabilitation monitoring sites are established, including:

- Two sites at the East Site;
- One site within the new portion of the REA (i.e. developed from 2023-2027);
- One site at the West Site; and
- One site within the footprint of the Evaporation Ponds.

Wherever practicable, rehabilitation monitoring will be undertaken at annual intervals. Rehabilitation in a particular area will be considered successful if the following criteria are satisfied at two consecutive monitoring rounds:

- Ground cover exceeds 70%; and
- Less than 10% of vegetation is composed of undesirable species (weeds).

If monitoring indicates that rehabilitation is not meeting the desired targets, the Trigger Action Response Plan in the RMP will be implemented.

Rehabilitation schedule

The REA will be progressively rehabilitated once the emplaced material reaches its final design level and achieves the necessary level of consolidation and strength. Progressive rehabilitation will involve capping the emplaced rejects with inert material, top-dressing and re-vegetation to establish open grassland.

Subsidence remediation for underground operations

Previous longwall mining operations were suspended in 2006. All subsidence effects associated with past mining have already occurred. Minor remediation works have been undertaken to repair subsidence impacts such as surface cracking.

The bord and pillar mining scheduled for the remainder of the approved mining period will not result in any perceptible subsidence.

Progressive mining and rehabilitation statistics

Three-yearly forecast cumulative disturbance and rehabilitation progression

	FORECAST	UNIT	YEAR 1	YEAR 2	YEAR 3
A	**Total surface disturbance footprint**	(ha)	168.26	174.05	178.21
B	**Total active disturbance**	(ha)	137.3	142.58	145.7
C	**Land prepared for rehabilitation**	(ha)	0	0.5	1.55
D	**Ecosystem and land use establishment**	(ha)	0	0	0

Rehabilitation key performance indicators (KPIs)

	FORECAST	UNIT	YEAR 1	YEAR 2	YEAR 3
O	**Total new active disturbance area**	(ha)	1.88	5.79	4.16
P	**Area proposed for active rehabilitation**	(ha)		0.5	1.04
Q	**Annual rehabilitation to disturbance ratio**			0.09	0.25

Attachment 1 – Reporting Definitions

REPORTING CATEGORY		DEFINITION
A	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.
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.
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.

REPORTING CATEGORY	DEFINITION
O	The area of any new active disturbance that will be created during the next three years, as defined under definition A1 (definition A1 Table 5).
P	The sum of any new rehabilitation to be commenced in the next three years. These areas may be in the phases "Rehabilitation - Land Preparation" or the "Ecosystem & Land Use Establishment" (definitions C & D in Table 5).
Q	The rehabilitation to disturbance ratio (S / R) indicates how many hectares of new rehabilitation are undertaken for each hectare of land disturbed during the three years. A ratio of 1/1 indicates that the area of new rehabilitation and disturbance in that period are the same.

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 3 – Plans

Plan 2A attachment not provided.

Plan 2B attachment not provided.

Plan 2C attachment not provided.